



NetIQ® Identity Manager 4.8.3 Installation and Upgrade Guide

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About this Book and the Library

This guide provides instructions for installing or updating Identity Manager to the 4.8.3 version.

Intended Audience

This book is intended for identity architects and identity administrators responsible for installing or updating Identity Manager to this service pack.

Other Information in the Library

For more information about the library for Identity Manager, see the [Identity Manager documentation website](#).

About NetIQ Corporation

We are a global, enterprise software company, with a focus on the three persistent challenges in your environment: Change, complexity and risk—and how we can help you control them.

Our Viewpoint

Adapting to change and managing complexity and risk are nothing new

In fact, of all the challenges you face, these are perhaps the most prominent variables that deny you the control you need to securely measure, monitor, and manage your physical, virtual, and cloud computing environments.

Enabling critical business services, better and faster

We believe that providing as much control as possible to IT organizations is the only way to enable timelier and cost effective delivery of services. Persistent pressures like change and complexity will only continue to increase as organizations continue to change and the technologies needed to manage them become inherently more complex.

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Updating Identity Manager on Standalone Servers

This section guides you through the process of installing or updating to the Identity Manager 4.8.3 version on standalone servers.

1 Planning Your Identity Manager Update

This service pack contains the following deliverables:

Filename	Description
Identity_Manager_4.8.3_Linux.iso	Contains files for Identity Manager Server (Identity Manager Engine, Remote Loader, Fanout Agent, and iManager), Identity Applications, and Identity Reporting for Linux platforms.
Identity_Manager_4.8.3_Windows.iso	Contains files for Identity Manager Server (Identity Manager Engine, Remote Loader, Fanout Agent, and iManager), Identity Applications, and Identity Reporting for Windows platforms.
Identity_Manager_4.8.3_Containers.tar.gz	Contains individual container images for Identity Manager Engine, Remote Loader, Fanout Agent, ActiveMQ, Form Renderer, OSP, Identity Applications, Identity Reporting, iManager, PostgreSQL, and SSPR.
Identity_Manager_4.8.3_Designer.zip	Contains files for Designer for all platforms.
SentinelLogManagementForIGA8.4.0.0.tar.gz	Contains Sentinel Log Management for Identity Governance and Administration (IGA) files.

NOTE: This installation is supported only on Linux.

Supported Update Paths

The update process requires you to update Identity Manager components in a specific order.

NOTE: If you are currently on Identity Manager 4.7.4 or a prior version, first upgrade your components to 4.8 and apply 4.8.3 update according to the following update paths.

Base Version	Updated Version
Identity Manager Engine 4.8.x where x is 0, 0.1, 1, or 2 with eDirectory 9.2.x, where x is 0, 1, 2, or 3	Identity Manager Engine 4.8.3 with eDirectory 9.2.4
Identity Manager 4.8.x with Remote Loader 4.8.x, where x is 0, 1, or 2	Identity Manager 4.8.x with Remote Loader 4.8.3, where x is 0,1, 2, or 3 Identity Manager 4.8.3 with Remote Loader 4.8.x, where x is 0,1, 2, or 3
Identity Manager Designer 4.8, 4.8.0.1, 4.8.1, 4.8.1.1, or 4.8.2	Identity Manager Designer 4.8.3
Identity Applications 4.8, 4.8.0.1, 4.8.1, 4.8.1.1, 4.8.2, or 4.8.2.1	Identity Applications 4.8.3

Base Version	Updated Version
Identity Reporting 4.8, 4.8.1, or 4.8.2	Identity Reporting 4.8.3
Identity Analyzer 4.8	Identity Analyzer 4.8
Fanout Agent 1.2.2 or 1.2.3 or 1.2.4	Fanout Agent 1.2.5
Sentinel Log Management for IGA 8.3	Sentinel Log Management for IGA 8.4

Update Order

You must update the components in the following order:

1. Identity Vault
2. Identity Manager Engine
3. Remote Loader
4. Fanout Agent
5. iManager Web Administration
6. (Conditional) PostgreSQL

NOTE: NetIQ recommends you to update PostgreSQL to the latest version when you are using PostgreSQL shipped with Identity Manager and when PostgreSQL (shipped with Identity Manager) is installed on the same server as Identity Applications or Identity Reporting. For information on the supported versions of PostgreSQL, see the [Identity Manager 4.8.x System Requirements Guide](#).

7. Identity Applications (for Advanced Edition)
8. Identity Reporting
9. Designer
10. Sentinel Log Management for IGA
11. Self-Service Password Reset (SSPR)

NOTE: Standalone update of SSPR is required if SSPR is installed on a remote server.

Considerations for Updating SSPR on Linux and Windows

The following considerations apply to Self Service Password Reset (SSPR) before you update Identity Manager to 4.8.3 version on Linux and Windows platforms:

- ♦ If auditing is enabled on SSPR server with Syslog output format type as CEF, then you must uninstall the NetIQ Self Service Password Reset Collector from Sentinel Syslog server, else the Syslog server will not be able to parse the SSPR audit events.
- ♦ SSPR supports both CEF and JSON output format type for auditing events. SSPR 4.5.0.3 will continue to support NetIQ Self Service Password Reset Collector for JSON output format type. If there are more than one SSPR servers connected to a single Sentinel Syslog server, then you must select only one format type for auditing events across all servers.

After you update Identity Manager to 4.8.3 version, SSPR is upgraded to 4.5.0.3 version which requires Universal CEF Collector for collecting auditing events in CEF format type.

NOTE: If you are enabling the SSPR auditing in CEF output format type for the first time, ensure that the NetIQ Self Service Password Reset Collector is not configured on the Sentinel Syslog server.

2 Updating the Identity Manager Components on Linux

The following considerations apply before you update Identity Manager components on Linux platforms:

- ◆ Ensure that you install the `zip` and `unzip` RPM packages.

NOTE: NetIQ recommends that you obtain the dependent packages from your operating system subscription service to ensure continued support from your operating system vendor. If you do not have a subscription service, you can find the recent packages from a website such as <http://rpmfind.net/linux>.

- ◆ (Conditional) If you are updating the Identity Manager from 4.8 to 4.8.3 directly, then you must apply the Identity Applications 4.8.0.1 patch before 4.8.3 version in the following scenarios:
 - ◆ eDirectory 9.2 and Identity Applications 4.8 are installed on the same server.
 - ◆ iManager 3.2 and Identity Applications 4.8 are installed on the same server.
 - ◆ Identity Applications 4.8 and PostgreSQL are installed on the same server.

The Identity Applications 4.8.0.1 patch resolves the dependencies between the NGINX module and the OpenSSL libraries. For instructions on applying the patch, see the [NetIQ Identity Applications 4.8.0 Hotfix 1 Release Notes](#).

If you do not apply the Identity Applications 4.8.0.1 patch, the Identity Vault update fails and the installer reports the following error message:

```
Problem: patterns-edirectory-9.2.2-6.x86_64 requires netiq-openssl =
1.0.2u, but this requirement cannot be provided not installable
providers: netiq-openssl-1.0.2u-32.x86_64[edirectory-9.2.2]
Solution 1: deinstallation of netiq-nginx-1.14.2-1.x86_64
Solution 2: do not install patterns-edirectory-9.2.2-6.x86_64
Solution 3: break patterns-edirectory-9.2.2-6.x86_64 by ignoring some
of its dependencies
```

Updating the Identity Vault

- 1 Download and mount the `Identity_Manager_4.8.3_Linux.iso` file from the download site.
- 2 Navigate to the `<ISO mounted location>/IDVault/setup` directory.
- 3 Run the following command:

```
./nds-install
```
- 4 Accept the license agreement.
- 5 Specify the Administrator DN and the password for the Identity Vault instance.

Updating the Identity Manager Components

The update of the Identity Manager components on Linux is supported through a single script. You must run the `install.sh` script to update these components. The components include Identity Manager Engine, Remote Loader, Fanout Agent, iManager Web Administration, Identity Applications, and Identity Reporting.

Before updating the Remote Loader, ensure that the following components are stopped:

- ♦ Remote Loader instances

```
rdxml -config <filename> -u
```

- ♦ Driver instances running with the Remote Loader
- ♦ Identity Vault

```
ndsmanage stopall
```

NetIQ provides two options for updating the components to the current version: [interactive](#) and [silent](#).

Interactive Update

- 1 Download and mount the `Identity_Manager_4.8.3_Linux.iso` file from the download site.

- 2 Navigate to the `<ISO mounted location>` and run the following command:

```
./install.sh
```

- 3 Specify the component that you want to update.

NOTE: You can update only one component at a time.

- 4 To start the Identity Manager components, run the following commands:

- ♦ **Remote Loader:** `rdxml -config <filename>`

- ♦ **Fanout Agent:** Perform the following steps:

1. Navigate to `/opt/novell/dirxml/fanoutagent/bin` directory.
2. Run the following command:

```
./startAgent -config <FanoutAgent Installation Location>/config/  
fanoutagentconfig.properties
```

- ♦ **Identity Applications:** `systemctl start netiq-tomcat.service`

- ♦ **Identity Reporting:** `systemctl start netiq-tomcat.service`

- 5 (Conditional) If you have applied any customizations on Identity Applications and Identity Reporting components, restore the customizations and restart the Tomcat service.
- 6 (Conditional) Clear your browser cache before accessing the updated Identity Applications Dashboard.

Silent Update

Locate the `silent.properties` file from the extracted directory and modify the file to update the required components.

- ♦ To update the Identity Vault, set `IDVAULT_SKIP_UPDATE=false`
- ♦ To update Identity Manager Engine, set `INSTALL_ENGINE=true`
- ♦ To update Remote Loader, set `INSTALL_RL=true`
- ♦ To update Fanout Agent, set `INSTALL_FOA=true`
- ♦ To update iManager, set `INSTALL_IMAN=true`
- ♦ To update Identity Reporting, set `INSTALL_REPORTING=true`
- ♦ To update Identity Applications, set `INSTALL_UA=true`

NOTE

- ♦ You must set the value to `true` for only one component at a time.
 - ♦ While updating any component other than Identity Vault, you must always set the value of `IDVAULT_SKIP_UPDATE` to `true` to skip the Identity Vault update.
 - ♦ When you update iManager, the iManager plug-ins, if any, are also upgraded.
-

Perform the following actions to update the components silently:

- 1 Download and mount the `Identity_Manager_4.8.3_Linux.iso` file from the download site.
- 2 Navigate to the `<ISO mounted location>` directory.
- 3 Run the following command:

```
./install.sh -s -f silent.properties
```

- 4 To start the Identity Manager components, run the following commands:

- ♦ **Remote Loader:** `rdxml -config <filename>`
- ♦ **Fanout Agent:** Perform the following steps:

1. Navigate to `/opt/novell/dirxml/fanoutagent/bin` directory.
2. Run the following command:

```
./startAgent -config <FanoutAgent Installation Location>/config/  
fanoutagentconfig.properties
```

- ♦ **Identity Applications:** `systemctl start netiq-tomcat.service`
- ♦ **Identity Reporting:** `systemctl start netiq-tomcat.service`

- 5 (Conditional) If you have applied any customizations on Identity Applications and Identity Reporting components, restore the customizations and restart the Tomcat service.
- 6 (Conditional) Clear your browser cache before accessing the updated Identity Applications Dashboard.

Updating PostgreSQL

The following considerations apply before updating PostgreSQL:

- ◆ NetIQ recommends you to update PostgreSQL to the latest version when you are using PostgreSQL shipped with Identity Manager and when PostgreSQL (shipped with Identity Manager) is installed on the same server as Identity Applications or Identity Reporting. For information on the supported versions of PostgreSQL, see the [Identity Manager 4.8.x System Requirements Guide](#).
- ◆ If Identity Vault and PostgreSQL are installed on the same server, update Identity Vault before you update PostgreSQL.

NOTE: In addition to the default capabilities offered by PostgreSQL 12.4, this service pack allows you to configure the PostgreSQL database with SSL (OpenSSL 1.0.2x built with FIPS). This service pack also bundles the PostgreSQL Contrib packages.

- 1 Download and mount the `Identity_Manager_4.8.3_Linux.iso` file from the download site.
- 2 Navigate to the `<ISO mounted location>/common/scripts` directory and run the `pg-upgrade.sh` script.

NOTE: To specify a different directory than the existing directory, run the `SPECIFY_NEW_PG_DATA_DIR=true ./pg-upgrade.sh` command.

The upgrade script performs the following actions:

- ◆ Takes a backup of the existing postgres to a different folder. For example, from `/opt/netiq/idm/postgres` to `/opt/netiq/idm/postgres-<timestamp>-backup`.
 - ◆ Updates the existing Postgres directory. For example, `/opt/netiq/idm/postgres`.
- 3 Specify the following details to complete the installation:
 - Existing Postgres install location:** Specify the location where PostgreSQL is installed. For example, `/opt/netiq/idm/postgres`.
 - Existing Postgres Data Directory:** Specify the location of the existing PostgreSQL data directory. For example, `/opt/netiq/idm/postgres/data`.
 - Existing Postgres Database Password:** Specify the PostgreSQL password.
 - Enter New Postgres Data Directory:** Specify the location of the new PostgreSQL data directory. This prompt is displayed if you selected to specify a different directory other than the existing directory.

Performing a Standalone Update of SSPR

NOTE:

- ◆ If SSPR auditing output format type is CEF, make sure to uninstall the NetIQ Self Service Password Reset Collector on Sentinel Syslog server before updating SSPR. For more information, see [“Considerations for Updating SSPR on Linux and Windows” on page 14](#).

- ◆ Use this method if SSPR is:
 - ◆ Installed on a different server than the Identity Applications server.
 - ◆ Installed in a Standard Edition.
-

Perform the following steps to update SSPR:

- 1 Download and mount the `Identity_Manager_4.8.3_Linux.iso` file.
- 2 Navigate to the `<ISO mounted location>/sspr` directory.
- 3 Run the following command:

```
./install.sh
```
- 4 Specify inputs in the prompt.

Performing a Non-Root Update

You can install Identity Manager Engine as a non-root user to enhance the security of your Linux server. You cannot install Identity Manager Engine as a non-root user if you installed the Identity Vault as root. You need to perform the following steps to install the Identity Manager Engine as a non-root user:

- ◆ Update NCI. For more information, see [Updating NCI](#).
- ◆ Update eDirectory as a non-root user. For more information, see [Updating eDirectory as a Non-root User](#).
- ◆ Update Identity Manager Engine as a non-root user. For more information, see [Updating Identity Manager Engine as a Non-root User](#).

Updating NCI

Ensure that you are logged-in as a root user before updating NCI.

- 1 Navigate to the `/<location where you have mounted the ISO>/IDVault/setup` directory.
- 2 Run the following command:

```
rpm -Uvh nci64-3.1.0-2.x86_64.rpm
```

Updating eDirectory as a Non-root User

A non-root user can upgrade eDirectory using the new version of the tarball. Perform the following steps to upgrade eDirectory as a non-root user:

- 1 Log in as a non-root user.
- 2 Navigate to the `/<location where you mounted the ISO>/IDVault/` directory.
- 3 Copy the `eDir_NonRoot.tar.gz` file to a non-root home directory.
- 4 Run the following command to extract the `.tar.gz` file.

```
tar -zxvf eDir_NonRoot.tar.gz
```

- 5 (Conditional) Ensure the below paths are set in <non-root home directory>/<non-root home directory>/.bash_profile so that below path's are not required to be set for each time user logs in a session

```
export LD_LIBRARY_PATH=<non-root home directory>/eDirectory/opt/novell/  
eDirectory/lib64:<non-root home directory>/eDirectory/opt/novell/  
eDirectory/lib64/nds-modules:<non-root home directory>/eDirectory/opt/  
novell/lib64:$LD_LIBRARY_PATH
```

```
export PATH=<non-root home directory>/eDirectory/opt/novell/eDirectory/  
bin:<non-root home directory>/eDirectory/opt/novell/eDirectory/sbin:/  
opt/novell/eDirectory/bin:$PATH
```

```
export MANPATH=<non-root home directory>/eDirectory/opt/novell/  
man:<non-root home directory>/eDirectory/opt/novell/eDirectory/  
man:$MANPATH
```

```
export TEXTDOMAINDIR=<non-root home directory>/eDirectory/opt/novell/  
eDirectory/share/locale:$TEXTDOMAINDIR. <non-root home directory>/  
eDirectory/opt/novell/eDirectory/bin/ndspath
```

- 6 Restart eDirectory.

```
ndsmanage stopall
```

```
ndsmanage startall
```

Updating Identity Manager Engine as a Non-root User

Perform this action only if you have installed Identity Manager Engine as a non-root user. You can perform the update through an [interactive](#) or [silent](#) mode.

Interactive Update

Perform the follow steps to perform a non-root interactive update of Identity Manager Engine:

- 1 Download and mount the Identity_Manager_4.8.3_Linux.iso for non-root user to access.
- 2 Log in as a non-root user.
- 3 Run the following command from the location where you have mounted the Identity_Manager_4.8.3_Linux.iso:

```
./install.sh
```

- 4 Select **Identity Manager Engine** and press **Enter**.
- 5 Specify the non-root install location for Identity Vault.
For example, /home/user/eDirectory/.
- 6 Specify **Y** to complete the update.

Silent Update

Perform the follow steps to perform a non-root silent update of Identity Manager Engine:

- 1 Copy the `silent.properties` file from the `/<ISO mounted location>/` to a folder accessible by the non-root user.
- 2 In the `silent.properties` file, edit the following:
 - ♦ Set the value for the below properties to **true**:
 - ♦ `INSTALL_ENGINE`
 - ♦ `IDVAULT_SKIP_UPDATE`
 - ♦ Specify the value of the **NONROOT_IDVAULT_LOCATION** parameter as `/home/<non-root username>/eDirectory`, where `<non-root username>` indicates the name of the non-root user.
- 3 Navigate to the location where you mounted the ISO.
- 4 Run the following command:

```
./install.sh -s -f /<location where you copied the silent.properties file to in step 1>/silent.properties
```

Post-Update Tasks

Perform the following actions after updating Identity Manager to the 4.8.3 version:

Extending the Identity Vault Schema

(Conditional) This section does not apply if you have already upgraded to 4.8.1 and extended the Identity Vault Schema.

