# Code Promotion

January 2014

**IMPORTANT:** Code Promotion is an early access feature in the NetIQ Access Manager 4.0 release.

Code Promotion is an easy to use secure functionality to move the configuration data of Access Manager from one environment to another. It allows you to export the configuration data as a password-protected encrypted file. You can then import this file into another Access Manager system and seamlessly replicate the configuration into the target system.

The exported configuration data includes generic Identity Sever cluster configuration and policy configuration. It is independent of the device specific data and network specific data. Hence, you can use the Code Promotion feature to promote configuration between two Access Manager systems that are in different networks, with different number of devices, and with different user stores. The Access Manager systems must be on the same platform.



# 1 How Code Promotion Helps?

Code Promotion addresses the following pain points associated with the following activities:

- **Managing Multiple Access Manager Setups:** Typically, multiple Access Manager setups are maintained to test configuration changes before applying them on production systems. For example, you can use the staging environment to deploy Access Manager, test various configurations and customizations, and apply these changes to the production environment. Earlier, there was no easy way to promote the tested and approved configuration data to the production environment. The configuration data had to be manually replicated in to another

system. This was a time-consuming and error prone process. Code Promotion provides a mechanism to move the configuration data across environments. This increases efficiency, improves productivity, and in turn reduces costs of managing configurations across environments.

- **Different Administrators for Different Setups:** Different administrators can manage different Access Manager environments. Manually replicating the configuration to the different stages requires the maintenance of the precise list of all changes done on one system and this knowledge must be transferred among administrators. Hence, a mechanism is needed to ensure that all configuration changes are taken and moved correctly.
- **Replacing or Moving Physical Devices:** You may need to replace physical devices or you may need to move devices to a different network due to a business decision, such as, changing a network infrastructure vendor. Hence, a mechanism that is independent of these network changes is needed to transfer the configuration data.

# 2 Use Cases

Code Promotion simplifies promotion of the configuration data in the following scenarios:

- You want to test your configuration in a dedicated testing environment and then build a new production environment based on the tested configurations.
- You maintain multiple test environments and you want the configuration changes to pass through these stages before deploying the configuration data to an existing production environment.
- You want to move your application to another physical server.
- You want to move the application hardware to a different network infrastructure.

# 3 Code Promotion Mechanism

Table 1 lists the configurations that you can promote to another environment and the corresponding promotion mechanism.

***Table 1*** *Configuration Promotion Mechanism*

| Data | Promotion Supported? | Mechanism |
|---|---|---|
| Identity Server configuration | Yes | Use the Code Promotion feature.<br>For more information, see Section 9, “Exporting the Configuration Data by Using Code Promotion,” on page 5 and Section 10, “Importing the Configuration Data by Using Code Promotion,” on page 7. |
| Policies configurations | Yes | Use the Code Promotion feature.<br>For more information, see Section 9, “Exporting the Configuration Data by Using Code Promotion,” on page 5 and Section 10, “Importing the Configuration Data by Using Code Promotion,” on page 7. |

| Data | Promotion Supported? | Mechanism |
|---|---|---|
| Certificates and Keystores configurations | Yes | Use the Code Promotion feature.<br>For more information, see Section 9, “Exporting the Configuration Data by Using Code Promotion,” on page 5 and Section 10, “Importing the Configuration Data by Using Code Promotion,” on page 7. |
| Access Gateway configurations | Yes | Use the existing Access Gateway Export and Import Configuration feature.<br>For more information, see Section 12, “Exporting the Access Gateway Configuration Data,” on page 9 and Section 13, “Importing the Access Gateway Configuration Data,” on page 10. |
| Device customizations | No | Manually export and import the data.<br>For more information, see Section 11, “Post-Import Configuration Tasks,” on page 9. |
| Device information | No | Not applicable as devices are specific to a setup. |

# 4 Sequence of Promoting the Configuration Data

You must promote the configuration data in the following sequence:

1. Identity Server configurations, policies configurations, and Certificates and Keystores configurations
2. Access Gateway configurations

Promoting the configuration data consists of the following steps:

1. Install Access Manager 4.0 or upgrade the prior version of Access Manager on your source and target systems.

   For more information about how to install Access Manager, see *NetIQ Access Manager 4.0 Installation Guide*.

