

CA CloudMinder™

Installation Guide

1.52



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CA Technologies Product References

This document references the following CA Technologies products:

- CA CloudMinder™ Identity Management
- CA CloudMinder™ Advanced Authentication
- CA CloudMinder™ Single Sign-On
- CA Directory
- CA IdentityMinder™
- CA AuthMinder™
- CA RiskMinder™
- CA SiteMinder®
- CA SiteMinder® for Secure Proxy Server
- CA Layer 7

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Chapter 1: Installation Overview

This section contains the following topics:

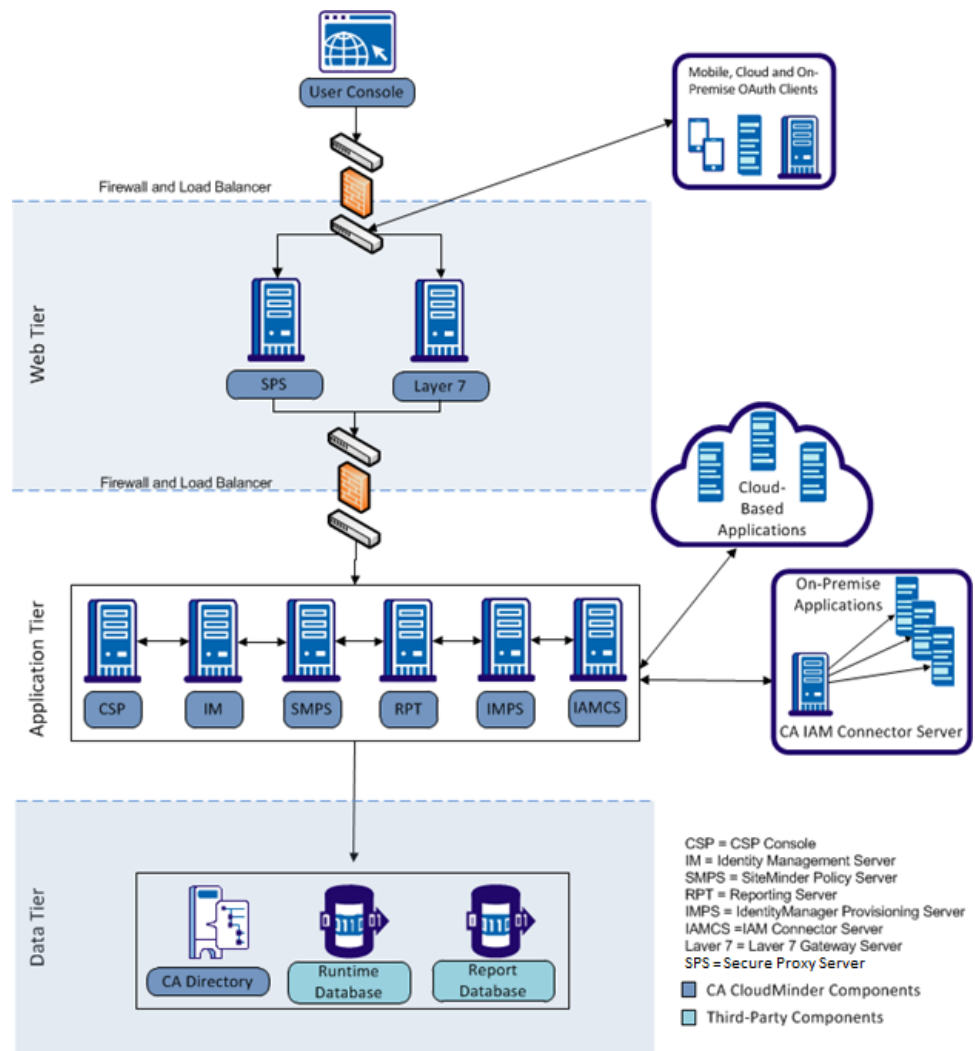
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[High Availability Architecture](#) (see page 9)

[Order of Component Installation](#) (see page 9)

[How to Deploy CA CloudMinder](#) (see page 11)

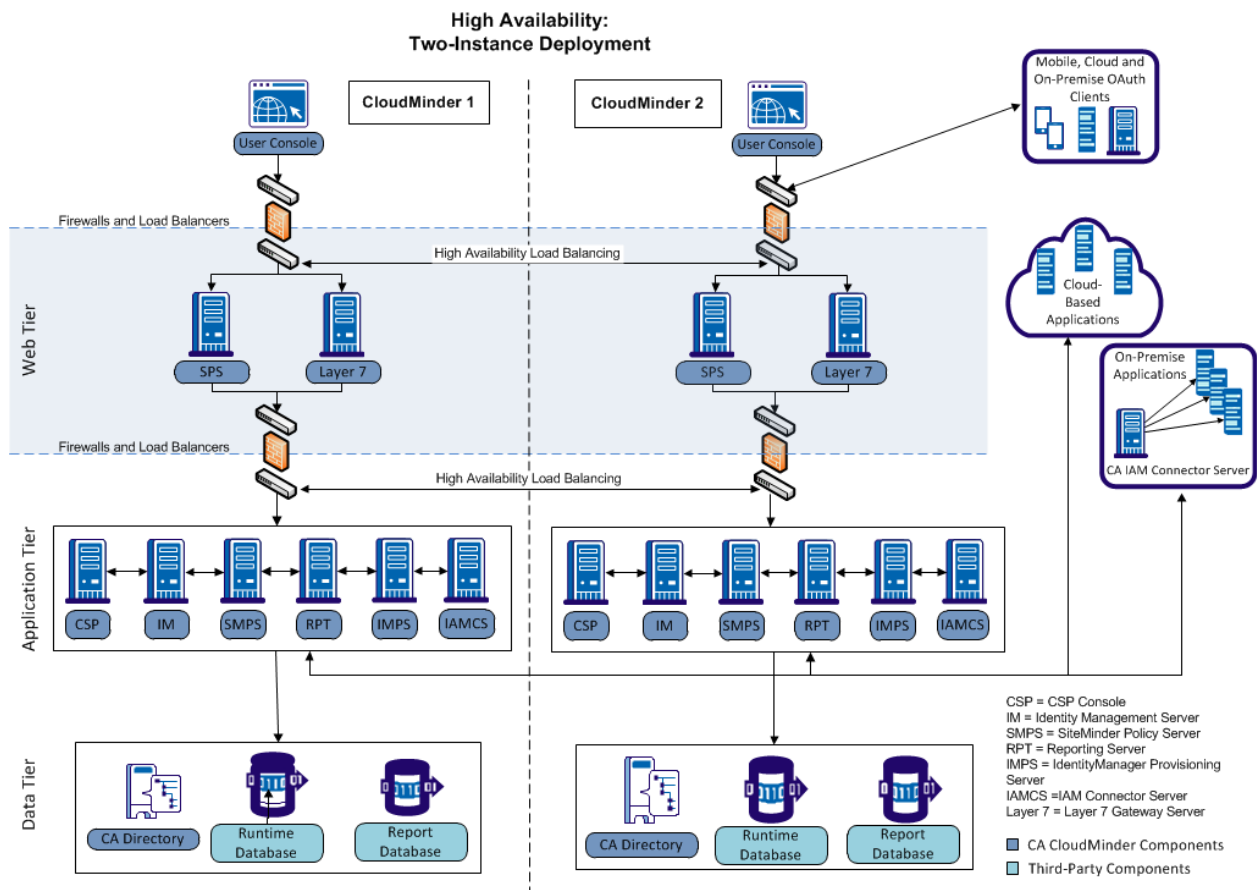
Standalone Architecture



CA CloudMinder is deployed using a three-tier architecture. Components are separated into web interface, application, and data tiers. Web services connect these tiers. The deployment architecture for a standalone installation is as follows:

High Availability Architecture

In a production setting, we recommend that you use a high-availability deployment. The deployment includes an Oracle RAC or a PostgreSQL databases in a Red Hat cluster. If any server or other component becomes unavailable, a duplicate server operates in its place. This approach minimizes the risk of service interruption.



Order of Component Installation

You can deploy CA CloudMinder in a Linux environment only. Prepare your installation environment accordingly. These separate systems can be physical or virtual. Have the appropriate physical or virtual hardware available before you begin installation.

You install system components in a specific order, beginning with the data tier. You then move upward through the architecture, installing the application servers and components, ending with the web and interface components. You install each component on a separate system as follows:

- Oracle or PostgreSQL database software

- CA Directory server
- Provisioning Server
- CA IAM Connector Server CA IAM CS
- CA SiteMinder® Policy server
- CSP console
- Secure Proxy server
- Identity Management server
- Business Objects server, if you plan to install CA Business Intelligence to enable reporting for your environment.
- Layer 7 Gateway

Install each component and confirm that it is running before you install the next component. For example, for a two-instance high-availability deployment, first you install two instances of CA Directory server. Then, you install two instances of Provisioning server as the next procedure.

How to Deploy CA CloudMinder

As a hosting administrator, you need an understanding of the high-level procedures for installing and configuring CA CloudMinder. This overview describes the process for creating a CA CloudMinder environment and includes links to detailed instructions.

1. Install CA CloudMinder, including:
 - [Installing all server components](#) (see page 19)
 - [Configuring load-balancing and high availability](#) (see page 161)
 - [Accessing logs](#) (see page 177)
2. Create tenants.
3. Replace default user accounts.

For security reasons, we recommend that you replace default user accounts and passwords with your own secure administrator accounts.
4. Configure the authentication method for the tenant.
 - Standard authentication
 - Advanced authentication, if applicable
5. Configure single sign-on, if applicable.
6. Configure your tenant user environment, including:
 - Assigning roles and adding administrators
 - Creating groups
 - Configuring managed endpoints to connect the system to external resources
 - Configuring provisioning to give users accounts in external resources
 - Configuring services to give users protected access to external resources
7. Add users to the tenant

In the *SSO Getting Started Guide*, the following topics describe how to configure common combinations of services:

- SSO Using Advanced Authentication and Provisioning
- SSO Using a Third-Party IdP and Self-Registration
- SSO Using an OAuth Authentication Scheme and Self-Registration

Chapter 2: Prerequisite Installation

Be sure to perform the following procedures before you begin the server installation.

Database Installation

Install Oracle or PostgreSQL database software for Identity Management runtime data and for reporting data.

PostgreSQL

- You can download the PostgreSQL software from <http://www.postgresql.org/>
Install the PostgreSQL client (postgresql-8.4.7-2.el6.x86_64) on the systems with the SiteMinder Policy Server and the Identity Management server.
- Install SQLAnywhere as the runtime database for reporting.
For Business Objects, use the CA Business Intelligence Installation Guide to perform a custom installation and choose SQLAnywhere for the Business Objects(CMS and the Audit database).

Oracle

- You can purchase the software from Oracle. Install an Oracle 11g database.
- Configure the database with all services (such as listener and DB) running.
- For good performance, the Oracle database requires the following settings:
 - Sessions=772
 - Processes=500
- Configure the Oracle database with a UTF-8 encoded character set. If you plan to enable Advanced Authentication for your environment, install the AL32UTF8 Oracle database character set.
- Create an Oracle user with the username CamAdmin and privileges to create tablespaces and users. Assign the CamAdmin user the DBA and Connect roles in Oracle. The CamAdmin user is used to create other base CA CloudMinder system users. Make a note of the password for CamAdmin for later use during installation.
- If you plan to install CA Business Intelligence for reporting, install and configure an additional logical database to house reporting data; install the new database on the same Oracle RAC server as the runtime database.

Database Configuration

Follow these steps:

1. Perform the following steps on all Oracle and PostgreSQL servers:
 - a. Edit the `/etc/ntp.conf` file
Add `"server <_ntp_server>"` to the list of servers
Where `<_ntp_server>` is the IP address of your NTP server.
 - b. Restart the `ntpd` service as follows:
`service ntpd restart`
 - c. Enable the `ntpd` service as follows:
`chkconfig ntpd on`
2. Increase the processes and sessions for the Oracle database servers as follows:
 - a. Launch SQL Plus and connect as the Oracle system database administrator.
 - b. Under SQL Plus, run the following commands:

```
alter system set processes=500 scope=spfile;  
alter system set sessions=824 SCOPE=spfile;  
ALTER SYSTEM SET EVENT='44951 TRACE NAME CONTEXT FOREVER, LEVEL  
1024' scope=spfile;  
shutdown immediate  
startup
```

3. To enable on the Oracle database transactions for Workpoint 3.5, execute the following commands, substituting an appropriate value for *Identity Management user*:

```
ALTER SYSTEM SET JAVA_POOL_SIZE=120M scope=spfile;
ALTER SYSTEM SET SHARED_POOL_SIZE=240M scope=spfile;
create pfile from spfile;
shutdown immediate;
startup;
@$ORACLE_HOME\javavm\install\initjvm.sql;
@$ORACLE_HOME\javavm\install\initxa.sql;
grant select,insert,update,delete on DBA_PENDING_TRANSACTIONS to
Identity Management user;
grant select,insert,update,delete on DBA_PENDING_TRANSACTIONS to
system;
shutdown immediate;
startup;
```

Note: You can ignore errors such as "ORA-29539: Java system classes already installed." However, you may receive a disconnect message from the database. This error is mostly observed while executing the following command:

```
@$ORACLE_HOME\javavm\install\initjvm.sql;
```

If you receive this error, continue with the next SQL command:

```
@$ORACLE_HOME\javavm\install\initjvm.sql;
```

4. To enable on the PostgreSQL database transactions for Workpoint 3.5, follow these steps:

- a. Execute the following commands:

```
export POSTGRES_HOME=PostgreSQL Installation directory
cd $POSTGRES_HOME/data
```

- b. Set max_connections to a value based on the number of users to be updated with the bulk loader task. The value should be greater than the number of connections you enable in your connection pool.
- c. Update postgresql.conf to set max_prepared_transactions to the max_connections value or higher.

If you set max_prepared_transactions to 0, you disable transactions.

- d. Restart the database as follows:

```
cd $POSTGRES_HOME/bin
./pg_ctl restart -D $POSTGRES_HOME/data -m fast
```

Port Communication Tables

We recommend that you configure a firewall and load balancer between external internet traffic and the Secure Proxy Server. We also recommend that you configure a firewall and load balancer between the Secure Proxy Server and the system application tier.

The following table shows the ports to configure on your firewalls and load balancers. The load balancer receives inbound traffic from the originating component over the Port In. Traffic traveling outbound from the load balancer uses the Port Out.

Open the appropriate ports on your load balancers.

Component	Port In	Port Out	Traffic Flow	Description
Web Tier Load Balancer (LB1)	443	443	(ext)->LB1->SPS	External traffic distributed across all Secure Proxy Server (SPS) instances.
Web Tier Load Balancer	8443	8443	(ext)->LB1->L7	External calls to the Layer 7 Gateway (L7) distributed across all Gateway instances.
Web Tier Load Balancer	1812	1812	(ext)->LB1->SPS	External calls to the Radius Proxy server (Radius) distributed across all SPS instances.
Application Tier Load Balancer (LB2)	8443	8080	a) SPS->LB2->IM b) SPS->LB2->IM.SMTP	a) Identity Management requests coming from SPS distributed across all IM instances. b) SMTP requests coming from SPS distributed across all IM instances.
Application Tier Load Balancer	8080	8080	a) IMPS->LB2->IM b) SMPS->LB2->IM	a) Identity Management requests coming from Provisioning Server distributed across all IM instances. b) Identity Management requests coming from SiteMinder Proxy Server (SMPS) distributed across all IM instances.
Application Tier Load Balancer	22002	22001	SPS->LB2->IAMCS	CA IAM CS (IAMCS) requests coming from SPS distributed across all IM instances.
Application Tier Load Balancer	443	20080	SPS->LB2->IAMCS	IAMCS management requests coming from SPS distributed across all IM instances.
Application Tier Load Balancer	44441	44441	a) SPS->LB2->SMPS b) IM->LB2->SMPS	a) SMPS requests coming from SPS distributed across all SMPS instances. b) SMPS requests coming from IM distributed across all SMPS instances.

Application Tier Load Balancer	9443	9090	a) SPS->LB2->SMPS b) SPS->LB2->SMPS	a) SMPS (authentication tenant web services) requests coming from SPS distributed across all SMPS instances. b) SMPS (authentication data service) requests coming from SPS distributed across all SMPS instances.
Application Tier Load Balancer	9090	9090	IM->LB2->SMPS	SMPS (authentication unified directory service) requests coming from the CSP console distributed across all SMPS instances.
Application Tier Load Balancer	9743	9742	SPS->LB2->SMPS	SMPS (AuthMinder) requests coming from SPS distributed across all SMPS instances.
Application Tier Load Balancer	9742	9742	IM->LB2->SMPS	SMPS (AuthMinder) requests coming from IM distributed across all SMPS instances.
Application Tier Load Balancer	9745	9745	IM->LB2->SMPS	SMPS (AuthMinder management service) requests coming from IM distributed across all SMPS instances.
Application Tier Load Balancer	7680	7680	IM->LB2->SMPS	SMPS (RiskMinder) requests coming from IM distributed across all SMPS instances.
Application Tier Load Balancer	1812	1814	SPS->LB2->Auth.Radius	Radius requests coming from the Radius Proxy running inside SPS. Port 1814 is used to respond back to the Radius Proxy.
Application Tier Load Balancer	20498	20498	L7->LB2->DXrouter	User Directory requests coming from the Layer 7 Gateway distributed across the application tier DXrouter instances.

IM = Identity Management

SPS = Secure Proxy Server

IMPS = Provisioning Server

SMPS = SiteMinder Policy Server

IAMCS = CA IAM Connector Server

L7 = Layer 7 Gateway Server

Radius = Radius Proxy Server

Product ISO Images

You receive instructions for downloading CA CloudMinder files when you receive your license.

To help ensure that the files download successfully, consider the following notes:

- Use Download Manager to download the files.
- Check the MD5SUM and size for each file after you download them.

CA CloudMinder 1.52	ISO File Name	MD5SUM	File Size
CA Business Intelligence r3.3 for Linux - DVD	DVD06213531E.iso	2276e0786505e7ad3504b3a6ca77c864	5,415,825,408
CA CloudMinder 1.52 Cloud Components (DVD 1 of 2)	DVD11092655E.iso	825cd4207f479672912a07cb4b4ba092	3,117,498,368
CA CloudMinder 1.52 Cloud Components (DVD 2 of 2)	DVD11092847E.iso	4f50a4e36196af0d396dcdd6fec0a9c	2,909,419,520
CA CloudMinder 1.52 On-premise Components	DVD11161206E.iso	216f0ebca9980336f3b6e451e489b7ad	1,784,479,744

Chapter 3: Server Installation

Be sure that you have performed the [prerequisite installation](#) (see page 13) procedures before you begin the server installation.

This section contains the following topics:

[Properties Files](#) (see page 19)

[Directory Server](#) (see page 20)

[Provisioning Server](#) (see page 29)

[Connector Server](#) (see page 41)

[SiteMinder Policy Server](#) (see page 52)

[CSP Console](#) (see page 69)

[Secure Proxy Server](#) (see page 76)

[Identity Management Server](#) (see page 87)

[Report Server](#) (see page 107)

[Layer 7 Gateway Server](#) (see page 139)

Properties Files

Each server component has a properties file, with the exception of the Layer 7 Gateway servers. Before installing a component, complete the properties file with information such as system and database user names, passwords, and host names. During installation, the properties file distributes the information, enabling components to function properly and communicate with one another.

You need the properties.sh files during future upgrades and for general reference. The installation of the server backs up the properties.sh file to this location with an appropriate time stamp:

`/opt/CA/config/`

If you prefer to use a different location, set the TARGET environment variable to that location.

Important! For security purposes, the backed up file excludes all passwords; therefore, make separate arrangements to recall the passwords you need.

Directory Server

Standalone Directory Server

Use this procedure to install a CA Directory Server.

After you complete this procedure, continue with the Directory Server 2 procedure for a high-availability deployment. Otherwise, continue with installing the Provisioning Server after you complete this procedure.

The Provisioning Directory is installed as part of CA Directory Kit.

CA Directory Pre-Installation Steps

To prepare for installation, confirm that your server environment is properly prepared. Then install the required packages.

Follow these steps:

1. Install 64-bit Linux RHEL 6.1.
2. Download, but do not install, a 64-bit JDK to your local system or to a file share. You can also use a JRE in place of a JDK.

Note: The system installer can install the JDK automatically. We recommend that you download a JDK and allow the system to install it.

3. Verify that the systems where you plan to install CA Directory and the Provisioning Server can ping each other. For a high availability installation, make sure each system can ping the three other systems. I.e., each CA Directory system can ping the other, and can ping both Provisioning Server systems, and vice versa.
4. Be sure that this system has sufficient disk space for the number of tenants it will support.

When you deploy a tenant, an LDIF file is uploaded through DSA Management. The upload process requires twice the amount of space. For example, if the DSA data store is 2.5 GB, the system needs 5 GB available while the LDIF is loading.

5. Obtain the Directory Server ISO image from the CA Support site and extract it.
6. Copy the kit (CAM-DIR_kit-*date*.zip) to / (the root folder).
7. Unzip the kit.
8. Install the following packages:
 - binutils-2*x86_64*
 - glibc-2*x86_64* nss-softokn-freebl-3*x86_64*

- glibc-2*i686* nss-softokn-freebl-3*i686*
- compat-libstdc++-33*x86_64*
- glibc-common-2*x86_64*
- glibc-devel-2*x86_64*
- glibc-devel-2*i686*
- glibc-headers-2*x86_64*
- elfutils-libelf-0*x86_64*
- elfutils-libelf-devel-0*x86_64*
- gcc-4*x86_64*
- gcc-c++-4*x86_64*
- ksh-*x86_64*
- libaio-0*x86_64*
- libaio-devel-0*x86_64*
- libaio-0*i686*
- libaio-devel-0*i686*
- libgcc-4*x86_64*
- libgcc-4*i686*
- libstdc++-4*x86_64*
- libstdc++-4*i686*
- libstdc++-devel-4*x86_64*
- make-3.81*x86_64*
- numactl-devel-2*x86_64*
- sysstat-9*x86_64*
- compat-libstdc++-33*i686*
- compat-libcap*
- unixODBC*
- libstdc++*
- compat-libstdc++-33.i686
- compat-libstdc++-296.i686
- glibc.i686

- ksh.x86_64
- libgcc.i686
- libidn.i686
- libstdc++.i686
- libX11.x86_64
- libXau.x86_64
- libxcb.x86_64
- libXext.i686
- libXi.i686
- libXtst.i686
- ncurses-devel.i686
- nss-softokn-freebl.i686
- dos2unix
- telnet

9. Run the following commands to set the state of the firewall/ip tables:

```
chkconfig iptables off  
service iptables stop
```

10. Run the following commands to check and set the state of SELinux:

- a. Check the status:
`sestatus`
- b. If the response is "permissive" or "disabled", do nothing
- c. If the response is "enforcing", change the state:
`sudo vi /etc/selinux/config`
`setenforce 0`

Configure the CA Directory Properties File

Set the parameters for the CA Directory server installation. Parameters pass information required to enable successful communication and function among system components.

You need the following information to complete the CA Directory parameters.

- The host names of the systems where you plan to install the CA Directory Servers
- The host names of the systems where you plan to install the IdentityMinder Provisioning Servers

Follow these steps:

1. Navigate to /tmp/properties.sh.
2. In the properties.sh file, set the following parameters.

`_Environment`

Leave as the default, `CHANGE_ME_LATER`.

`_SoftwareVersion`

Leave as the default, `STATIC`.

`_impd_fips_mode`

Leave as the default, `false`.

`_DomainSuffix`

Set this to your network domain.

`_impd_shared_secret`

A password shared by the Provisioning Directory and Provisioning Server. Use any password, but it must match the password for `_impd_shared_secret` in the properties file you will create during Provisioning Server installation.

Make a note of this password so you can use it later during the installation process.

`_imps_hostname`

Enter the host names of systems where you plan to install the Provisioning Server, separated by commas.

_ha_host_list

For a high-availability deployment, enter the host names of other systems where you plan to install CA Directory (other than the system on which you are currently installing CA Directory).

In a single-instance deployment, leave this parameter blank.

_ha_primary_host

For a high-availability deployment, enter the host name of the system where you install the first CA Directory. Use the same value for the second CA Directory installation.

In a single-instance deployment, leave this parameter blank.

_dir_webservice_details

Leave as default, true.

_dir_webservices_port

Port used by Web Services. Leave as the default, 9080, unless you cannot use this port in your environment. If you must change the web services port, enter a new port number.

Note: If you must change the web services port, use the same port for web services on all servers.

_dir_webservices_secure_port

Port used by Web Services. Leave as the default, 9443, unless you cannot use this port in your environment. If you must change the web services port, enter a new port number.

Note: If you must change the web services port, use the same port for web services on all servers.

_dir_webservices_username

User name for Web Services. Leave as the default, dsaweb.

_dir_webservices_password

The password for Web Services. Create any password, but it must match the password for `_impd_shared_secret` in the properties file you create during Provisioning Server installation.

Make a note of this password so you can use it later during the installation process.

_COMP_CLASS

Leave as the default, `ca_cam.directory`.

_COMP_NAME

Leave as the default, `main.directory`.

_APP_NAME

Leave as the default, `directory_server`.

JAVA64_LOCATION

Location of an existing 64-bit JRE if preinstalled. Set this parameter if you choose to install your JRE separately. In this case, symbolically link `/opt/java64` to your JRE.

However, instead of installing a JRE separately, the system installer can do this automatically. We recommend that you download a JRE and allow the system to install it.

See the `JAVA64_KIT` parameter.

JAVA64_KIT

Location of a 64-bit JRE that you download to the local system or to a file share. If this parameter is set, the server kit installs this JRE automatically.

USER_JAVA64

Leave blank for installation. This parameter is intended for upgrades, not installation.

_ntp_server

IP address or host name of the NTP server to use to synchronize the server time.

3. Back up the `properties.sh` file. Rename it to a logical name, for example, `directory1properties.sh`.

Note: This file is critical for upgrades. We recommend that you back up this file. This file contains passwords, so be sure to save it in a secure location.

Important! The original `properties.sh` file resides in a temp folder. If the server is shut down, the `properties.sh` file is discarded. Therefore, rename and back up this file before proceeding with any further installation or use of the system.

Install and Verify the CA Directory Server

After you set the CA Directory parameters and back up the `properties.sh` file, run the installation program.

Verify the installation before proceeding with further installation steps.

Follow these steps:

1. Navigate to:

```
/opt/CA/saas/repo/application/
```

2. Run:

```
./appliance_local.sh config
```

When installation is complete, verify the installation as follows.

3. On the CA Directory server system, check that Java is running:

```
ps -ef | grep java
```

The output shows the following:

```
java -Xms256m -Xmx1024m -cp ./lib/*  
com.ca.directory.dxagent.service.DxAgentService
```

4. Log in as the DSA user:

```
su - dsa
```

5. Check the Directory Server status by issuing the `dxserver status` command:

The output shows that the four `impd` processes have started:

```
<dir1 host>-impd-notify started  
<dir1 host>-impd-main started  
<dir1 host>-impd-inc started  
<dir1 host>-impd-co started
```

6. For a high-availability deployment, continue with installing a second CA Directory server. For a single-instance deployment, continue with installing the Provisioning Server.

High-Availability: Directory Server 2

Prepare a second system that is separate from the one on which you installed the first CA Directory instance.

Confirm that your server environment is properly prepared and install the required packages. [Follow the same steps](#) (see page 20) as you did for the first instance.

Configure the Second CA Directory Properties File

Set the parameters for the second CA Directory server instance.

Copy the properties file from the first CA Directory Server instance and change only the parameters that are different for the second instance. Remember to rename and back up the new properties file after you complete the parameters.

You need the following information to complete the CA Directory parameters.

General Information:

The host names of the systems where you plan to install the CA Directory Servers.

Follow these steps:

1. On the **first** CA Directory Server system, copy the properties.sh file that you just configured.
2. Navigate to /tmp/properties.sh on the **second** CA Directory Server system. Replace the properties.sh file with the configured copy from the first CA Directory Server system.
3. Change the following parameter values:

_ha_host_list

Enter the host names of other CA Directory systems in your environment, other than the system on which you are currently installing. In a two-instance high-availability deployment, enter the host name of the system where you installed the first CA Directory instance.

In a single-instance deployment, leave this parameter blank.

_ha_primary_host

Enter the host name of the system where you installed the first CA Directory instance.

For example, Directory1 (where the system on which you are currently installing is Directory2)

Note: The primary host is always the system where you installed the first CA Directory instance.

4. Leave all other parameter values as you set them for the first CA Directory Server.
5. Back up the properties.sh file. Rename it to a logical name, for example, directory2properties.sh.

Note: This file is critical for upgrades. We recommend that you back up this file. This file contains passwords, so be sure to save it in a secure location.

Important! The original properties.sh file resides in a temp folder. If the server is restarted, the properties.sh file is discarded. Therefore, rename and back up this file before proceeding with any further use of this component and the system on which it is installed.

Install and Verify the Second CA Directory Server

After you set the parameters for the second CA Directory instance and back up the properties.sh file, run the installation program.

Verify the installation before proceeding with further installation steps.

Follow these steps:

1. Navigate to:

```
/opt/CA/saas/repo/application/
```

2. Run:

```
./appliance_local.sh config
```

When installation is complete, verify the installation as follows.

3. On the CA Directory server system, check that Java is running:

```
ps -ef | grep java
```

The output shows the following:

```
java -Xms256m -Xmx1024m -cp ./lib/*  
com.ca.directory.dxagent.service.DxAgentService
```

4. Log in as the DSA user:

```
su - dsa
```

5. Check the Directory Server status by issuing the dxserver command:
dxserver status

The output shows that the four impd processes have started:

```
<dir2 host>-impd-notify started  
<dir2 host>-impd-main started  
<dir2 host>-impd-inc started  
<dir2 host>-impd-co started
```

Continue with installing the Provisioning Server.