However, this section applies:

- ♦ if you have installed Identity Manager as a root or a non-root user, and
- ♦ if you want to extend the Identity Vault schema for the Resource Weightage feature

To extend the Identity Vault schema, perform the following steps:

- 1 Log in to the server where you want to extend the Identity Vault schema.
- 2 Navigate to `/opt/novell/eDirectory/bin` directory.
- 3 Run the following command to extend the schema:

```
./idm-install-schema
```
- 4 Update the Role and Resource Service Driver to 4.8.3. For more information, refer to the section [“Update Driver Packages” on page 24](#).
- 5 Restart the Identity Vault.

Post-Update Tasks for Identity Manager Drivers

(Conditional) This section applies if you want to update to the following versions for these drivers:

- ♦ REST 1.1.2.1
- ♦ SOAP 4.1.0.1
- ♦ Oracle EBS 4.1.2.1
- ♦ MSGW 4.2.2.1

In your deployment, if two or more of these drivers are running, and you update one of the drivers to the latest version and then update the Jetty JAR to the latest version (9.4.34.v20201102), NetIQ recommends that you also update the other drivers and the Jetty JAR for those drivers to the latest versions.

For more information on using the `jetty-all-9.4.34.v20201102-uber.jar`, see the [NetIQ Identity Manager REST 1.1.2.1 Readme](#), [NetIQ Identity Manager SOAP 4.1.0.1 Readme](#), [NetIQ Identity Manager Oracle EBS 4.1.2.1 Readme](#), and the [NetIQ Identity Manager 4.2.2.1 Managed System Gateway Driver Readme](#).

Update Driver Packages

NOTE: Before updating the driver packages to 4.8.3, ensure that you have updated to the latest version of Identity Applications.

Once the Identity Applications is updated to the latest version, you can update the Role and Resource Service Driver (RRSD) to 4.8.3. For more information on updating RRSD to the 4.8.3 version, see [NetIQ Identity Manager Role and Resource Service Driver 4.8.3 Readme](#).

Update the Data Collection Services and Managed System Gateway Drivers

After updating Identity Reporting to the 4.8.3 version, you must update the Data Collection Services and the Managed System Gateway drivers to 4.2.1.0 and 4.2.2.1 versions respectively. For more information on updating the drivers, see [NetIQ Identity Manager Data Collection Services Driver 4.2.1.0 Readme](#) and [NetIQ Identity Manager Managed System Gateway Driver 4.2.2.1 Readme](#).

3 Updating the Identity Manager Components on Windows

The following considerations apply before you update Identity Manager components on Windows platforms:

This service pack includes a `Identity_Manager_4.8.3_Windows.iso` file for updating the Identity Manager components on Windows platforms.

NOTE: If Identity Manager Engine is installed on the same server as Identity Applications or Identity Reporting, then the Identity Applications or the Identity Reporting update process will restart the Identity Vault (eDirectory) service.

Updating the Identity Vault

- 1 Download and mount the `Identity_Manager_4.8.3_Windows.iso` file.
- 2 Navigate to the `<ISO mounted location>\IdentityManagerServer\eDirectory` directory and run the `eDirectory_924_Windows_x86_64.exe` file.

NOTE: The Identity Vault update process restarts the Identity Vault (eDirectory) server.

Tree Name

Verify the tree name for Identity Vault.

Server FDN

Verify the server FDN.

Tree Admin

Specify an administrator name for Identity Vault in NCP or dot format.

Admin Password

Specify the administrator password.

- 3 In the **Install Location** field, verify the location where Identity Vault is installed.
- 4 In the **DIB Location** field, verify the location where the DIB files are located.
- 5 Select the **NICI** check box.
- 6 Click **Upgrade**.

Updating the Identity Manager Server Components

This section describes how to update Identity Manager Server Components:

- 1 Download and mount the `Identity_Manager_4.8.3_Windows.iso` file from the download site.
- 2 Stop the Identity Vault and Remote Loader instances.
(Conditional) This step is applicable only if you are upgrading Remote Loader.
 - 2a Stop all Remote Loader instances.
 - 2b Close Remote Loader console.
 - 2c Stop all drivers.
 - 2d Stop the Identity Vault.
- 3 (Conditional) If you are performing an interactive update, perform the following steps:
 - 3a Navigate to the `<ISO mounted location>\IdentityManagerServer` directory.
 - 3b Run `install.exe` file.
 - 3c Select the component that you want to update from the list and click **Next**.
To update the Identity Manager Engine, select **Identity Manager Engine**.
To update the 32-bit Remote Loader, select **32-Bit Remote Loader Service**.
To update the 64-bit Remote Loader, select **64-Bit Remote Loader Service**.
To update the .NET Remote Loader, select **.NET Remote Loader Service**.
To update the Fanout Agent, select **Fanout Agent**.
To update the iManager, select **iManager**.
 - 3d In the **Pre-Installation Summary** page click **Install**.
- 4 (Conditional) If you are performing a silent update, perform the following steps:
 - 4a Navigate to the `<ISO mounted location>\IdentityManagerServer\response-file` directory.
 - 4b Copy the `install.properties` file to a different location.
 - 4c Edit the `install.properties` file and set the value of the components as appropriate.
To update Identity Manager Engine, set the value of `NETIQ_UPGRADE_ENGINE` to **True**.
To update the Remote Loader (root and non-root), set the value of `NETIQ_UPGRADE_REMOTE_LOADER` to **True**.
To update the 32-bit Remote Loader, set the value of `NETIQ_UPGRADE_REMOTE_LOADER_32` to **True**.
To update the 64-bit Remote Loader, set the value of `NETIQ_UPGRADE_REMOTE_LOADER_64` to **True**.
To update the Fanout Agent, set the value of `NETIQ_UPGRADE_FANOUT_AGENT` to **True**.
To update the iManager, set the value of `NETIQ_UPGRADE_iManager` to **True**.
 - 4d In the command prompt, run the following command:

```
install.exe -i silent -f <absolute path of install.properties>
```
- 5 Start the Remote Loader and Fanout Agent instances.

Updating the PostgreSQL Database

The following considerations apply before updating PostgreSQL:

- ◆ NetIQ recommends you to update PostgreSQL to the latest version when you are using PostgreSQL shipped with Identity Manager and when PostgreSQL (shipped with Identity Manager) is installed on the same server as Identity Applications or Identity Reporting. For information on the supported versions of PostgreSQL, see the [Identity Manager 4.8.x System Requirements Guide](#).
- ◆ If Identity Vault and PostgreSQL are installed on the same server, update Identity Vault before you update PostgreSQL.

NOTE: In addition to the default capabilities offered by PostgreSQL 12.4, this service pack allows you to configure the PostgreSQL database with SSL (OpenSSL 1.0.2x built with FIPS). This service pack also bundles the PostgreSQL Contrib packages.

- 1 Stop and disable the PostgreSQL service running on your server.
- 2 Navigate to the directory where PostgreSQL is installed. For example, `C:\Netiq\IDM`.
- 3 Rename the `postgres` directory.
For example, rename `postgres` to `postgres_old`.
- 4 Remove the old PostgreSQL service by running the following command:

```
sc delete <"postgres service name">
```


For example, `sc delete "NetIQ PostgreSQL"`
- 5 Download and mount the `Identity_Manager_4.8.3_Windows.iso` file.
- 6 Navigate to the `<ISO mounted location>\common\postgres` directory and run the `NetIQ_PostgreSQL.exe` file.

NOTE: Ensure that you have the Administrator privileges for the old and new PostgreSQL installation directories.

- 7 Specify the path where you want to install PostgreSQL. For example, `C:\Netiq\IDM`.
- 8 Click **Next**.
- 9 Specify the password for the `postgres` user.
- 10 Specify the PostgreSQL port. The default port is 5432.
- 11 Do not select the **Create database login account** and **Create empty database** check boxes.
- 12 Click **Next**.
- 13 Review the details on the **Pre-Installation summary** page and click **Next**.
- 14 Stop the newly installed PostgreSQL service.
Go to **Services**, search for `NetIQ PostgreSQL` service, and stop the service.

NOTE: Appropriate users can perform stop operations after providing valid authentication.

- 15 Change the permissions for the newly installed PostgreSQL directory by performing the following actions:
 - 15a (Optional) If postgres user is not created, then perform the following steps to create a postgres user:
 - 15a1 Go to **Control Panel > User Accounts > User Accounts > Manage Accounts**.
 - 15a2 Click **Add a user account**.
 - 15a3 In the **Add a User** page, specify postgres as the user name and provide a password for the user.
 - 15b Assign permissions for the postgres user to the existing and newly installed PostgreSQL directories. Right-click the corresponding directories and go to **Properties > Security > Edit**.
 - 15c Select **Full Control for the user** to provide complete permissions.
 - 15d Click **Apply**.
- 16 Access the PostgreSQL directory as postgres user.
 - 16a Log in to the server as postgres user.

Before logging in, make sure that postgres can connect to the Windows server by verifying if a remote connection is allowed for this user.
 - 16b Delete the data directory from the new PostgreSQL installed location.

For example, C:\NetIQ\IDM\postgres\data.
 - 16c Open a command prompt and set PGPASSWORD by using the following command:


```
set PGPASSWORD=<your pg password>
```
 - 16d Change to the newly installed PostgreSQL directory.

For example, C:\netiq\IDM\postgres\bin.
 - 16e Based on the encoding type that is set for the database, execute the following initdb commands as a postgres user from the bin directory.

If the encoding type is set to UTF8, run the following command:

```
initdb.exe -D <new_data_directory> -E <Encoding> UTF8 -U postgres
```

For example, `initdb.exe -D C:\NetIQ\IDM\postgres\data -E UTF8 -U postgres`

If the encoding type is set to WIN1252, run the following command:

```
initdb.exe -D <new_data_directory> -E <Encoding> WIN1252 -U postgres
```

For example, `initdb.exe -D C:\NetIQ\IDM\postgres\data -E WIN1252 -U postgres`
 - 16f Navigate to the C:\NetIQ\idm\postgres\data\ directory, edit the pg_hba.conf file, and set the **Method** type from md5 to trust.

IMPORTANT: You must also set the **Method** type from md5 to trust in the pg_hba.conf file located in the C:\NetIQ\idm\postgres_old\data\ directory.

- 17 Navigate to the C:\NetIQ\idm\postgres\bin directory and run the following command:


```
pg_upgrade.exe --old-datadir "C:\NetIQ\IDM\postgres_old\data" --new-datadir "C:\NetIQ\IDM\postgres\data" --old-bindir
```

```
"C:\NetIQ\IDM\postgres_old\bin" --new-bindir  
"C:\NetIQ\IDM\postgres\bin"
```

18 Once PostgreSQL is upgraded successfully, perform the following steps:

18a Navigate to the C:\NetIQ\IDM\postgres_old\data directory.

18b Copy the pg_hba.conf and postgresql.conf files.

18c Navigate to C:\NetIQ\IDM\postgres\data directory.

18d Replace the files you copied in [Step 18b](#).

19 Start the PostgreSQL service.

Go to **Services**, search for NetIQ PostgreSQL service, and start the service.

NOTE: Appropriate users can perform start operations after providing valid authentication.

20 (Optional) To ensure that the old cluster's data files are deleted and the service does not start automatically, perform the following steps:

20a Log in as postgres user.

20b Navigate to the C:\NetIQ\IDM\postgres\bin directory.

20c Run the analyze_new_cluster.bat and delete_old_cluster.bat files.

Updating the Identity Applications

(Conditional) Delete or take a back-up of the existing logs from the <install_directory>\IDM\apps\tomcat\logs directory.

1 Download and mount the Identity_Manager_4.8.3_Windows.iso file from the download site.

2 Navigate to the <ISO mounted location>\IdentityApplications directory.

3 Perform one of the following actions:

GUI: install.exe

Silent: In the command prompt, go to the <ISO mounted location>\IdentityApplications location and run install.exe -i silent

The Identity Applications update program will update User Application, OSP, SSPR, Tomcat, and JRE.

4 For GUI, on the **Introduction** page, click **Next**.

5 Review the **Deployed Applications** page, then click **Next**.

This page lists the currently installed components with their versions.

6 On the **Available Patches** page, click **Next**.

This page lists the available updates for the installed components.

7 Review the required disk space and available disk space for installation in the **Pre-Install Summary** page, then click **Install**.

The installation process might take some time to complete.

Before applying the service pack, the installation process automatically stops the Tomcat service.

The process also creates a back-up of the current configuration for the installed components. In case, the installation reports any warnings or errors, see the logs from the Service Pack Installation/Logs directory.

For example, C:\NetIQ\IDM\apps\Identity_Apps_4.8.3.0_Install\Logs. You must fix the issues and manually restart the Tomcat service.

- 8 Start the Tomcat service.
- 9 (Optional) To verify that the service pack has been successfully applied, launch the upgraded components and check the component versions.
- 10 Clear your browser cache before accessing Identity Applications.

NOTE: To modify any settings in the configuration update utility, launch `configupdate.bat` from the `<install_directory>\IDM\apps\configupdate` directory.

Updating Identity Reporting

(Conditional) Delete or take a back-up of the existing logs from the `<install_directory>\IDM\apps\tomcat\logs` directory.

- 1 Download and mount the `Identity_Manager_4.8.3_Windows.iso` file.
- 2 Navigate to the `<ISO mounted location>\IdentityReporting` directory.
- 3 Perform following steps:
 - Silent:** In the command prompt, go to the `<ISO mounted location>\IdentityReporting` location and run `install.exe -i silent`
 - GUI:** In the `IdentityReporting` directory, double-click on `install.exe`
- 4 For GUI, on the **Introduction** page, click **Next**.
- 5 Review the **Deployed Applications** page, then click **Next**.

This page lists the currently installed components with their versions.
- 6 On the **Available Updates** page, click **Next**.

This page lists the available updates for the installed components.
- 7 On the **Pre-Installation Summary** page, click **Install**.
- 8 Start the Tomcat service.
- 9 Clear your browser cache before accessing Identity Reporting.

NOTE: To modify any settings in the configuration update utility, launch `configupdate.bat` from the `<install_directory>\IDM\apps\configupdate` directory.

Post-Update Tasks

Perform the following actions after applying this service pack.

Extending the Identity Vault Schema

(Conditional) This section does not apply if you have already upgraded to 4.8.1 and extended the Identity Vault Schema.

This section applies if you want to extend the Identity Vault schema for the Resource Weightage feature.

To extend the Identity Vault schema, perform the following steps:

- 1 Log in to the server where you want to extend the Identity Vault schema.
- 2 Create a new file in your preferred directory.

For example, create `nrf-extensions.sch` file in the `C:\Temp` directory.

- 3 Open the `nrf-extensions.sch` file and add the following content:

```
--
-- The nrfResourceWeightage attribute contained by nrfResource object
-- class specifies the weightage of
-- resource object which is used for assignment/revocation based on
-- priority
--
NDSSchemaExtensions DEFINITIONS ::=
BEGIN
"nrfResourceWeightage" ATTRIBUTE ::=
{
    Operation                               ADD,
    Flags                                   {DS_SYNC_IMMEDIATE, DS_SINGLE_VALUED_ATTR},
    SyntaxID                               SYN_INTEGER,
    ASN1ObjID                               {2 16 840 1 113719 1
33 4 174}
}

"nrfResource" OBJECT-CLASS ::=
{
    Operation    MODIFY,
    MayContain   {"nrfResourceWeightage"}
}
END
```

- 4 Navigate to the `C:\NetIQ\eDirectory\` directory.
- 5 Run the following command to extend the schema:

```
ice -l <schema_update_log> -C -a -S SCH -f <file that you created in
step 2> -D LDAP -s <eDirectory DNS name/IP> -p <LDAP port> -d
<eDirectory_admin_dn> -w <eDirectory_admin_password>
```

where,

-C -a updates the destination schema.

-f indicates the schema file (sch).

-p indicates the port number of the LDAP server. The default port is 389. For secure communication, use port 636. Secure communication needs an SSL Certificate.

-L indicates a file in DER format containing a server key used for SSL authentication.

-s indicates the DNS name or IP address of the LDAP server.

For example,

```
ice -l schemaupdate.log -C -a -S SCH -f C:\Temp\nrf-extensions.sch -D  
LDAP -s idmorg.com -p 636 -d cn=admin,ou=idm,o=microfocus -w password -  
L cert.der
```

6 Update the Role and Resource Service Driver to 4.8.3. For more information, refer to the section [“Update Driver Packages” on page 32](#).

7 Restart the Identity Vault.

Post-Update Tasks for Identity Manager Drivers

(Conditional) This section applies if you want to update to the following versions for these drivers:

- ♦ REST 1.1.2.1
- ♦ SOAP 4.1.0.1
- ♦ Oracle EBS 4.1.2.1
- ♦ MSGW 4.2.2.1

In your deployment, if two or more of these drivers are running, and you update one of the drivers to the latest version and then update the Jetty JAR to the latest version (9.4.34.v20201102), NetIQ recommends that you also update the other drivers and the Jetty JAR for those drivers to the latest versions.

For more information on using the `jetty-all-9.4.34.v20201102-uber.jar`, see the [NetIQ Identity Manager REST 1.1.2.1 Readme](#), [NetIQ Identity Manager SOAP 4.1.0.1 Readme](#), [NetIQ Identity Manager Oracle EBS 4.1.2.1 Readme](#), and the [NetIQ Identity Manager 4.2.2.1 Managed System Gateway Driver Readme](#).

Update Driver Packages

NOTE: Before updating the driver packages to 4.8.3, ensure that you have the Identity Applications latest version.

Once the Identity Applications is updated to the latest version, you can update the Role and Resource Service Driver (RRSD) to 4.8.3. For more information on updating RRSD, see [NetIQ Identity Manager Role and Resource Service Driver 4.8.3 Readme](#).