   For more information about how to upgrade and migrate Access Manager, see *NetIQ Access Manager 4.0 Migration and Upgrade Guide*.
2. Apply the Code Promotion EAR patch on both the systems.

   For more information, see Section 7, “Applying the Code Promotion EAR Patch,” on page 4.
3. Enable Code Promotion on both source and target systems.

   For more information, see Section 8, “Enabling Code Promotion,” on page 5.
4. Export the Identity Server configuration and Policy configuration by using the Code Promotion feature from the source system.

   For more information, see Section 9, “Exporting the Configuration Data by Using Code Promotion,” on page 5.
5. Export the Access Gateway configuration from the source system.

   For more information, see Section 12, “Exporting the Access Gateway Configuration Data,” on page 9.
6. Import the Identity Server configuration and Policy configuration by using the Code Promotion feature on the target system.

For more information, see Section 10, “Importing the Configuration Data by Using Code Promotion,” on page 7.

7. Import the Access Gateway configuration into the target system. For more information, see Section 13, “Importing the Access Gateway Configuration Data,” on page 10.

# 5 Prerequisites

- Code Promotion is an early access feature in the 4.0 release. Hence, you must enable this feature to use it. See Section 8, “Enabling Code Promotion,” on page 5.
- The source server and the target server must have Access Manager 4.0. If you want to export the configuration data from an earlier version of Access Manager into Access Manager 4.0, you must upgrade or migrate the existing setup to Access Manager 4.0. For more information about how to upgrade or migrate Access Manager, see the *NetIQ Access Manager 4.0 Migration and Upgrade Guide*.
- The source server and the target server must run on the same operating system.
- The source server and the target server must have the same model; that is, both must be either Access Manager or Access Manager Appliance.
- Importing configuration data replaces the existing configuration data. Hence, use the backup option in the Import wizard to preserve a copy of the existing configuration before an import.

# 6 Limitations

- Code Promotion supports export and import of only the Identity Server configuration and policy configuration data.
- Code Promotion supports export and import of only the generic configuration data. It does not support exporting and importing the configuration data that vary from one system to another. For example, you can export and import network specific configuration, device specific configuration, configuration store, and its replica ring configuration.
- You can enable this feature only on the primary Administration Console.

# 7 Applying the Code Promotion EAR Patch

**Prerequisites**

- Before upgrading Access Manager, back up your current configuration. If the upgrade fails for any reason, you can use the backup file to recover your configuration.

  To back up your Access Manager configuration, go to the `/opt/novell/devman/bin` directory on the primary Administration Console. Run the `ambkup.sh` script.
- Verify that you have installed the latest version of Access Manager 4.0.

  In the Administration Console, click **Access Manager** > **Auditing** > **Troubleshooting** > **Version**.

**Procedure**

1. Download the `AM_400_HF_CP_EA_PatchTool.zip` file.
2. Run the following command to unzip the file:

   ```
   unzip AM_400_HF_CP_EA_PatchTool.zip
   ```
3. Perform any one of the following step:

   **3a** Go to the `/opt/novell/nam/patching/bin` folder and run the following command:

```
./patch -i /home/AM_400_HF_CP_EA-<buildnumber>.patch
```

**3b** Go to the `AM_400_HF_CP_EA` folder and run the following command:

```
sh installPTool.sh
```

Or

```
./installPTool.sh
```

For more information about options to administer the Access Manager patch file, see section *Upgrading Access Manager Using the Patch Process* > *Administering Patches* in the NetIQ Access Manager 3.2 SP2 Installation Guide.

# 8 Enabling Code Promotion

You must enable Code Promotion manually on the primary Administration Console. After enabling, the Administration Console displays a new option Code Promotion (**Access Manager** > **Code Promotion**), which allows you to export and import of configuration data across environments.