Provisioning Server

Standalone Provisioning Server

Use this procedure to install a Provisioning Server.

For a high-availability deployment, after you complete this procedure, continue with the Provisioning Server 2 procedure. Otherwise, after you complete this procedure continue with installing the CA IAM CS.

More Information:

[Provisioning Server Pre-Installation Steps](#) (see page 29)

[Configure the Provisioning Server Properties File](#) (see page 31)

[Install and Verify the Provisioning Server](#) (see page 36)

Provisioning Server Pre-Installation Steps

To prepare for installation, confirm that your server environment is properly prepared. Then install the required packages.

Follow these steps:

1. Install 64-bit Linux RHEL 6.1.
2. Download, but do not install, a 64-bit JDK to your local system or to a file share. You can also use a JRE in place of a JDK.
Note: The system installer can install the JDK automatically. We recommend that you download a JDK and allow the system to install it.
3. Verify that the systems where you previously installed CA Directory, and the systems where you plan to install the Provisioning Server, can ping each other. For a high availability installation, make sure each system can ping the three other systems. I.e., each Provisioning Server system can ping the other, and can ping both CA Directory systems, and vice versa.
4. Obtain the Provisioning Server ISO image from the CA Support site and extract it.
5. Copy the kit (CAM-IMPS_kit-*date*.zip) to / (the root folder).
6. Unzip the kit.
7. Install the following packages:

- binutils-2*x86_64*
- glibc-2*x86_64* nss-softokn-freebl-3*x86_64*
- glibc-2*i686* nss-softokn-freebl-3*i686*
- compat-libstdc++-33*x86_64*
- glibc-common-2*x86_64*
- glibc-devel-2*x86_64*
- glibc-devel-2*i686*
- glibc-headers-2*x86_64*
- elfutils-libelf-0*x86_64*
- elfutils-libelf-devel-0*x86_64*
- gcc-4*x86_64*
- gcc-c++-4*x86_64*
- ksh-*x86_64*
- libaio-0*x86_64*
- libaio-devel-0*x86_64*
- libaio-0*i686*
- libaio-devel-0*i686*
- libgcc-4*x86_64*
- libgcc-4*i686*
- libstdc++-4*x86_64*
- libstdc++-4*i686*
- libstdc++-devel-4*x86_64*
- make-3.81*x86_64*
- numactl-devel-2*x86_64*
- sysstat-9*x86_64*
- compat-libstdc++-33*i686*
- compat-libcap*
- unixODBC*
- libstdc++*
- compat-libstdc++-33.i686
- compat-libstdc++-296.i686

- glibc.i686
- ksh.x86_64
- libgcc.i686
- libidn.i686
- libstdc++.i686
- libX11.x86_64
- libXau.x86_64
- libxcb.x86_64
- libXext.i686
- libXi.i686
- libXtst.i686
- ncurses-devel.i686
- nss-softokn-freebl.i686
- dos2unix
- telnet

8. Run the following commands to set the state of the firewall/ip tables:

```
chkconfig iptables off
service iptables stop
```

9. Run the following commands to check and set the state of SELinux:

- a. Check the status:
`sestatus`
- b. If the response is "permissive" or "disabled", do nothing
- c. If the response is "enforcing", change the state:
`sudo vi /etc/selinux/config`
`setenforce 0`

Configure the Provisioning Server Properties File

Set the parameters for the Provisioning Server installation.

You need the following information to complete the Provisioning Server parameters.

General Information:

- Your CA Directory host names

From the CA Directory properties file:

- `_impd_shared_secret`
- `_dir_webservices_password`

Follow these steps:

1. Navigate to `/tmp/properties.sh`.
2. In the `properties.sh` file, set the following parameters.

`_Environment`

Leave as the default, `CHANGE_ME_LATER`.

`_SoftwareVersion`

Leave as the default, `STATIC`.

`_DomainSuffix`

Set this to your network domain.

`_impd_shared_secret`

Enter the same password you entered for `_impd_shared_secret` in the properties files for CA Directory.

`_impd_hostname`

Host name of the system where you installed the primary CA Directory instance.

`_impd_bind_pwd`

A password which the Provisioning Server uses to connect to the Provisioning Directory. Create any password.

Make a note of this password so you can use it later during the installation process.

`_impd_ha_hosts`

For a high-availability deployment, enter the host name of the alternate CA Directory server.

For example, `Directory2` (where the primary CA Directory server is `Directory1`)

Note: If you have three or more instances of CA Directory, separate the entries with commas. For example: `Directory2, Directory3`.

In a single-instance deployment, leave this parameter blank.

`_impd_root_domain_pwd`

Enter the same password you entered for `_impd_shared_secret` in the properties files for CA Directory.

_impd_parent_domain_pwd

Enter the same password you entered for `_impd_shared_secret` in the properties files for CA Directory.

_impd_etaadmin_pwd

Enter the same password you entered for `_impd_shared_secret` in the properties files for CA Directory.

_provisioning_server_pwd

The Provisioning Server password. Create any password. Use the same password on all Provisioning Servers.

Make a note of this password so you can use it later during the installation process.

_provisioning_repository_pwd

Enter the same password you entered for `_impd_shared_secret` in the properties files for CA Directory.

_connector_server_pwd

The password used to access the CA IAM CS. Create any password. This must match the password for `_connector_server_pwd` in the properties file you will create during CA IAM CS installation.

Make a note of this password so you can use it later during the installation process.

_provisioning_domain

Leave as the default value.

Important! The following six parameters are required only during CA IAM CS installation. If you are currently installing the Provisioning Server, leave the following six parameters blank.

_http_proxy_enabled

Addresses whether you need a proxy to connect to the internet. Set to True if you need to enable a proxy to connect to the internet. For example, set to True if the Provisioning Server is on a protected intranet. Set to False if the Provisioning Server has direct access to the internet and no proxy is enabled.

_http_proxy_user

The Proxy User required for authentication.

_http_proxy_pwd

The password for the Proxy User.

_http_proxy_domain

The proxy domain required for authentication.

_http_proxy_port

The proxy port required for authentication.

_http_proxy_server

The proxy server required for authentication.

_installimps

Set to True to install the Provisioning Server.

Note: This parameter allows you to install a Provisioning Server through this installer. Set this to False to prevent a Provisioning Server from installing.

Also see the `_install_jcs` parameter.

_impd_skip_snapshot

Leave as the default value, false. This setting allows tenant deployment to succeed.

_dir_webservices_port

Port used by Web Services. Leave as the default, 9080, unless you cannot use this port in your environment. If you must change the web services port, enter a new port number.

Note: If you must change the web services port, use the same port for web services on all servers.

_dir_webservices_username

User name for Web Services. Leave as the default, dsaweb.

_dir_webservices_password

Enter the same password you entered for `_dir_webservices_password` in the properties file for the first CA Directory instance.

_dir_webservices_secure_port

Port used by Web Services. Leave as the default, 9443, unless you cannot use this port in your environment. If you must change the web services port, enter a new port number.

Note: If you must change the web services port, use the same port for web services on all servers.

_imps_fips_keyfile

Leave as the default, false.

_COMP_CLASS

Leave as the default, ca_cam.directory.

_COMP_NAME

Leave as the default, main.directory.

_APP_NAME

Leave as the default, directory_server.

JAVA64_LOCATION

Location of an existing 64-bit JRE if preinstalled. Set this parameter if you choose to install your JRE separately. In this case, symbolically link /opt/java64 to your JRE.

However, instead of installing a JRE separately, the system installer can do this automatically. We recommend that you download a JRE and allow the system to install it.

See the JAVA64_KIT parameter.

JAVA64_KIT

Location of a 64-bit JRE that you download to the local system or to a file share. If this parameter is set, the server kit installs this JRE automatically.

USER_JAVA64

Leave blank for installation. This parameter is intended for upgrades, not installation.

_install_jcs

Set to False to install the Provisioning Server.

Note: This parameter allows you to install either a CA IAM CS through this installer. Set this to False to prevent a CA IAM CS from installing.

Also see the _install_imps parameter.

_ntp_server

IP address or host name of the NTP server to use to synchronize the server time.

_remote_imps_hostname

Enter the host name of the primary Provisioning Server system.

Note: This parameter is not needed when the Provisioning Server and CA IAM CS are on the same system.

3. Back up the properties.sh file. Rename it to a logical name. Example: provisioning1properties.sh.

Note: This file is critical for upgrades. We recommend that you back up this file. This file contains passwords, so be sure to save it in a secure location.

Important! The original properties.sh file resides in a temp folder. If the server is shut down, the properties.sh file is discarded. Therefore, rename and back up this file before proceeding with any further installation or use of the system.

Install and Verify the Provisioning Server

After you set the Provisioning Server parameters and back up the properties.sh file, run the installation program.

Verify the installation before proceeding with further installation steps.

Follow these steps:

1. Navigate to:

```
/opt/CA/saas/repo/application/
```

2. Run:

```
./appliance_local.sh config
```

When installation is complete, verify the installation as follows.

3. On the CA Directory Server system, check that Java is running:

```
ps -ef | grep java
```

The output shows the following:

```
/opt/CA/Directory/dxserver/dsamgmt/jvm/bin/java -Xms256m
-Xmx1024m -cp /opt/CA/Directory/dxserver/dsamgmt/lib/*
com.ca.directory.dxagent.service.DxAgentService
jvm/bin/java -ea
-Dkaraf.home=/opt/CA/IdentityManager/ConnectorServer -server
-Xms128M -Xmx1024M -XX:MaxPermSize=384m -Djava.awt.headless=true
-Dcom.sun.management.jmxremote
-Dderby.system.home=/opt/CA/IdentityManager/ConnectorServer/dat
a/der
by -Dderby.storage.fileSyncTransactionLog=true
-Djava.endorsed.dirs=/opt/CA/IdentityManager/ConnectorServer/li
b/endorsed
-Djava.ext.dirs=/opt/CA/IdentityManager/ConnectorServer/jvm/lib
/ext:/opt/CA/IdentityManager/ConnectorServer/lib/ext
-Dkaraf.instances=/opt/CA/IdentityManager/ConnectorServer/insta
nces
```

```
-Dkaraf.base=/opt/CA/IdentityManager/ConnectorServer
-Dkaraf.data=/opt/CA/IdentityManager/ConnectorServer/data
-Djava.util.logging.config.file=/opt/CA/IdentityManager/ConnectorServer/etc/java.util.logging.properties
-Dkaraf.startLocalConsole=false -Dkaraf.startRemoteShell=true
-Djcsroot=/opt/CA/IdentityManager/ConnectorServer/jcs
-Dlog4j.configuration=/opt/CA/IdentityManager/ConnectorServer/etc/org.ops4j.pax.logging.cfg
-Dsun.lang.ClassLoader.allowArraySyntax=true -classpath
/opt/CA/IdentityManager/ConnectorServer/conf:/opt/CA/IdentityManager/ConnectorServer/lib/karaf-jaas-boot.jar:/opt/CA/IdentityManager/ConnectorServer/lib/karaf.jar:/opt/CA/IdentityManager/ConnectorServer/lib/servicemix-version.jar:/opt/CA/IdentityManager/ConnectorServer/lib/smix4SecurityWrapper.jar:/opt/CA/IdentityManager/ConnectorServer/jcs/tools/lib/cacommns.jar
smix.security.wrapper.Smix4SecurityWrapper
```

4. Log in as the DSA user:

```
su - dsa
```

5. Enter the following command:

```
dxserver status
```

The output shows that the server has started:

```
<Provisioning-Server-host>-imps-router started
```

6. Log in as the IMPS user:

```
su - imps
```

7. Navigate to /opt/CA/IdentityManager/ProvisioningServer/bin.

8. Enter the following command:

```
./imps status
```

The output shows the following:

```
im_ps is running
```

9. For a high-availability deployment, continue with installing a second Provisioning Server. For a single-instance deployment, continue with installing the CA IAM CS.

Note: The following error in /tmp/imps_server_install.log indicates that a required RHEL package is not installed:

```
(October 31, 2014 2:12:37 PM), Install,
com.ca.etrust.install.admin.ConfigureAdminServer, err, ProductException: (error code =
200; message="Java error"; exception = [ProductException: (error code = 200;
message="Java error"; exception = [javax.naming.NamingException:
javax.naming.NamingException: javax.naming.CommunicationException:
myserver05:20390 [Root exception is java.net.ConnectException: Connection
refused]]]))
```

If this error occurs, verify that the packages in [Provisioning Server Pre-Installation Steps](#) (see page 29) and [CA Directory Pre-Installation Step](#) (see page 20)s are installed correctly.

High-Availability: Provisioning Server 2

Prepare a second system that is separate from the one on which you installed the first Provisioning Server instance.

Confirm that your server environment is properly prepared and install the required packages. [Follow the same steps](#) (see page 29) as you did for the first instance.

Configure the Second Provisioning Server Properties File

Set the parameters for the second Provisioning Server instance.

Copy the properties file from the first Provisioning Server instance and change only the parameters that are different for the second instance. Remember to rename and back up the new properties file after you complete the parameters.

You need the following information to complete the Provisioning Server parameters.

From the properties file of your first Provisioning Server instance:

- `_impd_bind_pwd`

Follow these steps:

1. On the **first** Provisioning Server system, copy the properties.sh file that you just configured.
2. Navigate to /tmp/properties.sh on the **second** Provisioning Server system. Replace the properties.sh file with the configured copy from the first Provisioning Server system.
3. Change the following parameter values:

_impd_bind_pwd

Enter the same password you entered for _impd_bind_pwd in the properties file for the first Provisioning Server instance.

4. Leave all other parameter values as you set them for the first Provisioning Server.
5. Back up the properties.sh file. Rename it to a logical name. Example: provisioning2properties.sh.

Note: This file is critical for upgrades. We recommend that you back up this file. This file contains passwords, so be sure to save it in a secure location.

Important! The original properties.sh file resides in a temp folder. If the server is shut down, the properties.sh file is discarded. Therefore, rename and back up this file before proceeding with any further installation or use of the system.

Install and Verify the Second Provisioning Server

After you set the parameters for the second Provisioning Server instance and back up the properties.sh file, run the installation program.

Verify the installation before proceeding with further installation steps.

Follow these steps:

1. Navigate to:

`/opt/CA/saas/repo/application/`

2. Run:

`./appliance_local.sh config`

When installation is complete, verify the installation as follows.

3. On the CA Directory Server system, check that Java is running:

`ps -ef | grep java`

The output shows the following:

```
/opt/CA/Directory/dxserver/dsamgmt/jvm/bin/java -Xms256m
-Xmx1024m -cp /opt/CA/Directory/dxserver/dsamgmt/lib/*
com.ca.directory.dxagent.service.DxAgentService
```

```
jvm/bin/java -ea
-Dkaraf.home=/opt/CA/IdentityManager/ConnectorServer -server
-Xms128M -Xmx1024M -XX:MaxPermSize=384m -Djava.awt.headless=true
-Dcom.sun.management.jmxremote
-Dderby.system.home=/opt/CA/IdentityManager/ConnectorServer/data/der
by -Dderby.storage.fileSyncTransactionLog=true
-Djava.endorsed.dirs=/opt/CA/IdentityManager/ConnectorServer/lib/endorsed
-Djava.ext.dirs=/opt/CA/IdentityManager/ConnectorServer/jvm/lib
/ext:/opt/CA/IdentityManager/ConnectorServer/lib/ext
-Dkaraf.instances=/opt/CA/IdentityManager/ConnectorServer/instances
-Dkaraf.base=/opt/CA/IdentityManager/ConnectorServer
-Dkaraf.data=/opt/CA/IdentityManager/ConnectorServer/data
-Djava.util.logging.config.file=/opt/CA/IdentityManager/ConnectorSer
ver/etc/java.util.logging.properties
-Dkaraf.startLocalConsole=false -Dkaraf.startRemoteShell=true
-Djcsroot=/opt/CA/IdentityManager/ConnectorServer/jcs
-Dlog4j.configuration=/opt/CA/IdentityManager/ConnectorServer/etc/org.ops4j.pax.logging.cfg
-Dsun.lang.ClassLoader.allowArraySyntax=true -classpath
/opt/CA/IdentityManager/ConnectorServer/conf:/opt/CA/IdentityMa
nager/ConnectorServer/lib/karaf-jaas-boot.jar:/opt/CA/IdentityM
anager/ConnectorServer/lib/karaf.jar:/opt/CA/IdentityManager/Co
nectorServer/lib/servicemix-version.jar:/opt/CA/IdentityManage
r/ConnectorServer/lib/smix4SecurityWrapper.jar:/opt/CA/Identity
Manager/ConnectorServer/j
cs/tools/lib/cacommns.jar
smix.security.wrapper.Smix4SecurityWrapper
```

4. Log in as the DSA user:

```
su - dsa
```

5. Enter the following command:

```
dxserver status
```

The output shows that the server has started:

```
Provisioning-Server-host>-imps-router started
```

6. Log in as the IMPS user:

```
su - imps
```

7. Navigate to `/opt/CA/IdentityManager/ProvisioningServer/bin`.

8. Enter the following command:

```
./imps status
```

The output shows the following:

```
im_ps is running
```

Continue with installing the CA IAM CS.

Connector Server

Standalone CA IAM CS

Use this procedure to install a CA IAM CS.

For a high-availability deployment, after you complete this procedure, continue with the CA IAM CS 2 procedure. Otherwise, after you complete this procedure continue with installing the SiteMinder Policy Server.

Note: You install the CA IAM CS using the same server kit as you used to install the Provisioning Server. However, several steps and parameters are different from the Provisioning Server installation. Follow the instructions in this section carefully.

CA IAM CS Pre-Installation Steps

To prepare for installation, confirm that your server environment is properly prepared. Then install the required packages.

Follow these steps:

1. Install 64-bit Linux RHEL 6.1.
2. Download, but do not install, a 64-bit JDK to your local system or to a file share. You can also use a JRE in place of a JDK.

Note: The system installer can install the JDK automatically. We recommend that you download a JDK and allow the system to install it.

3. Obtain the Provisioning Server ISO image from the CA Support site and extract it.
4. Copy the kit (CAM-IMPS_kit-*date*.zip) to / (the root folder).
5. Unzip the kit.

6. Install the following packages:

- binutils-2*x86_64*
- glibc-2*x86_64* nss-softoken-freebl-3*x86_64*
- glibc-2*i686* nss-softoken-freebl-3*i686*
- compat-libstdc++-33*x86_64*
- glibc-common-2*x86_64*
- glibc-devel-2*x86_64*
- glibc-devel-2*i686*
- glibc-headers-2*x86_64*
- elfutils-libelf-0*x86_64*
- elfutils-libelf-devel-0*x86_64*
- gcc-4*x86_64*
- gcc-c++-4*x86_64*
- ksh-*x86_64*
- libaio-0*x86_64*
- libaio-devel-0*x86_64*
- libaio-0*i686*
- libaio-devel-0*i686*
- libgcc-4*x86_64*
- libgcc-4*i686*
- libstdc++-4*x86_64*
- libstdc++-4*i686*
- libstdc++-devel-4*x86_64*
- make-3.81*x86_64*
- numactl-devel-2*x86_64*
- sysstat-9*x86_64*
- compat-libstdc++-33*i686*
- compat-libcap*
- unixODBC*
- libstdc++*
- compat-libstdc++-33.i686
- compat-libstdc++-296.i686

- glibc.i686
- ksh.x86_64
- libgcc.i686
- libidn.i686
- libstdc++.i686
- libX11.x86_64
- libXau.x86_64
- libxcb.x86_64
- libXext.i686
- libXi.i686
- libXtst.i686
- ncurses-devel.i686
- nss-softokn-freebl.i686
- dos2unix

7. Run the following commands to set the state of the firewall/ip tables:

```
chkconfig iptables off
service iptables stop
```

8. Run the following commands to check and set the state of SELinux:

- a. Check the status:
`sestatus`
- b. If the response is "permissive" or "disabled", do nothing
- c. If the response is "enforcing", change the state:
`sudo vi /etc/selinux/config`
`setenforce 0`

Configure the CA IAM CS Properties File

Set the parameters for the CA IAM CS installation.

You need the following information to complete the CA IAM CS parameters.

General Information:

- Your CA Directory host names
- Your Provisioning Server host names
- The IP address or host name of your NTP server

From the CA Directory properties file:

- `_impd_shared_secret`
- `_dir_webservices_password`

From your Provisioning Server properties file:

- `_impd_bind_pwd`
- `_provisioning_server_pwd`
- `_connector_server_pwd`

Follow these steps:

1. Navigate to `/tmp/properties.sh`.
2. In the `properties.sh` file, set the following parameters.

`_Environment`

Leave as the default, `CHANGE_ME_LATER`.

`_SoftwareVersion`

Leave as the default, `STATIC`.

`_DomainSuffix`

Set this to your network domain.

`_impd_shared_secret`

Enter the same password you entered for `_impd_shared_secret` in the properties files for CA Directory.

`_impd_hostname`

Host name of the system where you installed the primary CA Directory instance.

`_impd_bind_pwd`

Enter the same password you entered for `_impd_bind_pwd` in the properties file for the Provisioning Servers.

_impd_ha_hosts

For a high-availability deployment, enter the host name of the alternate CA Directory server.

For example, Directory2 (where the primary CA Directory server is Directory1)

Note: If you have three or more instances of CA Directory, separate the entries with commas. For example: Directory2, Directory3.

In a single-instance deployment, leave this parameter blank.

_impd_root_domain_pwd

Enter the same password you entered for _impd_shared_secret in the properties files for CA Directory.

_impd_parent_domain_pwd

Enter the same password you entered for _impd_shared_secret in the properties files for CA Directory.

_impd_etaadmin_pwd

Enter the same password you entered for _impd_shared_secret in the properties files for CA Directory.

_provisioning_server_pwd

Enter the same password you entered for _provisioning_server_pwd in the properties files for the Provisioning Servers.

_provisioning_repository_pwd

Enter the same password you entered for _impd_shared_secret in the properties files for CA Directory.

_connector_server_pwd

Enter the same password you entered for _connector_server_pwd in the properties files for the Provisioning Servers.

_provisioning_domain

Leave as the default value.

Note: The following six parameters are required only if you need a proxy between the CA IAM CS and the internet. Otherwise, leave them blank.

_http_proxy_enabled

Addresses whether you need a proxy to connect to the internet. Set to True if you need to enable a proxy to connect to the internet. For example, set to True if the Provisioning Server is on a protected intranet. Set to False if the Provisioning Server has direct access to the internet and no proxy is enabled.

_http_proxy_user

The Proxy User required for authentication.

_http_proxy_pwd

The password for the Proxy User.

_http_proxy_domain

The proxy domain required for authentication.

_http_proxy_port

The proxy port required for authentication.

_http_proxy_server

The proxy server required for authentication.

_installimps

Set to False to install the CA IAM CS.

Note: This parameter allows you to install a Provisioning Server through this installer. Set this to False to prevent a Provisioning Server from installing.

Also see the `_install_jcs` parameter.

_impd_skip_snapshot

Leave as the default value, false. This setting allows tenant deployment to succeed.

_dir_webservices_port

Port used by Web Services. Leave as the default, 9080, unless you cannot use this port in your environment. If you must change the web services port, enter a new port number.

Note: If you must change the web services port, use the same port for web services on all servers.

_dir_webservices_username

User name for Web Services. Leave as the default, dsaweb.

_dir_webservices_password

Enter the same password you entered for `_dir_webservices_password` in the properties file for the first CA Directory instance.

_dir_webservices_secure_port

Port used by Web Services. Leave as the default, 9443, unless you cannot use this port in your environment. If you must change the web services port, enter a new port number.

Note: If you must change the web services port, use the same port for web services on all servers.

_imps_fips_keyfile

Leave as the default, false.

_COMP_CLASS

Leave as the default, `ca_cam.directory`.

_COMP_NAME

Leave as the default, `main.directory`.

_APP_NAME

Leave as the default, `directory_server`.

JAVA64_LOCATION

Location of an existing 64-bit JRE if preinstalled. Set this parameter if you choose to install your JRE separately. In this case, symbolically link `/opt/java64` to your JRE.

However, instead of installing a JRE separately, the system installer can do this automatically. We recommend that you download a JRE and allow the system to install it.

See the `JAVA64_KIT` parameter.

JAVA64_KIT

Location of a 64-bit JRE that you download to the local system or to a file share. If this parameter is set, the server kit will install this JRE automatically.

USER_JAVA64

Leave blank for installation. This parameter is intended for upgrades, not installation.

_install_jcs

Set to True to install the CA IAM CS.

Note: This parameter allows you to install an CA IAM CS through this installer. Set this to False to prevent an CA IAM CS from installing.

Also see the `_install_imps` parameter.

_ntp_server

IP address or host name of the NTP user to use to synchronize the server time.

_remoteimps_hostname

Enter the host name of the primary Provisioning Server system.

Note: This parameter is not needed when the Provisioning Server and CA IAM CS are on the same system.

3. Back up the properties.sh file. Rename it to a logical name, for example, connectorserver1properties.sh.

Note: This file is critical for upgrades. We recommend that you back up this file. This file contains passwords, so be sure to save it in a secure location.

Important! The original properties.sh file resides in a temp folder. If the server is shut down, the properties.sh file is discarded. Therefore, rename and back up this file before proceeding with any further installation or use of the system.

Install and Verify the CA IAM CS

After you set the CA IAM CS parameters and back up the properties.sh file, run the installation program.

Verify the installation before proceeding with further installation steps.

Follow these steps:

1. Navigate to:

`/opt/CA/saas/repo/application/`

2. Run:

`./appliance_local.sh config`

When installation is complete, verify the installation as follows.

3. Check that Java is running:

`ps -ef | grep java`

The output shows the following:

```
/opt/CA/Directory/dxserver/dsamgmt/jvm/bin/java -Xms256m
-Xmx1024m -cp /opt/CA/Directory/dxserver/dsamgmt/lib/*
com.ca.directory.dxagent.service.DxAgentService
jvm/bin/java -ea
-Dkaraf.home=/opt/CA/IdentityManager/ConnectorServer -server
-Xms128M -Xmx1024M -XX:MaxPermSize=384m -Djava.awt.headless=true
-Dcom.sun.management.jmxremote
-Dderby.system.home=/opt/CA/IdentityManager/ConnectorServer/dat
a/der
```

```

by -Dderby.storage.fileSyncTransactionLog=true
-Djava.endorsed.dirs=/opt/CA/IdentityManager/ConnectorServer/lib/endorsed
-Djava.ext.dirs=/opt/CA/IdentityManager/ConnectorServer/jvm/lib/ext:/opt/CA/IdentityManager/ConnectorServer/lib/ext
-Dkaraf.instances=/opt/CA/IdentityManager/ConnectorServer/instances
-Dkaraf.base=/opt/CA/IdentityManager/ConnectorServer
-Dkaraf.data=/opt/CA/IdentityManager/ConnectorServer/data
-Djava.util.logging.config.file=/opt/CA/IdentityManager/ConnectorServer/etc/java.util.logging.properties
-Dkaraf.startLocalConsole=false -Dkaraf.startRemoteShell=true
-Djcsroot=/opt/CA/IdentityManager/ConnectorServer/jcs
-Dlog4j.configuration=/opt/CA/IdentityManager/ConnectorServer/etc/org.ops4j.pax.logging.cfg
-Dsun.lang.ClassLoader.allowArraySyntax=true -classpath
/opt/CA/IdentityManager/ConnectorServer/conf:/opt/CA/IdentityManager/ConnectorServer/lib/karaf-jaas-boot.jar:/opt/CA/IdentityManager/ConnectorServer/lib/karaf.jar:/opt/CA/IdentityManager/ConnectorServer/lib/servicemix-version.jar:/opt/CA/IdentityManager/ConnectorServer/lib/smix4SecurityWrapper.jar:/opt/CA/IdentityManager/ConnectorServer/jcs/tools/lib/cacommmons.jar
smix.security.wrapper.Smix4SecurityWrapper

```

4. Log in as the root user.

```
su - root
```

5. Enter the following command:

```
service im_jcs status
```

The output shows the following:

```
jcs is running
```

6. For a high-availability deployment, continue with installing a second CA IAM CS. For a single-instance deployment, continue with installing the SiteMinder Policy Server.

High-Availability: CA IAM CS 2

Prepare a second system that is separate from the one on which you installed the first CA IAM CS instance.

Confirm that your server environment is properly prepared and install the required packages. [Follow the same steps](#) (see page 41) as you did for the first instance.

Configure the Second CA IAM CS Properties File

Set the parameters for the second CA IAM CS instance.

Copy the properties file from the first CA IAM CS instance and change only the parameters that are different for the second instance. Remember to rename and back up the new properties file after you complete the parameters.

You need the following information to complete the CA IAM CS parameters.

General Information:

- Your Provisioning Server host names

Follow these steps:

1. On the **first** CA IAM CS system, copy the properties.sh file that you just configured.
2. Navigate to /tmp/properties.sh on the **second** CA IAM CS system. Replace the properties.sh file with the configured copy from the first CA IAM CS system.
3. Change the following parameter values:

_remoteimps_hostname

Enter the host name of the failover (second) Provisioning Server system.

Note: This parameter is not needed when the Provisioning Server and CA IAM CS are on the same system.

4. Leave all other parameter values as you set them for the first CA IAM CS.
5. Back up the properties.sh file. Rename it to a logical name, for example, connectorserver2properties.sh.

Note: This file is critical for upgrades. We recommend that you back up this file. This file contains passwords, so be sure to save it in a secure location.