Update the Data Collection Services and Managed System Gateway Drivers

After updating Identity Reporting to the 4.8.3 version, you must update the Data Collection Services and the Managed System Gateway drivers to 4.2.1.0 and 4.2.2.1 versions respectively. For more information on updating the drivers, see [NetIQ Identity Manager Data Collection Services Driver 4.2.1.0 Readme](#) and [NetIQ Identity Manager Managed System Gateway Driver 4.2.2.1 Readme](#).

4 Updating Designer

You must be on Designer 4.8 at a minimum to apply this update. The update process includes the following tasks:

Performing a Designer Update

You can apply the update in one of the following ways:

Online Update (using the Auto Update feature)

You can apply this update using the built-in auto-update feature of Designer. The auto-update feature notifies you of new features available at the Designer Download Site. This feature allows you to download Designer package and software updates when the computer that has Designer installed is connected to the Internet.

- 1 Launch Designer.
- 2 From Designer's main menu, click **Help > Check for Designer Updates**.
- 3 Click **Yes** to accept the Designer updates.
- 4 Restart Designer for the changes to take effect.

Offline Update (Using the download page to apply the update)

This service pack includes a `Identity_Manager_4.8.3_Designer.zip` file for updating Designer. You also can perform an offline update of Designer when the computer that has Designer installed is not connected to the Internet. To perform an offline update, first download this service pack on a local or remote computer and then point Designer to the directory containing the downloaded files.

To update Designer in an offline mode, create an offline copy of the Designer update files and then configure Designer to read the patch updates from the files copied to the local directory.

To create an offline copy of the Designer update files:

- 1 Go to [NetIQ Downloads Page](#).
- 2 Under **Patches**, click **Search Patches**.
- 3 Specify `Identity_Manager_4.8.3_Designer.zip` in the search box and download the file.
- 4 Log in to the computer that has Designer installed and create a local directory.
- 5 Unzip the downloaded files into the local directory.

To configure Designer to read the patch updates from the local directory:

- 1 Launch Designer.
- 2 From Designer's main menu, click **Windows > Preferences**.
- 3 Click **NetIQ > Identity Manager** and select **Updates**.
- 4 For URL, specify `file:///media/<path_to_update_file>/updatesite1_0_0/`
For a Linux mounted ISO, use the following URL format:
`file:///media/designer483offline/updatesite1_0_0/`
- 5 Click **Apply**, then click **OK**.
- 6 From Designer's main menu, click **Help > Check for Designer Updates**.
- 7 Select the required updates and click **Yes** to accept and update the Designer.
- 8 Restart Designer for the changes to take effect.

Updating Azul Zulu OpenJRE 1.8.0_272

This service pack updates Designer to support Azul Zulu OpenJRE 1.8.0_272 (64-bit).

- 1 On the server where you installed Designer, download and install the Azul Zulu OpenJRE 1.8.0_272 files in a local directory.
- 2 Open the `Designer.ini` file located in the Designer installation directory.
- 3 Update the JRE path in the `Designer.ini` file.

Updating Azul Zulu OpenJRE 1.8.0_272 for Analyzer

This service pack updates Analyzer to support Azul Zulu OpenJRE 1.8.0_272 (64-bit).

1. On the server where you installed Analyzer, download and install the Azul Zulu OpenJRE 1.8.0_272 files in a local directory.
2. Open the `Analyzer.ini` file located in the Analyzer installation directory.
3. Update the Java path in the `Analyzer.ini` file.

5 Updating Sentinel Log Management for IGA

This service pack includes the `SentinelLogManagementForIGA8.4.0.0tar.gz` file for updating the Sentinel Log Management for Identity Governance and Administration (IGA) component. Ensure that the required port is available before you update Sentinel.

- 1 Download the `SentinelLogManagementForIGA8.4.0.0.tar.gz` file from NetIQ Download Website <https://dl.netiq.com/index.jsp> to the server where you want to install this version.

- 2 Run the following command to extract the file:

```
tar -zxvf SentinelLogManagementForIGA8.4.0.0.tar.gz
```

NOTE: Ensure that you extract the `SentinelLogManagementForIGA8.4.0.0.tar.gz` file to a directory that has `novell` user permissions. NetIQ recommends that you extract the file under the `tmp` or `opt` directories.

- 3 Navigate to the `SentinelLogManagementforIGA` directory.
- 4 To install Sentinel Log Management for IGA, run the following command:

```
./install.sh
```

NOTE: Identity Manager 4.8.3 supports Universal CEF Collector 2011.1r5 for CEF auditing.

Deploying Identity Manager Containers

This section guides you through the process of deploying Identity Manager components using containers.

Identity Manager provides the flexibility of deploying Identity Manager components through a containerized mechanism. Identity Manager uses Docker for managing containers. The Identity Manager components, that support containerization, are delivered as Docker images. The Docker images are self-sufficient to run on their own.

All the functionalities and operations that can be achieved through the enterprise mode of installation are also available through the containerized mechanism.

However, the advantage of using containers is the ability to perform a fresh installation with every new version of containers along with the option of updating from previous versions. NetIQ recommends you to directly use the 4.8.4 version of containers if you are using containers for the first time.

6 Overview and Planning

The following sections describe the high-level planning required for a container-based deployment in Docker environment:

- ♦ “System Requirements” on page 39
- ♦ “Obtaining the Docker Images” on page 39

System Requirements

You must ensure that the following requirements are met for deploying the containers:

Software	Certified Versions
Docker	19.03.1 or later

Obtaining the Docker Images

Perform the following steps to obtain the Docker images:

- 1 Download the `Identity_Manager_4.8.3_Containers.tar.gz` from the [download page](#).
- 2 Run the following command to extract the `.tar.gz` file:

```
tar -zxvf Identity_Manager_4.8.3_Containers.tar.gz
```


7 Fresh Deployment of Identity Manager Containers

This section guides you through the process of installing Identity Manager containers. After Identity Manager containers are deployed, you must perform some additional configuration steps for the components to be fully functional. For more information, see [Final Steps for Completing the Installation](#) section in the [NetIQ Identity Manager Setup Guide for Linux](#).

The Docker images are available for the following Identity Manager components:

- ◆ Identity Manager Engine
- ◆ Remote Loader
- ◆ iManager
- ◆ One SSO Provider (OSP)
- ◆ Fanout Agent
- ◆ ActiveMQ
- ◆ PostgreSQL (Redistribution)
- ◆ Identity Applications
- ◆ Self Service Password Reset (SSPR)
- ◆ Form Renderer
- ◆ Identity Reporting

NOTE: The Identity Configuration Generator image is used for generating the silent properties file. For information about creating the silent properties file, see [“Creating the Silent Properties File”](#) on page 44.

The procedures for deploying containers are described in subsequent sections.

- ◆ [“Preparing Your Container Deployment”](#) on page 41
- ◆ [“Deploying Containers on Distributed Servers”](#) on page 46
- ◆ [“Deploying Containers on a Single Server”](#) on page 61

Preparing Your Container Deployment

The Identity Manager containers deployment process requires pre-installation, installation, and post-installation work. Use the information in this section as you prepare to deploy the Identity Manager containers.

Some containers are dependent on others. The following table provides details on those containers that are dependent on other containers.

Table 7-1 *Dependent Containers*

Container	Dependent containers
OSP	<ul style="list-style-type: none">◆ Identity Manager Engine◆ iManager
Identity Applications	<ul style="list-style-type: none">◆ OSP◆ Databases for Identity Applications
Form Renderer	Identity Applications
Identity Reporting	<ul style="list-style-type: none">◆ Identity Applications◆ Databases for Identity Reporting
SSPR	OSP

Managing Container Volume Data

Docker supports several mechanisms for data storage and persistence. One such mechanism of persisting container data is by using shared volumes in containers.

The examples used in this guide assumes that you create and use shared volumes. For example, create a shared volume called `/data` on your Docker host.

```
mkdir /data
```

However, you can use other volumes that Docker supports. For more information, see [Docker](#) documentation.

NOTE: The `/data` directory of the Docker host will be mapped to the `/config` directory of the containers. Ensure that you have read-write permissions for the shared volumes. However, if you want to map the shared volume with a different directory inside the container, you must map them while deploying the container itself. For example, you can map the `/data` directory with the `/etc/opt/novell/dirxml/rdxml/` directory inside the Remote Loader container.

Prerequisites for Deploying Containers

Based on your container deployment, NetIQ recommends that you review the following prerequisites before deploying containers.

- ◆ The `/etc/hosts` file of all the Docker hosts in your Docker deployment must be updated with the details of all the containers running on that host. Ensure that the hostname for all containers are in Fully Qualified Domain Name (FQDN) format only.
 - ◆ If you are deploying containers on distributed servers, ensure that the host file entries follows the below format for all the components:

```
<IP of the container> <FQDN> <short_name>
```

In the sample deployment used in this guide, add the following entries in the `/etc/hosts` file:

```

192.168.0.12    identityengine.example.com    identityengine
192.168.0.2    remoteloader.example.com     remoteloader
192.168.0.3    fanoutagent.example.com     fanoutagent
192.168.0.4    imanager.example.com        imanager
192.168.0.5    osp.example.com             osp
192.168.0.6    postgresql.example.com      postgresql
192.168.0.7    identityapps.example.com    identityapps
192.168.0.8    formrenderer.example.com    formrenderer
192.168.0.9    activemq.example.com        activemq
192.168.0.10  identityreporting.example.com identityreporting
192.168.0.11  sspr.example.com            sspr

```

You must also add the following entries on the `hosts` file of the machine where you will access the containers from:

```

<IP Address of Docker host A> <FQDN of all containers deployed on
Docker Host A> <short name of all containers deployed on Docker
host A>

```

```

<IP Address of Docker host B> <FQDN of all containers deployed on
Docker Host B> <short name of all containers deployed on Docker
host B>

```

- ◆ If you are deploying containers on a single server, ensure that the host file entry follows the below format:

```
<IP of the host> <FQDN> <short_name>
```

For example:

```
172.120.0.1    identitymanager.example.com    identitymanager
```

NOTE: The examples in the guide assume virtual IP addresses for all the containers. Based on your requirement, you can assign IP addresses that are accessible across your network.

- ◆ You must know the ports that you want to use for each containers in your deployment. You must expose the required ports and map the container ports with the ports on the Docker host. The following table provides information on ports that you must expose on the Docker hosts based on the examples provided in the guide.

Table 7-2 Default Ports Exposed As per the Sample Deployment

Container	Default ports assumed as per the sample deployment
Remote Loader	8090
Fanout Agent	Not applicable
iManager	8743
iMonitor	8030
OSP	8543

Container	Default ports assumed as per the sample deployment
Identity Applications	18543
Identity Reporting	28543
Form Renderer	8600
ActiveMQ	<ul style="list-style-type: none"> ◆ 8161 ◆ 61616
PostgreSQL	5432
SSPR	8443

NOTE: SSPR container runs only on 8443 port.

However, you can customize the ports based on your requirement. The following considerations apply while you expose the ports:

- ◆ Ensure that you expose those ports that are not in use.
- ◆ The container port must be mapped to the same port on the Docker host. For example, the 8543 port on the container must be mapped to the 8543 port on the Docker host.

Creating the Silent Properties File

Identity Manager supports silent mode only for deployment of containers. You must generate the silent properties file if you are deploying containers for the first time. If you are updating containers from previous versions, the silent properties file is not required.

1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

2 Navigate to the `docker-images` directory.

3 Run the following command to load the image:

```
docker load --input IDM_483_idm_conf_generator.tar.gz
```

4 Deploy the container using the following command:

```
docker run --rm -it --name=idm_conf_generator --
hostname=identitymanager.example.com -v /data:/config
idm_conf_generator:idm-4.8.3
```

NOTE

- ◆ Ensure that you specify the machine FQDN as a value for the hostname.
 - ◆ The `--rm` flag deletes the container after the silent properties file is created.
-

5 Specify the silent property file name with the absolute path:

NOTE: Ensure that you create the `silent.properties` file in the `/config` shared volume location. In other words, the silent properties file will be available in the `/data` directory of the Docker host.

- 6 Specify `n` for the **Do you want to generate inputs for Kubernetes Orchestration** parameter.
- 7 Decide the Identity Manager server edition you want to install. Enter `y` for Advanced Edition and `n` for Standard Edition.
- 8 From the list of components available for installation, select the required components:
 - ♦ To install Identity Manager Engine, select **Identity Manager Engine**.
 - ♦ To install Identity Reporting, select **Identity Reporting**.
 - ♦ To install Identity Applications, select **Identity Applications**.

NOTE

- ♦ You must generate a single `silent.properties` file for deploying all the Identity Manager components.
- ♦ Ensure that you specify the following values for the ports used by different containers:

Prompt	Port to be specified
One SSO Server SSL port	8543
Identity Reporting Tomcat HTTPS port	28543
Identity Applications Tomcat HTTPS port	18543

- ♦ Use FQDN for all IP related configuration prompts. In other words, the hostname that you provide in the `/etc/hosts` entry for all components must be specified while generating the `silent.properties` file.
- ♦ The `SSO_SERVER_SSL_PORT`, `TOMCAT_HTTPS_PORT`, `UA_SERVER_SSL_PORT`, and `RPT_TOMCAT_HTTPS_PORT` must be unique ports.

- 9 (Conditional) If you are deploying containers on a single server using the host network mode, you must perform the following tasks after the `silent.properties` file is generated:
 - ♦ Modify the `SSO_SERVER_SSL_PORT` to **8543**, `TOMCAT_HTTPS_PORT` and `UA_SERVER_SSL_PORT` to **18543**, and `RPT_TOMCAT_HTTPS_PORT` to **28543** respectively.
 - ♦ Add the `SKIP_PORT_CHECK=1` entry.

NOTE: When the `silent.properties` file is generated, it will be available in the shared volume of your Docker host. For example, `/data`.

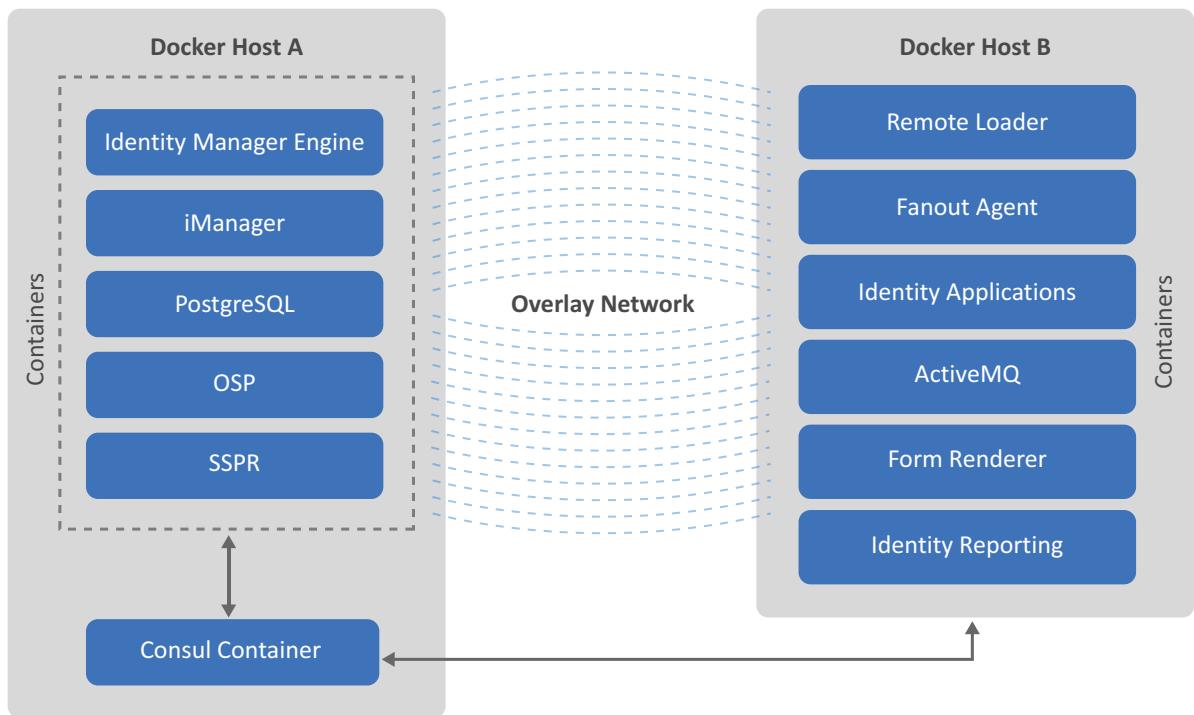
Deploying Containers on Distributed Servers

NetIQ recommends you to use overlay or bridge network mode for deploying all Identity Manager containers in a distributed setup. The scenarios documented in the guide provide instructions and commands to deploy containers in an overlay network. However, you can also use bridge network for deploying containers.

In the following distributed servers scenario, the Identity Manager Engine, iManager, PostgreSQL, OSP, and SSPR containers will be deployed on Docker Host A. On Docker Host B, the Remote Loader, Fanout Agent, Identity Applications, ActiveMQ, Form Renderer, and Identity Reporting containers will be deployed. The Consul container will be deployed on Docker host A. However, you can deploy the Consul container on any of the Docker hosts in your deployment.

The following figure illustrates the deployment of Identity Manager containers on two Docker hosts in an overlay network.

Figure 7-1 Containers Deployment Architecture in an Overlay Network



The containers must be deployed in the following order:

- ◆ [“Setting Up an Overlay Network” on page 47](#)
- ◆ [“Deploying Identity Manager Engine Container” on page 48](#)
- ◆ [“Deploying Remote Loader Container” on page 48](#)
- ◆ [“Deploying Fanout Agent Container” on page 49](#)
- ◆ [“Deploying iManager Container” on page 49](#)
- ◆ [“Generating Certificates With Identity Vault Certificate Authority” on page 51](#)
- ◆ [“Deploying OSP Container” on page 55](#)
- ◆ [“Deploying PostgreSQL Container” on page 55](#)

- ♦ [“Deploying Identity Applications Container” on page 57](#)
- ♦ [“Deploying Form Renderer Container” on page 58](#)
- ♦ [“Deploying ActiveMQ Container” on page 58](#)
- ♦ [“Deploying Identity Reporting Container” on page 59](#)
- ♦ [“Deploying SSPR Container” on page 60](#)

Setting Up an Overlay Network

Perform the following steps to set up an overlay network:

- 1 Run the following command on Docker Host A:

```
docker run -d -p <host port>:8500 -h consul --name <container name> --
restart unless-stopped progrium/consul -server -bootstrap
```

For example:

```
docker run -d -p 8500:8500 -h consul --name consul --restart unless-
stopped progrium/consul -server -bootstrap
```

- 2 On both the Docker Hosts, edit the **docker** file located at `/etc/sysconfig/` directory and add the following line:

```
DOCKER_OPTS="-H tcp://0.0.0.0:2375 -H unix:///var/run/docker.sock --
cluster-advertise <Master Server Network Interface>:2375 --cluster-
store consul://<Docker Host A IP Address>:<Docker Host A Port>"
```

For example:

```
DOCKER_OPTS="-H tcp://0.0.0.0:2375 -H unix:///var/run/docker.sock --
cluster-advertise eth0:2375 --cluster-store consul://172.120.0.1:8500"
```

- 3 Restart the Docker service on both the Docker hosts:

```
systemctl restart docker
```

- 4 On Docker Host B, run the following command to check whether Docker Host B is added to the cluster:

```
docker info
```

The sample output will be as follows:

```
Cluster store: consul://<Docker HOST A IP Address>:8500
Cluster advertise: <Docker HOST B IP Address>:2375
```

- 5 Create an overlay network on any of the Docker hosts:

```
docker network create -d overlay --subnet=<subnet in CID format that
represents a network segment> --gateway=<ipv4 gateway> <name of the
overlay network>
```

For example:

```
docker network create -d overlay --subnet=192.168.0.0/24 --
gateway=192.168.0.1 idmoverlaynetwork
```

- 6 Run the following command to verify whether the overlay network is created:

```
docker network ls
```

Deploying Identity Manager Engine Container

1 Use the silent properties file generated in the [Creating the Silent Properties File](#) section for deploying the container.

2 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

3 Navigate to the `docker-images` directory.

4 Run the following command to load the image:

```
docker load --input IDM_483_identityengine.tar.gz
```

5 Deploy the container using the following command:

```
docker run -d --ip=192.168.0.12 --network=idmoverlaynetwork --hostname=identityengine.example.com --name=engine-container -v /etc/hosts:/etc/hosts -v /data:/config -p 8028:8028 -p 524:524 -p 389:389 -p 8030:8030 -p 636:636 -e SILENT_INSTALL_FILE=/config/silent.properties --stop-timeout 100 identityengine:itm-4.8.3
```

6 To verify whether the container was successfully deployed, check the log files by running the following command:

```
tail -f /data/idm/log/idmconfigure.log
```

7 To log in to the container, run the following command:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it engine-container bash
```

NOTE: To run the Identity Vault utilities such as `ndstrace` or `ndsrepair`, log in to the container as a non-root user called as `nds`. These utilities cannot be run if you are logged in as a root user. To log in to the container as a `nds` user, run the `docker exec -it engine-container su nds` command.

Deploying Remote Loader Container

1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

2 Navigate to the `docker-images` directory.

3 Run the following command to load the image:

```
docker load --input IDM_483_remoteloader.tar.gz
```

4 Deploy the container using the following command:

```
docker run -d --ip=192.168.0.2 --network=idmoverlaynetwork --hostname=remoteloader.example.com -p 8090:8090 --name=rl-container -v /etc/hosts:/etc/hosts -v /data:/config --stop-timeout 100 remoteloader:itm-4.8.3
```

The driver files can be found at the `/opt/novell/eDirectory/lib/dirxml/classes/` directory of the container.

5 To log in to the container, run the following command:


```
docker exec -it <container> <command>
```

For example,

```
docker exec -it rl-container bash
```

- 6 Configure Remote Loader. For more information, see [Configuring the Remote Loader and Drivers](#) in the *NetIQ Identity Manager Driver Administration Guide*.
- 7 Ensure that the configuration file is available in the `/config` shared volume of the container. For example, `config8000.txt`.

Deploying Fanout Agent Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 2 Navigate to the `docker-images` directory.

- 3 Run the following command to load the image:

```
docker load --input IDM_483_fanoutagent.tar.gz
```

- 4 Deploy the container using the following command:

```
docker run -d --ip=192.168.0.3 --network=idmoverlaynetwork --  
hostname=fanoutagent.example.com --name=foa-container -v /etc/hosts:/  
etc/hosts -v /data:/config --stop-timeout 100 fanoutagent:idm-4.8.3
```

- 5 To log in to the container, run the following command:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it foa-container bash
```

- 6 Configure the Fanout Agent. For more information, see [Configuring the Fanout Agent](#) in the *NetIQ Identity Manager Driver for JDBC Fanout Implementation Guide*.

Deploying iManager Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 2 Navigate to the `docker-images` directory.

- 3 Run the following command to load the image:

```
docker load --input iManager_324.tar.gz
```

- 4 Create a `.env` file with the required configuration to suit your environment. For example, the `iManager.env` is created in the `/data` directory.

```

# Certificate Public Key Algorithm
# Allowed Values: RSA, ECDSA256, ECDSA384
CERTIFICATE_ALGORITHM=RSA
# Cipher Suite
# Allowed Values:
# For RSA - NONE, LOW, MEDIUM HIGH
# For ECDSA256 - SUITEB128ONLY
# For ECDSA384 - SUITEB128, SUITEB192
CIPHER_SUITE=NONE
# Tomcat Server HTTP Port
TOMCAT_HTTP_PORT=8080
# Tomcat Server SSL Port
TOMCAT_SSL_PORT=8743
# iManager Authorized User (admin_name.container_name.tree_name)
AUTHORIZED_USER=

```

5 Create a sub-directory called as iManager under the shared volume /data.

6 Deploy the container using the following command:

```

docker run -d --ip=192.168.0.4 --name=iman-container --
network=idmoverlaynetwork --hostname=imanager.example.com -v /etc/
hosts:/etc/hosts -v /data:/config -v /data/iManager.env:/etc/opt/
novell/iManager/conf/iManager.env -p 8743:8743 --stop-timeout 100
imanager:3.2.4

```

7 To install the Identity Manager plug-ins, perform the following steps:

7a Log in to iManager.

```
https://imanager.example.com:8743/nps/
```

7b Click **Configure**.

7c Click **Plug-in Installation** and then click **Available NetIQ Plug-in Modules**.

7d Select all the plug-ins from the **NetIQ Plug-in Modules** list and then click **Install**.

To obtain the plug-ins offline, perform the following steps:

1. Download the `Identity_Manager_4.8.3_Linux.iso` from the NetIQ Downloads website.
2. Mount the downloaded `.iso`.
3. From the mounted location, navigate to the `/iManager/plugins` directory and obtain the required plug-ins.

Alternatively, you can install the plug-ins from the [iManager plug-ins website](#).

8 Restart the iManager container.

```
docker restart iman-container
```

9 To log in to the container, run the following command:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it iman-container bash
```

For more information about deploying the iManager container, see the [Deploying iManager Using Docker Container](#) in the *NetIQ iManager Installation Guide*.

Generating Certificates With Identity Vault Certificate Authority

(Conditional) This section applies only if you are using Identity Vault as the Certificate Authority.

The following components require you to generate certificates before they are deployed. Before you generate the certificates for the following components, ensure that you deploy the [Identity Manager Engine](#) and [iManager](#) containers.

- ♦ [OSP](#)
- ♦ [Identity Applications](#)
- ♦ [Identity Reporting](#)

Generating Certificates for OSP

Perform the following steps to generate the certificates:

- 1 Log in to the iManager container.

```
docker exec -it -u root <container> <command>
```

For example,

```
docker exec -it -u root iman-container bash
```

- 2 Ensure that you set the Java path. For example, run the following command:

```
export PATH=<java installed location>/bin:$PATH
```

For example,

```
export PATH=/opt/netiq/common/jre/bin/:$PATH
```

NOTE: Ensure that the Java version installed is Azul Zulu 1.80_272 or later.

- 3 Generate the PKCS keystore:

```
keytool -genkey -alias osp -keyalg RSA -storetype pkcs12 -keystore /  
config/tomcat-osp.ks -validity 3650 -keysize 2048 -dname  
"CN=osp.example.com" -keypass <password> -storepass <password>
```

- 4 Generate a certificate signing request:

```
keytool -certreq -v -alias osp -file /config/osp.csr -keypass  
<password> -keystore /config/tomcat-osp.ks -storepass <password>
```

- 5 Generate a self-signed certificate:

- 5a Launch iManager from Docker host and log in as an administrator.

- 5b Navigate to **Roles and Tasks > NetIQ Certificate Server > Issue Certificate**.

- 5c Browse to the `.csr` file created in step 3. For example, `osp.csr`.

- 5d Click **Next**.

- 5e Specify the key usage and click **Next**.

- 5f For the certificate type, select **Unspecified**.

- 5g Click **Next**.

- 5h Specify the validity of the certificate and click **Next**.

- 5i Select the **File in binary DER format radio** button.

- 5j Click **Next**.
- 5k Click **Finish**.
- 5l Download the certificate and copy the downloaded certificate to the /data directory.
- 6 Export the root certificate in .der format:
 - 6a Launch iManager from Docker host and log in as an administrator.
 - 6b Navigate to **Roles and Tasks > NetIQ Certificate Access > Server Certificates**.
 - 6c Select the **SSL CertificateDNS** check box and click **Export**.
 - 6d In the **Certificates** drop-down list, select the Organizational CA.
 - 6e In the **Export Format** drop-down list, select DER.
 - 6f Click **Next**.
 - 6g Download the certificate and copy the downloaded certificate to the /data directory.
- 7 Import the certificates into the PKCS keystore you created in step 2:


```
keytool -import -trustcacerts -alias root -keystore /config/tomcat-osp.ks -file /config/cert.der -storepass <password> -noprompt
keytool -import -alias osp -keystore /config/tomcat-osp.ks -file /config/osp.der -storepass <password> -noprompt
```

NOTE: Ensure that the keystore is available in the path that was specified as an input for deployment.

Generating Certificates for Identity Applications

Perform the following steps to generate the certificates:

- 1 Log in to the iManager container.

```
docker exec -it -u root <container> <command>
```

For example,

```
docker exec -it -u root iman-container bash
```

- 2 Ensure that you set the Java path. For example, run the following command:

```
export PATH=<java installed location>/bin:$PATH
```

For example,

```
export PATH=/opt/netiq/common/jre/bin/:$PATH
```

NOTE: Ensure that the Java version installed is Azul Zulu 1.80_272 or later.

- 3 Generate the PKCS keystore:

```
keytool -genkey -alias ua -keyalg RSA -storetype pkcs12 -keystore /config/tomcat-ua.ks -validity 3650 -keysize 2048 -dname "CN=identityapps.example.com" -keypass <password> -storepass <password>
```

- 4 Generate a certificate signing request:

```
keytool -certreq -v -alias ua -file /config/ua.csr -keypass <password> -keystore /config/tomcat-ua.ks -storepass <password>
```

- 5 Generate a self-signed certificate:
 - 5a Log in to iManager as an administrator.
 - 5b Navigate to **Roles and Tasks > NetIQ Certificate Server > Issue Certificate**.
 - 5c Browse to the `.csr` file created in step 3. For example, `ua.csr`.
 - 5d Click **Next**.
 - 5e Specify the key usage and click **Next**.
 - 5f For the certificate type, select **Unspecified**.
 - 5g Click **Next**.
 - 5h Specify the validity of the certificate and click **Next**.
 - 5i Select the **File in binary DER format radio** button.
 - 5j Click **Next**.
 - 5k Click **Finish**.
 - 5l Download the certificate and copy the downloaded certificate to the `/data` directory.
- 6 Export the root certificate in `.der` format:
 - 6a Log in to iManager as an administrator.
 - 6b Navigate to **Roles and Tasks > NetIQ Certificate Access > Server Certificates**.
 - 6c Select the **SSL CertificateDNS** check box and click **Export**.
 - 6d In the **Certificates** drop-down list, select the Organizational CA.
 - 6e In the Export Format drop-down list, select DER.
 - 6f Click **Next**.
 - 6g Download the certificate and copy the downloaded certificate to the `/data` directory.
- 7 Import the certificates into the PKCS keystore in step 2:


```
keytool -import -trustcacerts -alias root -keystore /config/tomcat-ua.ks -file /config/cert.der -storepass <password> -noprompt
keytool -import -alias ua -keystore /config/tomcat-ua.ks -file /config/ua.der -storepass <password> -noprompt
```

NOTE: Ensure that the certificates are available in the path that was specified as an input for deployment.

Generating Certificates for Identity Reporting

Perform the following steps to generate the certificates:

- 1 Log in to the iManager container.


```
docker exec -it -u root <container> <command>
```

 For example,


```
docker exec -it -u root iman-container bash
```
- 2 Ensure that you set the Java path. For example, run the following command:


```
export PATH=<java installed location>/bin:$PATH
```

For example,

```
export PATH=/opt/netiq/common/jre/bin/:$PATH
```

NOTE: Ensure that the Java version installed is Azul Zulu 1.80_272 or later.

3 Generate the PKCS keystore:

```
keytool -genkey -alias rpt -keyalg RSA -storetype pkcs12 -keystore /  
config/tomcat-rpt.ks -validity 3650 -keysize 2048 -dname  
"CN=identityreporting.example.com" -keypass <password> -storepass  
<password>
```

4 Generate a certificate signing request:

```
keytool -certreq -v -alias rpt -file /config/rpt.csr -keypass  
<password> -keystore /config/tomcat-rpt.ks -storepass <password>
```

5 Generate a self-signed certificate:

5a Log in to iManager as an administrator.

5b Navigate to **Roles and Tasks > NetIQ Certificate Server > Issue Certificate**.

5c Browse to the `.csr` file created in step 3. For example, `rpt.csr`.

5d Click **Next**.

5e Specify the key usage and click **Next**.

5f For the certificate type, select **Unspecified**.

5g Click **Next**.

5h Specify the validity of the certificate and click **Next**.

5i Select the **File in binary DER format radio** button.

5j Click **Next**.

5k Click **Finish**.

5l Download the certificate and copy the downloaded certificate to the `/data` directory.

6 Export the root certificate in `.der` format:

6a Log in to iManager as an administrator.

6b Navigate to **Roles and Tasks > NetIQ Certificate Access > Server Certificates**.

6c Select the **SSL CertificateDNS** check box and click **Export**.

6d In the **Certificates** drop-down list, select the **Organizational CA**.

6e In the **Export Format** drop-down list, select **DER**.

6f Click **Next**.

6g Download the certificate and copy the downloaded certificate to the `/data` directory.

7 Import the certificates into the PKCS keystore you created in step 2:

```
keytool -import -trustcacerts -alias root -keystore /config/tomcat-  
rpt.ks -file /config/cert.der -storepass <password> -noprompt  
keytool -import -alias rpt -keystore /config/tomcat-rpt.ks -file /  
config/rpt.der -storepass <password> -noprompt
```

NOTE: Ensure that the certificates are available in the path that was specified as an input for deployment.

Deploying OSP Container

NOTE: Before you deploy the OSP container, ensure that you generate the required certificates. For more information, see [Generating Certificates for OSP](#).

- 1 Use the silent properties file generated in the [Creating the Silent Properties File](#) section for deploying the container.
- 2 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.
- 3 Navigate to the `docker-images` directory.
- 4 Run the following command to load the image:

```
docker load --input IDM_483_osp.tar.gz
```
- 5 Deploy the container using the following command:

```
docker run -d --ip=192.168.0.5 --network=idmoverlaynetwork --hostname=osp.example.com -p 8543:8543 --name=osp-container -v /etc/hosts:/etc/hosts -v /data:/config -e SILENT_INSTALL_FILE=/config/silent.properties --stop-timeout 100 osp:idm-4.8.3
```
- 6 To verify whether the container was successfully deployed, check the log files by running the following command:

```
tail -f /data/osp/log/idmconfigure.log
```
- 7 Run the following command to log in to the container:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it osp-container bash
```
- 8 Navigate to the `/opt/netiq/idm/apps/configupdate/` directory.
- 9 Modify the `configupdate.sh.properties` file.
- 10 Set the value of the `no_nam_oauth` parameter to *false*.
- 11 Save the `configupdate.sh.properties` file.
- 12 Run the following command to exit the container.

```
exit
```

Deploying PostgreSQL Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.
- 2 Navigate to the `docker-images` directory.
- 3 Run the following command to load the image:

```
docker load --input IDM_483_postgres.tar.gz
```

- 4 Create a sub-directory under the shared volume /data, for example, postgres.

```
mkdir postgres
```

- 5 Deploy the container using the following command:

```
docker run -d --ip=192.168.0.6 --network=idmoverlaynetwork --hostname=postgresql.example.com --name=postgresql-container -p 5432:5432 -e POSTGRES_PASSWORD=<password> -v /data/postgres:/var/lib/postgresql/data -v /etc/hosts:/etc/hosts -v /data:/config --stop-timeout 100 postgres:12.4
```

For example,

```
docker run -d --ip=192.168.0.6 --network=idmoverlaynetwork --hostname=postgresql.example.com --name=postgresql-container -p 5432:5432 -e POSTGRES_PASSWORD=novell -v /data/postgres:/var/lib/postgresql/data -v /etc/hosts:/etc/hosts -v /data:/config --stop-timeout 100 postgres:12.4
```

- 6 Create the idmdamin user for Identity Applications.

```
docker exec -it postgresql-container psql -U postgres -c "CREATE USER idmdamin WITH ENCRYPTED PASSWORD '<password>'"
```

- 7 Create the Identity Applications, Workflow, and Identity Reporting databases.

```
docker exec -it postgresql-container psql -U postgres -c "CREATE DATABASE idmuserappdb"
```

```
docker exec -it postgresql-container psql -U postgres -c "CREATE DATABASE igaworkflowdb"
```

```
docker exec -it postgresql-container psql -U postgres -c "CREATE DATABASE idmrptdb"
```

NOTE: These databases are used while you configure the Identity Applications and Identity Reporting containers.