Important! The original properties.sh file resides in a temp folder. If the server is shut down, the properties.sh file is discarded. Therefore, rename and back up this file before proceeding with any further installation or use of the system.

Install and Verify the Second CA IAM CS

After you set the parameters for the second CA IAM CS instance and back up the properties.sh file, run the installation program.

Verify the installation before proceeding with further installation steps.

Follow these steps:

1. Navigate to:

```
/opt/CA/saas/repo/application/
```

2. Run:

```
./appliance_local.sh config
```

When installation is complete, verify the installation as follows.

3. Check that Java is running:

```
ps -ef | grep java
```

The output shows the following:

```
/opt/CA/Directory/dxserver/dsamgmt/jvm/bin/java -Xms256m
-Xmx1024m -cp /opt/CA/Directory/dxserver/dsamgmt/lib/*
com.ca.directory.dxagent.service.DxAgentService
jvm/bin/java -ea
-Dkaraf.home=/opt/CA/IdentityManager/ConnectorServer -server
-Xms128M -Xmx1024M -XX:MaxPermSize=384m -Djava.awt.headless=true
-Dcom.sun.management.jmxremote
-Dderby.system.home=/opt/CA/IdentityManager/ConnectorServer/dat
a/der
by -Dderby.storage.fileSyncTransactionLog=true
-Djava.endorsed.dirs=/opt/CA/IdentityManager/ConnectorServer/li
b/endorsed
-Djava.ext.dirs=/opt/CA/IdentityManager/ConnectorServer/jvm/lib
/ext:/opt/CA/IdentityManager/ConnectorServer/lib/ext
-Dkaraf.instances=/opt/CA/IdentityManager/ConnectorServer/insta
nces
-Dkaraf.base=/opt/CA/IdentityManager/ConnectorServer
-Dkaraf.data=/opt/CA/IdentityManager/ConnectorServer/data
-Djava.util.logging.config.file=/opt/CA/IdentityManager/Connect
orSer
ver/etc/java.util.logging.properties
-Dkaraf.startLocalConsole=false -Dkaraf.startRemoteShell=true
-Djcsroot=/opt/CA/IdentityManager/ConnectorServer/jcs
-Dlog4j.configuration=/opt/CA/IdentityManager/ConnectorServer/e
tc/org.ops4j.pax.logging.cfg
-Dsun.lang.ClassLoader.allowArraySyntax=true -classpath
```

```
/opt/CA/IdentityManager/ConnectorServer/conf:/opt/CA/IdentityMa
nager/ConnectorServer/lib/karaf-jaas-boot.jar:/opt/CA/IdentityM
anager/ConnectorServer/lib/karaf.jar:/opt/CA/IdentityManager/Co
nnecterServer/lib/servicemix-version.jar:/opt/CA/IdentityManage
r/ConnectorServer/lib/smix4SecurityWrapper.jar:/opt/CA/Identity
Manager/ConnectorServer/j
cs/tools/lib/cacommns.jar
smix.security.wrapper.Smix4SecurityWrapper
```

4. Log in as the root user.

```
su - root
```

5. Enter the following command:

```
service im_jcs status
```

The output shows the following:

```
jcs is running
```

Continue with installing the SiteMinder Policy Server.

SiteMinder Policy Server

Standalone Policy Server

Use this procedure to install a SiteMinder Policy Server.

For a high-availability deployment, after you complete this procedure, continue with the SiteMinder Policy Server 2 procedure. Otherwise, after you complete this procedure continue with installing the CSP console.

SiteMinder Policy Server Pre-Installation Steps

To prepare for installation, confirm that your server environment is properly prepared. Then install the required packages.

Follow these steps:

1. Install 64-bit Linux RHEL 6.1.
2. Download, but do not install, a 32-bit JDK and a 64-bit JDK to your local system or to a file share.

Note: The system installer can install the JDK automatically. We recommend that you download a JDK and allow the system to install it.

Important! The SiteMinder Policy Server installation requires a JDK, rather than a JRE.

3. Download, but do not install, JBoss 5.1.0 to your local system or to a file share.
Note: The system installer JBoss automatically.
4. Obtain the SiteMinder Policy Server ISO image from the CA Support site and extract it.
5. Copy the kit (CAM-SMPS_kit-*date*.zip) to / (the root folder).
6. Unzip the kit.
7. Install the following packages required for Advanced Authentication
 - binutils-2*x86_64*
 - glibc-2*x86_64* nss-softokn-freebl-3*x86_64*
 - glibc-2*i686* nss-softokn-freebl-3*i686*
 - compat-libstdc++-33*x86_64*
 - glibc-common-2*x86_64*
 - glibc-devel-2*x86_64*
 - glibc-devel-2*i686*
 - glibc-headers-2*x86_64*
 - elfutils-libelf-0*x86_64*
 - elfutils-libelf-devel-0*x86_64*
 - gcc-4*x86_64*
 - gcc-c++-4*x86_64*
 - ksh-*x86_64*
 - libaio-0*x86_64*
 - libaio-devel-0*x86_64*
 - libaio-0*i686*
 - libaio-devel-0*i686*
 - libgcc-4*x86_64*
 - libgcc-4*i686*
 - libstdc++-4*x86_64*
 - libstdc++-4*i686*
 - libstdc++-devel-4*x86_64*
 - make-3.81*x86_64*
 - numactl-devel-2*x86_64*
 - sysstat-9*x86_64*

- compat-libstdc++-33.i686*
- compat-libcap*
- unixODBC*
- libstdc++*
- compat-libstdc++-33.i686
- compat-libstdc++-296.i686
- glibc.i686
- ksh.x86_64
- libgcc.i686
- libidn.i686
- libstdc++.i686
- libX11.x86_64
- libXau.x86_64
- libxcb.x86_64
- libXext.i686
- libXi.i686
- libXtst.i686
- ncurses-devel.i686
- nss-softokn-freebl.i686
- dos2unix
- telnet

8. Issue the following command:

```
rpm -i compat-libtermcap-2.0.8-49.el6.i686.rpm
```

9. Install the Korn shell packages at /bin/ksh.
10. Run the following commands to set the state of the firewall/ip tables:

```
chkconfig iptables off
service iptables stop
```
11. Run the following commands to check and set the state of SELinux:
 - a. Check the status:

```
sestatus
```
 - b. If the response is "permissive" or "disabled", do nothing
 - c. If the response is "enforcing", change the state:

```
sudo vi /etc/selinux/config
setenforce 0
```

Configure the SiteMinder Policy Server Properties File

Set the parameters for the SiteMinder Policy Server installation.

You need the following information to complete the SiteMinder Policy Server parameters.

General Information:

- Your Provisioning Server host names
- The host names of the systems where you plan to install the SiteMinder Policy Servers
- Fully Qualified Domain Name of your SiteMinder Policy Server system, or in a high-availability deployment, the SiteMinder Policy Server load balancer
- Fully Qualified Domain Name of your Secure Proxy Server system, or in a high-availability deployment, the Secure Proxy Server load balancer
- The file path to your JBoss kit. The kit should be in zip file format.
- License.dat file for SiteMinder. Contact customer support to download this file from the CA Support site.
- The IP address or host name of your NTP server

From your Oracle installation:

- Password for your CamAdmin user
- The host name of your Oracle Server or RAC
- Your Oracle SID, or if a RAC configuration, your Oracle Service name

From your CSP DSA installation:

- `_csp_dir_host`

From the CA Directory properties file:

- `_dir_webservices_password`

Follow these steps:

1. Navigate to `/tmp/properties.sh`.
2. In the `properties.sh` file, set the following parameters.

`_Environment`

Leave as the default, VMWare

`_db_schema_user`

Database user with DBA privileges for Oracle and Postgres. The default is `caadmin`. For an upgrade on Oracle, `_oracle_schema_user` is used if `db_schema_user` is not set.

`_db_schema_password`

Password for user defined by `db_schema_user`. If this property is blank on an upgrade from Oracle, `_Oracle_schema_password` is used.

`_oracle_schema_user`

An Oracle database user with DBA and Connect privileges. This property remains for backwards compatibility with CA CloudMinder 1.5. If it is set and `db_schema_user` is not set, `db_schema_user` uses this value.

For upgrade, you can leave this unchanged or set it to the value used for `_db_schema_user`.

`_oracle_schema_password`

The password for the `oracle_schema_user`. This property remains for backwards compatibility with CA CloudMinder 1.5. If it is set and `db_schema_password` is not set, `db_schema_password` uses this value.

For upgrade, you can leave this unchanged or set it to the value used for `_db_schema_password`.

`_db_server`

Hostname of Oracle and Postgres database server. For an Oracle RAC setup, use the RAC host name.

`_database_name`

For Oracle, the SID or Service name (use the Service name for an Oracle RAC setup); for PostgreSQL, the default database name..

_ps_tablespace_filename

For Oracle, enter the path to the tablespace file as follows:

`<path_to_PS_tablespace_file>/<name_of_PS_tablespace_file.dbf>`

This property is not used for PostgreSQL. Make a note of this value so you can use it later during the installation process.

_ps_tablespace_filesize

For Oracle, the size of the table space for the SiteMinder Policy Server database. We recommend an initial size of 1000MB. This property is not used for PostgreSQL.

_ps_ha_hosts

For a high-availability deployment, enter the host name where you plan to install the second SiteMinder Policy Server.

Note: If you have three or more instances of SiteMinder Policy Server, separate the entries with commas. For example: PolicyServer2, PolicyServer3. Do not include the host name on which you are currently installing.

In a single-instance deployment, leave this parameter blank.

_ps_db_user

A user name for the Oracle or PostgreSQL database user for the Policy Server database. Create any user name.

Make a note of this user name so you can use it later during the installation process.

_ps_db_password

A password for the Oracle or PostgreSQL database user for the SiteMinder Policy Server database. Create any password.

Make a note of this password so you can use it later during the installation process.

_ps_tablespace_name

Table space name for the Policy Server database. Create any table space name.

Make a note of this name so you can use it later during the installation process. This property is not used for PostgreSQL.

_aa_db_user

A user name for the Advanced Authentication Oracle or PostgreSQL database. Create any user name.

Make a note of this user name so you can use it later during the installation process. Use the same value for _im_webfort_user when you install the Identity Management Server.

_aa_db_password

A password for the aa_db_user. Create any password.

Make a note of this password so you can use it later during the installation process. Use the same value for _im_webfort_password when you install the Identity Management Server.

_aa_tablespace_filename

Enter a name for the Oracle tablespace file for the Advanced Authentication database, in one of the following formats. This property is not used for PostgreSQL.

- For an Oracle RAC setup, enter only the tablespace file name. Do not include the file name extension:

<name_of_AA_tablespace_file>

- For a non-RAC setup, enter the full path to the tablespace file. Include the file name extension:

<path_to_AA_tablespace_file>/<name_of_AA_tablespace_file.dbf>

_aa_tablespace_filesize

The size of the file for the table space for the Advanced Authentication database. We recommend an initial size of 1000MB. This property is not used for PostgreSQL.

_aa_tablespace_name

The name of the Advanced Authentication table space. This property is not used for PostgreSQL.

_aa_tomcat_user

The name of a user who starts the Advanced Authentication Tomcat service. Leave as the default, root.

_ps_encryption_key

An encryption key for the Policy Server. Enter any string for the encryption key.

Note: This key is used in encryption processes by the SiteMinder policy server. Choose a string that fulfills typical password best practices.

_ps_admin_password

A password for the default SiteMinder user. Create any password.

Make a note of this password so you can use it later during the installation process. Use the same value for _generic_password when you install the Identity Management Server.

_sm_audit_cleanup_days

Leave as the default, 10.

_ps_license_data

Enter the path on your local system or in a file share to the license.dat file for your SiteMinder Policy Server. Enter the path in the following format:

<path_to_license.dat_file>/license.dat

_dir_webservices_username

User name for Web Services. Leave as the default, dsaweb.

_dir_webservices_password

Enter the same password you entered for _dir_webservices_password in the properties file for the first CA Directory instance.

_csp_console

Set to false if you are installing a SiteMinder Policy Server.

Note: This parameter allows you to install a CSP Console through this installer. Set this to False to prevent a CSP Console from installing.

Important! Set this to true only once for your entire deployment. You only need one CSP Console instance, even in a high-availability deployment.

We recommend that you install a CSP console on a system separate from your SiteMinder Policy Server.

_csp_deploy_dsa

Set to false if you are installing a SiteMinder Policy Server.

Note: This parameter allows you to install a CSP DSA through this installer. Set this to False to prevent a CSP Console from installing.

Important! Set this to true only once for your entire deployment. You only need one CSP DSA instance, even in a high-availability deployment.

We recommend that you install a CSP DSA on the same system on which you install the CSP Console. Install the CSP Console and CSP DSA on a system separate from your SiteMinder Policy Server.

_csp_dir_webservices_port

Port used by Web Services. Leave as the default, 9080, unless you cannot use this port in your environment. If you must change the web services port, enter a new port number.

Note: If you must change the web services port, use the same port for web services on all servers.

_csp_dir_webservices_username

User name for Web Services. Leave as the default, dsaweb.

_csp_dir_webservices_password

Enter the same password you entered for _dir_webservices_password in the properties file for the first CA Directory instance.

_csp_id

Leave as the default, cacsp.

_csp_dir_host

Enter the host name of the system where you plan to install the CSP DSA.

_csp_dir_port

Port used for CSP DSA. Leave as the default, 50000, unless you cannot use this port in your environment. If you must change the web services port, enter a new port number.

Note: If you must change the CSP DSA port, use the same port for the CSP DSA on all SiteMinder Policy Servers.

_csp_dir_password

The administrator password for the default user cspadmin in the CSP DSA. Create any password.

Make a note of this password for future use.

Note: The installation automatically creates the cspadmin user name. You choose the password to apply to this account.

_csp_webservice_cfg_id

Leave as the default, cspwebservice.

_csp_webservice_cfg_secret

Leave as the default. Internal use, do not change.

_aa_dsn_name

Required. The ODBC data source name. Enter any name for the data source.

_aa_tws_base_url

Required. Enter the URL for Tenant Web Services, using the following format:

http://<internal_host:internal_tomcat_port>/tenant-services/cm/tenanttw

- For a non-high-availability deployment, the internal host is the fully-qualified domain name of the SiteMinder Policy Server.
- For a high-availability deployment, use the fully-qualified domain name of the SiteMinder Policy Server load balancer.
- The port number is 9090 by default.

aa_im_base_url

Required. Enter the base URL for the Identity Management Server, using the following format:

https://<external_host>/iam/im/

- For a non-high-availability deployment, the external host is the fully-qualified domain name of the Secure Proxy Server.
- For a high-availability deployment, use the fully-qualified domain name of the Secure Proxy Server load balancer.
- If your Secure Proxy Server is not using the https protocol, begin the base URL with http://

This information is used for browser redirect.

_aa_tws_config_id

Required. The configuration id for Tenant Web Services. The default value, tenantwebservices, is pre-populated.

If you want to use a different value, you must update the value here and in the Identity Management Server properties file.

_aa_tws_shared_secret

Required. The plain shared secret used by Tenant Web Services. The default value, firewall, is pre-populated.

We recommend that you change this value. Enter any value.

Note: You must update the value here and in the Identity Management Server properties file.

_aa_tomcat_host_address

Required. Enter the internal host address.

- For a non-high-availability deployment, the internal host is the fully-qualified domain name of the SiteMinder Policy Server.
- For a high-availability deployment, use the fully-qualified domain name of the SiteMinder Policy Server load balancer.

_shim_aui_host_port

Required. Enter the external host address, such as the domain exposed to the outside world. Supply the host name even though the parameter name ends with _port.

- For a non-high-availability deployment, the external host is the fully-qualified domain name of the Secure Proxy Server.
- For a high-availability deployment, use the fully-qualified domain name of the Secure Proxy Server load balancer.

_shim_sm_webagent_host_port

Required. Enter the external host address, such as the domain exposed to the outside world. Supply the host name even though the parameter name ends with _port.

- For a non-high-availability deployment, the external host is the fully-qualified domain name of the Secure Proxy Server.
- For a high-availability deployment, use the fully-qualified domain name of the Secure Proxy Server load balancer.

_twis_imdb_user

Required. A user name in the Identity Management data store. Enter any user name.

Make a note of this user name so you can use it later during the installation process. Use the same value for _im_db_user when you install the Identity Management Server. This user is created during Identity Management installation.

_twis_imdb_pwd

A password for the user defined in _twis_imdb_user. Enter any password.

Make a note of this password so you can use it later during the installation process. Use the same value for _im_db_password when you install the Identity Management Server.

_twis_im_ws_host

Enter the host name of the system where you plan to install the Identity Management Server. This is used in TWS for accessing the web services deployed in the Identity Management Server.

_haprefimps

Enter the host name of the primary IdentityMinder Provisioning Server. This is the first Provisioning Server you installed.

_hafoimps

Enter the host name of the secondary or failover IdentityMinder Provisioning Server. This is the second Provisioning Server you installed.

_advanced_auth

Set to true to enable advanced authentication.

USER_INSTALL_DIR

Default location of your SiteMinder installation. For example: /opt/CA.

JAVA64_LOCATION

Location of an existing 64-bit JRE if preinstalled. Set this parameter if you choose to install your JRE separately. In this case, symbolically link /opt/java64 to your JRE.

However, instead of installing a JRE separately, the system installer can do this automatically. We recommend that you download a JRE and allow the system to install it.

See the JAVA64_KIT parameter.

JAVA64_KIT

Location of a 64-bit JRE that you download to the local system or to a file share. If this parameter is set, the server kit will install this JRE automatically.

USER_JAVA64

Leave blank for installation. This parameter is intended for upgrades, not installation.

JAVA32_LOCATION

Location of an existing 32-bit JRE if preinstalled. Set this parameter if you choose to install your JRE separately. In this case, symbolically link /opt/java32 to your JRE.

However, instead of installing a JRE separately, the system installer can do this automatically. We recommend that you download a JRE and allow the system to install it.

See the JAVA32_KIT parameter.

JAVA32_KIT

Location of a 32-bit JRE that you download to the local system or to a file share. If this parameter is set, the server kit will install this JRE automatically.

USER_JAVA32

Leave blank for installation. This parameter is intended for upgrades, not installation.

JBOSS_KIT

Enter the file path, on the local system or a file share, of the JBoss to install. The JBoss kit should be in zip file format. JBOSS can be either the community version or the Enterprise Application Platform (EAP).

_ntp_server

IP address or host name of the NTP server to use to synchronize the server time.

_aa_report_tablespace_filename

Required. The path for the orcl_aa_report.dbf file, in the following format:

<Path on Oracle Server>/orcl_aa_report.dbf

_aa_report_tablespace_filesize

Required. The size of the file for the table space for Advanced Authentication reports. Leave as the default, 20M.

AA_CATALINA_LOG_DIR

Leave as the default, \$USER_INSTALL_DIR/AdvancedAuth/Tomcat/logs

This is the location of catalina.log.

3. Back up the properties.sh file. Rename it to a logical name, for example, policyserver1properties.sh.

Note: This file is critical for upgrades. We recommend that you back up this file. This file contains passwords, so be sure to save it in a secure location.

Important! The original properties.sh file resides in a temp folder. If the server is shut down, the properties.sh file is discarded. Therefore, rename and back up this file before proceeding with any further installation or use of the system.

Install and Verify the SiteMinder Policy Server

After you set the Policy Server parameters and back up the properties.sh file, run the installation program.

Verify the installation before proceeding with further installation steps.

Follow these steps:

1. Navigate to:

`/opt/CA/saas/repo/application/`

2. Before the next step, be sure that you unset the DISPLAY variable.

Important! Unless you unset the DISPLAY variable, the installation will complete, but CA SiteMinder services will not start.

3. Run:

`./appliance_local.sh config`

When installation is complete, verify the installation as follows.

4. Issue this command to check if Java is running:

`ps -ef|grep java`

The response is as follows:

```
"java -Xms256m -Xmx1024m -cp ./lib/*
com.ca.directory.dxagent.service.DxAgentService"
"/opt/32/jdk1.6.0_31/jre/bin/java -Xrs
-Dnete.ps.root=/opt/CA/siteminder -classpath
/opt/CA/siteminder/lib/smconapi.jar:/opt/CA/siteminder/monitor/
smmon.jar com.netegrity.smmonagent.SmMonAgentRun"
"/opt/CA/siteminder/adminui/runtime/bin/java
-Dprogram.name=run.sh -server -Xms128m -Xmx1024m
-XX:MaxPermSize=256m -Dorg.jboss.resolver.warning=true
-Dsun.rmi.dgc.client.gcInterval=3600000
-Dsun.rmi.dgc.server.gcInterval=3600000 -disableassertions
-Djboss.platform.mbeanserver=true
-Dderby.system.home=/opt/CA/siteminder/adminui/server/default/d
ata/derby
-Djavax.net.ssl.keyStore=/opt/CA/siteminder/adminui/server/defa
ult/conf/keyStore.jks -Djavax.net.ssl.keyStoreType=jks
-Djavax.net.ssl.keyStorePassword=changeit
-Djavax.net.ssl.trustStore=/opt/CA/siteminder/adminui/server/de
fault/conf/trustStore.jks -Djavax.net.ssl.trustStoreType=jks
-Djavax.net.ssl.trustStorePassword=changeit
-Djava.net.preferIPv4Stack=true
-Djava.endorsed.dirs=/opt/CA/siteminder/adminui/lib/endorsed
-classpath
/opt/CA/siteminder/adminui/bin/run.jar:/opt/CA/siteminder/admin
ui/runtime/lib/tools.jar org.jboss.Main"
```

5. Inspect the /opt/CA/siteminder/registry/sm.registry file.

It should have the following highlighted entry (usually at second line in file):

```
HKEY_LOCAL_SYSTEM\SOFTWARE\Netegrity\SiteMinder\CurrentVersion=
813012936
ImInstalled= 8.0; REG_SZ
InstallKey=
{RC2}Xemlc/LaIcFzZdUpcR+CSlR9A6SNgg0YDQ0wEsqfvKk=; REG_SZ
Label= 758; REG_SZ
Language= EN; REG_SZ
Location= /opt/CA/siteminder; REG_SZ
MasterKeyFile= /opt/CA/siteminder/bin/EncryptionKey.txt;
REG_SZ
Update= 00.00; REG_SZ
Version= 12.51; REG_SZ
```

6. Issue this command to confirm that SiteMinder is running:

```
ps -ef|grep sm
```

The response is as follows:

```
"/opt/CA/siteminder/bin/smexec"
```

```
"smpolicysrv"
```

```
"/opt/32/jdk1.6.0_31/jre/bin/java -Xrs
```

```
-Dnete.ps.root=/opt/CA/siteminder -classpath
```

```
/opt/CA/siteminder/lib/smconapi.jar:/opt/CA/siteminder/monitor/
```

```
smmon.jar com.netegrity.smmonagent.SmMonAgentRun"
```

7. For a high-availability deployment, continue with installing a second SiteMinder Policy Server. For a single-instance deployment, continue with installing the CSP Console.

Update the SiteMinder Realm for the Tenant

Follow these steps:

1. Log in to the CSP console
2. Click Policies, Domain, Domains.
3. Select *tenantDomain*.
4. Go to the Realms tab.
5. Modify realm *tenant_chsforms_realm_es*.
6. Locate the Persistent Session option under Session.
7. Select to enable Persistent Session.
8. Click Ok and then Submit.

High-Availability: SiteMinder Policy Server 2

Prepare a second system that is separate from the one on which you installed the first SiteMinder Policy Server instance.

Confirm that your server environment is properly prepared and install the required packages. [Follow the same steps](#) (see page 52) as you did for the first instance.

Configure the Second SiteMinder Policy Properties File

Set the parameters for the second SiteMinder Policy Server instance.

Copy the properties file from the first SiteMinder Policy Server instance and change only the parameters that are different for the second instance. Remember to rename and back up the new properties file after you complete the parameters.

You need the following information to complete the SiteMinder Policy Server parameters.

General Information:

- The host names of the systems where you plan to install the SiteMinder Policy Servers
- License.dat file for SiteMinder. Contact customer support to download this file from the CA Support site

Follow these steps:

1. On the **first** SiteMinder Policy Server system, copy the properties.sh file that you just configured.
2. Navigate to /tmp/properties.sh on the **second** SiteMinder Policy Server system. Replace the properties.sh file with the configured copy from the first SiteMinder Policy Server system.
3. Change the following parameter values:

`_ps_ha_hosts`

For a high-availability deployment, enter the host name where you installed the first SiteMinder Policy Server.

Note: If you have three or more instances of SiteMinder Policy Server, separate the entries with commas. For example: PolicyServer1, PolicyServer3. Do not include the host name on which you are currently installing.

In a single-instance deployment, leave this parameter blank.

`_ps_license_data`

Enter the path on your local system or in a file share to the license.dat file for your SiteMinder Policy Server. Enter the path in the following format:

`<path_to_license.dat_file>/license.dat`

4. Leave all other parameter values as you set them for the first SiteMinder Policy Server.
5. Back up the properties.sh file. Rename it to a logical name, for example, policyserver2properties.sh.

Note: This file is critical for upgrades. We recommend that you back up this file. This file contains passwords, so be sure to save it in a secure location.

Important! The original properties.sh file resides in a temp folder. If the server is shut down, the properties.sh file is discarded. Therefore, rename and back up this file before proceeding with any further installation or use of the system.

Install and Verify the Second SiteMinder Policy Server

After you set the parameters for the second Policy Server instance and back up the properties.sh file, run the installation program.

Verify the installation before proceeding with further installation steps.

Follow these steps:

1. Navigate to:
`/opt/CA/saas/repo/application/`

2. Run:
`./appliance_local.sh config`

When installation is complete, verify the installation as follows.

3. Issue this command to check if Java is running:

```
ps -ef|grep java
```

The response is as follows:

```
"java -Xms256m -Xmx1024m -cp ./lib/*
com.ca.directory.dxagent.service.DxAgentService"
"/opt/32/jdk1.6.0_31/jre/bin/java -Xrs
-Dnete.ps.root=/opt/CA/siteminder -classpath
/opt/CA/siteminder/lib/smconapi.jar:/opt/CA/siteminder/monitor/
smmon.jar com.netegrity.smmonagent.SmMonAgentRun"
"/opt/CA/siteminder/adminui/runtime/bin/java
-Dprogram.name=run.sh -server -Xms128m -Xmx1024m
-XX:MaxPermSize=256m -Dorg.jboss.resolver.warning=true
-Dsun.rmi.dgc.client.gcInterval=3600000
-Dsun.rmi.dgc.server.gcInterval=3600000 -disableassertions
-Djboss.platform.mbeanserver=true
-Dderby.system.home=/opt/CA/siteminder/adminui/server/default/d
ata/derby
```

```
-Djavax.net.ssl.keyStore=/opt/CA/siteminder/adminui/server/default/conf/keyStore.jks -Djavax.net.ssl.keyStoreType=jks
-Djavax.net.ssl.keyStorePassword=changeit
-Djavax.net.ssl.trustStore=/opt/CA/siteminder/adminui/server/default/conf/trustStore.jks -Djavax.net.ssl.trustStoreType=jks
-Djavax.net.ssl.trustStorePassword=changeit
-Djava.net.preferIPv4Stack=true
-Djava.endorsed.dirs=/opt/CA/siteminder/adminui/lib/endorsed
-classpath
/opt/CA/siteminder/adminui/bin/run.jar:/opt/CA/siteminder/adminui/runtime/lib/tools.jar org.jboss.Main"
```

4. Inspect the /opt/CA/siteminder/registry/sm.registry file.

It should have the following highlighted entry (usually at second line in file):

```
HKEY_LOCAL_SYSTEM\SOFTWARE\Netegrity\SiteMinder\CurrentVersion=
813012936
ImInstalled= 8.0; REG_SZ
InstallKey=
{RC2}Xemlc/LaIcFzZdUpcR+CSlR9A6SNgg0YDQ0wEsqfvKk=; REG_SZ
Label= 758; REG_SZ
Language= EN; REG_SZ
Location= /opt/CA/siteminder; REG_SZ
MasterKeyFile= /opt/CA/siteminder/bin/EncryptionKey.txt;
REG_SZ
Update= 00.00; REG_SZ
Version= 12.51; REG_SZ
```

5. Issue this command to confirm that SiteMinder is running:

```
ps -ef|grep sm
```

The response is as follows:

```
"/opt/CA/siteminder/bin/smexec"
"smpolicysrv"
"/opt/32/jdk1.6.0_31/jre/bin/java -Xrs
-Dnete.ps.root=/opt/CA/siteminder -classpath
/opt/CA/siteminder/lib/smconapi.jar:/opt/CA/siteminder/monitor/
smmon.jar com.netegrity.smmonagent.SmMonAgentRun"
```

Continue with installing the CSP Console.

CSP Console

Use this procedure to install a CSP Console.

You only need to install one instance of the CSP console, even if you are installing a high-availability deployment. After you complete this procedure continue with installing the Secure Proxy Server.

CSP Console Pre-Installation Steps

To prepare for installation, confirm that your server environment is properly prepared. Then install the required packages.

Important! The host name of the machine where you install the CSP Console must contain lower case letters only. If the host name includes upper case letters, the CSP Console does not open, and a looping error occurs in the log.

Follow these steps:

1. Install 64-bit Linux RHEL 6.1.
2. Download, but do not install, a 32-bit JDK and a 64-bit JDK to your local system or to a file share.

Note: The system installer can install the JDK automatically. We recommend that you download a JDK and allow the system to install it.

Important! The CSP console installation requires a JDK, rather than a JRE.

3. Download, but do not install, JBoss 5.1.0 to your local system or to a file share.

Note: The system installs JBoss automatically.

4. Verify Oracle is configured as follows:
 - The Oracle Database server is available with all Oracle services (listener, DB, and so on) running
 - Oracle has a user with username "CamAdmin" with the privileges to create tablespace and user. CamAdmin has the DBA and Connect Oracle roles. Make a note of the password for CamAdmin for later use during installation.
 - The Oracle Database uses a UTF-8 encoded character set. If you plan to enable Advanced Authentication for your environment, install the AL32UTF8 Oracle database character set.
5. Obtain the SiteMinder Policy Server ISO image from the CA Support site and extract it.
6. Copy the kit (CAM-SMPS_kit-date.zip) to / (the root folder).
7. Unzip the kit.
8. Install the following packages required for Advanced Authentication:
 - `yum install -y binutils-2*x86_64*`
 - `yum install -y glibc-2*x86_64* nss-softokn-freebl-3*x86_64*`
 - `glibc-2*i686* nss-softokn-freebl-3*i686*`
 - `compat-libstdc++-33*x86_64*`
 - `glibc-common-2*x86_64*`
 - `glibc-devel-2*x86_64*`

- glibc-devel-2*i686*
- glibc-headers-2*x86_64*
- elfutils-libelf-0*x86_64*
- elfutils-libelf-devel-0*x86_64*
- gcc-4*x86_64*
- gcc-c++-4*x86_64*
- ksh-*x86_64*
- libaio-0*x86_64*
- libaio-devel-0*x86_64*
- libaio-0*i686*
- libaio-devel-0*i686*
- libgcc-4*x86_64*
- libgcc-4*i686*
- libstdc++-4*x86_64*
- libstdc++-4*i686*
- libstdc++-devel-4*x86_64*
- make-3.81*x86_64*
- numactl-devel-2*x86_64*
- sysstat-9*x86_64*
- compat-libstdc++-33*i686*
- compat-libcap*
- unixODBC*
- libstdc++*
- compat-libstdc++-33.i686
- compat-libstdc++-296.i686
- glibc.i686
- ksh.x86_64
- libgcc.i686
- libidn.i686
- libstdc++.i686

- libX11.x86_64
- libXau.x86_64
- libxcb.x86_64
- libXext.i686
- libXi.i686
- libXtst.i686
- ncurses-devel.i686
- nss-softoken-freebl.i686
- dos2unix
- telnet

9. Execute the following command:

```
rpm -i compat-libtermcap-2.0.8-49.el6.i686.rpm
```

10. Make sure that the following soft link still exists. Reverting a virtual machine snapshot removes this link.

```
mv /dev/random /dev/random.orig  
ln -s /dev/urandom /dev/random
```

11. Install the Korn shell packages at /bin/ksh.

12. Run the following commands to set the state of the firewall/ip tables:

```
chkconfig iptables off  
service iptables stop
```

13. Run the following commands to check and set the state of SELinux:

- a. Check the status:
`sestatus`
- b. If the response is "permissive" or "disabled", do nothing
- c. If the response is "enforcing", change the state:
`sudo vi /etc/selinux/config`
`setenforce 0`

Configure the CSP Console Properties File

Set the parameters for the CSP console installation.

The SiteMinder Policy Server installation and the CSP console installation are very similar. Copy the properties file from the first SiteMinder Policy Server instance and change only the parameters that are different for CSP console installation. Remember to rename and back up the new properties file after you complete the parameters.

You need the following information to complete the CSP console parameters.

General Information:

- The host names of the systems where you plan to install the SiteMinder Policy Servers
- License.dat file for SiteMinder. Contact customer support to download this file from the CA Support site

Follow these steps:

1. On the first SiteMinder Policy Server system, copy the properties.sh file that you recently configured.
2. Navigate to /tmp/properties.sh on the CSP console system. Replace the properties.sh file with the configured copy from the first SiteMinder Policy Server system.
3. Change the following parameter values:

`_ps_ha_hosts`

For a high-availability deployment, enter the host name where you installed the first SiteMinder Policy Server.

Note: If you have three or more instances of SiteMinder Policy Server, separate the entries with commas. For example: PolicyServer1, PolicyServer3. Do not include the host name on which you are currently installing.

In a single-instance deployment, leave this parameter blank.

_ps_license_data

Enter the path on your local system or in a file share to the license.dat file for your SiteMinder Policy Server. Enter the path in the following format:

`<path_to_license.dat_file>/license.dat`

_csp_console

Required. Set to true to install the CSP console.

Note: This parameter allows you to install a CSP console through this installer. Set this to False to prevent a CSP console from installing.

Important! Set this to true only once for your entire deployment. You only need one CSP console instance, even in a high-availability deployment.

We recommend that you install a CSP console on a system that is separate from your SiteMinder Policy Server.

_csp_deploy_dsa

Required. Set to true to install the CSP DSA.

Note: This parameter allows you to install a CSP DSA through this installer. Set this to False to prevent a CSP DSA from installing.

Important! Set this to true only once for your entire deployment. You only need one CSP DSA instance, even in a high-availability deployment.

We recommend that you install a CSP DSA on the same system on which you install the CSP Console. Install the CSP Console and CSP DSA on a system that is separate from your SiteMinder Policy Server.

4. Leave all other parameter values as you set them for the first SiteMinder Policy Server.
5. Back up the properties.sh file. Rename it to a logical name, for example, cspconsoleproperties.sh.

Note: This file is critical for upgrades. We recommend that you back up this file. This file contains passwords, so be sure to save it in a secure location.

Important! The original properties.sh file resides in a temp folder. If the server is shut down, the properties.sh file is discarded. Therefore, rename and back up this file before proceeding with any further installation or use of the system.

Install and Verify the CSP Console

After you set the CSP console parameters and back up the properties.sh file, run the installation program.

Verify the installation before proceeding with further installation steps.

Follow these steps:

1. Navigate to:

```
/opt/CA/saas/repo/application/
```

2. Run:

```
./appliance_local.sh config
```

When installation is complete, verify the installation as follows.

3. Issue this command to check if Java is running:

```
ps -ef|grep java
```

The response is as follows:

```
"java -Xms256m -Xmx1024m -cp ./lib/*
com.ca.directory.dxagent.service.DxAgentService"
"/opt/32/jdk1.6.0_31/jre/bin/java -Xrs
-Dnete.ps.root=/opt/CA/siteminder -classpath
/opt/CA/siteminder/lib/smconapi.jar:/opt/CA/siteminder/monitor/
smmon.jar com.netegrity.smmonagent.SmMonAgentRun"
"/opt/CA/siteminder/adminui/runtime/bin/java
-Dprogram.name=run.sh -server -Xms128m -Xmx1024m
-XX:MaxPermSize=256m -Dorg.jboss.resolver.warning=true
-Dsun.rmi.dgc.client.gcInterval=3600000
-Dsun.rmi.dgc.server.gcInterval=3600000 -disableassertions
-Djboss.platform.mbeanserver=true
-Dderby.system.home=/opt/CA/siteminder/adminui/server/default/d
ata/derby
-Djavax.net.ssl.keyStore=/opt/CA/siteminder/adminui/server/defa
ult/conf/keyStore.jks -Djavax.net.ssl.keyStoreType=jks
-Djavax.net.ssl.keyStorePassword=changeit
-Djavax.net.ssl.trustStore=/opt/CA/siteminder/adminui/server/de
fault/conf/trustStore.jks -Djavax.net.ssl.trustStoreType=jks
-Djavax.net.ssl.trustStorePassword=changeit
-Djava.net.preferIPv4Stack=true
-Djava.endorsed.dirs=/opt/CA/siteminder/adminui/lib/endorsed
-classpath
/opt/CA/siteminder/adminui/bin/run.jar:/opt/CA/siteminder/admin
ui/runtime/lib/tools.jar org.jboss.Main"
```

4. Inspect the `/opt/CA/siteminder/registry/sm.registry` file.

It should have the following highlighted entry (usually at second line in file):

```
HKEY_LOCAL_SYSTEM\SOFTWARE\Netegrity\SiteMinder\CurrentVersion=
813012936
ImInstalled=                                8.0; REG_SZ
InstallKey=
{RC2}Xemlc/LaIcFzZdUpcR+CSlR9A6SNgg0YDQ0wEsqfvKk=;      REG_SZ
Label=                                                    758; REG_SZ
Language=                                                    EN; REG_SZ
Location=                                                    /opt/CA/siteminder; REG_SZ
MasterKeyFile=          /opt/CA/siteminder/bin/EncryptionKey.txt;
REG_SZ
Update=                                                    00.00; REG_SZ
Version=                                                    12.51; REG_SZ
```

5. Issue this command to confirm that SiteMinder is running:

```
ps -ef|grep sm
```

The response is as follows:

```
"/opt/CA/siteminder/bin/smexec"
"smpolicysrv"
"/opt/32/jdk1.6.0_31/jre/bin/java -Xrs
-Dnete.ps.root=/opt/CA/siteminder -classpath
/opt/CA/siteminder/lib/smconapi.jar:/opt/CA/siteminder/monitor/
smmon.jar com.netegrity.smmonagent.SmMonAgentRun"
```

Continue with installing the Secure Proxy Server.

Secure Proxy Server

Standalone Secure Proxy Server

Use this procedure to install a Secure Proxy Server.

For a high-availability deployment, after you complete this procedure, continue with the Secure Proxy Server 2 procedure. Otherwise, continue with installing the Identity Management Server after you complete this procedure.

Secure Proxy Server Pre-Installation Steps

To prepare for the installation, confirm that your server environment is properly prepared. Then install the required packages.

Follow these steps:

1. Install 64-bit Linux RHEL 6.1.
2. Download, but do not install, a 32-bit JDK and a 64-bit JDK to your local system or to a file share. You can also use a JRE in place of a JDK.

Note: The system installer can install the JDK automatically. We recommend that you download a JDK and allow the system to install it.

3. Obtain the Secure Proxy Server ISO image from the CA Support site and extract it.
4. Copy the kit (CAM-SPS_kit-*date*.zip) to / (the root folder).
5. Unzip the kit.
6. Install the 32-bit version of the libkeyutils.so.1 library.
7. Install the following packages:

- binutils-2*x86_64*
- glibc-2*x86_64* nss-softoken-freebl-3*x86_64*
- glibc-2*i686* nss-softoken-freebl-3*i686*
- compat-libstdc++-33*x86_64*
- glibc-common-2*x86_64*
- glibc-devel-2*x86_64*
- glibc-devel-2*i686*
- glibc-headers-2*x86_64*
- elfutils-libelf-0*x86_64*
- elfutils-libelf-devel-0*x86_64*
- gcc-4*x86_64*
- gcc-c++-4*x86_64*
- ksh-*x86_64*
- libaio-0*x86_64*
- libaio-devel-0*x86_64*
- libaio-0*i686*
- libaio-devel-0*i686*
- libgcc-4*x86_64*
- libgcc-4*i686*

- libstdc++-4*x86_64*
- libstdc++-4*i686*
- libstdc++-devel-4*x86_64*
- make-3.81*x86_64*
- numactl-devel-2*x86_64*
- sysstat-9*x86_64*
- compat-libstdc++-33*i686*
- compat-libcap*
- unixODBC*
- libstdc++*
- compat-libstdc++-33.i686
- compat-libstdc++-296.i686
- glibc.i686
- ksh.x86_64
- libgcc.i686
- libidn.i686
- libstdc++.i686
- libX11.x86_64
- libXau.x86_64
- libxcb.x86_64
- libXext.i686
- libXi.i686
- libXtst.i686
- ncurses-devel.i686
- nss-softokn-freebl.i686
- dos2unix
- telnet

8. Run the following commands:

```
rpm -i compat-expat1-1.95.8-8.el6.i686.rpm
rpm -i libuuid-2.17.2-12.el6.i686.rpm
rpm -i apr-1.3.9-3.el6.i686.rpm
rpm -i db4-4.7.25-16.el6.i686.rpm
rpm -i expat-2.0.1-9.1.el6.i686.rpm
rpm -i apr-util-1.3.9-3.el6_0.1.i686.rpm
```

9. Run the following commands to set the state of the firewall/ip tables:

```
chkconfig iptables off
service iptables stop
```

10. Run the following commands to check and set the state of SELinux:

- a. Check the status:
`sestatus`
- b. If the response is "permissive" or "disabled", do nothing
- c. If the response is "enforcing", change the state:
`sudo vi /etc/selinux/config`
`setenforce 0`

Configure the Secure Proxy Server Properties File

Set the parameters for the Secure Proxy Server installation.

You need the following information to complete the CSP console parameters.

General Information:

- Your primary SiteMinder Policy Server host name
- Your primary CA IAM CS host name
- The host name of the system where you plan to install the primary Identity Management Server
- The domain name for your installation, for example, forwardinc.com
- The path to your Secure Proxy Server certificate file and key file, if it already exists

From the SiteMinder Policy Server properties file:

- `_ps_admin_password`

Follow these steps:

1. Navigate to `/tmp/properties.sh`.
2. In the `properties.sh` file, set the following parameters.

`_Environment`

Leave as the default, VMWare.

`_policy_server_hostname`

Enter the host name for the first SiteMinder Policy Server you installed.

_im_hostname

Enter the host name of the system where you plan to install the first Identity Management Server.

_jcs_hostname

Enter the host name for the first CA IAM CS you installed.

policy_server_password

Password for the default SiteMinder Policy Server user. Enter the same password you entered for `_ps_admin_password` in the properties file for the Policy Server.

_DomainSuffix

Enter the domain name for your installation, for example, forwardinc.com

JAVA64_LOCATION

Location of an existing 64-bit JRE if preinstalled. Set this parameter if you choose to install your JRE separately. In this case, symbolically link `/opt/java64` to your JRE.

However, instead of installing a JRE separately, the system installer can do this automatically. We recommend that you download a JRE and allow the system to install it.

See the `JAVA64_KIT` parameter.

JAVA64_KIT

Location of a 64-bit JRE that you download to the local system or to a file share. If this parameter is set, the server kit will install this JRE automatically.

USER_JAVA64

Leave blank for installation. This parameter is intended for upgrades, not installation.

JAVA32_LOCATION

Location of an existing 32-bit JRE if preinstalled. Set this parameter if you choose to install your JRE separately. In this case, symbolically link `/opt/java32` to your JRE.

However, instead of installing a JRE separately, the system installer can do this automatically. We recommend that you download a JRE and allow the system to install it.

See the JAVA32_KIT parameter.

JAVA32_KIT

Location of a 32-bit JRE that you download to the local system or to a file share. If this parameter is set, the server kit will install this JRE automatically.

USER_JAVA32

Leave blank for installation. This parameter is intended for upgrades, not installation.

_ntp_server

Required. IP address or host name of the NTP user to use to synchronize the server time.

SSL_ENABLE

Required. Set to yes to run the Secure Proxy Server in SSL mode.

CERT_SPS

Enter the path to your Secure Proxy Server certificate file. Leave this value blank if you want the installer to create a self-signed certificate.

Note: A production installation should not use a self-signed certificate.

An example for an existing certificate file could be:

/opt/mycerts/MySPS.crt

KEY_SPS

Enter the path to your Secure Proxy Server key file. Leave this value blank if you want the installer to create a key.

_cert_passwd

The password of the Secure Proxy Server self-signed certificate that the install will generate. Create any password.

The value is required only if you want the installer to create a self-signed certificate. If your certificate already exists, leave this value blank.

SSL_SUBJECT

The subject of the certificate that the install will generate. The value is required only if you want the installer to create a self-signed certificate. The following shows an example format:

/C=IN/ST=AP/L=HYD/CN=XYZ

Where C = country name, ST = state, L = City, and CN = common name

3. Back up the properties.sh file. Rename it to a logical name, for example, secureproxyserver1properties.sh.

Note: This file is critical for upgrades. We recommend that you back up this file. This file contains passwords, so be sure to save it in a secure location.

Important! The original properties.sh file resides in a temp folder. If the server is shut down, the properties.sh file is discarded. Therefore, rename and back up this file before proceeding with any further installation or use of the system.

Proxy UI for the Secure Proxy Server

This procedure enables the CSP administrator to access the proxy UI.

Follow these steps:

1. Log in to the CSP console.
2. Navigate to policies, Domain, Domains and edit domain DOMAIN-SPSADMINUI-cam-agent
3. Add the following user directory on the General tab:
cacsp Directory
4. Click Submit.
5. Navigate to policies, Domain, Domains and edit domain DOMAIN-SPSADMINUI-cam-agent

6. Navigate to Policies and edit "POLICY-SPSADMINUI-cam-agent. Make these changes on the Users tab.
 - a. Add users and Add All.
 - b. Click Ok and Submit.

The Proxy UI can be accessed from following URLs:

- `https://Primary SPS Hostname:8443/proxyui/`
- `https://Secondary SPS Hostname:8443/proxyui/`

Install and Verify the Secure Proxy Server

After you set the Secure Proxy Server parameters and back up the properties.sh file, run the installation program.

Verify the installation before proceeding with further installation steps.

Follow these steps:

1. Navigate to:

```
/opt/CA/saas/repo/application/
```

2. Run:

```
./appliance_local.sh config
```

When installation is complete, verify the installation as follows.

3. Make sure that services are running. Enter this command:

```
ps -ef | grep httpd
```

The response should be instances of the following line:

```
/opt/CA/secure-proxy/httpd/bin/httpd -d
/opt/CA/secure-proxy/httpd -k start
```

4. Check that Java is running. Enter the following command:

```
ps -ef | grep java
```

The response should be similar to the following, ending with server.conf:

```
/opt/jdk1.6.0_31/32/bin/java -ms256m -mx512m -server
-Dcatalina.base=/opt/CA/secure-proxy/Tomcat
-Dcatalina.home=/opt/CA/secure-proxy/Tomcat
-Djava.io.tmpdir=/opt/CA/secure-proxy/Tomcat/temp
-DHTTPClient.log.mask=0
-DHTTPClient.Modules=HTTPClient.RetryModule|org.tigris.noodle.N
oodleCookieModule|HTTPClient.DefaultModule
-Dlogger.properties=/opt/CA/secure-proxy/Tomcat/properties/logg
er.properties -DNETE_WA_ROOT=/opt/CA/webagent
-DPWD=/opt/CA/secure-proxy -classpath
```

```
/opt/CA/secure-proxy/Tomcat/bin/proxybootstrap.jar:/opt/CA/secure-proxy/Tomcat/properties:/opt/jdk1.6.0_31/32/lib/tools.jar:/opt/CA/secure-proxy/Tomcat/bin/bootstrap.jar:
com.netegrity.proxy.ProxyBootstrap -config
/opt/CA/secure-proxy/proxy-engine/conf/server.conf
```

5. Start the Secure Proxy Server as follows:

- a. Navigate to `/opt/CA/secure-proxy/proxy-engine`
- b. Issue these commands:

```
./sps-ctl stop
./sps-ctl startssl
```

The Secure Proxy Server starts.

6. For a high-availability deployment, continue with installing a second Secure Policy Server. For a single-instance deployment, continue with installing the Identity Management Server.

High-Availability: Secure Proxy Server 2

Prepare a second system that is separate from the one on which you installed the first Secure Proxy Server instance.

Confirm that your server environment is properly prepared and install the required packages. [Follow the same steps](#) (see page 77) as you did for the first instance.

Configure the Second Secure Proxy Server Properties File

Set the parameters for the second Secure Proxy Server instance.

Copy the properties file from the first Secure Proxy Server instance and change only the parameters that are different for the second instance. Remember to rename and back up the new properties file after you complete the parameters.

You need the following information to complete the Secure Proxy Server parameters.

General Information:

- Your second (failover) SiteMinder Policy Server host name
- Your second (failover) CA IAM CS host name
- The host name of the system where you plan to install the second (failover) Identity Management Server

From the SiteMinder Policy Server properties file:

- `_ps_admin_password`

Follow these steps:

1. On the **first** Secure Proxy Server system, copy the properties.sh file that you just configured.
2. Navigate to /tmp/properties.sh on the **second** Secure Proxy Server system. Replace the properties.sh file with the configured copy from the first Secure Proxy Server system.
3. Change the following parameter values:

_policy_server_hostname

Enter the host name for the second SiteMinder Policy Server you installed.

_im_hostname

Enter the host name of the system where you plan to install the second Identity Management Server.

_jcs_hostname

Enter the host name for the second CA IAM CS you installed.

4. Leave all other parameter values as you set them for the first SiteMinder Policy Server.
5. Back up the properties.sh file. Rename it to a logical name, for example, secureproxyserver2properties.sh.

Note: This file is critical for upgrades. We recommend that you back up this file. This file contains passwords, so be sure to save it in a secure location.

Important! The original properties.sh file resides in a temp folder. If the server is shut down, the properties.sh file is discarded. Therefore, rename and back up this file before proceeding with any further installation or use of the system.

Install and Verify the Second Secure Proxy Server

After you set the parameters for the second Secure Proxy Server and back up the properties.sh file, run the installation program.

Verify the installation before proceeding with further installation steps.

Follow these steps:

1. Navigate to:

```
/opt/CA/saas/repo/application/
```

2. Run:

```
./appliance_local.sh config
```

When installation is complete, verify the installation as follows.

3. Make sure that services are running. Enter this command:

```
ps -ef | grep httpd
```

The response should be instances of the following line:

```
/opt/CA/secure-proxy/httpd/bin/httpd -d  
/opt/CA/secure-proxy/httpd -k start
```

4. Check that Java is running. Enter the following command:

```
ps -ef | grep java
```

The response should be similar to the following, ending with server.conf:

```
/opt/jdk1.6.0_31/32/bin/java -ms256m -mx512m -server  
-Dcatalina.base=/opt/CA/secure-proxy/Tomcat  
-Dcatalina.home=/opt/CA/secure-proxy/Tomcat  
-Djava.io.tmpdir=/opt/CA/secure-proxy/Tomcat/temp  
-DHTTPClient.log.mask=0  
-DHTTPClient.Modules=HTTPClient.RetryModule|org.tigris.noodle.NoodleCookieModule|HTTPClient.DefaultModule  
-Dlogger.properties=/opt/CA/secure-proxy/Tomcat/properties/logger.properties -DNETE_WA_ROOT=/opt/CA/webagent  
-DPWD=/opt/CA/secure-proxy -classpath  
/opt/CA/secure-proxy/Tomcat/bin/proxybootstrap.jar:/opt/CA/secure-proxy/Tomcat/properties:/opt/jdk1.6.0_31/32/lib/tools.jar:/opt/CA/secure-proxy/Tomcat/bin/bootstrap.jar:  
com.netegrity.proxy.ProxyBootstrap -config  
/opt/CA/secure-proxy/proxy-engine/conf/server.conf
```

5. Start the Secure Proxy Server as follows:
 - a. Navigate to `/opt/CA/secure-proxy/proxy-engine`
 - b. Issue these commands:

```
./sps-ctl stop
./sps-ctl startssl
```

The Secure Proxy Server starts.

Continue with installing the Identity Management Server.

Identity Management Server

Standalone Identity Management Server

Use this procedure to install an Identity Management Server.

After you complete this procedure, continue with the Identity Management Server 2 procedure in a high availability deployment. Otherwise, after you complete this procedure continue with installing the Report Server.

Identity Management Server Pre-Installation Steps

To prepare for installation, confirm that your server environment is properly prepared. Then install the required packages.

Note: For installation a high-availability JBoss cluster, all nodes on the cluster must be on the same subnet.

Follow these steps:

1. Install 64-bit Linux RHEL 6.1.
2. Download, but do not install, a 64-bit JDK to your local system or to a file share.

Note: The system installer can install the JDK automatically. We recommend that you download a JDK and allow the system to install it.

Important! The Identity Management installation requires a JDK, rather than a JRE.

3. Download, but do not install, JBoss 5.1.0 to your local system or to a file share.

Note: The system installer JBoss automatically.

4. From the Oracle web site, download the JCE policy zip file, `jce_policy-6.zip`. Copy the file to the `/tmp` folder on your Identity Management server.
5. Obtain the Identity Management Server ISO image from the CA Support site and extract it.
6. Copy the kit (`CAM-IM_kit-date.zip`) to `/` (the root folder).
7. Unzip the kit.
8. Install the following packages:
 - `binutils-2*x86_64*`
 - `glibc-2*x86_64* nss-softokn-freebl-3*x86_64*`
 - `glibc-2*i686* nss-softokn-freebl-3*i686*`
 - `compat-libstdc++-33*x86_64*`
 - `glibc-common-2*x86_64*`
 - `glibc-devel-2*x86_64*`
 - `glibc-devel-2*i686*`
 - `glibc-headers-2*x86_64*`
 - `elfutils-libelf-0*x86_64*`
 - `elfutils-libelf-devel-0*x86_64*`
 - `gcc-4*x86_64*`
 - `gcc-c++-4*x86_64*`
 - `ksh-*x86_64*`
 - `libaio-0*x86_64*`
 - `libaio-devel-0*x86_64*`
 - `libaio-0*i686*`
 - `libaio-devel-0*i686*`
 - `libgcc-4*x86_64*`
 - `libgcc-4*i686*`
 - `libstdc++-4*x86_64*`
 - `libstdc++-4*i686*`
 - `libstdc++-devel-4*x86_64*`
 - `make-3.81*x86_64*`
 - `numactl-devel-2*x86_64*`
 - `sysstat-9*x86_64*`

- compat-libstdc++-33.i686*
- compat-libcap*
- unixODBC*
- libstdc++*
- compat-libstdc++-33.i686
- compat-libstdc++-296.i686
- glibc.i686
- ksh.x86_64
- libgcc.i686
- libidn.i686
- libstdc++.i686
- libX11.x86_64
- libXau.x86_64
- libxcb.x86_64
- libXext.i686
- libXi.i686
- libXtst.i686
- ncurses-devel.i686
- nss-softokn-freebl.i686
- dos2unix
- telnet

9. Run the following commands to set the state of the firewall/ip tables:

```
chkconfig iptables off
service iptables stop
```

10. Run the following commands to check and set the state of SELinux:

- a. Check the status:
`sestatus`
- b. If the response is "permissive" or "disabled", do nothing
- c. If the response is "enforcing", change the state:
`sudo vi /etc/selinux/config`
`setenforce 0`

Configure the Identity Management Server Properties File

Set the parameters for the Identity Management Server installation.

General Information:

- The host names of the systems where you installed the CA Directory servers
- The host names of the systems where you installed the SiteMinder Policy servers
- The host names of the systems where you installed the Provisioning servers
- The host names of the systems where you plan to install the Identity Management servers
- The JBoss ID for the Identity Management Server you are installing.
- The name of the mail server that you want the Identity Management server to use for email notifications
- The return address that you want the Identity Management server to use for email
- The full file path to the JCE policy zip file, jce_policy-6.zip

From your Oracle installation:

- Password for your CamAdmin user
- The host name of your Oracle Server or RAC
- Your Oracle SID, or if a RAC configuration, your Oracle Service name

From the CA Directory properties file:

- `impd_shared_secret`
- `_dir_webservices_username`
- `_dir_webservices_password`
- `_dir_webservices_port`

From the SiteMinder Policy Server properties file:

- `_ps_db_user`
- `_ps_db_password`
- `_ps_tablespace_name`
- `_ps_admin_password`
- `_aa_db_user`
- `_aa_db_password`
- `_csp_dir_host`
- `_csp_dir_port`
- `_csp_dir_password`

From the Provisioning Server properties file:

- `_provisioning_server_pwd`
- `_connector_server_pwd`

Follow these steps:

1. Navigate to `/tmp/properties.sh`.
2. In the `properties.sh` file, set the following parameters.

`_Environment`

Leave as the default, VMWare.

`_db_server`

Hostname of Oracle and PostgreSQL database server. For an Oracle RAC setup, use the RAC host name.

`db_schema_user`

Database user with DBA privileges for Oracle and PostgreSQL. The default is `caadmin`. For an upgrade on Oracle, `_oracle_schema_user` is used if `db_schema_user` is not set.

`db_schema_password`

Password for user defined by `db_schema_user`. If this property is blank on an upgrade from Oracle, `_oracle_schema_password` is used.

`_oracle_schema_user`

An Oracle database user with DBA and Connect privileges. This property remains for backwards compatibility with CA CloudMinder 1.5. If it is set and `db_schema_user` is not set, `db_schema_user` uses this value.

For upgrade, you can leave this unchanged or set it to the value used for `_db_schema_user`.

`_oracle_schema_password`

The password for the `_oracle_schema_user`. This property remains for backwards compatibility with CA CloudMinder 1.5. If it is set and `db_schema_password` is not set, `db_schema_password` uses this value.

For upgrade, you can leave this unchanged or set it to the value used for `_db_schema_password`.

`_database_name`

For Oracle, the SID or Service name (use the Service name for an Oracle RAC setup); for PostgreSQL, the default database name.

`_im_db_user`

A user name for the Identity Management database. Create any user name.

_im_db_password

A password you for the Identity Management Oracle or PostgreSQL database user. Create any password.

_im_tablespace_name

Table space name for the Identity Management Oracle or PostgreSQL database. Create any table space name.

_im_tablespace_filename

Enter a name for the Oracle tablespace file for the Identity Management server, in one of the following formats.

- For an Oracle RAC setup, enter only the tablespace file name. Do not include the file name extension:
<name_of_IM_tablespace_file>
- For a non-RAC setup, enter the full path to the tablespace file. Include the file name extension:
<path_to_IM_tablespace_file>/<name_of_IM_tablespace_file.dbf>

_im_tablespace_filesize

The size of the table space for the Identity Management database. We recommend an initial size of 1000MB. This property is not used for PostgreSQL.

_ps_db_user

Enter the same user name you entered for _ps_db_user in the properties file for the first SiteMinder Policy Server instance. This property is used for Oracle and PostgreSQL.