- 8 Grant all the privileges on the databases for the idmdamin user:

```
docker exec -it postgresql-container psql -U postgres -c "GRANT ALL PRIVILEGES ON DATABASE idmuserappdb TO idmdamin"
```

```
docker exec -it postgresql-container psql -U postgres -c "GRANT ALL PRIVILEGES ON DATABASE igaworkflowdb TO idmdamin"
```

- 9 To log in to the container, run the following command:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it postgresql-container bash
```


Deploying Identity Applications Container

NOTE: Before you deploy the Identity Applications container, ensure that you generate the required certificates. For more information, see [Generating Certificates for Identity Applications](#).

- 1 Use the silent properties file generated in the [Creating the Silent Properties File](#) section for deploying the container.

NOTE: Specify the exposed port, 18543, as the value for the application server port.

- 2 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 3 Navigate to the `docker-images` directory.

- 4 Run the following command to load the image:

```
docker load --input IDM_483_identityapplication.tar.gz
```

- 5 Deploy the container using the following command:

```
docker run -d --ip=192.168.0.7 --network=idmoverlaynetwork --hostname=identityapps.example.com -p 18543:18543 --name=idapps-container -v /etc/hosts:/etc/hosts -v /data:/config -e SILENT_INSTALL_FILE=/config/silent.properties --stop-timeout 100 identityapplication:idm-4.8.3
```

- 6 To verify whether the container was successfully deployed, check the log files by running the following command:

```
tail -f /data/userapp/log/idmconfigure.log
```

- 7 Run the following command to log in to the container:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it idapps-container bash
```

- 8 Run the following command:

NOTE: Before performing this step, ensure that the container is deployed successfully.

```
/opt/netiq/common/jre/bin/keytool -importkeystore -srckeystore /config/tomcat-osp.ks -srcstorepass <password> -destkeystore /opt/netiq/idm/apps/tomcat/conf/idm.jks -deststorepass <password>
```

- 9 Type `yes` to overwrite the entry for the `root` alias.

- 10 Run the following command to exit the container.

```
exit
```

- 11 Restart the Identity Applications container.

```
docker restart idapps-container
```

NOTE: To modify any settings in the configuration update utility, launch `configupdate.sh` from the `/opt/netiq/idm/apps/configupdate/` directory of the Identity Applications container. The configuration update utility can be launched in console mode only.

Deploying Form Renderer Container

1 Use the silent properties file generated in the [Creating the Silent Properties File](#) section for deploying the container.

2 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

3 Navigate to the `docker-images` directory.

4 Run the following command to load the image:

```
docker load --input IDM_483_formrenderer.tar.gz
```

5 Deploy the container using the following command:

```
docker run -d --ip=192.168.0.8 --network=idmoverlaynetwork --hostname=formrenderer.example.com -p 8600:8600 --name=fr-container -v /etc/hosts:/etc/hosts -v /data:/config -e SILENT_INSTALL_FILE=/config/silent.properties --stop-timeout 100 formrenderer:itm-4.8.3
```

6 To log in to the container, run the following command:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it fr-container bash
```

Deploying ActiveMQ Container

NOTE: This procedure assumes that you will use the ActiveMQ container with the Identity Applications container. To use the ActiveMQ container with the Fanout Agent container, you must deploy a new instance of the ActiveMQ container with different IP address and ports.

1 Use the silent properties file generated in the [Creating the Silent Properties File](#) section for deploying the container.

2 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

3 Navigate to the `docker-images` directory.

4 Run the following command to load the image:

```
docker load --input IDM_483_activemq.tar.gz
```

5 Deploy the container using the following command:

```
docker run -d --ip=192.168.0.9 --network=idmoverlaynetwork --hostname=activemq.example.com -p 8161:8161 -p 61616:61616 --name=amq-container -v /etc/hosts:/etc/hosts -v /data:/config --env-file /data/silent.properties --stop-timeout 100 activemq:itm-4.8.3
```

6 To log in to the container, run the following command:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it amq-container bash
```

Deploying Identity Reporting Container

NOTE: Before you deploy the Identity Reporting container, ensure that you generate the required certificates. For more information, see [Generating Certificates for Identity Reporting](#).

- 1 Use the silent properties file generated in the [Creating the Silent Properties File](#) section for deploying the container.

NOTE: Specify the exposed port, 28543, as the value for the application server port.

- 2 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 3 Navigate to the `docker-images` directory.

- 4 Run the following command to load the image:

```
docker load --input IDM_483_identityreporting.tar.gz
```

- 5 Deploy the container using the following command:

```
docker run -d --ip=192.168.0.10 --network=idmoverlaynetwork --hostname=identityreporting.example.com -p 28543:28543 --name=rpt-container -v /etc/hosts:/etc/hosts -v /data:/config -e SILENT_INSTALL_FILE=/config/silent.properties --stop-timeout 100 identityreporting:idm-4.8.3
```

- 6 To verify whether the container was successfully deployed, check the log files by running the following command:

```
tail -f /data/reporting/log/idmconfigure.log
```

- 7 Run the following command to log in to the container:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it rpt-container bash
```

- 8 Run the following command:

NOTE: Before performing this step, ensure that the container is deployed successfully.

```
/opt/netiq/common/jre/bin/keytool -importkeystore -srckeystore /config/tomcat-osp.ks -srcstorepass <password> -destkeystore /opt/netiq/idm/apps/tomcat/conf/idm.jks -deststorepass <password>
```

- 9 Type `yes` to overwrite the entry for the `root` alias.

- 10 Run the following command to exit the container.

```
exit
```

- 11 Restart the Identity Reporting container.

```
docker restart rpt-container
```

Deploying SSPR Container

Perform the following tasks to deploy the SSPR container:

- 1 Use the silent properties file generated in the [Creating the Silent Properties File](#) section for deploying the container.

- 2 Create a sub-directory under the shared volume `/data`, for example, `sspr`.

```
mkdir sspr
```

- 3 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 4 Navigate to the `docker-images` directory.

- 5 Run the following command to load the image:

```
docker load --input IDM_483_sspr.tar.gz
```

- 6 Deploy the container using the following command:

```
docker run -d --ip=192.168.0.11 --network=idmoverlaynetwork --hostname=sspr.example.com --name=sspr-container -v /etc/hosts:/etc/hosts -v /data/sspr:/config -p 8443:8443 --stop-timeout 100 sspr/sspr-webapp:latest
```

- 7 Run the following command from the Docker host to copy the `silent.properties` file from the Docker host to SSPR container:

```
docker cp /data/silent.properties sspr-container:/tmp
```

- 8 Load the silent properties file to the SSPR container.

```
docker exec -it sspr-container /app/command.sh ImportPropertyConfig /tmp/silent.properties
```

NOTE: Check if the `SSPRConfiguration.xml` is created under the `/config` directory of SSPR container and verify the content of the file.

- 9 Import the OAuth certificate to SSPR:

- 9a From the Docker host, edit the `SSPRConfiguration.xml` file located at `/data/sspr` directory and set the value of the `configIsEditable` flag to **true** and save the changes.

- 9b Launch a browser and enter the `https://sspr.example.com:8443/sspr` URL.

- 9c Click **OK**.


- 9d Log in using administrator credentials, for example, `uaadmin`.

- 9e Click on the user, for example, `uaadmin`, on the top-right corner and then click **Configuration Editor**.

- 9f Specify the configuration password and click **Sign In**.

- 9g Click **Settings > Single Sign On (SSO) Client > OAuth** and ensure that all URLs use the HTTPS protocol and correct ports.

- 9h Under **OAuth Server Certificate**, click **Import from Server** to import a new certificate and then click **OK**.

- 9i Click  at the top-right corner to save the certificate.

9j Review the changes and click **OK**.

9k After the SSPR application is restarted, edit the `SSPRConfiguration.xml` file and set the value of the `configIsEditable` flag to **false** and save the changes.

Deploying Containers on a Single Server

In this example, all the Identity Manager containers are deployed on a single Docker host using the host network mode.

The containers must be deployed in the following order:

- ♦ “Deploying Identity Manager Engine Container” on page 61
- ♦ “Deploying Remote Loader Container” on page 62
- ♦ “Deploying Fanout Agent Container” on page 62
- ♦ “Deploying iManager Container” on page 63
- ♦ “Generating Certificate With Identity Vault Certificate Authority” on page 64
- ♦ “Deploying OSP Container” on page 66
- ♦ “Deploying PostgreSQL Container” on page 67
- ♦ “Deploying Identity Applications Container” on page 68
- ♦ “Deploying Form Renderer Container” on page 69
- ♦ “Deploying ActiveMQ Container” on page 69
- ♦ “Deploying Identity Reporting Container” on page 70
- ♦ “Deploying SSPR Container” on page 71

Deploying Identity Manager Engine Container

1 Use the silent properties file generated in the [Creating the Silent Properties File](#) section for deploying the container.

2 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

3 Navigate to the `docker-images` directory.

4 Run the following command to load the image:

```
docker load --input IDM_483_identityengine.tar.gz
```

5 Deploy the container using the following command:

```
docker run -d --network=host --name=engine-container -v /data:/config -e SILENT_INSTALL_FILE=/config/silent.properties --stop-timeout 100 identityengine:idm-4.8.3
```

6 To verify whether the container was successfully deployed, check the log files by running the following command:

```
tail -f /data/idm/log/idmconfigure.log
```

7 To log in to the container, run the following command:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it engine-container bash
```

NOTE: To run the Identity Vault utilities such as `ndstrace` or `ndsrepair`, log in to the container as a non-root user called as `nds`. These utilities cannot be run if you are logged in as a root user. To log in to the container as a `nds` user, run the `docker exec -it engine-container su nds` command.

Deploying Remote Loader Container

1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

2 Navigate to the `docker-images` directory.

3 Run the following command to load the image:

```
docker load --input IDM_483_remoteloader.tar.gz
```

4 Deploy the container using the following command:

```
docker run -d --network=host --name=rl-container -v /data:/config --stop-timeout 100 remoteloader:idm-4.8.3
```

The driver files can be found at the `/opt/novell/eDirectory/lib/dirxml/classes/` directory of the container.

NOTE: The 32-bit Remote Loader is not supported with containers.

5 To log in to the container, run the following command:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it rl-container bash
```

6 Configure Remote Loader. For more information, see [Configuring the Remote Loader and Drivers](#) in the *NetIQ Identity Manager Driver Administration Guide*.

7 Ensure that the configuration file is available in the `/config` shared volume of the container. For example, `config8000.txt`.

Deploying Fanout Agent Container

1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

2 Navigate to the `docker-images` directory.

3 Run the following command to load the image:

```
docker load --input IDM_483_fanoutagent.tar.gz
```

4 Deploy the container using the following command:

```
docker run -d --network=host --name=foa-container -v /data:/config --stop-timeout 100 fanoutagent:idm-4.8.3
```

5 To log in to the container, run the following command:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it foa-container bash
```

- 6 Configure the Fanout Agent. For more information, see [Configuring the Fanout Agent](#) in the *NetIQ Identity Manager Driver for JDBC Fanout Implementation Guide*.

Deploying iManager Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 2 Navigate to the `docker-images` directory.

- 3 Run the following command to load the image:

```
docker load --input iManager_324.tar.gz
```

- 4 Create a `.env` file with the required configuration to suit your environment. For example, the `iManager.env` is created in the `/data` directory.

```
# Certificate Public Key Algorithm
# Allowed Values: RSA, ECDSA256, ECDSA384
CERTIFICATE_ALGORITHM=RSA
# Cipher Suite
# Allowed Values:
# For RSA - NONE, LOW, MEDIUM HIGH
# For ECDSA256 - SUITEB128ONLY
# For ECDSA384 - SUITEB128, SUITEB192
CIPHER_SUITE=NONE
# Tomcat Server HTTP Port
TOMCAT_HTTP_PORT=8080
# Tomcat Server SSL Port
TOMCAT_SSL_PORT=8743
# iManager Authorized User (admin_name.container_name.tree_name)
AUTHORIZED_USER=
```

- 5 Create a sub-directory called as `iManager` under the shared volume `/data`.

- 6 Deploy the container using the following command:

```
docker run -d --network=host --name=iman-container -v /data:/config -v
/data/iManager.env:/etc/opt/novell/iManager/conf/iManager.env --stop-
timeout 100 imanager:3.2.4
```

- 7 To install the Identity Manager plug-ins, perform the following steps:

- 7a Log in to iManager.

```
https://identitymanager.example.com:8743/nps/
```

- 7b Click **Configure**.

- 7c Click **Plug-in Installation** and then click **Available NetIQ Plug-in Modules**.

- 7d Select all the plug-ins from the **NetIQ Plug-in Modules** list and then click **Install**.

To obtain the plug-ins offline, perform the following steps:

1. Download the `Identity_Manager_4.8.3_Linux.iso` from the NetIQ Downloads website.
2. Mount the downloaded `.iso`.
3. From the mounted location, navigate to the `/iManager/plugins` directory and obtain the required plug-ins.

Alternatively, you can install the plug-ins from the [iManager plug-ins website](#).

- 8 Restart the iManager container.

```
docker restart iman-container
```

- 9 To log in to the container, run the following command:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it iman-container bash
```

For more information about deploying the iManager container, see the [Deploying iManager Using Docker Container](#) in the *NetIQ iManager Installation Guide*.

Generating Certificate With Identity Vault Certificate Authority

(Conditional) This section applies only if you are using Identity Vault as the Certificate Authority.

The following components require you to generate certificate before they are deployed. Before you generate the certificates for the following components, ensure that you deploy the [Identity Manager Engine](#) and [iManager](#) containers.

- ♦ OSP
- ♦ Identity Applications
- ♦ Identity Reporting

Perform the following steps to generate the certificate:

- 1 Log in to the iManager container.

```
docker exec -it -u root <container> <command>
```

For example,

```
docker exec -it -u root iman-container bash
```

- 2 Ensure that you set the Java path. For example, run the following command:

```
export PATH=<java installed location>/bin:$PATH
```

For example,

```
export PATH=/opt/netiq/common/jre/bin/:$PATH
```

NOTE: Ensure that the Java version installed is Azul Zulu 1.80_272 or later.

- 3 Generate the PKCS keystore:


```
keytool -genkey -alias idm -keyalg RSA -storetype pkcs12 -keystore /  
config/tomcat.ks -validity 3650 -keysize 2048 -dname  
"CN=identitymanager.example.com" -keypass <password> -storepass  
<password>
```

4 Generate a certificate signing request:

```
keytool -certreq -v -alias idm -file /config/idm.csr -keypass  
<password> -keystore /config/tomcat.ks -storepass <password>
```

5 Generate a self-signed certificate:

5a Launch iManager from Docker host and log in as an administrator.

5b Navigate to **Roles and Tasks > NetIQ Certificate Server > Issue Certificate**.

5c Browse to the `.csr` file created in step 3. For example, `idm.csr`.

5d Click **Next**.

5e Specify the key usage and click **Next**.

5f For the certificate type, select **Unspecified**.

5g Click **Next**.

5h Specify the validity of the certificate and click **Next**.

5i Select the **File in binary DER format radio** button.

5j Click **Next**.

5k Click **Finish**.

5l Download the certificate and copy the downloaded certificate to the `/data` directory.

6 Export the root certificate in `.der` format:

6a Launch iManager from Docker host and log in as an administrator.

6b Navigate to **Roles and Tasks > NetIQ Certificate Access > Server Certificates**.

6c Select the **SSL CertificateDNS** check box and click **Export**.

6d In the **Certificates** drop-down list, select the **Organizational CA**.

6e In the **Export Format** drop-down list, select **DER**.

6f Click **Next**.

6g Download the certificate and copy the downloaded certificate to the `/data` directory.

7 Import the certificates into the PKCS keystore you created in step 2:

```
keytool -import -trustcacerts -alias root -keystore /config/tomcat.ks -  
file /config/cert.der -storepass <password> -noprompt
```

```
keytool -import -alias idm -keystore /config/tomcat.ks -file /config/  
idm.der -storepass <password> -noprompt
```

NOTE: Ensure that the keystore is available in the path that was specified as an input for deployment.

Deploying OSP Container

NOTE: Before you deploy the OSP container, ensure that you generate the required certificate. For more information, see [Generating Certificate With Identity Vault Certificate Authority](#).

1 Use the silent properties file generated in the [Creating the Silent Properties File](#) section for deploying the container.

2 Ensure that the `SSO_SERVER_SSL_PORT` property is set to a unique port.

3 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

4 Navigate to the `docker-images` directory.

5 Run the following command to load the image:

```
docker load --input IDM_483_osp.tar.gz
```

6 Deploy the container using the following command:

```
docker run -d --network=host --name=osp-container -v /data:/config -e SILENT_INSTALL_FILE=/config/silent.properties --stop-timeout 100 osp:idm-4.8.3
```

7 To verify whether the container was successfully deployed, check the log files by running the following command:

```
tail -f /data/osp/log/idmconfigure.log
```

8 Stop the container using the following command:

```
docker stop osp-container
```

9 Run the following command to modify the Tomcat shutdown port in the `server.xml` file. In the following example, the port 8005 will be changed to 18005:

```
sed -i "s~8005~18005~g" /data/osp/tomcat/conf/server.xml
```

10 Start the container using the following command:

```
docker start osp-container
```

11 Run the following command to log in to the container:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it osp-container bash
```

12 Navigate to the `/opt/netiq/idm/apps/configupdate/` directory.

13 Modify the `configupdate.sh.properties` file.

14 Set the value of the `no_nam_oauth` parameter to *false*.

15 Save the `configupdate.sh.properties` file.

16 Run the following command to exit the container.

```
exit
```

Deploying PostgreSQL Container

1 Navigate to the location where you have extracted the Identity_Manager_4.8.3_Containers.tar.gz file.

2 Navigate to the docker-images directory.

3 Run the following command to load the image:

```
docker load --input IDM_483_postgres.tar.gz
```

4 Create a sub-directory under the shared volume /data, for example, postgres.

```
mkdir postgres
```

5 Deploy the container using the following command:

```
docker run -d --network=host --name=postgresql-container -e  
POSTGRES_PASSWORD=<password> -v /data/postgres:/var/lib/postgresql/data  
--stop-timeout 100 postgres:12.4
```

For example,

```
docker run -d --network=host --name=postgresql-container -e  
POSTGRES_PASSWORD=novell -v /data/postgres:/var/lib/postgresql/data --  
stop-timeout 100 postgres:12.4
```

6 Create the idmdamin user for Identity Applications.

```
docker exec -it postgresql-container psql -U postgres -c "CREATE USER  
idmadmin WITH ENCRYPTED PASSWORD '<password>'"
```

7 Create the Identity Applications, Workflow, and Identity Reporting databases.

```
docker exec -it postgresql-container psql -U postgres -c "CREATE  
DATABASE idmuserappdb"
```

```
docker exec -it postgresql-container psql -U postgres -c "CREATE  
DATABASE igaworkflowdb"
```

```
docker exec -it postgresql-container psql -U postgres -c "CREATE  
DATABASE idmrptdb"
```

NOTE: These databases are used while you configure the Identity Applications and Identity Reporting containers.