_ps_db_password

Enter the same password you entered for _ps_db_password in the properties file for the first SiteMinder Policy Server instance. This property is used for Oracle and PostgreSQL.

_ps_tablespace_name

Enter the same name you entered for _ps_tablespace_name in the properties file for the first SiteMinder Policy Server instance. This property is not used for PostgreSQL.

_generic_username

The default SiteMinder Policy Server user name.

_generic_password

Enter the same password you entered for `_ps_admin_password` in the properties file for the first SiteMinder Policy Server installation. This is the password for the default SiteMinder Policy Server user.

_agent_name

The name of the agent which the Identity Management Server uses to communicate with the SiteMinder Policy Server. For internal use. Leave as the default, `camadmin`.

_agent_password

A password you create for the agent used by the Identity Management Server to communicate with the SiteMinder Policy Server.

_sm_host

Enter the host address of the SiteMinder Policy Server load balancer VIP.

_use_siteminder

Set to the value `"True"` so that the Identity Management Server is installed with SiteMinder integration enabled.

_use_clustering

Set to the value `"True"` to enable high availability installation of the Identity Management servers.

Set to the value `"False"` to disable high availability installation, for example, in a test environment.

_mail_server

Enter the name of the mail server that you want the Identity Management server to use for email notifications.

_sendmail_smart_relay_host

This is used for the sendmail configuration of the relay host. Leave blank or specify the local host.

_email_return_address

Enter the return address that you want the Identity Management server to use for email.

_cluster_sucker_password

A password used by JBoss cluster. Leave as the default setting or create any password.

_cluster_peer_host

Enter the host name of the server on which you are currently installing Identity Management.

`_jboss_server_id`

Enter a JBoss ID for the Identity Management Server you are installing. Create any unique ID. We recommend a value of "1" for your first Identity Management instance, "2" for your second instance, etc.

`_uarm_user_id`

Internal use only. Do not change.

`_uarm_password`

Internal use only. Do not change.

`_uarm_dev_user_id`

Internal use only. Do not change.

`_multicast_groupname`

Enter a unique name you create for this Identity Management cluster. Choose a different multicast groupname for each cluster you run.

All the Identity Management Servers in the cluster share the same value for this parameter. This can be any text string, but we recommend a short name, because it is included in every message sent around the cluster.

`_multicast_address`

Enter a unique multicast address you create for this Identity Management cluster. Choose a different multicast address for each cluster you run.

All the Identity Management servers in the cluster share the same value for this parameter. By default, JBoss AS uses UDP multicast for most intra-cluster communication. Consider a multicast address of the form 239.255.x.y. See JBoss documentation for additional guidelines.

`_im_fips_mode`

Set to the value "False" to install without FIPS mode. CA CloudMinder 1.5 does not currently support FIPS mode.

`_im_fips_key_location`

"/tmp"

Location of the FIPS key.

Leave as the default. CA CloudMinder 1.5 does not currently support FIPS mode.

_im_webfort_user

Enter the same name you entered for `_aa_db_user` in the properties file for the first SiteMinder Policy Server instance. This is the advanced authentication database user name. If webfort is not used, set this property to the same value as `_im_db_user`. This property applies for both Oracle and PostgreSQL.

_im_webfort_password

Enter the same name you entered for `_aa_db_password` in the properties file for the first SiteMinder Policy Server instance. This is the advanced authentication database user password. If webfort is not used, set this property to the same value as `_im_db_password`. This property applies for both Oracle and PostgreSQL.

_TenantProvDirPassword

Enter the same value you entered for `impd_shared_secret` in the properties file for the first Directory Server instance.

_TenantProvServerSecret

Enter the same value you entered for `_provisioning_server_pwd` in the properties file for the first Provisioning Server instance.

_TenantProvDirectorySecret

Enter the same value you entered for `impd_shared_secret` in the properties file for the first Directory Server instance.

_TenantProvJCSPassword

Enter the same value you entered for `_connector_server_pwd` in the properties file for the first Provisioning Server instance.

_cspHostName

Enter the host name where you installed the first (primary) SiteMinder Policy Server.

_cspHostPort

Enter 8080, or enter the CSP console Port if it is installed on a non-default port.

_cspContextPath

Internal use. Do not change.

_cspAlias

Internal use. Do not change.

_cspSecure

Set to the value "True" to enable SSL on the CSP console (use HTTPS).

Set to the value "False" to disable SSL on the CSP console (use HTTP).

_cspConfigurationId

Internal use. Do not change.

_cspConfigurationSecret

Internal use. Do not change.

_envBaseURL

Enter the base URL for your CA CloudMinder environment, in the following format:

<SPS>.<YOURDOMAIN>/iam/im

Where SPS is your Secure Proxy Server, and YOURDOMAIN is the domain address for your environment.

For example:

cloudminderspvp1.forwardinc.com/iam/im

_dirHosts

Enter all CA Directory host names in your environment, separated by commas.

_internalBaseURL

Set this Hosting Container to specify Internal Base URL when you do not want the notifications from Provisioning Server to go to the Environment Base URL.

You can specify an internal Identity Management Server load balancer here. This load balancer is used as the Provisioning Server notification URL for any tenants deployed. Tenants deployed when no Internal Base URL has been specified have a Provisioning Server notification URL that is derived from the Environment Base URL.

_dirDsaMgmtUser

Enter the same value as you entered for `_dir_webservices_username` in the properties file for the first CA Directory instance. Be sure to uncomment this parameter (remove # from the parameter name).

_dirDsaMgmtPassword

Enter the same value as you entered for `_dir_webservices_password` in the properties file for the first CA Directory instance. Be sure to uncomment this parameter (remove # from the parameter name).

_dirDsaMgmtPort

Enter the same value as you entered for `_dir_webservices_port` in the properties file for the first CA Directory instance. Be sure to uncomment this parameter (remove # from the parameter name).

_tenantDsaRouterHosts

Enter the host names for all hosts with a DSA router in your installation, separated by commas.

For Example:

Identity Management Server1, Identity Management Server2, SiteMinder Policy Server1, SiteMinder Policy Server2, Provisioning Server1, Provisioning Server2

_tenantDsaRouterMgmtUser

Leave as default, blank.

_tenantDsaRouterMgmtPassword

Leave as default, blank.

_tenantDsaRouterMgmtPort

Leave as default, blank.

_impsHosts

Enter the host names for all Provisioning Servers, separated by commas.

For Example:

Provisioning Server1, Provisioning Server2

_impsDsaMgmtUser

Leave as default, blank.

_impsDsaMgmtPassword

Leave as default, blank.

_impsDsaMgmtPort

Leave as default, blank.

_impsTenantServiceHost

Enter the host name of the first (primary) Provisioning Server.

Note: If the CA IAM CS is on a separate server, enter the host name of the CA IAM CS instead.

_impsTenantServicePassword

Enter the same password as you entered for `_connector_server_pwd` in the properties file for the first instance of the Provisioning Server. This is the password used to access the CA IAM CS.

_haprefimps

Enter the host name of the first (primary) Provisioning Server.

_hafoimps

Enter the host name of the second (failover) Provisioning Server.

_CSPDeployDir

Internal use. Do not change.

_CSPID

Internal use. Do not change.

_CSPName

Internal use. Do not change.

_CSPDirPassword

Enter the same password you entered for `_csp_dir_password` in the properties file for the first SiteMinder Policy Server instance.

_CSPDirHost

Enter the same host name you entered for `_csp_dir_host` in the properties file for the first SiteMinder Policy Server instance.

_CSPDirPort

Enter the same password you entered for `_csp_dir_port` in the properties file for the first SiteMinder Policy Server instance.

_authMinderHost

Enter the host name for the first (primary) SiteMinder Policy Server.

JAVA64_LOCATION

Location of an existing 64-bit JRE if preinstalled. Set this parameter if you choose to install your JRE separately. In this case, symbolically link `/opt/java64` to your JRE.

However, instead of installing a JRE separately, the system installer can do this automatically. We recommend that you download a JRE and allow the system to install it.

See the `JAVA64_KIT` parameter.

JAVA64_KIT

Location of a 64-bit JRE that you download to the local system or to a file share. If this parameter is set, the server kit will install this JRE automatically.

JBOSS_KIT

Enter the file path, on the local system or a file share, of the JBoss to install. The JBoss kit should be in zip file format. JBOSS can be either the community version or the Enterprise Application Platform (EAP).

_ntp_server

IP address or host name of the NTP server to use to synchronize the server time.

_jce_zip_file

Enter the full file path to the JCE policy zip file. You downloaded the `jce_policy-6.zip` file from the Oracle web site during the Identity Management pre-installation steps.

_secure_session_cookie

The server kit configures JBoss to use session cookies with `secure` and `httpOnly` attributes if two conditions are met:

1. property `_secure_session_cookie` is set to `true` in `properties.sh`:

```
_secure_session_cookie=true; export _secure_session_cookie
```

2. property `_envBaseUrl` starts with `https` in `properties.sh`:

```
_envBaseUrl=https://webserver.ca.com; export _envBaseUrl
```

If both conditions are not met, the session cookie will be left as is. The server kit contains a script that can be used to reconfigure the session cookie based on these conditions at any time:

`configSessionCookie.sh`

This script reads the properties and either enables the attributes in the JBoss session cookie or disables them depending on the values of the two properties. A JBoss restart is then required for the settings to take effect.

The User Console does not work properly without HTTPS if configured with secure session cookies.

1. Back up the `properties.sh` file. Rename it to a logical name, for example, `identitymanager1properties.sh`.

Note: This file is critical for upgrades. We recommend that you back up this file. This file contains passwords, so be sure to save it in a secure location.

Important! The original `properties.sh` file resides in a temp folder. If the server is shut down, the `properties.sh` file is discarded. Therefore, rename and back up this file before proceeding with any further installation or use of the system.

Install and Verify the Identity Management Server

After you set the Identity Management Server parameters and back up the `properties.sh` file, run the installation program.

Verify the installation before proceeding with further installation steps.

Follow these steps:

1. Navigate to:
`/opt/CA/saas/repo/application/`
2. Run:
`./appliance_local.sh config`

When installation is complete, set up JBoss. Then verify the installation as follows.

Setup Using JBoss EAP

If you are using JBoss EAP, do the following:

1. Edit the file
`/opt/jboss-eap-5.1.2/jboss-as/server/all/conf/props/jmx-console-users.properties`
2. Uncomment the line "#admin=admin"
3. Run the following command:
`dos2unix ../conf/props/jmx-console-users.properties`
4. Stop and Start the Identity Management Server using JBoss, using the following steps:
`cd /etc/init.d/im stop`
`cd /etc/init.d/im start`

JBoss Configuration

The recommended memory for the Identity Management Server on JBoss is 6GB (6144). This is physical memory rather than swap space.

During installation, the system allocates memory to JBoss. The installation process calculates the memory allocation based on the physical memory of the system, as follows:

- Less than 8G, *memory* minus 2G is allocated
- More than 8G, *memory* divided by 2 is allocated
- The minimum memory allocated is 1G

After installation is complete, check your overall system memory and check the memory allocated to JBoss. The JBoss memory allocation is found in the `run.sh` file on the Identity Management Server.

If you do not have sufficient memory on the system, increase the max memory used by JBoss as follows:

1. Edit the file `/opt/jboss-5.1.0.GA/bin/run.sh` as follows:
`JAVA_OPTS="$IDM_OPTS $DEBUG_OPTS`
`-Djava.security.policy=workpoint_client.policy -Xms256m`
`-Xmx6144m -XX:MaxPermSize=256m -XX:ReservedCodeCacheSize=50m"`

In this example, the memory allocated is 6GB (6144).
2. Restart JBoss.

Verify the Server Installation

1. Issue this command to check if Java is running:
`ps -ef|grep java`

The response includes the following:

```
java -Xms256m -Xmx4096m -cp ./lib/*  
com.ca.directory.dxagent.service.DxAgentService
```

2. Verify that the /opt/jboss-5.1.0.GA/bin/run.sh file has the multicast_address and multicast_groupname that were set in /tmp/properties.sh file.
3. Verify that the following folders are present.

For the community edition of JBoss:

```
/opt/jboss-5.1.0.GA/server/all/deploy/iam_im.ear/user_console.w  
ar/META-INF/csp  
/opt/jboss-5.1.0.GA/server/all/deploy/iam_im.ear/user_console.w  
ar/META-INF/tenant
```

For JBoss EAP:

```
/opt/jboss-eap-5.1.2/jboss-as/server/all/deploy/iam_im.ear/use  
r_console.war/META-INF/csp  
/opt/jboss-eap-5.1.2/jboss-as/server/all/deploy/iam_im.ear/use  
r_console.war/META-INF
```

4. Verify that the following files are present.

For the community edition of JBoss:

```
/opt/jboss-5.1.0.GA/server/all/deploy/iam_im.ear/user_console.w  
ar/META-INF/csp/CSP.properties  
/opt/jboss-5.1.0.GA/server/all/deploy/iam_im.ear/user_console.w  
ar/META-INF/tenant/Container.properties
```

For JBoss EAP:

```
/opt/jboss-eap-5.1.2/jboss-as/server/all/deploy/iam_im.ear/use  
r_console.war/META-INF/csp/CSP.properties  
/opt/jboss-eap-5.1.2/jboss-as/server/all/deploy/iam_im.ear/use  
r_console.war/META-INF/tenant/Container.properties
```

5. For a high availability installation, edit the following file:

For the community edition of JBoss:

```
/opt/jbos-5.1.0.GA/server/all/deploy/iam_im.ear/policyserver.rar/META-INF/ra.xml
```

For JBoss EAP:

```
/opt/jboss-eap-5.1.2/jboss-as//server/all/deploy/iam_im.ear/policyserver.rar/META-INF/ra.xml
```

This requires the following line:

```
<config-property-value>Your SiteMinder Policy Server1
Hostname,44441,44442,44443</config-property-value>
```

6. For a high-availability deployment, continue with installing a second Identity Management Server. For a single-instance deployment, continue with installing the Report Server.

High-Availability: Identity Management Server 2

Prepare a second system that is separate from the one on which you installed the first Identity Management Server instance.

Confirm that your server environment is properly prepared and install the required packages. [Follow the same steps](#) (see page 87) as you did for the first instance.

Configure the Second Identity Management Server Properties File

Set the parameters for the second Identity Management Server instance.

Copy the properties file from the first Secure Proxy Server instance and change only the parameters that are different for the second instance. Remember to rename and back up the new properties file after you complete the parameters.

You need the following information to complete the Secure Proxy Server parameters.

General Information:

- The host names of the systems where you are installing the Identity Management servers.
- The JBoss ID for the Identity Management Server you are installing.

Follow these steps:

1. On the **first** Identity Management server system, copy the properties.sh file that you just configured.
2. Navigate to /tmp/properties.sh on the **second** Identity Management server system. Replace the properties.sh file with the configured copy from the first Identity Management system.
3. Change the following parameter values:

_cluster_peer_host

Enter the host name of the server on which you are currently installing Identity Management.

_jboss_server_id

Enter a JBoss ID for the Identity Management Server you are installing. Create any unique ID. We recommend a value of "1" for your first Identity Management instance, "2" for your second instance, etc.

4. Leave all other parameter values as you set them for the first Identity Management server.
5. Back up the properties.sh file. Rename it to a logical name, for example, identitymanager2properties.sh.

Note: This file is critical for upgrades. We recommend that you back up this file. This file contains passwords, so be sure to save it in a secure location.

Important! The original properties.sh file resides in a temp folder. If the server is shut down, the properties.sh file is discarded. Therefore, rename and back up this file before proceeding with any further installation or use of the system.

Install and Verify the Second Identity Management Server

After you set the parameters for the Identity Management Server and back up the `properties.sh` file, run the installation program.

Verify the installation before proceeding with further installation steps.

Follow these steps:

1. Navigate to:

```
/opt/CA/saas/repo/application/
```

2. Run:

```
./appliance_local.sh config
```

When installation is complete, set up JBoss. Then verify the installation as follows.

Setup Using JBoss EAP

If you are using JBoss EAP, do the following:

1. Edit the file
`/opt/jboss-eap-5.1.2/jboss-as/server/all/conf/props/jmx-console-users.properties`
2. Uncomment the line `"#admin=admin"`
3. Run the following command:
`dos2unix ../conf/props/jmx-console-users.properties`
4. Stop and Start the Identity Management Server using JBoss, using the following steps:
`cd /etc/init.d/im stop`
`cd /etc/init.d/im start`

JBoss Configuration

The recommended memory for the Identity Management Server on JBoss is 6GB (6144). This is physical memory rather than swap space.

During installation, the system allocates memory to JBoss. The installation process calculates the memory allocation based on the physical memory of the system, as follows:

- Less than 8G, *memory* minus 2G is allocated
- More than 8G, *memory* divided by 2 is allocated
- The minimum memory allocated is 1G

After installation is complete, check your overall system memory and check the memory allocated to JBoss. The JBoss memory allocation is found in the run.sh file on the Identity Management Server.

If you do not have sufficient memory on the system, increase the max memory used by JBoss as follows:

1. Edit the file /opt/jboss-5.1.0.GA/bin/run.sh as follows:
JAVA_OPTS="\$IDM_OPTS \$DEBUG_OPTS
-Djava.security.policy=workpoint_client.policy -Xms256m
-Xmx6144m -XX:MaxPermSize=256m -XX:ReservedCodeCacheSize=50m"
In this example, the memory allocated is 6GB (6144).
2. Restart JBoss.

Verify the Server Installation

1. Issue this command to check if Java is running:

```
ps -ef|grep java
```

The response includes the following:

```
java -Xms256m -Xmx4096m -cp ./lib/*  
com.ca.directory.dxagent.service.DxAgentService
```

2. Verify that the /opt/jboss-5.1.0.GA/bin/run.sh file has the multicast_address and multicast_groupname that were set in /tmp/properties.sh file.
3. Verify that the following folders are present.

For the community edition of JBoss:

```
/opt/jboss-5.1.0.GA/server/all/deploy/iam_im.ear/user_console.w  
ar/META-INF/csp  
/opt/jboss-5.1.0.GA/server/all/deploy/iam_im.ear/user_console.w  
ar/META-INF/tenant
```

For JBoss EAP:

```
/opt/jboss-eap-5.1.2/jboss-as/server/all/deploy/iam_im.ear/use  
r_console.war/META-INF/csp  
/opt/jboss-eap-5.1.2/jboss-as/server/all/deploy/iam_im.ear/use  
r_console.war/META-INF
```

4. Verify that the following files are present.

For the community edition of JBoss:

```
/opt/jboss-5.1.0.GA/server/all/deploy/iam_im.ear/user_console.war/META-INF/csp/CSP.properties
/opt/jboss-5.1.0.GA/server/all/deploy/iam_im.ear/user_console.war/META-INF/tenant/Container.properties
```

For JBoss EAP:

```
/opt/jboss-eap-5.1.2/jboss-as/server/all/deploy/iam_im.ear/user_console.war/META-INF/csp/CSP.properties
/opt/jboss-eap-5.1.2/jboss-as/server/all/deploy/iam_im.ear/user_console.war/META-INF/tenant/Container.properties
```

5. For a high availability installation, edit the following file:

For the community edition of JBoss:

```
/opt/jbos-5.1.0.GA/server/all/deploy/iam_im.ear/policyserver.rar/META-INF/ra.xml
```

For JBoss EAP:

```
/opt/jboss-eap-5.1.2/jboss-as/server/all/deploy/iam_im.ear/policyserver.rar/META-INF/ra.xml
```

This requires the following line:

```
<config-property-value>Your SiteMinder Policy Server1
Hostname,44441,44442,44443</config-property-value>
```

Continue with installing the Report Server.

Report Server

Tenant administration reports are drawn from data in the Business Objects database. They are visible in the reporting tasks which is accessible from the User Console.

Standalone Report Server

If you do not need high availability for the Report Server, use the following procedure for a standalone installation.

Prerequisites

If you are planning to use RHEL 6 for the Business Objects installation, these prerequisites exist:

- Minimum patch requirements for RHEL 6: compat-libstdc++-33-3.2.3-69.el6.i686 (compatibility standard C++ library from GCC 3.3.4); glibc-2.12-1 (RedHat advisory RHBA-2007:0619-3); libXext.i386; libncurses.so.5, libXext-devel-1.1-3.el6.i686, libXext-devel-1.1-3.el6.x86_64

Note: Install both X86_64 & i686 patches for the above. We recommend using yum install *package_name*.

The hostname cannot have special characters such as '-' (a hyphen). It can be only alpha-numeric.

- Oracle Client 32Bit (or you can use Instant Client. To download OracleLinuxClient.zip)
- Open your Oracle server Enterprise Management Console or SQL console and create Tablespace for CMS ("BO_CMS_TS") and Auditing ("BO_AUDIT_TS"). Also create 2 users, one for CMS ("BO_CMS_USER") and other for Auditing ("BO_AUDIT_USER") and give them dba privileges on respective Tablespace.
- locale en_US.utf8 (to be default locale for BO installation)
- export LANG=en_US.utf8

Follow these steps:

1. Create a UNIX group (for example: bobje) to be used as a CA Business Intelligence User:
groupadd -g 400 bobje
2. Create a folder to be used as home folder for CA Business Intelligence User:
mkdir /home/bobje
3. Create a UNIX user (for example: bobje) to be used by the CA Business Intelligence installer for administrators:
useradd -d /home/bobje -g bobje bobje
4. Set the password for the user created in step 3.
passwd bobje
5. Change the ownership of the home directory as follows:
chown -R bobje:bobje /home/bobje

6. Download and copy the CABI3.3 to /home/bobje (or home folder created in step #2)
7. Extract the installer GZ file as follows:
`gunzip cabi-version_number-linux.tar.gz`
8. Extract the TAR file as follows:
`tar -xvf cabi-version_number-linux.tar`
9. Give necessary permissions on CABI install folder and Installer media
`copy OracleLinuxClient.zip to /tmp`
10. Extract zip file and all other zip files in it
11. Rename the folder "instantclient_11_2" to "oracle" and move "oracle" folder to /opt/.
12. Go to /opt/oracle and create softlinks as below
`ln -s libclntsh.so.11.1 libclntsh.so`
`ln -s libocci.so.11.1 libocci.so`
13. Create a file "tnsnames.ora" with following content. Remember to replace parameters (specified between < and >) according to your setup

```
<your Oracle SID> =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = <Oracle Hostname>)(PORT =
1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = <your Oracle Service/SID name>)
```
14. Edit .bash_profile of both "root" (/root/.bash_profile) and "bobje" (/home/bobje/.bash_profile) (or CA Business object user created in step #3) and add the following.

Note: If /home/bobje/.bash_profile does not exist for bobje user, create one and change owner to bobje using command "chown bobje:bobje /home/bobje/.bash_profile"

```
export ORACLE_HOME=/opt/oracle
export PATH=$PATH:$ORACLE_HOME
export TNS_ADMIN=/opt/oracle
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/opt/oracle
```
15. Go to the user home folder (/home/bobje).
16. Run the Cabi installer.
`cabiinstall.sh`

Note: CABI installation is console installation. Provide the necessary details in the screen, keeping note of the passwords, ports and usernames provided during the installation.

See the following section for a few important parameters to be given during installation.

Run the Installation Program

Follow these steps:

Run the BusinessObjects Enterprise installation program, supplying the following values:

1. Supply the credentials for a non-root user.
 - User Name: bobje
 - Group Name: bobje
2. Central Management Server port: (6400)
Important! The installation uses a static port of 6400. Do not change this port to a dynamic port.
3. Choose the Installation Type for your database software.
 - For Oracle, select New.
 - For PostgreSQL, select Custom.
4. Select 1 - Use an existing database (Oracle/DB2/Sybase/MySQL,SQLAnywhere)" for CMS Repository.
5. Select 2 - Oracle for Database Type
6. Provide CMS user details for the CMS Database
7. Provide Audit user details for the Audit Database
8. Select Yes to initialize the database.
9. Select 1 - Install Tomcat, deploy web applications
Note: In case of any database error during install, check the latest
"/opt/CA/SharedComponents/CommonReporting3/setup/logs/dbcheck" for details.
All installation logs exist here:
"/opt/CA/SharedComponents/CommonReporting3/setup/logs/"
10. Confirm installation success by accessing the CMS console
`http://hostname:8080/CmcApp`

Post Installation for the Report Server

Starting and Stopping the Report Server

1. To start the server, SSH to the Business Objects system:

```
cd /opt/CA/SharedComponents/CommonReporting3/bobje/setup
source env.sh
cd ..
./startservers
./tomcatstartup.sh
```

2. To stop the server, SSH to Business Objects system:

```
cd /opt/CA/SharedComponents/CommonReporting3/bobje/setup
source env.sh
cd ..
./stopservers
./tomcatshutdown.sh
```

To Check the Installed Business Objects Server Version

1. Log in to CMS Console.
2. On the Home page, click Settings under the Manage section.
3. Check the Product Version is 12.5.0.1265, which applies to CA Business Intelligence 3.3.

Customize the mergeconnections script

1. Update Registry Entries as follows:

For reports, such as JDBC/XML, set the registry key to use the Crystal Enterprise/Report Application Server

For the Identity Management Server to change data sources for reports in the Report Server, run the mergeConnection script.

2. Check for Windows control characters in the mergeconnections script.

If you downloaded the software using FTP in binary mode, these characters do not appear in this script. If you used another download method, use the dos2unix command to remove these characters.

3. Copy the mergeconnections_3.0.cf script from the system with the Identity Management Admin toolkit to the Report Server. On the system with the toolkit, the default location for this script is as follows:

```
/opt/CA/IdentityManager/IAM_Suite/Identity_Manager/tools/Report
ServerTools
```

4. On the Report Server system, place the script in this location:

```
installation-directory/bobje/enterprise120/generic
```

5. Source in the environment variables for BusinessObjects Enterprise, as follows:

```
source installation-directory/bobje/setup/env.sh
```

6. Run the following script:

```
./configpatch.sh mergeconnections_3.0.cf
```

7. Select 1 as the option when prompted.

Note: Set the environment variable as follows before you run the script:

```
export _POSIX2_VERSION=199209
```

8. Restart crystal processing servers as follows:
9. Log in as the non-root user you used to install the Report Server.
10. Issue these commands:

```
cd /opt/CA/SharedComponents/CommonReporting3/bobje
./stopservers
./startservers
```

Copy the JDBC JAR Files

Follow these steps:

1. Navigate to the jdbcdrivers folder where the Identity Management Server Admin toolkit is installed. The default location is as follows:

```
[set the alternate Installation Path
variable]/tools/lib/jdbcdrivers
```

2. Copy ojdbc14.jar (for Oracle) or sqljdbc.jar (for SQL Server) or postgresql-9.3-1101.jdbc3.jar (for PostgreSQL) to the following location:

```
/opt/CA/SharedComponents/CommonReporting3/bobje/java/lib/external
```

The ojdbc14.jar and the sqljdbc.jar files are in the following location:

```
/opt/CA/IdentityManager/IAM_Suite/IdentityManager/tools/ReportServerTools/
```

The postgresql-9.3-1101.jdbc3.jar is available at the following location:

```
/opt/reports
```

3. Open the jdbc.sbo file in this directory:

```
$CABI_HOME/bobje/enterprise120/linux_x86/dataAccess/RDBMS/connectionServer/jdbc
```

4. If you are using an Oracle Database, add the path for the location of jar file under the section for Oracle 11.

Replace this section:

```
<JDBCDriver>
  <!-- Uncomment and edit the following lines
        to define java classes required by JDBC driver
    <ClassPath>
        <Path>your jar or class files directory</Path>
    </ClassPath>
  -->
  <Parameter Name="JDBC
Class">oracle.jdbc.OracleDriver</Parameter>
  <Parameter Name="URL
Format">jdbc:oracle:thin:@$DATASOURCE${:$DATABASE$}</Parameter>
</JDBCDriver>
```

With this section

```
<JDBCDriver>
  <ClassPath>

  <Path>/opt/CA/SharedComponents/CommonReporting3/bobje/java/lib/
external/ojdbc14.jar</Path>
  </ClassPath>
  <Parameter Name="JDBC
Class">oracle.jdbc.OracleDriver</Parameter>
  <Parameter Name="URL
Format">jdbc:oracle:thin:@$DATASOURCE${:$DATABASE$}</Parameter>
</JDBCDriver>
```

5. If you are using a PostgreSQL database, add the path for location of jar file under the section for PostgreSQL 8.

Replace this section:

```
<JDBCDriver>
  <!-- Uncomment and edit the following lines
        to define java classes required by JDBC driver
    <ClassPath>
        <Path>your jar or class files directory</Path>
    </ClassPath>
  -->
```

```
    <Parameter Name="JDBC
Class">org.postgresql.Driver</Parameter>
    <Parameter Name="URL
Format">jdbc:postgresql://$DATASOURCE/$DATABASE$</Parameter>
</JDBCDriver>
```

With this section:

```
<JDBCDriver>
  <ClassPath>

  <Path>/opt/CA/SharedComponents/CommonReporting3/bobje/java/lib/
external/postgresql-9.3-1101.jdbc3.jar</Path>
  </ClassPath>
  <Parameter Name="JDBC
Class">org.postgresql.Driver</Parameter>
  <Parameter Name="URL
Format">jdbc:postgresql://$DATASOURCE/$DATABASE$</Parameter>
</JDBCDriver>
```

6. Save and close jdbc.sbo file.
7. Open the CRConfig.xml file, found in the following location:
/opt/CA/SharedComponents/CommonReporting3/bobje/java
8. Add the location of the JDBC JAR files to the Classpath.
 - PostgreSQL - \${BOBJEDIR}/java/lib/external/postgresql-9.3-1101.jdbc3.jar
 - Oracle - \${BOBJEDIR}/java/lib/external/ojdbc14.jar

For example:

```
<Classpath>${BOBJEDIR}/java/lib/external/postgresql-9.3-1101.jd
bc3.jar:${BOBJEDIR}/java/lib/sqljdbc.jar:${BOBJEDIR}/java/lib/o
jdbc14.jar:...</Classpath>
```

9. Save the file.
10. Restart the Report Server as follows:

```
cd /opt/CA/SharedComponents/CommonReporting3/bobje
./stopservers
./startservers
```

Deploy Default Reports

The Identity Management Server comes with default reports you can use for reporting. BIConfig is a utility that uses a specific XML format to install these default reports for the Identity Management Server.