8 Grant all the privileges on the databases for the idmadmin user:

```
docker exec -it postgresql-container psql -U postgres -c "GRANT ALL  
PRIVILEGES ON DATABASE idmuserappdb TO idmadmin"
```

```
docker exec -it postgresql-container psql -U postgres -c "GRANT ALL  
PRIVILEGES ON DATABASE igaworkflowdb TO idmadmin"
```

9 To log in to the container, run the following command:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it postgresql-container bash
```

Deploying Identity Applications Container

NOTE: Before you deploy the Identity Applications container, ensure that you generate the required certificate. For more information, see [Generating Certificate With Identity Vault Certificate Authority](#).

1 Use the silent properties file generated in the [Creating the Silent Properties File](#) section for deploying the container.

2 Ensure that the `UA_SERVER_SSL_PORT` property is set to a unique port.

3 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

4 Navigate to the `docker-images` directory.

5 Run the following command to load the image:

```
docker load --input IDM_483_identityapplication.tar.gz
```

6 Deploy the container using the following command:

```
docker run -d --network=host --name=idapps-container -v /data:/config -e SILENT_INSTALL_FILE=/config/silent.properties --stop-timeout 100 identityapplication:idm-4.8.3
```

7 To verify whether the container was successfully deployed, check the log files by running the following command:

```
tail -f /data/userapp/log/idmconfigure.log
```

8 Run the following command to log in to the container.

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it idapps-container bash
```

9 Run the following command:

NOTE: Before performing this step, ensure that the container is deployed successfully.

```
/opt/netiq/common/jre/bin/keytool -importkeystore -srckeystore /config/tomcat.ks -srcstorepass <password> -destkeystore /opt/netiq/idm/apps/tomcat/conf/idm.jks -deststorepass <password>
```

10 Run the following command to exit the container.

```
exit
```

11 Run the following command to modify the Tomcat shutdown port in the `server.xml` file. In the following example, the port 8005 will be changed to 28005:

```
sed -i "s~8005~28005~g" /data/userapp/tomcat/conf/server.xml
```

12 Restart the container using the following command:

```
docker restart idapps-container
```

NOTE: To modify any settings in the configuration update utility, launch `configupdate.sh` from the `/opt/netiq/idm/apps/configupdate/` directory of the Identity Applications container. The configuration update utility can be launched in console mode only.

Deploying Form Renderer Container

1 Use the silent properties file generated in the [Creating the Silent Properties File](#) section for deploying the container.

2 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

3 Navigate to the `docker-images` directory.

4 Run the following command to load the image:

```
docker load --input IDM_483_formrenderer.tar.gz
```

5 Deploy the container using the following command:

```
docker run -d --network=host --name=fr-container -v /data:/config -e SILENT_INSTALL_FILE=/config/silent.properties --stop-timeout 100 formrenderer:idm-4.8.3
```

6 To log in to the container, run the following command:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it fr-container bash
```

Deploying ActiveMQ Container

NOTE: This procedure assumes that you will use the ActiveMQ container with the Identity Applications container. To use the ActiveMQ container with the Fanout Agent container, you must deploy a new instance of the ActiveMQ container with different IP address and ports.

1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

2 Navigate to the `docker-images` directory.

3 Run the following command to load the image:

```
docker load --input IDM_483_activemq.tar.gz
```

4 Deploy the container using the following command:

```
docker run -d --network=host --name=amq-container -v /data:/config --env-file /data/silent.properties --stop-timeout 100 activemq:idm-4.8.3
```

5 To log in to the container, run the following command:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it amq-container bash
```

Deploying Identity Reporting Container

NOTE: Before you deploy the Identity Reporting container, ensure that you generate the required certificate. For more information, see [Generating Certificate With Identity Vault Certificate Authority](#).

1 Use the silent properties file generated in the [Creating the Silent Properties File](#) section for deploying the container.

2 Ensure that the TOMCAT_HTTPS_PORT property is set to a unique port.

3 Navigate to the location where you have extracted the Identity_Manager_4.8.3_Containers.tar.gz file.

4 Navigate to the docker-images directory.

5 Run the following command to load the image:

```
docker load --input IDM_483_identityreporting.tar.gz
```

6 Deploy the container using the following command:

```
docker run -d --network=host --name=rpt-container -v /data:/config -e SILENT_INSTALL_FILE=/config/silent.properties --stop-timeout 100 identityreporting:idm-4.8.3
```

7 To verify whether the container was successfully deployed, check the log files by running the following command:

```
tail -f /data/reporting/log/idmconfigure.log
```

8 Run the following command to log in to the container:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it rpt-container bash
```

9 Run the following command:

NOTE: Before performing this step, ensure that the container is deployed successfully.

```
/opt/netiq/common/jre/bin/keytool -importkeystore -srckeystore /config/tomcat.ks -srcstorepass <password> -destkeystore /opt/netiq/idm/apps/tomcat/conf/idm.jks -deststorepass <password>
```

10 Run the following command to exit the container.

```
exit
```

11 Run the following command to modify the Tomcat shutdown port in the server.xml file. In the following example, the port 8005 will be changed to 38005:

```
sed -i "s~8005~38005~g" /data/reporting/tomcat/conf/server.xml
```

12 *(Conditional) Applies only if you are using Identity Vault as the Certificate Authority.*

Add the `-Dcom.sun.net.ssl.checkRevocation=false` parameter in the `export CATALINA_OPTS` entry of the `setenv.sh` file. In this example, the `setenv.sh` file is located under the `/data/reporting/tomcat/bin/` directory.

13 Restart the container using the following command:

```
docker restart rpt-container
```

Deploying SSPR Container

Perform the following tasks to deploy the SSPR container:

- 1 Use the silent properties file generated in the [Creating the Silent Properties File](#) section for deploying the container.

- 2 Create a sub-directory under the shared volume `/data`, for example, `sspr`.

```
mkdir sspr
```

- 3 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 4 Navigate to the `docker-images` directory.

- 5 Run the following command to load the image:

```
docker load --input IDM_483_sspr.tar.gz
```

- 6 Deploy the container using the following command:

```
docker run -d --network=host --name=sspr-container -v /data/sspr:/config --stop-timeout 100 sspr/sspr-webapp:latest
```

- 7 Run the following command from the Docker host to copy the `silent.properties` file from the Docker host to SSPR container:

```
docker cp /data/silent.properties sspr-container:/tmp
```

- 8 Load the silent properties file to the SSPR container.

```
docker exec -it sspr-container /app/command.sh ImportPropertyConfig /tmp/silent.properties
```

NOTE: Check if the `SSPRConfiguration.xml` is created under the `/config` directory of SSPR container and verify the content of the file.

- 9 Import the OAuth certificate to SSPR:

- 9a From the Docker host, edit the `SSPRConfiguration.xml` file located at `/data/sspr/` directory and set the value of the `configIsEditable` flag to **true** and save the changes.

- 9b Launch a browser and enter the `https://identitymanager.example.com:8443/sspr` URL.

- 9c Click **OK**.


- 9d Log in using administrator credentials, for example, `uaadmin`.

- 9e Click on the user, for example, `uaadmin`, on the top-right corner and then click **Configuration Editor**.

- 9f Specify the configuration password and click **Sign In**.

- 9g Click **Settings > Single Sign On (SSO) Client > OAuth** and ensure that all URLs use the HTTPS protocol and correct ports.

- 9h Under **OAuth Server Certificate**, click **Import from Server** to import a new certificate and then click **OK**.

- 9i Click  at the top-right corner to save the certificate.

- 9j Review the changes and click **OK**.
- 9k After the SSPR application is restarted, edit the `SSPRConfiguration.xml` file and set the value of the `configIsEditable` flag to **false** and save the changes.

8

Updating Identity Manager Containers

This section provides information on updating individual containers of Identity Manager.

The procedures for updating containers are described in subsequent sections.

- ♦ [“Prerequisites for Updating Containers” on page 73](#)
- ♦ [“Updating Containers on Distributed Servers” on page 73](#)
- ♦ [“Updating Containers on a Single Server” on page 80](#)

Prerequisites for Updating Containers

Perform the following steps before you update each of the Identity Manager containers.

IMPORTANT: This section does not apply for the PostgreSQL container. For information about updating the PostgreSQL container, see [Updating PostgreSQL Container](#) in the [“Updating Containers on Distributed Servers” on page 73](#) section or [“Updating PostgreSQL Container” on page 83](#) in the [“Updating Containers on a Single Server” on page 80](#) section.

- 1 Stop all the Identity Manager containers.

```
docker stop <container name>
```

For example,

```
docker stop engine-container
```

- 2 Take a back up of the shared volume. The examples in the guide assumes `/data` as the shared volume.

- 3 Delete all the Identity Manager containers.

```
docker rm <container name>
```

For example,

```
docker rm engine-container
```

- 4 (Conditional) Delete all obsolete Docker images.

```
docker rmi <image ID>
```

Updating Containers on Distributed Servers

The containers must be updated in the following order:

- ♦ [“Updating Identity Manager Engine Container” on page 74](#)
- ♦ [“Updating Remote Loader Container” on page 74](#)
- ♦ [“Updating Fanout Agent Container” on page 75](#)
- ♦ [“Updating iManager Container” on page 75](#)

- ♦ “Updating OSP Container” on page 76
- ♦ “Updating PostgreSQL Container” on page 77
- ♦ “Updating Identity Applications Container” on page 78
- ♦ “Updating Form Renderer Container” on page 78
- ♦ “Updating ActiveMQ Container” on page 79
- ♦ “Updating Identity Reporting Container” on page 79
- ♦ “Updating SSPR Container” on page 79

Updating Identity Manager Engine Container

- 1 Create a `credentials.properties` file under the shared volume `/data` with the following content.

```
ID_VAULT_ADMIN="<ID_VAULT_ADMIN>"
ID_VAULT_PASSWORD="<ID_VAULT_PASSWORD>"
```

where, `ID_VAULT_ADMIN` must be in dot format.

For example,

```
ID_VAULT_ADMIN="admin.sa.system"
ID_VAULT_PASSWORD="novell"
```

- 2 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.
- 3 Navigate to the `docker-images` directory.
- 4 Run the following command to load the image:


```
docker load --input IDM_483_identityengine.tar.gz
```
- 5 Update the container using the following command if you are deploying the Identity Manager Engine using the overlay network:

```
docker run -d --ip=192.168.0.12 --network=idmoverlaynetwork --
hostname=identityengine.example.com --name=engine-container -v /etc/
hosts:/etc/hosts -v /data:/config -p 8028:8028 -p 524:524 -p 389:389 -p
8030:8030 -p 636:636 -e SILENT_INSTALL_FILE=/config/
credentials.properties --stop-timeout 100 identityengine:idm-4.8.3
```

Update the container using the following command if you are deploying the Identity Manager Engine using the host network:

```
docker run -d --network=host --name=engine-container -v /etc/hosts:/
etc/hosts -v /data:/config -e SILENT_INSTALL_FILE=/config/
credentials.properties --stop-timeout 100 identityengine:idm-4.8.3
```

Updating Remote Loader Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.
- 2 Navigate to the `docker-images` directory.
- 3 Run the following command to load the image:

```
docker load --input IDM_483_remoteloader.tar.gz
```

- 4 Update the container using the following command:

```
docker run -d --ip=192.168.0.2 --network=idmoverlaynetwork --  
hostname=remoteloader.example.com -p 8090:8090 --name=rl-container -v /  
etc/hosts:/etc/hosts -v /data:/config --stop-timeout 100  
remoteloader:idm-4.8.3
```

The driver files can be found at the `/opt/novell/eDirectory/lib/dirxml/classes/` directory of the container.

- 5 Start the Remote Loader instances.

Updating Fanout Agent Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 2 Navigate to the `docker-images` directory.

- 3 Run the following command to load the image:

```
docker load --input IDM_483_fanoutagent.tar.gz
```

- 4 Update the container using the following command:

```
docker run -d --ip=192.168.0.3 --network=idmoverlaynetwork --  
hostname=fanoutagent.example.com --name=foa-container -v /etc/hosts:/  
etc/hosts -v /data:/config --stop-timeout 100 fanoutagent:idm-4.8.3
```

- 5 Start Fanout Agent.

Updating iManager Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 2 Navigate to the `docker-images` directory.

- 3 Run the following command to load the image:

```
docker load --input iManager_324.tar.gz
```

- 4 Ensure that the `iManager.env` file is created and present in the `/data` directory.

```
# Certificate Public Key Algorithm  
# Allowed Values: RSA, ECDSA256, ECDSA384  
CERTIFICATE_ALGORITHM=RSA  
# Cipher Suite  
# Allowed Values:  
# For RSA - NONE, LOW, MEDIUM HIGH  
# For ECDSA256 - SUITEB128ONLY  
# For ECDSA384 - SUITEB128, SUITEB192  
CIPHER_SUITE=NONE  
# Tomcat Server HTTP Port  
TOMCAT_HTTP_PORT=8080  
# Tomcat Server SSL Port  
TOMCAT_SSL_PORT=8743  
# iManager Authorized User (admin_name.container_name.tree_name)  
AUTHORIZED_USER=
```

- 5 Update the container using the following command:

```
docker run -d --ip=192.168.0.4 --name=iman-container --
network=idmoverlaynetwork --hostname=imanager.example.com -v /etc/
hosts:/etc/hosts -v /data:/config -v /data/iManager.env:/etc/opt/
novell/iManager/conf/iManager.env -p 8743:8743 --stop-timeout 100
imanager:3.2.4
```

- 6 (Conditional) If you have already installed Identity Manager, run the following command to check whether the plug-ins are loaded.

```
docker log <container name>
```

For example,

```
docker log <iman-container>
```

- 7 To install the Identity Manager plug-ins, perform the following steps:

- 7a** Log in to iManager.

```
https://imanager.example.com:8743/nps/
```

- 7b** Click **Configure**.

- 7c** Click **Plug-in Installation** and then click **Available NetIQ Plug-in Modules**.

- 7d** Select all the plug-ins from the **NetIQ Plug-in Modules** list and then click **Install**.

To obtain the plug-ins offline, perform the following steps:

1. Download the `Identity_Manager_4.8.3_Linux.iso` from the NetIQ Downloads website.
2. Mount the downloaded `.iso`.
3. From the mounted location, navigate to the `/iManager/plugins` directory and obtain the required plug-ins.

Alternatively, you can install the plug-ins from the [iManager plug-ins website](#).

- 8 Restart the iManager container.

```
docker restart iman-container
```

Updating OSP Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 2 Navigate to the `docker-images` directory.

- 3 Run the following command to load the image:

```
docker load --input IDM_483_osp.tar.gz
```

- 4 Update the container using the following command:

```
docker run -d --ip=192.168.0.5 --network=idmoverlaynetwork --
hostname=osp.example.com -p 8543:8543 --name=osp-container -v /etc/
hosts:/etc/hosts -v /data:/config --stop-timeout 100 osp:idm-4.8.3
```

- 5 Run the following command to log in to the container:

```
docker exec -it <container> <command>
```

For example,

- ```
docker exec -it osp-container bash
```
- 6 Navigate to the `/opt/netiq/idm/apps/configupdate/` directory.
  - 7 Modify the `configupdate.sh.properties` file.
  - 8 Set the value of the `no_nam_oauth` parameter to `false`.
  - 9 Save the `configupdate.sh.properties` file.
  - 10 Run the following command to exit the container.

```
exit
```

## Updating PostgreSQL Container

---

**NOTE:** Before you update the PostgreSQL container, ensure that you stop the dependent containers such as Identity Applications and/or Identity Reporting.

---

- 1 On the Docker host, navigate to any location. For example:

```
cd /tmp
```
- 2 Run the following command to take a back up of the existing PostgreSQL container data.

```
docker exec postgresql-container pg_dumpall -U postgres > dump.sql
```
- 3 Stop the PostgreSQL container.

```
docker stop <container name>
```

For example,

```
docker stop postgresql-container
```
- 4 Delete the PostgreSQL container.

```
docker rm <container name>
```
- 5 Delete the existing PostgreSQL data directory.

```
rm -rf /data/postgres
```
- 6 (Conditional) Delete the PostgreSQL Docker image.

```
docker rmi <image ID>
```
- 7 Create a sub-directory under the shared volume `/data`, for example, `postgres`.