Follow these steps:

1. Switch to using the Identity Management server.
2. Gather the following information about the Report Server:
 - Hostname
 - Administrator name
 - Administrator password
 - Snapshot database type
3. Download the CA Business Intelligence 3.3 BIConfig utility (biconfig_3_3_1_0.zip) from the [CABI FTP site](#).
4. Locate the *installer-root-directory/disk1/cabi/biconfig* folder on the Business Objects report server.
5. Copy from the biconfig folder to the *im_admin_tools_dir/ReportServerTools* folder on the Identity Management server.
6. Set the JAVA_HOME variable to the 64-bit version of the JDK 6 update45 you installed.
7. On the Identity Management server, run the following command

For Oracle:

```
./biconfig.sh -h "hostname" -u "administrator_name" -p  
"administrator_password" -f "oracle-biar.xml"
```

For PostgreSQL:

```
./biconfig.sh -h "hostname" -u "administrator_name" -p  
"administrator_password" -f "postgres-biar.xml"
```

Note: Be sure that biconfig.sh has execute permissions.

8. View the biconfig.log file found in the location where you ran the biconfig command.
9. Verify that the default reports installed successfully. Inspect the end of the log file for status; a successful installation appears as follows:

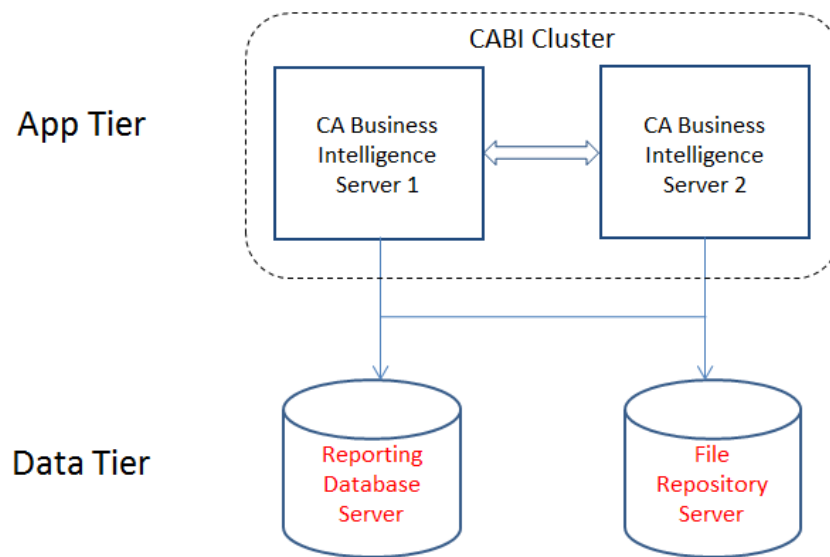
```
ReportingDeployUtility - Reporting utility program terminated and  
return code = 0
```

High Availability Report Server on PostgreSQL

The Report Server (CA Business Intelligence) supports clustered installation. The Report Server works with any supported database as the CMS and Audit databases. However, this procedure describes the use of a SQLAnywhere database.

Note: The version of SQLAnywhere that is installed with CA Business Intelligence does not support high availability. We recommend using PostgreSQL with RedHat clustering. Streaming replication works between the primary and disaster recovery sites.

The following diagram displays the architecture for reference.



Setup CABI Common File Share on File Repository Server

For the current CABI installation, the share is created on a separate Linux server and is shared using NFS. Therefore, you can access it directly from another computer or you can mount it on another Linux machine. However, we recommend you create this share on a high availability SAN or NAS storage.

To configure CABI in a clustered mode, it is important that the file repository servers are shared across the CMS Servers. In Linux, we can share folders across different machines using different methods like NFS or Samba. In this setup we will be using NFS.

You must log in to the machine as root and perform the steps below on the File Repository Server Machine to configure file sharing using NFS.

Follow these steps:

1. From the terminal, execute the following commands to start the nfs server.

```
service nfs status
```
2. After verifying the status of the nfs server, if the server is in stopped state , start the nfs server with the following command:

```
service nfs start
```
3. Create a directory to share across all the machines as the file repository:

```
mkdir -p /home/nfs/cabi
```
4. Create a group, bobje for example, for use as an NFS Share User:

```
groupadd -g 400 bobje
```
5. Create a user who is the owner of this share with the following command:

```
useradd -s /bin/bash bobje
```

To make this user the owner for the share, execute:

```
chown -R bobje:bobje /home/nfs/cabi
```
6. Once the directory has been created, share this location with the other machines:
 - a. Open /etc/exports file and add the following entry for each machine where the share has to be accessed.
 - /home/nfs/cabi Machine*(rw,all_squash,anonuid=501,anongid=501)
 - eg: /home/nfs/cabi lod0123(rw,all_squash) lod0124(rw,all_squash)
 - b. Run the command “exportfs -a”.

All the file shares that are listed in the /etc/exports file are exported.
 - c. Validate the folder is shared, by running: “showmount -e FileRepositoryServer”.
 - d. All folders shared from FileRepositoryServer are displayed.
 - e. Login as bobje using “su bobje”.

- f. Create directories for the input and the output file repositories using the following commands:
`cd /home/nfs/cabi`
`mkdir frsinput frsoutput`

Prerequisites for SQL Anywhere Database

Follow these steps:

1. Ensure that the minimum patch requirements for RHEL 6 exists.
2. Execute the following command for all the below patches:

```
rpm -qa | grep package_name
```


compat-libstdc++-33-3.2.3-69.el6.i686 (compatibility standard C++ library from GCC 3.3.4); glibc-2.12-1 (RedHat advisory RHBA-2007:0619-3); libXext.i386; libncurses.so.5, libXext-devel-1.1-3.el6.i686, libXext-devel-1.1-3.el6.x86_64.
3. Download and install missing patches by using the following command:

```
yum install package_name
```
4. Set the locale for database installation:

```
export LC_ALL=en_US.utf8  
export LANG=en_US.utf8
```
5. Verify that the locale is set to UTF8:

```
locale
```
6. Create a UNIX group to be used as CA Business Intelligence User. For example:

```
groupadd -g 400 bobje
```
7. Create a UNIX user to be used by the CA Business Intelligence installer for administrators. For example:

```
useradd -d /home/bobje -g bobje bobje
```
8. Set the password for the user you just created.

```
passwd bobje
```
9. Edit /etc/hosts file and confirm that you have the following line:

```
127.0.0.1      localhost
```
10. Obtain the CABI installation program as follows:
 - a. Download and copy the CABI 3.3 installer to the /home/bobje directory.
 - b. Go to /home/bobje directory and extract the GZ installer file:

```
gunzip cabi_installer.gz
```
 - c. Extract the TAR installer file:

```
tar -xvf cabi_installer.tar
```
 - d. Assign sufficient permissions to the CABI install folder and installer media:

```
# chmod 777 /home/bobje/
```

Install the SQL Anywhere Database Server

Once you have met the prerequisites for the SQL Anywhere database, run the installation program to install the database server.

Follow these steps:

1. Start the installation program.

```
./cabi_installer.sh
```

Respond to the prompts that appear in the following steps.

2. Enter Non-Root Credentials:

- User Name: bobje
- Group Name: bobje

3. Accept the default path for the CA Shared Components Directory.

4. Respond Yes to these questions:

- Install sample templates?
- Do you want to save the response file?

Accept the default name for the response file.

5. Press Enter to invoke the Business Objects Enterprise installer.

6. Enter the default installation directory:

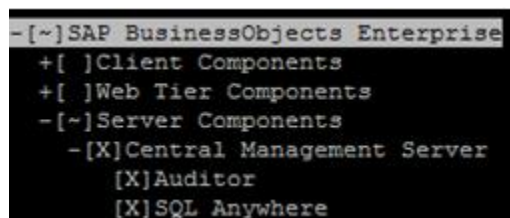
```
/opt/CA/SharedComponents/CommonReporting3/
```

7. Installation Type: select User –Regular SAP Business Objects Enterprise installation

8. Select: 2 – Custom or Expand.

Select only the following features to install:

- Under Server Components, select Central Management Server with these options:
 - Auditor
 - SQL Anywhere



```
-[~]SAP BusinessObjects Enterprise
+[ ]Client Components
+[ ]Web Tier Components
-[~]Server Components
  -[X]Central Management Server
    [X]Auditor
    [X]SQL Anywhere
```

- Under Database Access, select SQL Anywhere
9. Enter the following information for new CMS:
 - Host name of the local system
 - CMS port number, using the default port: 6400
 - Administrator password
 10. Enter information about the SQL Anywhere database:
 - Host name
 - Port number
 - Administrator password
 - CMS database name
 - Audit database name
 - User ID and password for the database user
 11. Respond to the final questions to complete the installation.

Configure the SQL Anywhere Database

Perform these steps on the SQL Anywhere database server, replacing each \$VARIABLE with an appropriate value.

Follow these steps:

1. Execute the following commands to set the environment of SQL Anywhere:

```
cd $INSTALLATION_DIR/bobje/SQLAW/Bin/  
source sa_config.sh
```

2. Execute the following commands to create CMS and AUDIT databases:

- a. Create a Database directory using the below command:

```
mkdir -p $DATABASE_DIR
```

- b. Create the CMS database in the directory created above, and set the Admin and password for this database:

```
./dbinit -o "$DATABASE_DIR/cms_check.log" -dba  
$ADMIN_UID,$ADMIN_PWD "$DATABASE_DIR/CM.db"
```

- c. Create the AUDIT database in the directory created above, and set the Admin and password for this database:

```
./dbinit -o "$DATABASE_DIR/audit_check.log" -dba  
$ADMIN_UID,$ADMIN_PWD "$DATABASE_DIR/AUDIT/.db"
```

3. To stop the SQL Anywhere Database created during installation:

```
./dbstop -y -c "uid=$ADMIN_UID;pwd=$ADMIN_PWD"  
$SQLANYWHERE_SERVER
```

Or use the following:

```
./dbstop -y -c "uid=$ADMIN_UID;pwd=$ADMIN_PWD" $Database_Name
```

4. To start SQL Anywhere to host CMS and Audit databases created above:

```
./dbspawn ./dbsrv12 -n "$SQLANYWHERE_SERVER" -x  
\"tcpip(port=$SQLANYWHERE_PORT)\" \"$DATABASE_DIR/cms.db"  
"$DATABASE_DIR/audit.db"
```

5. Verify that the required services are running on the SQL Anywhere port:

```
netstat -an | grep $SQLANYWHERE_PORT
```

6. Create Business Object Enterprise User and assign privileges on both the databases(CMS & AUDIT) using the following commands:

```
./dbisqlc -q -c  
"uid=$ADMIN_UID;pwd=$ADMIN_PWD;server=$SQLANYWHERE_SERVER;host=  
$SQLANYWHERE_HOST:$SQLANYWHERE_PORT;dbn=cms" CREATE USER  
"$BOE_CMS_UID" IDENTIFIED BY "$BOE_CMS_PWD"
```

```

./dbisqlc -q -c
"uid=$ADMIN_UID;pwd=$ADMIN_PWD;server=$SQLANYWHERE_SERVER;host=
$SQLANYWHERE_HOST:$SQLANYWHERE_PORT;dbn=cms" GRANT RESOURCE,
VALIDATE, PROFILE, READFILE TO "$BOE_CMS_UID"
./dbisqlc -q -c
"uid=$ADMIN_UID;pwd=$ADMIN_PWD;server=$SQLANYWHERE_SERVER;host=
$SQLANYWHERE_HOST:$SQLANYWHERE_PORT;dbn=audit" CREATE USER
"$BOE_AUDIT_UID" IDENTIFIED BY "$BOE_AUDIT_PWD"
./dbisqlc -q -c
"uid=$ADMIN_UID;pwd=$ADMIN_PWD;server=$SQLANYWHERE_SERVER;host=
$SQLANYWHERE_HOST:$SQLANYWHERE_PORT;dbn=audit" GRANT RESOURCE,
VALIDATE, PROFILE, READFILE TO "$BOE_AUDIT_UID"

```

Configure the SQL Anywhere Client to Connect to the Remote Database

Perform these steps on the Report Server system.

Follow these steps:

1. Download and Install SQL Anywhere Client (32 bit).
2. Set the environment of SQL Anywhere:

```

cd $Installation_Dir/bin32/
source sa_config.sh

```

3. To connect and verify that the CMS DSN is accessible:

```

./dbping -c
"UID=$BOE_CMS_UID;PWD=$BOE_CMS_PWD;SERVER=$SQLANYWHERE_SERVER;L
INKS=TCPIP(HOST=$SQLANYWHERE_HOST;PORT=$SQLANYWHERE_PORT)"

```

4. To create CMS Data Source:

```

./dbdsn -w $CMSDataSource -c
"UID=$BOE_CMS_UID;PWD=$BOE_CMS_PWD;SERVER=$SQLANYWHERE_SERVER;h
ost=$SQLANYWHERE_HOST:$SQLANYWHERE_PORT;dbn=cms"

```

5. To connect and verify that the AUDIT DSN is accessible:

```

./dbping -c
"UID=$BOE_AUDIT_UID;PWD=$BOE_AUDIT_PWD;SERVER=$SQLANYWHERE_SERV
ER;LINKS=TCPIP(HOST=$SQLANYWHERE_HOST;PORT=$SQLANYWHERE_PORT)"

```

6. Create the audit DSN:

```

./dbdsn -w "AuditDataSource" -c
"UID=$BOE_AUDIT_UID;PWD=$BOE_AUDIT_PWD;SERVER=$SQLANYWHERE_SERV
ER;host=$SQLANYWHERE_HOST:$SQLANYWHERE_PORT;dbn=cms"

```

Install the First Report Server with the Remote Database

Follow these steps:

1. Obtain the CABI installation program as follows:
 - a. Download and copy the CABI 3.3 installer to the /home/bobje directory.
 - b. Go to /home/bobje directory and extract the GZ installer file:

```
gunzip cabi_installer.gz
```
 - c. Extract the TAR installer file:

```
tar -xvf cabi_installer.tar
```
 - d. Assign sufficient permissions to the CABI install folder and installer media:

```
# chmod 777 /home/bobje/
```
2. Edit /etc/hosts file, commenting out the existing lines and adding the below line:

```
127.0.0.1      localhost
```
3. Start the installation program.

```
./cabi_installer.sh
```

Respond to the prompts that appear.
4. Enter Non-Root Credentials:
 - User Name: bobje
 - Group Name: bobje
5. Accept the default path for the CA Shared Components Directory.
6. Respond No to the question about installing sample templates.
7. Respond Yes to the question about saving the response file?
Accept the default name for the response file.
8. Press Enter to invoke the Business Objects Enterprise installer.
9. Enter the default installation directory:

```
/opt/CA/SharedComponents/CommonReporting3/
```
10. Select the Installation Type:
User – Regular SAP Business Objects Enterprise installation
11. Select: 2 – Custom or Expand.
Unselect the following components and press [Enter]:
 - Client Components
 - Server Components
 - Central Management Server

12. Select 1 – Yes – This is the first CMS in this deployment.
13. Select the choice to use an existing database.
14. Enter the following information for new CMS database.
 - For database type, select SQL Anywhere12
 - Supply the same information you provided when you installed the SQL Anywhere Database server.
15. Enter the following information for new audit database.
 - For database type, select SQL Anywhere12
 - Supply the same information you provided when you installed the SQL Anywhere Database server.
16. Respond Yes to reinitialize the database.
17. Assign any name for the service intelligence agent.
18. Select a Java application Server or install tomcat.
Use the default port for tomcat.

You will receive an installation complete message.

Post-Installation for the First Report Server

Perform the following steps after installing the first report server with a remote SQL Anywhere database.

Follow these steps:

1. Enter the following commands:

```
su bobje
cd /opt/CA/SharedComponents/CommonReporting3/bobje
./stopservers
./cmsdbsetup.sh
```
2. Enter the *SIA Name* provided during the first Report Server installation.
3. Enter 3 to change the cluster.
Enter the value for CA Business Intelligence cluster name.
4. Enter this command:

```
./startservers
```

Install the Second Report Server

Perform these steps to install a second report server with a remote SQL Anywhere database.

Follow these steps:

1. Begin the *cabi_installer.sh* program as you did for the first report server.
2. Respond No when you reach the question asking if this is the first CMS.
3. Enter the existing CMS Hostname as first Report Server name.
4. For CMS Database type, select 2 – SQL Anywhere12.
Enter the CMS Database details that you provided during the first Report Server installation.
5. For Auditing Database type, select 2 – SQL Anywhere12.
Enter the Audit Database details that you provided during the first Report Server installation.
6. Enter SIA for the second Report Server.
7. Wait until installation is completed.

Mount NFS Share Location on both CABI Servers

Perform the following steps on both CABI server machines to setup the NFS client. This is required to access the shared location available in the file repository server.

Follow these steps:

1. Login as a root.
2. Create a directory which will be used to mount the shared directory:
 - `mkdir -p /home/nfs/cabi`
3. Make the user 'bobje', the owner for this directory
 - `chown -R bobje:bobje /home/nfs/cabi`
4. Open /etc/fstab.
5. Mount the directory /home/nfs/cabi from the File repository server, to the directory /home/nfs/cabi in the current machine
 - `FileRepositoryServer:/home/nfs/cabi /home/nfs/cabi nfs defaults 0 0`
6. Mount all the shares:
 - `mount -a`
7. Verify the share has been mounted and its location by executing mount.
8. Login as bobje `su -bobje`.
9. Ensure that you have write permissions for the share by creating a file with the following commands:
`cd /home/nfs/cabi`
`touch a`
If you do not have permissions, this command will throw an error.
`rm a`
Note: Delete the file if it was created
10. Copy the file repositories from this machine to the share.
`cd /opt/CA/SharedComponents/CommonReporting3/bobje`
11. Stop the servers by running:
`./stopservers"`
12. Navigate to the location of the Input File repository:
`cd data/frsinput"`
13. Copy all the files from this directory to the share:
`cp -r * /home/nfs/cabi/frsinput`
14. Navigate to the Location of the Output File Repository:
`cd ../frsoutput`
15. Copy all the files from Output file repository to the share:
`cp -r * /home/nfs/cabi/frsoutput`

16. Remove the frsinput and frsoutput folders from
`/opt/CA/SharedComponents/CommonReporting3/bobje/data`
17. Add softlinks pointing to the NFS shared folders:
`ln -s /home/nfs/cabi/frsinput`
`ln -s /home/nfs/cabi/frsoutput`
18. Start the servers:
`"cd /opt/CA/SharedComponents/CommonReporting3/bobje"`
`./startservers`

Post-Installation for the First Report Server

Perform the following steps after installing the first report server with a remote SQL Anywhere database.

Follow these steps::

1. SSH to the Business Objects system, and enter the following commands:
`su bobje`
`cd /opt/CA/SharedComponents/CommonReporting3/bobje`
`./stopservers`
`./cmsdbsetup.sh`
2. Enter the SIA Name you provided during installation of the first Report Server.
3. Enter 3 to change the cluster.
Enter the value for the CA Business Intelligence cluster name.
4. Enter the following command:
`./startservers`

Configure Identity Management for High Availability Reporting

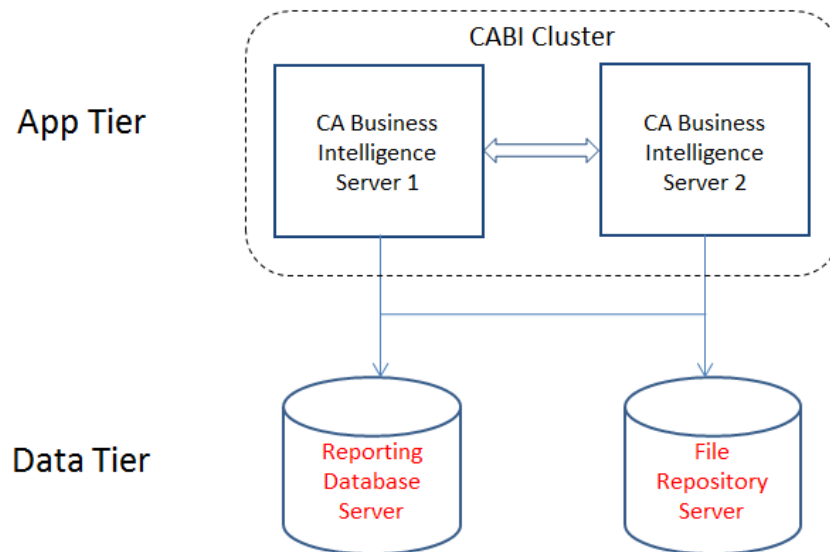
Make host entry changes on the Identity Management servers to enable high availability reporting.

Follow these steps:

1. Log in to the first Identity Management server.
2. Edit the `/etc/hosts` file.
3. Map the IP Address of the first Report Server to this virtual name:
`cabiserver`
4. Log in to the second Identity Management server.
5. Edit the `/etc/hosts` file.
6. Map the IP Address of the second Report Server to the same virtual name:
`cabiserver`
7. In the User Console, use the same virtual name, `cabiserver`, where you configure the Report server connection.

High Availability Report Server on Oracle

The Report Server (CA Business Intelligence) supports clustered installation. The Report Server works with any supported database as the CMS and Audit databases. However, this procedure describes the use of an Oracle database. The following diagram displays the architecture for reference.



Prerequisites for the High Availability Report Server on Oracle

If you are planning to use RHEL 6 for the Business Objects installation, you must complete these prerequisites:

1. Meet these minimum patch requirements for RHEL 6 exist.
2. Execute the following command for all the below patches:

```
rpm -qa | grep package_name
```


compat-libstdc++-33-3.2.3-69.el6.i686 (compatibility standard C++ library from GCC 3.3.4); glibc-2.12-1 (RedHat advisory RHBA-2007:0619-3); libXext.i386; libncurses.so.5, libXext-devel-1.1-3.el6.i686, libXext-devel-1.1-3.el6.x86_64.
3. Download and install missing patches with the following command:

```
yum install package_name
```


Note: Install both x86_64 & i686 patches.
4. Download Oracle Client 32Bit (OracleLinuxClient.zip).
5. Open your Oracle server Enterprise Management Console or SQL console and create Tablespace for
 - CMS ("BO_CMS_TS")
 - Auditing ("BO_AUDIT_TS")
6. Create two users and give them dba privileges on the respective Tablespace:
 - CMS ("BO_CMS_USER")
 - Auditing ("BO_AUDIT_USER")
7. Set the locale for database installation:
 - locale en_US.utf8 (The default locale for BO installation)
 - export LANG=en_US.utf8

Setup CABI Common File Share on File Repository Server

For the current CABI installation, the share is created on a separate Linux server and is shared using NFS. Therefore, you can access it directly from another computer or you can mount it on another Linux machine. However, we recommend you create this share on a high availability SAN or NAS storage.

To configure CABI in a clustered mode, it is important that the file repository servers are shared across the CMS Servers. In Linux, we can share folders across different machines using different methods like NFS or Samba. In this setup we will be using NFS.

You must log in to the machine as root and perform the steps below on the File Repository Server Machine to configure file sharing using NFS.

Follow these steps:

1. From the terminal, execute the following commands to start the nfs server.

```
service nfs status
```
2. After verifying the status of the nfs server, if the server is in stopped state , start the nfs server with the following command:

```
service nfs start
```
3. Create a directory to share across all the machines as the file repository:

```
mkdir -p /home/nfs/cabi
```
4. Create a group, bobje for example, for use as an NFS Share User:

```
groupadd -g 400 bobje
```
5. Create a user who is the owner of this share with the following command:

```
useradd -s /bin/bash bobje
```

To make this user the owner for the share, execute:

```
chown -R bobje:bobje /home/nfs/cabi
```
6. Once the directory has been created, share this location with the other machines:
 - a. Open /etc/exports file and add the following entry for each machine where the share has to be accessed.
 - /home/nfs/cabi Machine*(rw,all_squash,anonuid=501,anongid=501)
 - eg: /home/nfs/cabi lod0123(rw,all_squash) lod0124(rw,all_squash)
 - b. Run the command “exportfs -a”.

All the file shares that are listed in the /etc/exports file are exported.
 - c. Validate the folder is shared, by running: “showmount -e FileRepositoryServer”.
 - d. All folders shared from FileRepositoryServer are displayed.
 - e. Login as bobje using “su bobje”.

- f. Create directories for the input and the output file repositories using the following commands:
`cd /home/nfs/cabi`
`mkdir frsinput frsoutput`

Install the First Report Server with the Remote Database

Important! 'bobje' is used as an example to help you with configuration.

Follow these steps:

1. Create a UNIX group to be used as a CA Business Intelligence User:
`# groupadd -g 400 bobje`
2. Create a Directory at /home/bobje, a UNIX user such as bobje, for use by the CA Business Intelligence installer for administrators, and set this user as owner of bobje directory:
`# useradd -d /home/bobje -g bobje bobje`
3. Set the password for the user created in step 2:
`# passwd bobje`
4. Edit /etc/hosts file, and ensure you have the below line:
`127.0.0.1 localhost`
5. Download and copy the CABI3.3 installer to /home/bobje or the home folder you created in step 2.
6. Extract the installer GZ file as follows:
`# gunzip <cabi-version_number-linux.tar.gz>`
7. Extract the TAR file as follows:
`tar -xvf <cabi-version_number-linux.tar>`
8. Give permissions on the CABI install folder and Installer media:
`# chmod 777 /home/bobje/`
9. Copy OracleLinuxClient.zip to /tmp.
10. Extract the zip file and all other zip files in it.
11. Rename the folder instantclient_11_2 to oracle and move the folder oracle to /opt/.
12. Go to /opt/oracle and create softlinks:
`ln -s libclntsh.so.11.1 libclntsh.so`
`ln -s libocci.so.11.1 libocci.so`
13. Create a file tnsnames.ora with the content following this step.

Note: Replace parameters according to your setup:

```
<your Oracle SID> =  
(DESCRIPTION =  
(ADDRESS = (PROTOCOL = TCP)(HOST = <Oracle Hostname>)(PORT = 1521))  
(CONNECT_DATA =  
(SERVER = DEDICATED)  
(SERVICE_NAME = <your Oracle Service/SID name>)))
```

14. Edit `.bash_profile` of both root, in `/root/.bash_profile`, and bobje, in `/home/bobje/.bash_profile` and add the following.
Note: If `/home/bobje/.bash_profile` does not exist for bobje user, create one and change the owner to bobje using the command `chown -R bobje:bobje /home/bobje/.bash_profile`.

```
export ORACLE_HOME=/opt/oracle
export PATH=$PATH:$ORACLE_HOME
export TNS_ADMIN=/opt/oracle
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/opt/oracle
```
15. Go to the user home folder located at `/home/bobje`.
16. Start the installation program with the command below and follow the prompts:
`./cabi_installer.sh`
17. Enter Non-Root Credentials:
User Name: bobje
Group Name: bobje
18. Accept the default path for the CA Shared Components Directory.
19. Respond No to the question about installing sample templates.
20. Respond Yes to the question about saving the response file.
21. Accept the default name for the response file.
22. Press Enter to invoke the Business Objects Enterprise installer.
23. Enter the default installation directory:
`/opt/CA/SharedComponents/CommonReporting3/`
24. Select the Installation Type:
User – Regular SAP Business Objects Enterprise installation
25. Select: 2 – Custom or Expand.
26. Unselect the following components and press [Enter]:
 - Client Components
 - Server Components
 - Central Management Server
27. Select 1 – Yes – This is the first CMS in this deployment.
28. Select the choice to use an existing database.
29. Enter the following for a new CMS database:
 - For database type, select Oracle
 - For the CMS Database, enter CMS user details.

30. Enter the following information for new AUDIT database.

- For database type, select Oracle
- Provide AUDIT user details for the AUDIT Database

31. Respond Yes to initialize the database.

32. Assign any name for the service intelligence agent.

33. Select 1 - Install Tomcat, deploy web applications.

Note: In case of database error during install, check the latest logs for details located here: /opt/CA/SharedComponents/CommonReporting3/setup/logs/dbcheck

All installation logs are located here:

/opt/CA/SharedComponents/CommonReporting3/setup/logs/

34. Confirm installation success by accessing the CMS console at
http://<hostname>:8080/CmcApp.

Post-Installation for the First Report Server

Perform the following steps after installing the first report server with a remote SQL Anywhere database.

Follow these steps::

1. SSH to the Business Objects system, and enter the following commands:
su bobje
cd /opt/CA/SharedComponents/CommonReporting3/bobje
./stopservers
./cmsdbsetup.sh
2. Enter the SIA Name you provided during installation of the first Report Server.
3. Enter 3 to change the cluster.
Enter the value for the CA Business Intelligence cluster name.
4. Enter the following command:
./startservers

Install the Second Report Server

Perform these steps to install a second report server with a remote SQL Anywhere database.

Follow these steps:

1. Begin the `cabi_installer.sh` program as you did for the first report server.
2. Respond No when you reach the question asking if this is the first CMS.
3. Enter the existing CMS Hostname as first Report Server name.
4. For CMS Database type, select Oracle.
Enter the CMS Database details that you provided during the first Report Server installation.
5. For Auditing Database type, select Oracle.
Enter the Audit Database details that you provided during the first Report Server installation.
6. Enter SIA for the second Report Server.
7. Wait until installation is completed.

Mount NFS Share Location on both CABI Servers

Perform the following steps on both CABI server machines to setup the NFS client. This is required to access the shared location available in the file repository server.

Follow these steps:

1. Login as a root.
2. Create a directory which will be used to mount the shared directory:
 - `mkdir -p /home/nfs/cabi`
3. Make the user 'bobje', the owner for this directory
 - `chown -R bobje:bobje /home/nfs/cabi`
4. Open /etc/fstab.
5. Mount the directory /home/nfs/cabi from the File repository server, to the directory /home/nfs/cabi in the current machine
 - `FileRepositoryServer:/home/nfs/cabi /home/nfs/cabi nfs defaults 0 0`
6. Mount all the shares:
 - `mount -a`
7. Verify the share has been mounted and its location by executing mount.
8. Login as bobje `su -bobje`.
9. Ensure that you have write permissions for the share by creating a file with the following commands:
`cd /home/nfs/cabi`
`touch a`
If you do not have permissions, this command will throw an error.
`rm a`
Note: Delete the file if it was created
10. Copy the file repositories from this machine to the share.
`cd /opt/CA/SharedComponents/CommonReporting3/bobje`
11. Stop the servers by running:
`./stopservers"`
12. Navigate to the location of the Input File repository:
`cd data/frsinput"`
13. Copy all the files from this directory to the share:
`cp -r * /home/nfs/cabi/frsinput`
14. Navigate to the Location of the Output File Repository:
`cd ../frsoutput`
15. Copy all the files from Output file repository to the share:
`cp -r * /home/nfs/cabi/frsoutput`

16. Remove the frsinput and frsoutput folders from
/opt/CA/SharedComponents/CommonReporting3/bobje/data"
17. Add softlinks pointing to the NFS shared folders:
ln -s /home/nfs/cabi/frsinput
ln -s /home/nfs/cabi/frsoutput
18. Start the servers:
"cd /opt/CA/SharedComponents/CommonReporting3/bobje"
./startservers

Configure Identity Management for High Availability Reporting

Make host entry changes on Identity Management servers to enable high availability reporting.

Follow these steps:

1. Log in to the first Identity Management server.
2. Edit the /etc/hosts file
3. Map the IP Address of the first Report Server to this virtual name:
cabiserver
4. Log in to the second Identity Management server.
5. Edit /etc/hosts file
6. Map the IP Address of the second Report Server to the same virtual name:
cabiserver
7. In the User Console, use the same virtual name, cabiserver, where you configure the Report server connection.

Layer 7 Gateway Server

Use this procedure to install the Layer 7 Gateway servers.

Note: These instructions assume you are installing two Gateway servers in a high-availability deployment.

For additional information, see the complete Layer 7 Installation and Maintenance Manual in the CA CloudMinder bookshelf.

Layer 7 Gateway Server Pre-Installation Steps

To prepare for installation, confirm that your server environments are properly prepared.

Follow these steps:

1. Install 64-bit Linux RHEL 5.9 on your Layer 7 gateway systems.
2. Obtain all required installation files for the Layer 7 Gateway server, as follows. Download these files to ~/download on your Gateway systems:

From CA Support:

- add_slave_user.sh
- create_slave.sh
- harden.sh
- my.cnf
- ssg
- ssg-7.1.1-3_noDB.noarch.rpm

From Oracle:

- jdk-7u21-linux-x64.tar.gz
- UnlimitedJCEPolicyJDK7.zip

From MySQL:

- mysql-connector-java-5.1.20.tar.gz
- mySQL-client-5.5.30-1.rhel5.x86_64.rpm
- mySQL-server-5.5.30-1.rhel5.x86_64.rpm

Deploy the First Layer 7 Gateway

These steps describe how to deploy the first gateway server.

Important! Delete any previous installations or data before deploying the gateway. Residual test installations or MySQL data can cause installation problems.

Follow these steps:

1. Log in to the system as the root user.
2. Perform base system configuration:
 - a. Configure the network card for IPv4 with the following values:
 - Machine name
 - IP Address
 - Default gateway
 - DNS nameserver
 - b. Disable IPv6:
`NETWORKING_IPV6=no` in `/etc/sysconfig/network`
 - c. Configure the timezone:
`/etc/sysconfig/clock`
 - d. Install the NTP server, if you have not already done so:
`yum install ntp`
 - e. Enable NTP autostart:
`/sbin/chkconfig ntpd on`
 - f. Start the NTP Service:
`service ntpd start`
3. Reboot the machine:
`sync;sync;reboot`
4. Log in to the system as the root user.
5. Install the MySQL packages with the following commands:

```
cd ~/download
rpm -ivh MySQL-client-5.5.30-1.rhel5.x86_64.rpm
rpm -ivh MySQL-server-5.5.30-1.rhel5.x86_64.rpm
cp -p my.cnf /etc
service mysql start
```

Note: If the first RPM attempt fails, the base RedHat system may already have another version of MySQL installed. Use `rpm -e` to remove any conflicts.

6. `/usr/bin/mysql_secure_installation` and set the following values:
 - Enter current password for root (enter for none): Press <enter> for none
 - Set root password?: Y
 - New password: 7layer
 - Re-enter new password: 7layer
 - Remove anonymous users?: Y
 - Disallow root login remotely?: Y
 - Remove test database and access to it? : Y
 - Reload privilege tables now?:Y

7. Install the JDK under /opt/SecureSpan/JDK with the following commands:

Note: System scripts reference the JDK files in this location. Install the JDK in this specific subdirectory only.

```
cd ~/download
mkdir tmp
cd tmp
tar xvzf ../jdk-7u21-linux-x64.tar.gz
mkdir /opt/SecureSpan/
mv jdk1.7.0_21 /opt/SecureSpan/JDK
unzip ../UnlimitedJCEPolicyJDK7.zip
cp -p UnlimitedJCEPolicy/*jar
/opt/SecureSpan/JDK/jre/lib/security/
Set the following values for the preceding command:
    cp: overwrite
`/opt/SecureSpan/JDK/jre/lib/security/local_policy.jar'? : Y
    cp: overwrite
`/opt/SecureSpan/JDK/jre/lib/security/US_export_policy.jar'? : Y
```

Install the ssgnodb rpm and the required dependencies with the following commands:

```
cd ~/download
rpm -ivh ssg-7.1.1-3_noDB.noarch.rpm
mkdir tmp
cd tmp
tar xvzf ../mysql-connector-java-5.1.20.tar.gz
cp -p
mysql-connector-java-5.1.20/mysql-connector-java-5.1.20-bin.jar
/opt/SecureSpan/Gateway/runtime/lib/mysql-connector-java-5.1.20
.jar
chown layer7:layer7
/opt/SecureSpan/Gateway/runtime/lib/mysql-connector-java-5.1.20
.jar
chmod 444
/opt/SecureSpan/Gateway/runtime/lib/mysql-connector-java-5.1.20
.jar
```

8. Add ssg service with the following commands:

```
cd ~/download
chmod +x ssg
cp -p ssg /etc/init.d/ssg
/sbin/chkconfig --add ssg
```

Deploy the Second Layer 7 Gateway

These steps describe how to deploy the second gateway server.

Important! Delete any previous installations or data before deploying the gateway. Residual test installations or MySQL data can cause installation problems.

Follow these steps:

1. Log in to the system as the root user.
2. Perform base system configuration:
 - a. Configure the network card for IPv4 with the following values:
 - Machine name
 - IP Address
 - Default gateway
 - DNS nameserver
 - b. Disable IPv6:
`NETWORKING_IPV6=no` in `/etc/sysconfig/network`
 - c. Configure the timezone:
`/etc/sysconfig/clock`
 - d. Install the NTP server, if you have not already done so:
`yum install ntp`
 - e. Enable NTP autostart:
`/sbin/chkconfig ntpd on`
 - f. Start the NTP Service:
`service ntpd start`
3. Reboot the machine:
`sync;sync;reboot`
4. Log in to the system as the root user.

5. Download the following files to ~/download:

From CA Support:

- add_slave_user.sh
- create_slave.sh
- harden.sh
- my.cnf
- ssg
- ssg-7.1.1-3_noDB.noarch.rpm

From Oracle:

- jdk-7u21-linux-x64.tar.gz
- UnlimitedJCEPolicyJDK7.zip

From MySQL:

- mysql-connector-java-5.1.20.tar.gz
- MySQL-client-5.5.30-1.rhel5.x86_64.rpm
- MySQL-server-5.5.30-1.rhel5.x86_64.rpm

6. Install the MySQL packages with the following commands:

```
cd ~/download
rpm -ivh MySQL-client-5.5.30-1.rhel5.x86_64.rpm
rpm -ivh MySQL-server-5.5.30-1.rhel5.x86_64.rpm
cp -p my.cnf /etc
service mysql start
```

Note: If the first RPM attempt fails, the base RedHat system may already have another version of MySQL installed. Use rpm -e to remove any conflicts.

7. /usr/bin/mysql_secure_installation and set the following values:

- Enter current password for root (enter for none): Press <enter> for none
- Set root password?: Y
- New password: 7layer
- Re-enter new password: 7layer
- Remove anonymous users?: Y
- Disallow root login remotely?: Y
- Remove test database and access to it? : Y
- Reload privilege tables now?:Y

8. Install the JDK under /opt/SecureSpan/JDK with the following commands:

Note: System scripts reference the JDK files in this location. Install the JDK in this specific subdirectory only.

```
cd ~/download
mkdir tmp
cd tmp
tar xvfz ../jdk-7u21-linux-x64.tar.gz
mkdir /opt/SecureSpan/
mv jdk1.7.0_21 /opt/SecureSpan/JDK
unzip ../UnlimitedJCEPolicyJDK7.zip
cp -p UnlimitedJCEPolicy/*jar
/opt/SecureSpan/JDK/jre/lib/security/
Set the following values for the preceding command:
    cp: overwrite
`/opt/SecureSpan/JDK/jre/lib/security/local_policy.jar'? : Y
    cp: overwrite
`/opt/SecureSpan/JDK/jre/lib/security/US_export_policy.jar'? : Y
```

Install the ssgnodb rpm and the required dependencies with the following commands:

```
cd ~/download
rpm -ivh ssg-7.1.1-3_noDB.noarch.rpm
mkdir tmp
cd tmp
tar xvfz ../mysql-connector-java-5.1.20.tar.gz
cp -p
mysql-connector-java-5.1.20/mysql-connector-java-5.1.20-bin.jar
/opt/SecureSpan/Gateway/runtime/lib/mysql-connector-java-5.1.20
.jar
chown layer7:layer7
/opt/SecureSpan/Gateway/runtime/lib/mysql-connector-java-5.1.20
.jar
chmod 444
/opt/SecureSpan/Gateway/runtime/lib/mysql-connector-java-5.1.20
.jar
```

9. Add ssg service with the following commands:

```
cd ~/download
chmod +x ssg
cp -p ssg /etc/init.d/ssg
/sbin/chkconfig --add ssg
```

Configure Database Replication

Configure database replication on your Layer 7 Gateway servers by creating a Master-Master configuration.

Follow these steps:

1. SSH into both Gateways.
2. Stop the Gateway process on both servers by entering the following command:

```
service ssg stop
```

Note: You may see the following message:

Shutting down Gateway Services: [FAILED]

This simply means that the Gateway services were not started. Continue with database replication.

3. Enter the following command on both Gateways:

```
cd ~/download; chmod +x add_slave_user.sh; chmod +x  
create_slave.sh
```

4. On Gateway 1, run the following command:

```
./add_slave_user.sh
```

- a. For the slave hostname, enter the fully qualified system name of Gateway 2.
- b. For the replication user, enter the MySQL database account that is used for replication. The default name is repluser.
- c. For the root user password, enter 7layer.

Important! Enter known or default values for configurations that are not specified in this section.

- d. For the slave hostname, enter the fully qualified system name of Gateway 2.
- e. Set the node to primary (1).

5. On Gateway 2, run the following command:

```
./add_slave_user.sh
```

Respond to the questions as follows:

- a. For the slave hostname, enter the fully qualified system name of Gateway 1.
- b. For the replication user, enter the MySQL database account that is used for replication. The default name is repluser.
- c. For the root user password, enter 7layer.

Important! Enter known or default values for configurations that are not specified in this section.

- d. For the slave hostname, enter the fully qualified system name of Gateway 1.

- e. Set the node to secondary (2).
6. On Gateway 1, run the following command:

```
./create_slave.sh
```

Note: This script uses port 3306. If required, change the port to 3307.

 - a. For the replication user, enter the MySQL database account that is used for replication. The default name is repluser.
 - b. Enter the hostname of Gateway 2 for MASTER
Important! Do not clone the database.
7. On Gateway 2, run the following command:

```
./create_slave.sh
```

Note: This script uses port 3306. If required, change the port to 3307.

 - a. For the replication user, enter the MySQL database account that is used for replication. The default name is repluser.
 - b. Enter the hostname of Gateway 1 for MASTER.
Important! Do not clone the database.
8. Verify replication with the following command:

```
mysql -p -e "show slave status\G"
```

Note: -p is required to prompt for root password.
Enter 7layer for the password.

 - For Gateway 1, MASTER is Gateway 2.
 - For Gateway 2, MASTER is Gateway 1.

Create an Internal Database

In a clustered configuration, you create an internal database on only Gateway 1. This database is replicated automatically to Gateway 2. The Gateway 1 database is the primary, while the Gateway 2 database is used for failover.

Follow these steps:

1. On Gateway 1, enter the following commands:

```
/opt/SecureSpan/Gateway/runtime/bin/setup.sh --jdk  
/opt/SecureSpan/JDK
```
2. Select 2 Configure the Layer 7 Gateway.
3. Press Enter to accept the default Java VM Path.
4. Press Enter to accept the Java VM Memory Allocation [512].

5. Set the following configuration values:

- Database Connection: Yes
 - Database Host: enter "localhost" or the Gateway hostname
For example, enter L7host.forewardinc.com.
 - Database Port: 3306
 - Database Name: ssg
 - Database Username: any username
 - Database Password: any password

Note: If you modify the database username and password, record these values for later use.

- Administrative DB User: root
- Administrative DB Password: 7layer

Important! Do not modify the default administrative database user and password values. They reference existing default values.

- Configure Failover Connection: No
- SSM Username: admin
- SSM Password: your password
- Administrative HTTPS Listener?: No
- Cluster Hostname: Enter the URL of the load balancer.
- Cluster Password: your password

Note: Record this password for use when configuring Gateway 1 and 2.

- Enabled: Yes
- Press Enter to return to the menu

6. Type X to return to the UNIX shell.

Configure the Gateway 1 Database

This section covers connecting Gateway 1 to the internal database.

Follow these steps:

1. SSH into Gateway 1.
2. Enter `/opt/SecureSpan/Gateway/runtime/bin/setup.sh --jdk /opt/SecureSpan/JDK`.
3. Select 2 - Configure the Layer 7 Gateway.

4. Select 2 - Database Connection.
5. Enter the username and password you set when you created the database.
6. Set the following configuration values:
 - Database Connection: Yes
 - Database Host: The fully qualified system name for the Gateway 1
 - Database Port: 3306
 - Database Name: ssg
 - Database Username: any username
 - Database Password: any passwordRecord these values for later use.
 - Administrative DB User: root
 - Administrative DB Password: 7layer

Important! Use the default administrative database user and password values. They reference existing default values.

 - Configure Failover Connection: Yes
 - Database Failover Host: This is the failover MySQL database. Enter the fully qualified system name for the Gateway 2.
 - Database Failover Port: 3306
 - SSM Username: admin
 - SSM Password: Any password
 - Administrative HTTPS Listener?: No
 - Cluster Hostname: The URL of the load balancer
 - Cluster Password: The password you created for the cluster.
7. Select S - Save and Exit.
8. Press [Enter] to continue.
9. Enter the following commands:

```
/sbin/chkconfig ssg on
/sbin/chkconfig --list ssg
```

The system responds with:

```
ssg 0:off 1:off 2:on 3:on 4:on 5:on 6:off
```

Configure the Gateway 2 Database

This section describes how to connect Gateway 2 to the internal database.

Follow these steps:

1. SSH into Gateway 2.
2. Enter `/opt/SecureSpan/Gateway/runtime/bin/setup.sh --jdk /opt/SecureSpan/JDK`
3. Select 2 - Configure the Layer 7 Gateway.
4. Press Enter to accept the default Java VM Path.
5. Press Enter to accept the Java VM Memory Allocation [512].
6. Set the following configuration values:
 - Database Connection: Yes
 - Database Host: The fully qualified system name for the Gateway 1 even though this is gateway 2.
 - Database Port: 3306
 - Database Name: ssg
 - Database Username: any username.
 - Database Password: any password
Record these values for later use.
 - Administrative DB User: root
 - Administrative DB Password: 7layer
 - **Important!** Use the default administrative database user and password values. They reference existing default values.
 - Configure Failover Connection: Yes
 - Database Failover Host: This is the failover MySQL database. Enter the fully qualified system name for the Gateway 2.
 - Database Failover Port: 3306
 - SSM Username: admin
 - SSM Password: The password used for gateway one
 - Administrative HTTPS Listener?: No
 - Cluster Hostname: The URL of the load balancer
 - Cluster Password: The password used for gateway one.
7. Select S - Save and Exit.
8. Press [Enter] to continue.

9. Enter the following commands:

```
/sbin/chkconfig ssg on
/sbin/chkconfig --list ssg
```

The system responds with:

```
ssg 0:off 1:off 2:on 3:on 4:on 5:on 6:off
```

Reboot Both Gateways

Reboot both Gateways by running the following command on both machines:

```
synch;synch;reboot
```

Harden the Gateway Servers

This section describes how to harden the Gateways. Perform the steps and commands on both systems.

Follow these steps:

1. SSH into the Gateway server as root user and enter the following commands:

```
useradd -m ssgconfig
passwd ssgconfig
```

Provide the password of your choice for the user ssgconfig.

```
cd ~/download
chmod +x harden.sh
cp -p harden.sh ~/harden.sh
cd ~
```

```
./harden.sh -h vmware
```

2. If ./harden.sh -h vmware fails, review error messages and manually resolve any conflicts. For example, you may need to run the following commands:

```
yum erase subscription-manager
yum erase yum-updatesd
yum erase yum-security
yum erase rhn-client-tools
echo "SINGLE=/sbin/sulogin" >> /etc/sysconfig/init
```

3. Review ~/harden.sh.log for hardening results, manually resolve conflicts, and re-run the hardening process as needed.

Once the harden.sh script has been run successfully, you can no longer log in as root. If you wish to gain root access to the system, log in as user ssgconfig and run the su command to change your login ID to root. Typically, you must run the harden.sh script multiple times even if the script shows no error messages upon execution.

Install the PostgreSQL JDBC Driver

If any tenant OTK/OIDC database are PostgreSQL-driven, use this procedure on all Gateways in the cluster.

Follow these steps:

1. Connect with SSH.
2. Stop the service by running the following command:

```
service ssg stop
```
3. Install the JDBC driver by running the following commands:

```
cp postgresql-9.3-1100.jdbc41.jar  
/opt/SecureSpan/Gateway/runtime/lib/ext/.  
chown layer7:layer7  
/opt/SecureSpan/Gateway/runtime/lib/ext/postgresql-9.3-1100.jdbc41.jar
```
4. Expose the JDBC driver to the Gateway by modifying system properties. Edit this file:

```
/opt/SecureSpan/Gateway/node/default/etc/conf/system.properties
```
5. Add this line:

```
com.l7tech.server.jdbcDriver=com.mysql.jdbc.Driver\ncom.l7tech.jdbc.mysql.MySQLDriver\ncom.l7tech.jdbc.db2.DB2Driver\ncom.l7tech.jdbc.oracle.OracleDriver\ncom.l7tech.jdbc.sqlserver.SQLServerDriver\norg.postgresql.Driver
```
6. Save and exit.
7. Start the service by running the following command:

```
service ssg start
```

Install Mobile Access Gateways (MAG) and Siteminder Assertion Packages

The steps for this procedure are different on the two Gateways of your high-availability deployment. Follow the instructions carefully.

On Gateway 1:

1. Connect with SSH.
2. Run the following commands:
 - `service ssg stop`
 - `rpm -Uvh --nodeps ssg-mag-cloudminder_1.51-2.0-3.noarch.rpm`
 - `rpm -Uvh ssg-sm12-7.0-1.x86_64.rpm`
3. Register the agent by running the following commands:

- `cd /opt/SecureSpan/siteminder/bin/`
- `./smregghost.sh -i <SITEMINDER-IP> -u <SITEMINDER-USER> -p <SITEMINDER-PASS> -hn <CLUSTER-HOSTNAME> -hc <SITEMINDER-CONFIG-SETTING> -cf <SITEMINDER-FIPS-MODE>`

Note: The SiteMinder values refer to the existing SiteMinder deployment for this environment.

This command builds the SmHost.conf file.

An example of this command is as follows:

```
./smregghost.sh -i SMPVIP -u siteminder -p <pwd> -hn layer7 -hc  
DefaultHostSettings -cf COMPAT
```

4. Restart the service by running the following command:

```
service ssg start
```

On Gateway 2:

1. Connect with SSH.
2. Run the following commands:
 - `service ssg stop`
 - `rpm -Uvh --nodeps ssg-mag-2.0-1-cloudminder.noarch.rpm`
 - `rpm -Uvh ssg-mag-cloudminder_1.51-2.0-3.noarch.rpm`
3. Restart the service by running the following command:

```
service ssg start
```

After installing the MAG and SiteMinder assertion packages, perform the remaining configuration steps on Gateway one only. No further configuration is necessary on Gateway 2.

Install the Layer 7 License File

Note: In a high-availability environment where you have installed two gateways, perform these steps on Gateway 1 only.

Upon initial login to the Gateway, the Layer 7 Policy Manager prompts you to install your license file.

Follow these steps:

1. Navigate to the Layer 7 Policy Manager web interface at the following URL:
`https://<GATEWAY_ONE_HOSTNAME>:8443/ssg/webadmin`
2. Log in using the credentials you created during installation for the Gateway admin user.

These are the credentials you entered for SSM username and SSM password.

Note: The Gateway includes a login security feature to prevent unauthorized access. After several failed login attempts, the system locks. After 20 minutes, the lockout timer expires and you may attempt login again.

The Cluster License window appears.

3. Click Install License.
4. Navigate to the location where you unpacked the Layer 7 tarball and select the following license file:

`CA_Cloudminder_MSP_SSGv7_5yr.xml`

5. Click I Agree to start the license installation.

The Cluster License window reappears.

Note: Installation is proceeding at this time. The system may seem unresponsive for several minutes while the installation completes. Do not attempt to interact with the system until installation is confirmed.

6. Verify that the license is valid and close the window.

Import the Certificate for the Gateway

Note: In a high-availability environment where you have installed two gateways, perform these steps on Gateway 1 only.

Import the digital certificate for the Layer 7 Gateway.

Follow these steps:

1. Select Manage, then Manage Certificates.
2. Click Add.

The Add Certificate Wizard opens.

3. Select Retrieve via SSL Connection and enter the HTTPS URL of the certificate as follows:

`https://localhost:8443`

4. Click Next.
5. Click to Accept hostname mismatch, if applicable.
6. Leave the Certificate Name unchanged. Click Next.
7. Select the following usage options:

Outbound SSL Connections

Signing Certificated for Outbound SSL Connections

Signing Client Certificates

8. Confirm that the certificate is a Trust Anchor.
9. Leave Revocation Checking as the default.
10. Click Finish.
11. Click Close.

Create Cluster Property: `siteminder12.agent.configuration`

Note: In a high-availability environment where you have installed two gateways, perform these steps on Gateway 1 only.

Configure the `siteminder12.agent.configuration` property settings for your Layer 7 Gateway node. This cluster property helps manage the interaction of the Gateway with the CA SiteMinder® component.

If your node is part of a cluster, all other nodes in the cluster inherit the new settings as well.

Follow these steps:

1. Select Manage, then Manage Cluster-Wide Properties.
2. Click Add.

3. In the Key field, enter:
`siteminder12.agent.configuration`
4. Navigate to the Layer 7 Gateway tarball and locate the following file in a text editor:
`siteminder12.agent.configuration.txt`
5. Save a copy of this file. Rename the copy to reflect the name of the tenant for which you are configuring OAuth. For example:
`siteminder12.agent.configuration.forwardinc.txt`
6. Open the file in a text editor.
7. Navigate to the following file:
`SmHost.conf`
Note: The `SmHost.conf` file is found in the same location as the `smregghost` script. The `smregghost` script runs during installation and creates the `SmHost.conf` file. You can find it on Gateway 1 in `/opt/SecureSpan/siteminder/bin`.
8. Open the file in a text editor.
9. In the SiteMinder agent configuration file, perform the following operations:
 - a. Replace `<SITEMINDER-AGENT>` with the configured Agent ID from SiteMinder.
This is the agent associated with all realms.
 - b. Replace `<SITEMINDER-IP>` with the VIP or host name for the CA SiteMinder® Policy Server listed in `SmHost.conf`.
 - c. Replace `<SITEMINDER-SECRET>` with the secret listed in `SmHost.conf`.
Copy and paste the secret, excluding the quotation marks (`"`).
 - d. Replace `<SITEMINDER-FIPSMODE>` with the FIPS mode listed in `SmHost.conf`.
 - e. Replace `<CLUSTER-HOSTNAME>` with the host name listed in `SmHost.conf`.
 - f. If required, modify other parameters. If not, leave the parameters as the default values.
Note: The `agent.ipcheck` parameter must remain set to `True`.
 - g. Save the SiteMinder agent configuration file, then copy the contents of the file to your clipboard.
10. In the Policy Manager, in the Value field for the `siteminder12.agent.configuration` property, paste the updated contents of the `siteminder12.agent.configuration.txt` file.
11. Click Ok.

Create Cluster Property: token.salt

Note: In a high-availability environment where you have installed two gateways, perform these steps on Gateway 1 only.

Configure the token.salt property settings for your Layer 7 Gateway node. If your node is part of a cluster, all other nodes in the cluster inherit the new settings as well.

Salt enhances the security of the token store. It is a random string that the system uses to encrypt the token store.

Follow these steps:

1. Select Manage, then Manage Cluster-Wide Properties.
2. Examine the list of properties. If token.salt already exists, skip the remainder of this process.

If the property does not already exist, click Add.

3. In the Key field, enter:
`token.salt`
4. In the Value field, enter a random string that acts as salt for the token store. Generate a random string by running the following on the command line:
`openssl rand -base64 32`
5. Copy the output and paste it into the Value field.
6. Click Ok.

Restart Gateways

To complete the Layer 7 Gateway installation, restart the service on both Gateways by running the following command:

```
service ssg start
```

You have now completed the Layer 7 Gateway installation.

The Layer 7 Gateway is used to enable CloudMinder to act as an OAuth Authorization Server for an OAuth client. For example, if a tenant wants their users to access an OAuth client application through single sign-on, you can configure CloudMinder to validate the request for user authorization. Perform the necessary configuration for each tenant and each OAuth client application by following the steps in SSO with CloudMinder as an OAuth Authorization Server.

Steps to Address OAuth Security Vulnerability

A Gateway with OAuth installed may be vulnerable to unauthorized access due to the following issues:

- OAuth SAML token grant type does not check signer of bearer token
- OAuth validation and storage endpoints do not validate TLS client certificate

Important! No known exploitations of this vulnerability have occurred at sites running the affected software.

Note: OAuth policies may be vulnerable if the SAML token grant type policy branches are present, regardless of whether they are actually used.

Affected Product Versions

Important! CA CloudMinder 1.5x must be considered affected by this vulnerability.

All currently released versions of the OAuth Toolkit and CA Mobile API Gateway are affected:

- OAuth Toolkit installed by CA API Gateway versions before 8.2
- MAG Policies installed by CA Mobile API Gateway versions before 2.2

CA CloudMinder1.5x uses a Gateway version 7.1 with MAG version 2.0.1.

Solution

A two-part solution exists, involving the following components:

- OAuth SAML Token Grant Type
- Validation with Storage Endpoints

OAuth SAML Token Grant Type

The Gateway in CA CloudMinder 1.5x does not utilize the SAML grant type. Therefore, you add a "Stop Processing" assertion at the top of a specific policy to ensure that the vulnerable policy branch is never successfully executed.

Perform the following steps for each tenant:

1. In the Gateway Policy Manager or webadmin, open the policy that is named: **<PREFIX> MAG-<version>/Policy Fragments/grant_types/OTK grant_type=SAML**
2. Disable support for the SAML Token grant type by inserting a "**Stop Processing**" assertion at the top of the policy.
3. Save and activate the changes.

Validation with Storage Endpoints

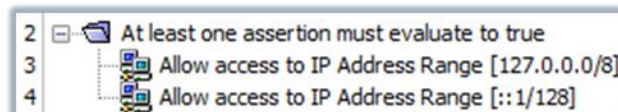
The Gateway in CA CloudMinder 1.5x uses some of the storage and validation endpoints that are affected by the vulnerability of lacking TLS certificate validation. Because the endpoints in question only need to be accessible by the Gateway itself, you can mitigate the vulnerability by only allowing local access.