```
mkdir postgres
```
- 8 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.
- 9 Navigate to the `docker-images` directory.
- 10 Run the following command to load the image:

```
docker load --input IDM_483_postgres.tar.gz
```
- 11 Update the container using the following command:

```
docker run -d --ip=192.168.0.6 --network=idmoverlaynetwork --hostname=postgresql.example.com --name=postgresql-container -p 5432:5432 -e POSTGRES_PASSWORD=<password> -v /data/postgres:/var/lib/postgresql/data -v /etc/hosts:/etc/hosts -v /data:/config --stop-timeout 100 postgres:12.4
```

For example,

```
docker run -d --ip=192.168.0.6 --network=idmoverlaynetwork --
hostname=postgresql.example.com --name=postgresql-container -p
5432:5432 -e POSTGRES_PASSWORD=novell -v /data/postgres:/var/lib/
postgresql/data -v /etc/hosts:/etc/hosts -v /data:/config --stop-
timeout 100 postgres:12.4
```

- 12 Copy the data file you backed up on the Docker host ([Step 2](#)) to the new PostgreSQL data directory.

```
cp /tmp/dump.sql /data/postgres
```

- 13 Run the following command to log in to the container:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it postgresql-container bash
```

- 14 Navigate to the `/var/lib/postgresql/data/` directory.
- 15 Restore the data backed up in [Step 2](#) to the new PostgreSQL container.

```
psql -U postgres < dump.sql
```

- 16 Run the following command to exit the container.

```
exit
```

## Updating Identity Applications Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 2 Navigate to the `docker-images` directory.

- 3 Run the following command to load the image:

```
docker load --input IDM_483_identityapplication.tar.gz
```

- 4 Update the container using the following command:

```
docker run -d --ip=192.168.0.7 --network=idmoverlaynetwork --
hostname=identityapps.example.com -p 18543:18543 --name=idapps-
container -v /etc/hosts:/etc/hosts -v /data:/config --stop-timeout 100
identityapplication:idm-4.8.3
```

## Updating Form Renderer Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 2 Navigate to the `docker-images` directory.

- 3 Run the following command to load the image:

```
docker load --input IDM_483_formrenderer.tar.gz
```

- 4 Update the container using the following command:

```
docker run -d --ip=192.168.0.8 --network=idmoverlaynetwork --
hostname=formrenderer.example.com -p 8600:8600 --name=fr-container -v /
etc/hosts:/etc/hosts -v /data:/config --stop-timeout 100
formrenderer:idm-4.8.3
```

## Updating ActiveMQ Container

- 1 Navigate to the location where you have extracted the Identity\_Manager\_4.8.3\_Containers.tar.gz file.
- 2 Navigate to the docker-images directory.
- 3 Run the following command to load the image:

```
docker load --input IDM_483_activemq.tar.gz
```

- 4 Update the container using the following command:

```
docker run -d --ip=192.168.0.9 --network=idmoverlaynetwork --
hostname=activemq.example.com -p 8161:8161 -p 61616:61616 --name=amq-
container -v /etc/hosts:/etc/hosts -v /data:/config --stop-timeout 100
activemq:idm-4.8.3
```

## Updating Identity Reporting Container

- 1 Navigate to the location where you have extracted the Identity\_Manager\_4.8.3\_Containers.tar.gz file.
- 2 Navigate to the docker-images directory.
- 3 Run the following command to load the image:

```
docker load --input IDM_483_identityreporting.tar.gz
```

- 4 Update the container using the following command:

```
docker run -d --ip=192.168.0.10 --network=idmoverlaynetwork --
hostname=identityreporting.example.com -p 28543:28543 --name=rpt-
container -v /etc/hosts:/etc/hosts -v /data:/config --stop-timeout 100
identityreporting:idm-4.8.3
```

## Updating SSPR Container

- 1 Navigate to the location where you have extracted the Identity\_Manager\_4.8.3\_Containers.tar.gz file.
- 2 Navigate to the docker-images directory.
- 3 Run the following command to load the image:

```
docker load --input IDM_483_sspr.tar.gz
```

- 4 Update the container using the following command:

```
docker run -d --ip=192.168.0.11 --network=idmoverlaynetwork --
hostname=sspr.example.com --name=sspr-container -v /etc/hosts:/etc/
hosts -v /data/sspr:/config -p 8443:8443 --stop-timeout 100 sspr/sspr-
webapp:latest
```

# Updating Containers on a Single Server

The containers must be updated in the following order:

- ♦ “Updating Identity Manager Engine Container” on page 80
- ♦ “Updating Remote Loader Container” on page 80
- ♦ “Updating Fanout Agent Container” on page 81
- ♦ “Updating iManager Container” on page 81
- ♦ “Updating OSP Container” on page 82
- ♦ “Updating PostgreSQL Container” on page 83
- ♦ “Updating Identity Applications Container” on page 84
- ♦ “Updating Form Renderer Container” on page 84
- ♦ “Updating ActiveMQ Container” on page 84
- ♦ “Updating Identity Reporting Container” on page 85
- ♦ “Updating SSPR Container” on page 85

## Updating Identity Manager Engine Container

- 1 Create a `credentials.properties` file under the shared volume `/data` with the following content.

```
ID_VAULT_ADMIN=" <ID_VAULT_ADMIN> "
ID_VAULT_PASSWORD=" <ID_VAULT_PASSWORD> "
```

where, `ID_VAULT_ADMIN` must be in dot format.

For example,

```
ID_VAULT_ADMIN="admin.sa.system"
ID_VAULT_PASSWORD="novell"
```

- 2 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.
- 3 Navigate to the `docker-images` directory.
- 4 Run the following command to load the image:

```
docker load --input IDM_483_identityengine.tar.gz
```

- 5 Update the container using the following command:

```
docker run -d --network=host --name=engine-container -v /etc/hosts:/etc/hosts -v /data:/config -e SILENT_INSTALL_FILE=/config/credentials.properties --stop-timeout 100 identityengine:ids-4.8.3
```

## Updating Remote Loader Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.
- 2 Navigate to the `docker-images` directory.



- 3 Run the following command to load the image:

```
docker load --input IDM_483_remoteloader.tar.gz
```

- 4 Update the container using the following command:

```
docker run -d --network=host --name=rl-container -v /data:/config --stop-timeout 100 remoteloader:idm-4.8.3
```

The driver files can be found at the `/opt/novell/eDirectory/lib/dirxml/classes/` directory of the container.

- 5 Start the Remote Loader instances.

## Updating Fanout Agent Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 2 Navigate to the `docker-images` directory.

- 3 Run the following command to load the image:

```
docker load --input IDM_483_fanoutagent.tar.gz
```

- 4 Update the container using the following command:

```
docker run -d --network=host --name=foa-container -v /data:/config --stop-timeout 100 fanoutagent:idm-4.8.3
```

- 5 Start Fanout Agent.

## Updating iManager Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 2 Navigate to the `docker-images` directory.

- 3 Run the following command to load the image:

```
docker load --input iManager_324.tar.gz
```

- 4 Ensure that the `iManager.env` file is created and present in the `/data` directory.

```
Certificate Public Key Algorithm
Allowed Values: RSA, ECDSA256, ECDSA384
CERTIFICATE_ALGORITHM=RSA
Cipher Suite
Allowed Values:
For RSA - NONE, LOW, MEDIUM HIGH
For ECDSA256 - SUITEB128ONLY
For ECDSA384 - SUITEB128, SUITEB192
CIPHER_SUITE=NONE
Tomcat Server HTTP Port
TOMCAT_HTTP_PORT=8080
Tomcat Server SSL Port
TOMCAT_SSL_PORT=8743
iManager Authorized User (admin_name.container_name.tree_name)
AUTHORIZED_USER=
```

- 5 Update the container using the following command:

```
docker run -d --network=host --name=iman-container -v /data:/config -v /data/iManager.env:/etc/opt/novell/iManager/conf/iManager.env --stop-timeout 100 imanager:3.2.4
```

- 6 To install the Identity Manager plug-ins, perform the following steps:

- 6a Log in to iManager.

```
https://identitymanager.example.com:8743/nps/
```

- 6b Click **Configure**.

- 6c Click **Plug-in Installation** and then click **Available NetIQ Plug-in Modules**.

- 6d Select all the plug-ins from the **NetIQ Plug-in Modules** list and then click **Install**.

To obtain the plug-ins offline, perform the following steps:

1. Download the `Identity_Manager_4.8.3_Linux.iso` from the NetIQ Downloads website.
2. Mount the downloaded `.iso`.
3. From the mounted location, navigate to the `/iManager/plugins` directory and obtain the required plug-ins.

Alternatively, you can install the plug-ins from the [iManager plug-ins website](#).

- 7 Restart the iManager container.

```
docker restart iman-container
```

## Updating OSP Container

- 1 Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

- 2 Navigate to the `docker-images` directory.

- 3 Run the following command to load the image:

```
docker load --input IDM_483_osp.tar.gz
```

- 4 Update the container using the following command:

```
docker run -d --network=host --name=osp-container -v /data:/config --stop-timeout 100 osp:idm-4.8.3
```

- 5 Run the following command to log in to the container:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it osp-container bash
```

- 6 Navigate to the `/opt/netiq/idm/apps/configupdate/` directory.

- 7 Modify the `configupdate.sh.properties` file.

- 8 Set the value of the `no_nam_oauth` parameter to `false`.

- 9 Save the `configupdate.sh.properties` file.

- 10 Run the following command to exit the container.

```
exit
```

# Updating PostgreSQL Container

---

**NOTE:** Before you update the PostgreSQL container, ensure that you stop the dependent containers such as Identity Applications and/or Identity Reporting.

---

- 1 On the Docker host, navigate to any location. For example:

```
cd /tmp
```

- 2 Run the following command to take a back up of the existing PostgreSQL container data.

```
docker exec postgresql-container pg_dumpall -U postgres > dump.sql
```

- 3 Stop the PostgreSQL container.

```
docker stop <container name>
```

For example,

```
docker stop postgresql-container
```

- 4 Delete the PostgreSQL container.

```
docker rm <container name>
```

- 5 Delete the existing PostgreSQL data directory.

```
rm -rf /data/postgres
```

- 6 (Conditional) Delete the PostgreSQL Docker image.

```
docker rmi <image ID>
```

- 7 Create a sub-directory under the shared volume /data, for example, postgres.

```
mkdir postgres
```

- 8 Navigate to the location where you have extracted the Identity\_Manager\_4.8.3\_Containers.tar.gz file.

- 9 Navigate to the docker-images directory.

- 10 Run the following command to load the image:

```
docker load --input IDM_483_postgres.tar.gz
```

- 11 Update the container using the following command:

```
docker run -d --network=host --name=postgresql-container -e
POSTGRES_PASSWORD=<password> -v /data/postgres:/var/lib/postgresql/data
--stop-timeout 100 postgres:12.4
```

For example,

```
docker run -d --network=host --name=postgresql-container -e
POSTGRES_PASSWORD=novell -v /data/postgres:/var/lib/postgresql/data --
stop-timeout 100 postgres:12.4
```

- 12 Copy the data file you backed up on the Docker host ([Step 2](#)) to the new PostgreSQL data directory.

```
cp /tmp/dump.sql /data/postgres
```

- 13 Run the following command to log in to the container:

```
docker exec -it <container> <command>
```

For example,

```
docker exec -it postgresql-container bash
```

**14** Navigate to the `/var/lib/postgresql/data/` directory.

**15** Restore the data backed up in [Step 2](#) to the new PostgreSQL container.

```
psql -U postgres < dump.sql
```

**16** Run the following command to exit the container.

```
exit
```

## Updating Identity Applications Container

**1** Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

**2** Navigate to the `docker-images` directory.

**3** Run the following command to load the image:

```
docker load --input IDM_483_identityapplication.tar.gz
```

**4** Update the container using the following command:

```
docker run -d --network=host --name=idapps-container -v /data:/config -
-stop-timeout 100 identityapplication:idm-4.8.3
```

## Updating Form Renderer Container

**1** Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

**2** Navigate to the `docker-images` directory.

**3** Run the following command to load the image:

```
docker load --input IDM_483_formrenderer.tar.gz
```

**4** Update the container using the following command:

```
docker run -d --network=host --name=fr-container -v /data:/config --
stop-timeout 100 formrenderer:idm-4.8.3
```

## Updating ActiveMQ Container

**1** Navigate to the location where you have extracted the `Identity_Manager_4.8.3_Containers.tar.gz` file.

**2** Navigate to the `docker-images` directory.

**3** Run the following command to load the image:

```
docker load --input IDM_483_activemq.tar.gz
```

**4** Update the container using the following command:

```
docker run -d --network=host --name=amq-container -v /data:/config --
stop-timeout 100 activemq:idm-4.8.3
```

## Updating Identity Reporting Container

1 Navigate to the location where you have extracted the Identity\_Manager\_4.8.3\_Containers.tar.gz file.

2 Navigate to the docker-images directory.

3 Run the following command to load the image:

```
docker load --input IDM_483_identityreporting.tar.gz
```

4 Update the container using the following command:

```
docker run -d --network=host --name=rpt-container -v /data:/config --stop-timeout 100 identityreporting:idm-4.8.3
```

## Updating SSPR Container

1 Navigate to the location where you have extracted the Identity\_Manager\_4.8.3\_Containers.tar.gz file.

2 Navigate to the docker-images directory.

3 Run the following command to load the image:

```
docker load --input IDM_483_sspr.tar.gz
```

4 Update the container using the following command:

```
docker run -d --network=host --name=sspr-container -v /data/sspr:/config --stop-timeout 100 sspr/sspr-webapp:latest
```



# 9 Best Practices

This section includes some tips and best practices for deploying Docker containers:

- ◆ NetIQ recommends you to set a limit on the amount of CPU used for a container. This can be achieved by using the `--cpuset-cpus` flag in the docker run command.
- ◆ To set a restart policy for a container, use the `--restart` flag in the docker run command. It is recommended to choose the on-failure restart policy and limit the restart attempts to 5.
- ◆ To set a limit on the memory used by a container, use the `--memory` flag in the docker run command.
- ◆ To gracefully stop a container, use the `--stop-timeout` flag. NetIQ recommends you to set the value of this flag to 100. If there are any active processes running inside the container, the container waits for 100 seconds and then exits. If all the processes are killed before the time specified in the `--stop-timeout` flag, the container exits when the last process is killed.
- ◆ To redirect the default log output to customized docker logs, use the `LOGTOFOLLOW` flag with the docker run command. For example, if you want to follow the new logs for OSP, specify the `-e LOGTOFOLLOW="<list of files separated by space>"` in the docker run command. This prints the logs in the new docker logs. You can use the `docker logs -f <container-name>` command to monitor the log files. The default logs for each containers are listed in the following table.

| Container               | Default logs                                                |
|-------------------------|-------------------------------------------------------------|
| Identity Manager Engine | <code>/var/opt/novell/eDirectory/log/ndsd.log</code>        |
| OSP                     | <code>/opt/netiq/idm/apps/tomcat/logs/catalina.out</code>   |
| Identity Applications   | <code>/opt/netiq/idm/apps/tomcat/logs/catalina.out</code>   |
| Form Renderer           | <code>/opt/netiq/idm/apps/sites/logs/formslogger.log</code> |
| ActiveMQ                | <code>/opt/netiq/idm/activemq/data/activemq.log</code>      |
| Identity Reporting      | <code>/opt/netiq/idm/apps/tomcat/logs/catalina.out</code>   |

- ◆ For all containers except Remote Loader and Fanout Agent, you can monitor the health of the containers. Based on your requirement, you can customize the health status using the Docker runtime health checks. For example, to check the health of the `rdxml` service, use the `--health-cmd "ps -eaf | grep -i rdxml" --health-interval 60` flag.
- ◆ If you want to back up the trace files for the deployed drivers, then you can place the trace file under `/config/idm/` or manually copy the trace file to the volumized folder.

- ◆ To set a limit on the number of processes allowed to run at any point in time, use the `--pids-limit` flag in the `docker run` command. It is recommended to limit the PID value to 300.
- ◆ For Identity Manager Engine container, if you want to view the `environ` file located at the `/proc` directory of the `/proc` file system, use the `--cap-add=SYS_PTRACE` flag in the `docker run` command. By default, most of the privileges are restricted and only the required privileges are enabled. For more information, see [Docker](#) documentation.
- ◆ As a best practice, it is recommended to map individual data volume for each component.
- ◆ Ensure that the third party jar files are volume mounted so that they are available when the container is started every time. For example, if the `ojdbc.jar` is present in the `/opt/netiq/idm/apps/tomcat/lib` directory of the container, then you must volume mount the jar file using the following command:

```
-v /host/ojdbc.jar:/opt/netiq/idm/apps/tomcat/lib/ojdbc.jar
```

For example, run the following sample command containing all the above arguments for deploying containers:

```
docker run -d --name=<assign a name to the container> --network=<> --cap-add=SYS_PTRACE --pids-limit <tune container pids limit> --memory=<maximum amount of memory container can use> --restart=on-failure:5 --cpuset-cpus=<CPUs in which to allow execution> --network=<connect a container to network> --stop-timeout 100 -e LOGTOFOLLOW "/opt/netiq/idm/apps/tomcat/logs/catalina.out /opt/netiq/idm/apps/tomcat/logs/idapps.out" --health-cmd "ps -eaf | grep -i tomcat" --health-interval 60 -v <bind mount a volume> <image name>
```



# 10 Troubleshooting

This section provides useful information for troubleshooting problems with the Identity Manager containers.

## Identity Applications Container Displays Portlet Registration Exception

**Issue:** While deploying Identity Applications container, it displays the following exception:

```
ERROR
[com.novell.afw.portlet.consumer.core.EboPortletProducerChangeListener]
(main) [RBPM] Portlet registration with portletID: 'HeaderPortlet' does not
exist.
com.novell.afw.portlet.exception.EboPortletRegistrationException: Portlet
registration with portletID: 'HeaderPortlet' does not exist.
```

**Workaround:** Restart the Identity Applications container.

## Forms Are Not Loaded When Requesting For a Permission

**Issue:** After deploying the Identity Applications container, when you try to request for a permission that is associated with new forms, the form does not load as expected. This issue has been randomly observed.

**Workaround:** Ensure that the Form Renderer server and port details are specified in the `nginx.conf` file. To update the `nginx.conf` file, perform the following steps:

- 1 Log in to the Form Renderer container.  