Perform the following steps for each tenant:

1. Copy the following policy XML snippet from this document:

```
<?xml version="1.0" encoding="UTF-8"?>
<wsp:Policy xmlns:L7p="http://www.layer7tech.com/ws/policy"
xmlns:wsp="http://schemas.xmlsoap.org/ws/2002/12/policy">
  <wsp:All wsp:Usage="Required">
    <wsp:OneOrMore wsp:Usage="Required">
      <L7p:RemoteIpAddressRange>
        <L7p:NetworkMask intValue="8"/>
        <L7p:StartIp stringValue="127.0.0.0"/>
      </L7p:RemoteIpAddressRange>
      <L7p:RemoteIpAddressRange>
        <L7p:NetworkMask intValue="128"/>
        <L7p:StartIp stringValue="::1"/>
      </L7p:RemoteIpAddressRange>
    </wsp:OneOrMore>
  </wsp:All>
</wsp:Policy>
```

2. Search for endpoints within the folder "SecureZone - OVP":
 - a. /oauth/validation/v2/client
 - b. /oauth/validation/validate/v2/refresh token
 - c. /oauth/validation/validate/v2/token
 - d. /oauth/validation/validate/v2/idtoken
3. Search for endpoints within the folder "SecureZone - Storage":
 - a. /oauth/clientstore/*
 - b. /oauth/tokenstore/*
 - c. /oauth/session/*
4. Within each policy, paste the snippet into the top of the policy. Look for results that are similar to the following graphic:



5. Save and then activate the modified policy.

Chapter 4: Initial Configuration

The procedures in this chapter apply after installation of all components but before tenant creation. Tenant creation and management is described in the *Administration Guide*.

This section contains the following topics:

[Server Configuration](#) (see page 162)

[High Availability: Load Balancing](#) (see page 164)

[High-Availability: Network Peers for Connector Servers](#) (see page 170)

[Password Synchronization](#) (see page 172)

[Maximum Number of Tenants](#) (see page 173)

Server Configuration

Follow these steps after you have installed all components and you have confirmed that all servers are running.

Follow these steps:

1. For high-availability deployments, perform these steps on the second SiteMinder Policy Server system only:
 - a. Edit the following file:
`/opt/CA/AdvancedAuth/conf/arcotcommon.ini`
 - b. Search for InstanceId=1
 - c. Change the line to InstanceId=2
2. On all SiteMinder Policy Servers, restart Tomcat as follows:
 - a. Navigate to `/opt/CA/AdvancedAuth/Tomcat/bin`
 - b. (If Tomcat is already started) `./shutdown.sh`
 - c. `./startup.sh`
3. Bootstrap the AuthMinder/RiskMinder/Advanced Authentication UDS service:
 - a. Connect to `http://<SiteMinder Policy Server>:9090/arcotadmin/mabamlogin.htm` using the default password: `master1234!`
 - b. Change the default password to avoid any security loopholes.
 - c. Create a global administrator for use later for configurations that are currently unavailable from the CSP console.

Choose defaultorg as the organization and an appropriate username/password.

Select the global administrator role, and the following setting: manages all organizations.

- d. Log out.
- e. Start webfort and riskfort, if they are not currently running, using the following commands. In a high-availability deployment, start these servers on both SiteMinder Policy Server systems.

```
cd /opt/CA/AdvancedAuth/bin
./riskfortserver start
./webfortserver start
```

- 4. If you restarted the database in Step 1, restart webfort and riskfort on both SiteMinder Policy Servers:

```
cd /opt/CA/AdvancedAuth/bin
./riskfortserver stop
./webfortserver stop
./riskfortserver start
./webfortserver start
```

- 5. For each Identity Managementserver running JBoss EAP, perform these steps:

- a. Edit the jmx-console-users.properties in this location:

```
/opt/boss-eap-5.1.2/jboss-as/server/all/conf/props/
```

- b. Uncomment the "#admin=admin" line.

- c. Restart each Identity Management server in this manner:

```
service im stop
service im start
```

- 6. If you installed a second policy server, set fix the CHS\TWS configuration as follows:

- a. Edit the following file:

```
/opt/CA/AdvancedAuth/Tomcat/webapps/tenant-services/WEB-INF
/classes/resources/config.properties
```

Change IM_WEBSERVICE_HOST to the host of the second Identity Management server.

- b. Restart Tomcat on the second policy server as follows:

```
/opt/CA/AdvancedAuth/Tomcat/bin/shutdown.sh
/opt/CA/AdvancedAuth/Tomcat/bin/startup.sh
```

- 7. On each Identity Management server rnnning JBoss EAP, perform these steps:

- a. Restart each Identity Management server in this manner:

```
service im stop
service im start
```

- b. Restart Tomcat on each policy server:

```
/opt/CA/AdvancedAuth/Tomcat/bin/shutdown.sh
/opt/CA/AdvancedAuth/Tomcat/bin/startup.sh
```

High Availability: Load Balancing

To configure load balancing, make the following changes on each server.

Provisioning Servers

Create these VIPs/Pools on each server:

- CA IAM CS Requests over port 22001 – Used to talk to on-premise CA IAM CS.
- CA IAM CS over port 20080 – Used for accessing the Connector Server Admin console.
- CA IAM CS over port 20410 – Used for configuring connxp for acquiring the endpoint required for Directory Sync.
- CA IAM CS over port 20498 – Used for the Directory Sync from On-premise to Cloud.

SiteMinder Policy Server and Advanced Authentication

Make the following changes on each SiteMinder Policy Server.

Create these VIPs/Pools:

- SiteMinder Policy Server over port 44441 – This is for the agent to communicate with the Policy Server
- SiteMinder Policy Server over port 44442 - This is for the agent to communicate with the Policy Server
- SiteMinder Policy Server over port 44443 - This is for the agent to communicate with the Policy Server
- Authminder over port 9090 – Used for connecting to Arcot Admin Console
- Authminder over port 9745 – Used by Authminder Admin Service

- Authminder over port 9742 – Used by Authminder server for issuance
- Riskminder over port 7680 – Used by RiskMinder

Make the following file and configuration changes.

1. Log in to the Arcot Administration console as master admin.
 - a. Navigate to Services and Server Configurations, Administration Console, UDS Connectivity
 - b. Change the hostname from localhost to the internal host (SiteMinder Policy Server Load Balancer).
 - c. Refresh the caches of AuthMinder and RiskMinder (WebFort and RiskFort).
2. Edit `/opt/CA/siteminder/arcot/conf/adaptershim.ini`
 - a. For each authscheme entry, the following properties have the URL for end user browser redirects:

AuthSchemeParam, ArcotAFMLandingURL, ErrorPageURL, InitialFCCURL, FinalFCCURL
 - Replace all Secure Proxy Server hostnames with your Secure Proxy Server load balancer VIP in the URL.
 - Change http to https.
 - b. For each authscheme entry, the following properties have the URL for internal calls:

ArcotSMBaseURL
 - Replace all localhost with your SiteMinder Policy Server load balancer VIP.
 - Do not change http.
3. Edit `/opt/CA/AdvancedAuth/Tomcat/webapps/tenant-services/WEB-INF/classes/resources/config.properties`
 - Replace the internal Identity Management base URL with the Identity Management load balancer, as follows:

`imBaseURL=http://<Identity Management load balancer VIP>:8080/iam/im`
4. Copy the Secure Proxy Server load balancer SSL certificate and import it to the Java key store. Import it to the Java key store that is used by Tomcat.

Make these changes to the Advanced Authentication database:

1. In the table AOK_SYSTEM_DATA
 - a. Change `com.ca.cm.sso.ShimTokenServer` to your SiteMinder Policy Server load balancer VIP
 - b. Change `com.ca.cm.uds` to your SiteMinder Policy Server load balancer VIP
 - c. Change `webfort` to your SiteMinder Policy Server load balancer VIP

2. In the table AOK_OVERLOADED_PROPS
 - a. Change tws.base.url to http://<SMPS LB VIP>:9090/tenant-services/cm/tenantws
3. Restart the SiteMinder Policy Server, Tomcat, and the Secure Policy Server.

Secure Proxy Server

Make the following changes on each Secure Proxy Server.

Create these VIPs/Pools:

Secure Proxy Server over port 443 with offload to port 80 on Secure Proxy Server – used for all communication through Secure Proxy Server.

Make the following file and configuration changes.

1. Edit /opt/CA/secure-proxy/proxy-engine/conf/server.conf
Add your Secure Proxy Server Load Balancer VIP with the domain to the hostnames under VirtualHost section
2. Edit /opt/CA/secure-proxy/proxy-engine/conf/proxyrules.xml
 - a. Change the Identity Management Server hostname to your Identity Management Server Load Balancer VIP
 - b. Change CA IAM CS hostname with port 20080 to your CA IAM CS Admin Load Balancer VIP
 - c. Change CA IAM CS hostname with port 20001 to your CA IAM CS Request Load Balancer VIP
3. Edit
/opt/CA/secure-proxy/Tomcat/webapps//chs/WEB-INF/classes/config/chsConfig.properties
Change tenantwebservicebaseurl=http://SiteMinder Policy Server LB VIP:9090/tenant-services/cm/tenantws
4. Edit /opt/CA/secure-proxy/proxy-engine/conf/defaultagent/SmHost.conf
Change policyserver="SiteMinder Policy Server Load Balancer VIP,44441,44441,44441"

5. Copy the Secure Proxy Server Load Balancer VIP SSL certificate and import it to the Java key store. Import it to the Java key store that is used by Tomcat.

Use the command: `keytool -import -alias <any name> -keystore cacerts -file <certificate file>`

6. Edit `/opt/CA/secure-proxy/Tomcat/properties/instance.properties`

The value of the property `service.host` should be the internal host (SiteMinder Policy Server Load Balancer)

7. Restart the Secure Proxy Server.

Identity Management Server

Make these changes on each Identity Management Server.

Create these VIPs/Pools on each server:

Identity Management Server over port 8080 - used for communicating with the Identity Management Server

Make the following file and configuration changes.

1. Edit
`/opt/jboss-5.1.0.GA/server/all/deploy/iam_im.ear/policyserver.rar/META-INF/ra.xml`

Change `<config-property-value>` *Secure Proxy Server Load Balancing VIP,44441,44441,44441* `</config-property-value>`

2. Restart the Identity Management server by running the following commands:

```
/etc/init.d im stop
/etc/init.d/im start
```

3. If you have deployed any tenants, modify the Advanced Authentication Connection for the tenant:
 - a. Log in to the User Console.
 - b. Go to Advanced Authentication, Configure AuthMinder Connection

- c. Change the AuthMinder Host Name to the VIP for the SiteMinder Policy Server
`http://<SiteMinder Policy Server Load Balancer VIP>`

CSP console

Be sure to make the following changes before creating any tenant:

1. In the CSP console navigate to Infrastructure, Hosts, Host Configuration Objects
2. Click DefaultHostSettings, then click Modify.
 - a. Under Configuration Values, delete all individual hosts.
 - b. Add your SiteMinder Policy Server Load Balancer VIP. Enter port 44441 for all port values.
 - c. Uncheck Enable Failover.
 - d. Click Submit.
3. Navigate to Tenants, Manage Hosting Containers.
4. From the drop-down menu, select Modify Hosting Container for your host.
 - a. Change Environment Base URL to `https://<Secure Policy Server Load Balancer VIP>/iam/im`
 - b. Change Internal Base URL to `http://<Identity Management Load Balancer VIP>:8080/iam/im`

- c. Change AuthMinder Host to `http://<SiteMinder Policy Server Load Balancer VIP>`
5. Configure Siteminder to use the load balancer IP address.
 - a. Click Infrastructure, Agent, Agent Configuration Objects.
 - b. Modify the AgentConfigurationObject being configured for the Secure Proxy Server.
 - c. Set the CustomIpHeader to `HTTP_ORIGINAL_IP`.
 - d. Click Save.

Configure SSL from Secure Proxy Server to Identity Management Load Balancer

Network traffic coming from Secure Proxy Server to the load balancer must use SSL. Traffic coming from the load balancer to Identity Management is non-SSL. Perform the following steps to configure this transform from SSL to non-SSL through the load balancer.

1. Create a new virtual server for SSL traffic, port 8443, and assign it to the same pool that was being used for port 8080 to Identity Management.
2. Create a certificate for the Identity Management VIP.
3. Create SSL profile (client). Use the certificate created in the load balancer for the Identity Management VIP.
4. Export the certificate from the Identity Management load balancer to all Secure Proxy Servers:
`/opt/CA/secure-proxy/SSL/certs`
5. Run the following command from the above location, on all Secure Proxy Servers:
`openssl x509 -in IM_LB1-<Your VIP>.cert -text >> ca-bundle.cert`
6. Edit the following file on all Secure Proxy Servers:
`/opt/CA/secure-proxy/proxy-engine/conf/proxyrules.xml`
Update the file to use port 8443 (rather than port 8080), and to use https (rather than http), as follows:

```
<nete:case value="/iam/im/">
  <nete:forward>https://<Identity_Management_fully_qualified_domain_name>:8443$0</nete:forward>
```
7. Restart the Secure Proxy Server using `startssl`.

High-Availability: Network Peers for Connector Servers

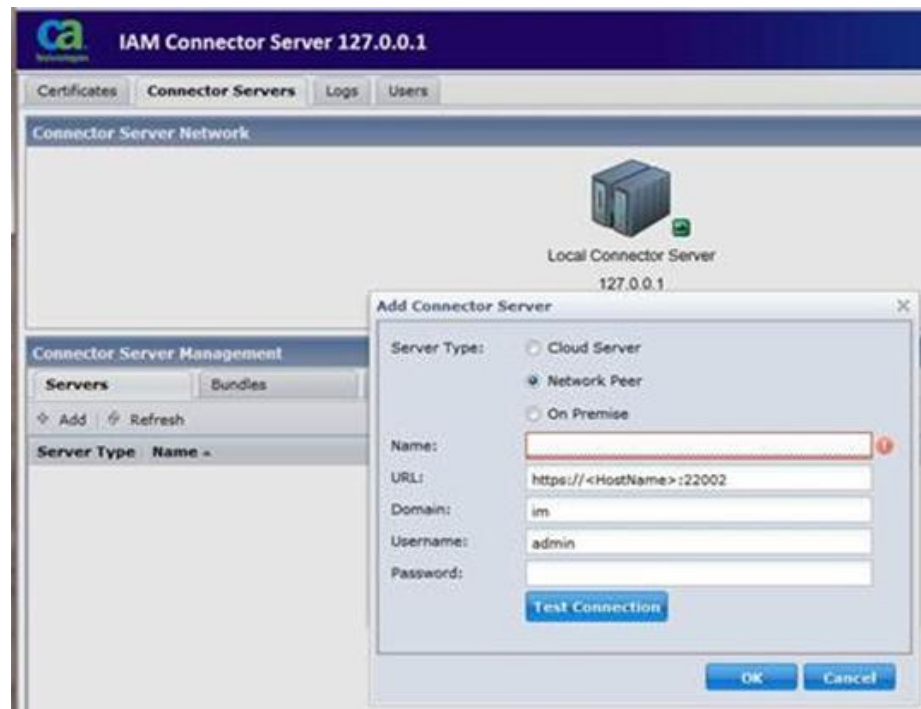
In a high-availability deployment, CA IAM CS systems are load balanced. The load balanced CA IAM CS systems need to be configured as network peers so that they can share configuration and requests. For this procedure, you use the management console of each connector server. Do not access the management console through the Apache server.

Follow these steps:

Log in to the CA IAM CS console using the admin/eTrust01 account.

1. Select the Servers tab.
2. Select the Add button to add a new server.
3. When the Add Connector Server dialog appears, select the Network Peer radio button.

Equation 1: Connector Server UI

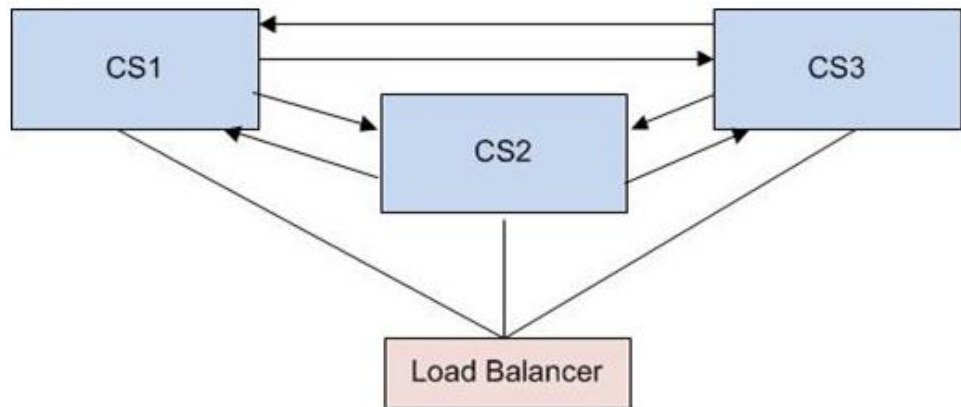


4. Enter the details.
The domain can usually be left unchanged.

5. Select Test Connection to make sure a connection can be established between the connector servers
6. Select OK

Each of the other peers must be added. If a connection cannot be established, check that the clocks on the peers are synchronized. Use the following diagram as an example:

Equation 2: Synchronize Connector Servers

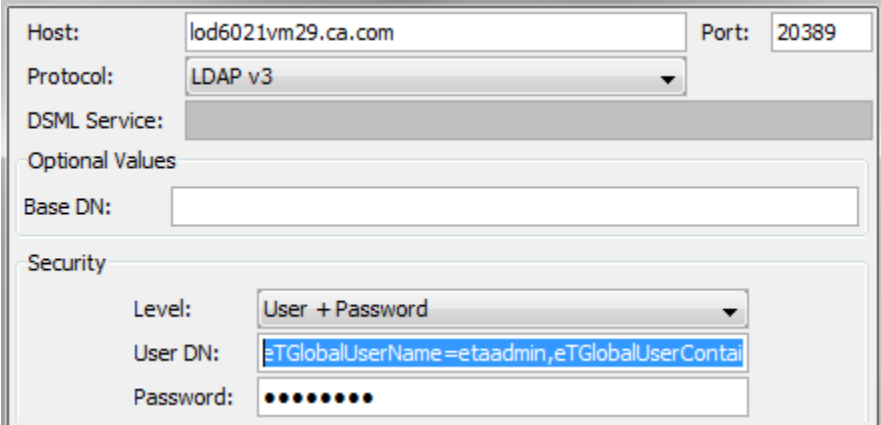


- A peer configuration for CS2 and CS3 must be added to CS1
- A peer configuration for CS1 and CS3 must be added to CS2
- A peer configuration for CS1 and CS2 must be added to CS3
- The three connector servers should be configured as a load balanced cluster in the apache HTTP server

Password Synchronization

To implement password synchronization, you may need to modify the agent response threshold. The default value is 600 seconds, or 10 minutes. You can modify this threshold by connecting to the Provisioning Server from an LDAP browser such as JXplorer.

Log into the LDAP browser using the following fields on the login screen:



The screenshot shows the JXplorer login dialog. The 'Host' field contains 'lod6021vm29.ca.com' and the 'Port' field contains '20389'. The 'Protocol' dropdown is set to 'LDAP v3'. The 'DSML Service' field is empty. Under 'Optional Values', the 'Base DN' field is empty. In the 'Security' section, the 'Level' dropdown is set to 'User + Password'. The 'User DN' field contains 'eTGlobalUserName=etaadmin,eTGlobalUserContai' and the 'Password' field is masked with dots.

Host

The host name of the Provisioning Server.

Port

20389

Level

Username + password

User DN

eTGlobalUserName=etaadmin,eTGlobalUserContainerName=Global
Users,eTNamespaceName=CommonObjects,dc=im,dc=eta

Password

The password used for the _impd_etaadmin_pwd in the Provisioning Server installation.

The agent response threshold is the maximum expected duration of each password change that the Provisioning Server sends to a managed endpoint on which a password synchronization agent is installed. This parameter allows the Provisioning Server to recognize when a Password Synchronization agent is processing a password change that is sent to it by the Provisioning Server as distinct from a password change originating on that managed endpoint.

If, during the Agent Response Threshold, a password other than the password just sent to the managed endpoint is provided in a password validation or password change notification, this password is rejected. Two concurrent password changes to the same account are not allowed.

In the LDAP browser, navigate to the following location to set this parameter: `eta, im, Commonobjects, Configuration, Parameters, Password Synchronization, Agent Response Time`

Maximum Number of Tenants

CA CloudMinder limits the number of tenants to 10. However, you can increase that limit.

Follow these steps:

1. Edit the following file:

```
/opt/CA/siteminder/adminui/server/default/deploy/iam_siteminder.ear/management_console.war/WEB-INF/web.xml
```

2. Set `AccessFilter` to enabled:

```
<filter>
  <filter-name>AccessFilter</filter-name>

  <filter-class>com.netegrity.ims.manage.filter.AccessFilter</filter-class>
    <init-param>
      <param-name>Enable</param-name>
      <param-value>true</param-value>
    </init-param>
</filter>
```

3. Save the `web.xml`.

4. Stop the application server:

```
/opt/CA/siteminder/adminui/bin/shutdown.sh -S
```

5. Start the application server:

```
nohup /opt/CA/siteminder/adminui/bin/run.sh &
```

6. Export the role definitions for the CSP console:

- a. Access the Management Console.
- b. Select `Environments, SiteMinder, Role and Task Settings, Export`.
- c. Save `SiteMinder-RoleDefinitions.xml`

- d. Edit SiteMinder-RoleDefinitions.xml
- e. Edit the screen field for Maximum Tenants on Create Hosting Container Profile Screen to have options for all possible values of max tenants:

```
<ScreenField name="Maximum Tenants" permission="RWM"
attribute="maxTenants">
  <PropertyDict name="Config">
    <Property name="allowNonOptions">1</Property>
    <Property name="CSSStyle"></Property>
    <Property name="DefaultValue"></Property>
    <Property
name="DefaultValueJavaScript"><![CDATA[]]></Property>
    <Property name="FieldSpan">1</Property>
    <Property
name="InitJavaScript"><![CDATA[]]></Property>
    <Property name="LabelRight"></Property>
    <Property name="LabelSpan">1</Property>
    <Property name="Options"><![CDATA[1
220]]></Property>
    <Property name="optionsMethod">Options</Property>
    <Property name="SCREENLOGICAL">true</Property>
    <Property name="Style">Dropdown</Property>
    <Property
name="StyleClass">im-autoFormField</Property>
    <Property name="ValidateOnChange">0</Property>
    <Property
name="ValidationExpression"><![CDATA[]]></Property>
    <Property name="ValidationJava"></Property>
    <Property
name="ValidationJavaScript"><![CDATA[]]></Property>
  </PropertyDict>
</ScreenField>
```

7. Edit the screen field for Maximum Tenants on Default Hosting Container Profile Screen to have script for generating all possible values of max tenants:

```

<ScreenField name="Maximum Tenants" permission="RWM"
attribute="maxTenants">
  <PropertyDict name="Config">
    <Property name="allowNonOptions">1</Property>
    <Property name="CSSStyle"></Property>
    <Property name="DefaultValue"></Property>
    <Property
name="DefaultValueJavaScript"><![CDATA[]]></Property>
    <Property name="FieldSpan">1</Property>
    <Property
name="InitJavaScript"><![CDATA[]]></Property>
    <Property name="LabelRight"></Property>
    <Property name="LabelSpan">1</Property>
    <Property name="optionsMethod">jsOptions</Property>
    <Property name="jsOptions"><![CDATA[function
getOptions(ctx) {
  var state = ctx.getProfileObject().getAttribute("state");
  var maxTenants = 1;
  if (!"INACTIVE".equals(state) && !"FAILED".equals(state)) {
    maxTenants = java.lang.Integer.parseInt(
ctx.getProfileObject().getLastCommittedAttribute("maxTenants")
);
  }
  var options = maxTenants;
  for (i=maxTenants+1 ; i<=20 ; i++) {
    options += "|";
    options += i;
  }
  return options;
}
]]></Property>
    <Property name="SCREENLOGICAL">true</Property>
    <Property name="Style">Dropdown</Property>
    <Property
name="StyleClass">im-autoFormField</Property>
    <Property name="ValidateOnChange">0</Property>
    <Property
name="ValidationExpression"><![CDATA[]]></Property>
    <Property name="ValidationJava"></Property>
    <Property
name="ValidationJavaScript"><![CDATA[]]></Property>
  </PropertyDict>
</ScreenField>

```

8. Save SiteMinder-RoleDefinitions.xml
9. Import the role definitions for the CSP console.
 - a. Access the Management Console.

- b. Select Environments, SiteMinder, Role and Task Settings, Import.
- c. Select SiteMinder-RoleDefinitions.xml and click Finish.
- d. Restart the environment in the Management Console.

Chapter 5: Logs

This section contains the following topics:

- [Provisioning Server Logs](#) (see page 177)
- [CA IAM CS Logs](#) (see page 178)
- [CA Directory Logs](#) (see page 179)
- [CA SiteMinder Logs](#) (see page 181)

Provisioning Server Logs

The Provisioning Server generates logs in the following locations:

- On the Provisioning Server:
 - **Location:**
`/opt/CA/IdentityManager/ProvisioningServer/logs`
 - Logs:**
`Etanotifydate-time.log`
`Etatransdate-time.log`
`im_ps.log`
- On the Directory Server:
 - Location:
`/opt/CA/Directory/dxserver/logs`
 - Logs**
`ProvisioningServerHostName-imps-router_date.log`
`ProvisioningServerHostName-imps-router_alarm.log`
`ProvisioningServerHostName-imps-router_diag_date.log`
`ProvisioningServerHostName-imps-router_stats_date.log`
`ProvisioningServerHostName-imps-router_time_date.log`
`ProvisioningServerHostName-imps-router_trace.log`
`ProvisioningServerHostName-imps-router_warn_date.log`

CA IAM CS Logs

The CA IAM CS generates logs in the following locations:

- On the Connector Server:
 - **Location:**
`/opt/CA/IdentityManager/ConnectorServer/jcs/logs`
 - Logs:**
`jcs_daily.log`
`jcs_stderr.log`
`jcs_stdout.log`
`servicemix.log`
- On the Directory Server:
 - **Location:**
`/opt/CA/Directory/dxserver/logs`
 - Logs:**
ProvisioningServerHostName-imps-router_date.log
ProvisioningServerHostName-imps-router_alarm.log
ProvisioningServerHostName-imps-router_diag_date.log
ProvisioningServerHostName-imps-router_stats_date.log
ProvisioningServerHostName-imps-router_time_date.log
ProvisioningServerHostName-imps-router_trace.log
ProvisioningServerHostName-imps-router_warn_date.log

CA Directory Logs

CA Directory generates logs in the following location on the Directory server machine:

- **Location:**

`/opt/CA/Directory/dxserver/logs`

- Logs:**

`tenant-tenantName-DirHostName_diag_date.log`

`tenant-tenantName-DirHostName_stats_date.log`

`tenant-tenantName-DirHostName_summary_date.log`

`tenant-tenantName-DirHostName_trace.log`

`tenant-tenantName-DirHostName_warn_date.log`

`DirHostName-cam-tenant-tenantName_summary_date.log`

`DirHostName-cam-tenant-tenantName_warn_date.log`

`DirHostName-cam-tenant-tenantName_stats_date.log`

`DirHostName-cam-tenant-tenantName_diag_date.log`

`DirHostName-cam-tenant-tenantName_trace.log`

`DirHostName-cam-tenant-tenantName_alarm.log`

DirHostName-impd-main_warn_date.log
DirHostName-impd-main_trace.log
DirHostName-impd-main_time_date.log
DirHostName-impd-main_diag_date.log
DirHostName-impd-main_date.log
DirHostName-impd-main_stats_date.log
DirHostName-impd-inc_stats_date.log
DirHostName-impd-inc_diag_date.log
DirHostName-impd-inc_warn_date.log
DirHostName-impd-inc_trace.log
DirHostName-impd-inc_time_date.log
DirHostName-impd-co_warn_date.log
DirHostName-impd-co_trace.log
DirHostName-impd-co_diag_date.log
DirHostName-impd-co_time_date.log
DirHostName-impd-co_date.log
DirHostName-impd-co_stats_date.log
DirHostName-impd-notify_diag_date.log
DirHostName-impd-notify_date.log
DirHostName-impd-notify_warn_date.log
DirHostName-impd-notify_trace.log
DirHostName-impd-notify_time_date.log
DirHostName-impd-notify_stats_date.log

CA SiteMinder Logs

CA SiteMinder generates logs in the following locations:

- On the Policy Server:
 - **Location:**
`/opt/CA/siteminder/log`
Logs:
`smps.log`
`smaccess.log`
`smexec.log`
 - **Location:**
`/opt/CA/siteminder/adminui/server/default/log`
Log:
`server.log`
 - **Location:**
`/opt/CA/AdvancedAuth/logs/`
Logs:
`arcotriskfortcasemgmtserver.log`
`arcotriskfortcasemgmtserverstartup.log`
`arcotriskfort.log`
`arcotriskfortstartup.log`
`arcotwatchdog.log`
`arcotwebfort.log`
`arcotwebfortstartup.log`

- **Location:**
/opt/CA/AdvancedAuth/Tomcat/logs

Logs:

catalina.*date*.log
catalina.out
host-manager.*date*.log
localhost.*date*.log
localhost_access_log.*date*.txt
manager.*date*.log
cm-aads.log

- **Location:**
/opt/CA/

Log:

Twslgging.log

■ On the Directory Server:

- **Location:**
/opt/CA/Directory/dxserver/logs

Logs:

SMPSHostName-cam-tenant-router_trace.log
SMPSHostName-cam-tenant-router_alarm.log
SMPSHostName-cam-tenant-router_diag_*date*.log
SMPSHostName-cam-tenant-router_warn_*date*.log
SMPSHostName-cam-tenant-router_summary_*date*.log
SMPSHostName-cam-tenant-router_stats_*date*.log