```
docker exec -it <container> <command>
```

For example,  

```
docker exec -it fr-container bash
```
- 2 Navigate to the `/opt/netiq/common/nginx/` directory.
- 3 Edit the `nginx.conf` file.
- 4 Specify the Form Renderer server and port details. For example:

```
server {
listen 8600 ssl;
server_name formrenderer.example.com;
```





# Deploying Identity Manager Containers Using Ansible

This release of Identity Manager introduces support for the deployment of Identity Manager containers using Ansible. Through the Ansible approach, the containers can be easily deployed through an automated process. The deployment process is simpler and time-efficient. Identity Manager ships Ansible playbook for automating the container deployment.

---

**NOTE:** This release only supports a fresh deployment of containers using Ansible.

---

This section provides instructions on deploying containers through Ansible.



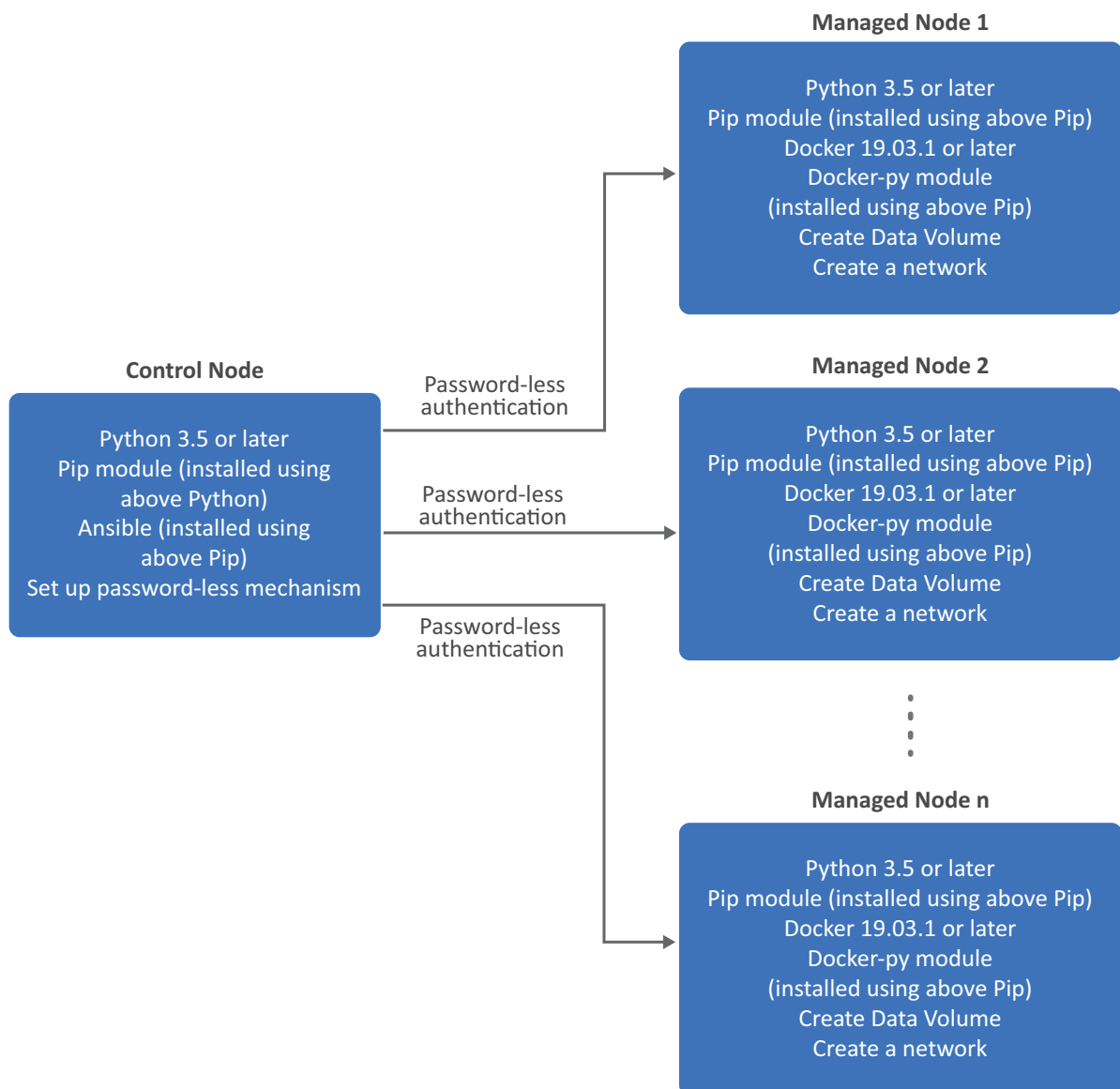
# 11 Planning Your Deployment

The containers deployment requires some planning and prerequisites to be followed. This section provides details on planning your deployment.

Identify two or more servers for Ansible-based container deployment. One of the servers is called Ansible Control Node (control node) and the remaining servers are called Managed Nodes (managed nodes). For more details on control node and managed nodes, see [Ansible](#) documentation.

## Preparing your Ansible Nodes

You must ensure that the Ansible nodes are set up appropriately before you begin with the deployment process. The prerequisites on the control and managed nodes are different from each other. The following figure provides a high-level view on how you must prepare your control and managed nodes.



## Preparing Your Control Node

Ensure that you perform the following tasks on the control node:

- ◆ Ensure Python3 or later is installed. To check for the Python version, navigate to the `/usr/bin/` directory and run the following command:

For example:

```
python3 --version
```

For more information, see [Python](#) documentation.

- ◆ Ensure pip is installed. To check for the pip version, run the following command:

For example:

```
pip --version
```

Ensure that `pip` has been installed through the Python3 or later version that you installed earlier.

For more information, see [Python](#) documentation.

- ◆ Install Ansible using the `pip` that you installed earlier. Ensure that you install Ansible version 2.10.5 or later.

For example:

```
pip install ansible
```

For more information, see [Ansible](#) documentation.

- ◆ Ensure that the managed nodes are reachable from the control node. For example, you can use `ping` or any relevant mechanisms to ensure the nodes are reachable.
- ◆ Ensure that you establish a password-less authentication between the control node and all the managed nodes in your deployment. Perform the following steps:

1. Generate a SSH key.

For example:

```
ssh-keygen
```

2. Do not enter any password and proceed with the key generation.

3. Run the following command to enable password-less authentication to the managed node:

```
ssh-copy-id root@<FQDN or IP Address of the managed node>
```

For example:

```
ssh-copy-id root@192.168.0.25
```

4. Specify the password of the managed node.

For example, `password`.

5. Test the connection to the managed node:

```
ssh 'root@<FQDN or IP Address of the managed node>'
```

For example:

```
ssh 'root@<192.168.0.25>'
```

## Preparing Your Managed Nodes

Ensure that you perform the following tasks on all the managed nodes:

- ◆ Ensure Python3 or later is installed. To check for the Python version, navigate to the `/usr/bin/` directory and run the following command:

For example:

```
python3 --version
```

For more information, see [Python](#) documentation.

- ◆ Ensure `pip` is installed. To check for the `pip` version, run the following command:

For example:

```
pip --version
```

Ensure that `pip` has been installed through the Python3 or later version that you installed earlier.

For more information, see [Python](#) documentation.

- ◆ Install Docker. Ensure that the Docker version is 19.03.1 or later. For more information, see [Docker](#) documentation.

- ◆ Install Docker python module using pip:

For example:

```
pip install docker-py
```

- ◆ Create a shared volume. For more information, see [“Managing Container Volume Data” on page 42](#).
- ◆ Create a network for establishing communication between containers. For example, to create an overlay network, see [“Setting Up an Overlay Network” on page 47](#).

## Creating the setup.csv File

The `setup.csv` file is an input file that will be used by Ansible while deploying containers. Identity Manager bundles a default template of the `setup.csv` file in the Identity Manager container tar file.

The default template of the `setup.csv` file is located at the `/<location where you extracted the container tar file>/ansible/input/` directory. You can edit the `setup.csv` file as per your requirement.

The parameters that the `setup.csv` file contains and the purpose of each parameters are described in the following section:

- ◆ **Component:** Indicates the container that you want to deploy. For example, `engine`.
- ◆ **Deploy:** Indicates whether you want to deploy the container. The supported values are `yes` and `no`.
- ◆ **DockerHost:** Indicates the Docker host where the container will be deployed. In other words, this can be any of the managed nodes you have identified for your deployment. For example, `DockerHostA`
- ◆ **IP Address:** Indicates the IP Address of the Docker host where the container will be deployed. For example, `192.168.0.15`
- ◆ **ContainerName:** Indicates the name of the container. For example, `engine-container`.
- ◆ **ContainerHostname:** Indicates the host name of the Docker hosts or server where the container will be deployed. NetIQ recommends that you specify the hostname in the FQDN format. For example, `identityengine.example.com`.
- ◆ **ExposedPorts:** Indicates the ports that you want to expose for the container to listen on. For example, `636`.

---

**NOTE:** Ensure that you expose unique ports for each containers and specify the same ports that you provided while creating the `silent.properties` file. For example, you can plan for the ports that you want to expose by referring to the sample ports provided in [Table 7-2](#).

---

- ◆ **FileMounting:** Indicates the path for any custom files such as `ojdbc.jar`. For example, `/opt/novell/eDirectory/lib/dirxml/classes/ojdbc.jar`.



---

**NOTE**

- ♦ If there are multiple values, specify them as a space-separated variable list. For example, `/opt/novell/eDirectory/lib/dirxml/classes/ojdbc.jar /opt/novell/eDirectory/lib/dirxml/classes/mssql.jar`
- ♦ (Conditional) This applies only when you have set the value for the Core DNS container as **no** in the `Deploy` column.

Ensure that the `hosts` file is mapped in the `FileMounting` field. For example, `/etc/hosts`.

---

- ♦ **SharedVolume:** Indicates the shared volume that you want the containers to use for data persistence. For example, `/data`.



# 12 Deploying Containers

Perform the following steps to deploy containers:

- 1 On the control node, perform the following steps:
  - 1a Download and extract the Identity Manager container tar file. For more information, see [“Obtaining the Docker Images” on page 39](#).
  - 1b Navigate to the `/<location where you extracted the tar file>/docker-images/` directory.
  - 1c Copy the `IDM_483_idm_conf_generator.tar.gz` file and place the file on any of the managed nodes.
- 2 On any of the managed nodes, perform the following steps:
  - 2a Place the `IDM_483_idm_conf_generator.tar.gz` file you copied in [Step 1c](#) in any location. For example, `/home`.
  - 2b Create the `silent.properties` file. For more information, see [“Creating the Silent Properties File” on page 44](#).
- 3 On the control node, perform the following steps:
  - 3a Navigate to the `/<location where you extracted the tar file>/ansible/input/` directory and place the following files:
    - ♦ `silent.properties` file that you created in [Step 2b](#)
    - ♦ `iManager.env` file. For more information on creating the `iManager.env` file, see [Step 4](#) in the [“Deploying iManager Container” on page 49](#) section.
    - ♦ `setup.csv` file that you created in the [“Creating the setup.csv File” on page 96](#) section
    - ♦ any custom certificates that you obtained from an external certificate authority

---

**NOTE:** If you are using Identity Vault as the certificate authority for generating certificates, perform the steps mentioned in [“Generating Certificate With Identity Vault Certificate Authority” on page 64](#).

---

    - ♦ any custom files such as `ojdbc.jar` or custom LDIF files

---

**NOTE:** Ensure that the destination path for these files are specified in the **FileMounting** column of the `setup.csv` file. For more information, see [“Creating the setup.csv File” on page 96](#).

---
  - 3b Navigate to the `/<location where you extracted the tar file>/ansible/` directory.
  - 3c (Optional) This step applies for advanced users. Review the `ansible.cfg` file for your deployment.
  - 3d Run the following command for deploying the `setup.yml` playbook:

```
ansible-playbook setup.yml
```

**3e** (Optional) This step applies for advanced users. Review the `idminventory.ini` file for your deployment.

**3f** Run the following command for deploying the `deploy.yml` playbook:

```
ansible-playbook deploy.yml -e 'network_set=<Docker network name>'
```

For example:

```
ansible-playbook deploy.yml -e 'network_set=idmoverlaynetwork'
```

# 13 Post-deployment Tasks

After completing the deployment of Identity Manager containers, you must perform certain tasks to ensure the Identity Manager solution works properly in your environment.

You must perform the following post-deployment tasks:

- ♦ (Conditional) This step applies only when you have set the value for the Core DNS container as **no** in the `setup.csv` file and want to log in to iManager user interface by specifying the hostname of the Identity Manager Engine container in the **Tree** field.

1. Log in to the iManager container.

```
docker exec -it -u root <container> <command>
```

For example,

```
docker exec -it -u root iman-container bash
```

2. Navigate to the `/etc/` directory.
3. Edit the `hosts` file.
4. Add the entries of all the containers running on that Docker host.

---

**NOTE:** Ensure that the hostname for all containers are in Fully Qualified Domain Name (FQDN) format only.

---

The entries must follow the below format:

```
<IP of the container> <FQDN> <short_name>
```

For example,

```
192.168.0.7 identityapps.example.com identityapps
```

5. Save the `hosts` file.
- ♦ Install the latest iManager plug-ins. For more information, see [Step 7](#) of the [Deploying iManager Container](#) section.
  - ♦ Set the value of the `no_nam_auth` parameter to `False`. For more information see, [Step 7](#) to [Step 11](#) of the [Deploying OSP Container](#) section.
  - ♦ Import the OAuth certificate to SSPR. For more information, see [Step 9](#) of the [Deploying SSPR Container](#) section.



# 14 Troubleshooting

This section provides useful information for troubleshooting problems with the Identity Manager containers that are deployed using Ansible.

## Running the `deploy.yml` File for the First Time Displays an Exception

**Issue:** When you are running the `deploy.yml` for the first time in your deployment, you will see the following message indicating that the Docker images are not present on the target nodes. For example, if you are deploying the Core DNS container, you will see the following error:

```
fatal: [<ip address/DNS>]: FAILED! => {"changed": true, "cmd": "docker images | grep coredns | grep 1.8.0", "delta": "0:00:00.914078", "end": "msg": "non-zero return code", "rc": 1, "start": "stderr": "", "stderr_lines": [], "stdout": "", "stdout_lines": []}
```

**Workaround:** There is no workaround at this time. However, you can ignore the message and proceed with the deployment. This does not cause any loss in functionality.

## Exception Reported When the IP Address Is Already In Use in Your Network

**Issue:** The container deployment fails when the IP address is already in use by a different container across your network. The following exception is reported on the console.

```
fatal: [<ip address/DNS>]: FAILED! => {"changed": false, "msg": "Error starting container
bleb07f42cf6bd63787ae6167f5e3a0f7cbee0f8be80a5764bcc7c7f9d6b96b1: 403 Client Error for http+docker://localhost/v1.40/containers/bleb07f42cf6bd63787ae6167f5e3a0f7cbee0f8be80a5764bcc7c7f9d6b96b1/start: Forbidden (\"Address already in use\")"}
```

**Workaround:** Assign a different IP address for the container.

## Unable to Fetch Tasks After Deploying Identity Applications Container

**Issue:** After deploying the Identity Applications container, when you log in to the Identity Manager Dashboard and navigate to the **Tasks** page, the Dashboard does not fetch the list of tasks as expected. The following error is reported in the `catalina.out` file.

```
SEVERE [main]
org.apache.catalina.startup.ContextConfig.processAnnotationsWebResource
Unable to process web resource [/WEB-INF/classes/com/microfocus/idm/nrf/
resources/NRFRsrc_fr.class] for annotations
 java.io.EOFException
 at java.io.DataInputStream.readFully(DataInputStream.java:197)
 at java.io.DataInputStream.readUTF(DataInputStream.java:609)
 at java.io.DataInputStream.readUTF(DataInputStream.java:564)
 at
org.apache.tomcat.util.bcel.classfile.ConstantUtf8.getInstance(ConstantUtf8.
java:36)
 at
org.apache.tomcat.util.bcel.classfile.Constant.readConstant(Constant.java:
79)
 at
org.apache.tomcat.util.bcel.classfile.ConstantPool.<init>(ConstantPool.jav
a:53)
 at
org.apache.tomcat.util.bcel.classfile.ClassParser.readConstantPool(ClassPa
rser.java:174)
 at
org.apache.tomcat.util.bcel.classfile.ClassParser.parse(ClassParser.java:8
3)
 at
org.apache.catalina.startup.ContextConfig.processAnnotationsStream(Context
Config.java:2351)
 at
org.apache.catalina.startup.ContextConfig.processAnnotationsWebResource(Co
ntextConfig.java:2250)
 at
org.apache.catalina.startup.ContextConfig.processAnnotationsWebResource(Co
ntextConfig.java:2244)
 at
org.apache.catalina.startup.ContextConfig.processAnnotationsWebResource(Co
ntextConfig.java:2244)
 at
org.apache.catalina.startup.ContextConfig.processAnnotationsWebResource(Co
ntextConfig.java:2244)
 at
org.apache.catalina.startup.ContextConfig.processAnnotationsWebResource(Co
ntextConfig.java:2244)
 at
org.apache.catalina.startup.ContextConfig.processAnnotationsWebResource(Co
ntextConfig.java:2244)
 at
org.apache.catalina.startup.ContextConfig.processAnnotationsWebResource(Co
ntextConfig.java:2244)
 at
org.apache.catalina.startup.ContextConfig.processClasses(ContextConfig.jav
a:1397)
 at
org.apache.catalina.startup.ContextConfig.webConfig(ContextConfig.java:130
2)
 at
org.apache.catalina.startup.ContextConfig.configureStart(ContextConfig.jav
a:985)
```



**Workaround:** To workaround this issue, perform the following steps:

- 1 Navigate to the `/opt/netiq/idm/apps/tomcat/webapps/` directory.
- 2 Delete the `workflow` folder.
- 3 (Optional) Restart Tomcat.