1. Log in to the primary Administration Console as a root user.
2. Stop the Administration Console by using the `/etc/init.d/novell-ac stop` command.
3. Add the following lines to the end of the `/opt/novell/nam/adminconsole/conf/tomcat7.conf` file:

   ```
   JAVA_OPTS="${JAVA_OPTS} -Dcom.netiq.nam.enableStaging=true"
   JAVA_OPTS="${JAVA_OPTS} -Dcom.netiq.nam.staging.removeexistingcontainers=true"
   ```

4. Start the Administration Console by using the `/etc/init.d/novell-ac start` command.

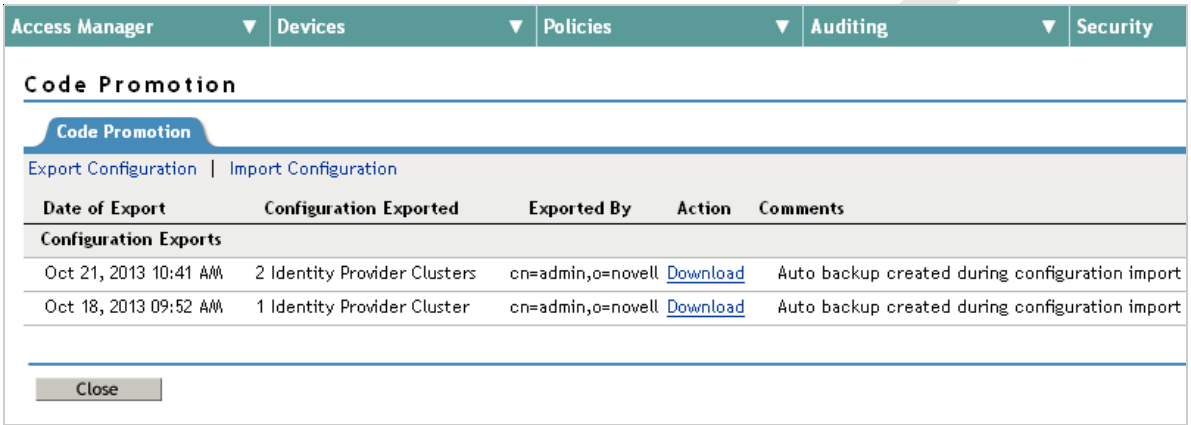
# 9 Exporting the Configuration Data by Using Code Promotion

The Code Promotion page displays a list of all configuration files exported from that system. It displays the metadata of each exported configuration: date of export, configuration exported, name of user who exported, a link to download the exported file, and the comments.

You can download the previously exported configuration files from this page. These exported files are also saved on the primary Administration Console system at the following location:

```
/var/opt/novell/novlwww/namconfig
```

You as an administrator can delete or back up these files if needed. If these files are deleted from the disk, they will no longer be listed on the Code Promotion page.



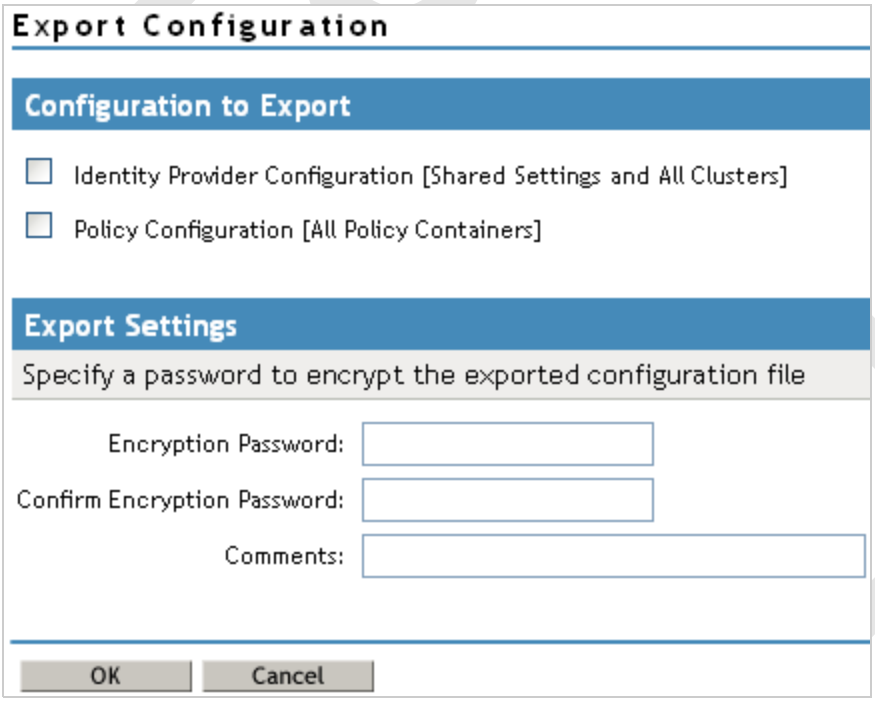
The exported configuration data includes:

- Identity Server configuration
  - Cluster configuration
  - Shared Settings
  - Keystores
  - Trusted roots
- Policy configuration
  - All policy containers
  - All policy definitions
  - Policy extensions

Perform the following steps to export the configuration data:

1. Log in to the Administration Console from where you want to export the configuration data.
2. In the Administration Console, click **Access Manager** > **Code Promotion**.

   You must enable Code Promotion to see this option. See Section 8, "Enabling Code Promotion," on page 5.
3. In the Code Promotion page, click **Export Configuration**.




4. Based on your requirements, select the configuration to export:

   **Identity Provider Configuration:** This will export all clusters, shared settings, keystores, and trust stores.

   **Policy Configuration:** This will export all the policy containers, policy definitions, and policy extensions.
5. Specify a password to encrypt the archived configuration data file.

You require this password to decrypt the ZIP file while importing configuration data into another environment.

6 Add an appropriate comment for this export in **Comments**. This can be helpful to identify the exported configuration.

For example, Configuration export after UAT completion.

7 Click **OK** and save the file at your preferred location on your local system.

# 10 Importing the Configuration Data by Using Code Promotion

Import the configuration data only on the primary Administration Console.

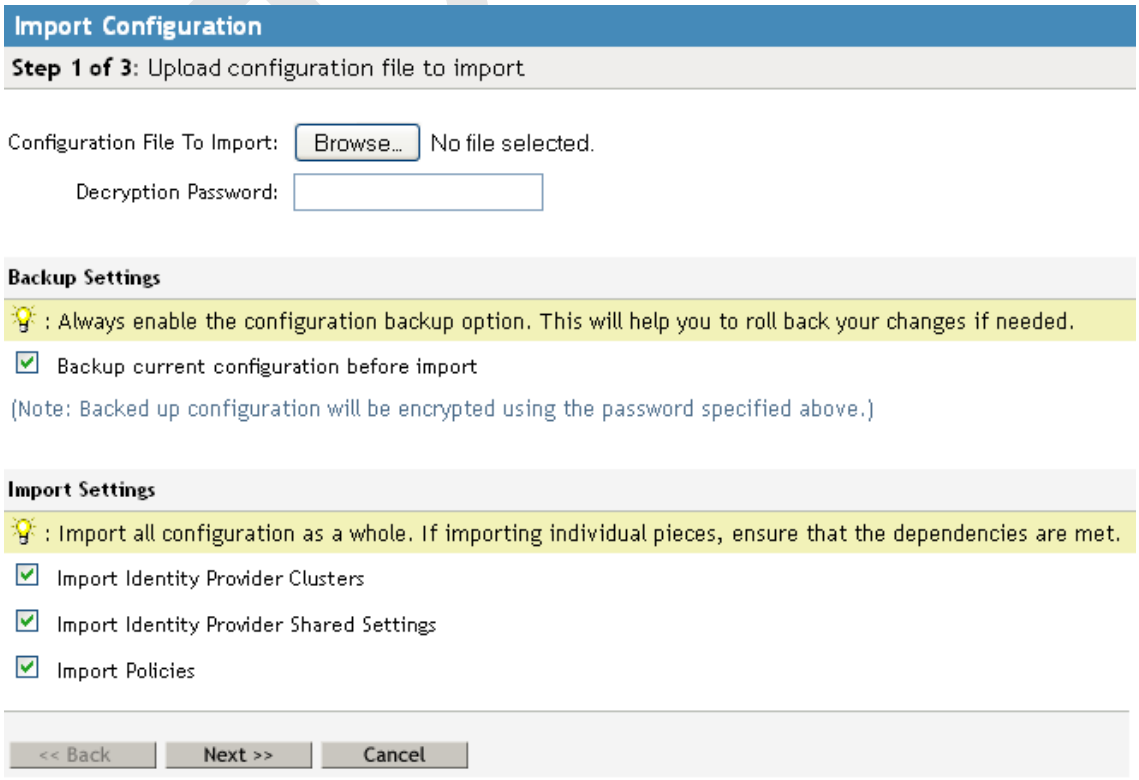
Perform the following steps to import configuration data:

1 Ensure that the ZIP file containing the configuration data that you want to import is accessible.

2 Log in to the Administration Console in which you want to import configuration data.

3 In the Administration Console, click **Access Manager** > **Code Promotion**.

4 In the Code Promotion page, click **Import Configuration**.




5 Click **Browse** to import the configuration file.

6 In **Decryption Password**, specify the password that you used to encrypt the configuration data file. You need this password to extract the contents of the configuration file.

7 (Optional) Select **Backup current configuration before import**. This backup helps to roll back your changes if needed. The backup file is encrypted with the same password that is used for decryption in Step 6. You can download this backup file from the Code Promotion page.

8 Under **Import Settings**, select the desired options based on your requirements.

Select all configurations and import them as a whole. Identity Server clusters have dependencies on Shared Settings. Hence, if you want to select only to import the Identity Server clusters configuration data, ensure that all Shared Settings that are referenced are configured in this system.

**NOTE:** Importing Shared Settings overwrites the existing Shared Settings on the system with new Shared Settings. However, these will not be deleted.

The following table lists examples with Attribute Sets illustrating the import action:

| Imported Attribute Sets | Existing Attribute Sets | Import Action |
|---|---|---|
| OIOSAML with five mappings | OIOSAML with two mappings | OIOSAML set is replaced with the imported one. Hence, it has five mappings. |
| AttrSet1 | Not available | AttrSet1 is added. |
| No import | AttrSet2 is defined only in the target system | AttrSet2 remains unchanged. |

9 Click **Next**.

If you selected **Import Identity Provider Clusters** in Step 8, the Import Identity Provider Clusters page allows you to specify the import action for each cluster found in the imported configuration.

10 Select a cluster to configure import settings in **Clusters To Import**.

11 Select an action for the selected cluster from **Import Action**. The following options are available:

**Do Not Import:** The default setting for all clusters. To import the cluster configuration data, you need to apply any of the other two options available for a particular cluster.

**Import As New Cluster:** Select this option if you want to import the cluster as a new cluster. Specify **New Cluster Name** and **New Cluster URL**. Ensure that the new cluster name is different from the existing cluster names defined on that system.

**Overwrite Existing Cluster:** Select this option if you want to overwrite the existing cluster with the selected cluster. Specify which **Cluster To Overwrite**.

**NOTE:** You need to configure import action for each cluster separately. If the cluster you want to import has only one user store, it will be mapped to the default user store of the existing cluster. If the cluster you are importing has multiple user stores, then you must specify how to map them to the user stores of the existing cluster.

12 Click **Next**.

When import is done, the final page displays the status of the import operation. It also lists the manual steps you must perform to get the Identity Sever clusters to a working state.

13 Make a note of manual configuration steps and then click **Finish**.

14 Add Identity Server devices to the new clusters imported. For overwritten existing clusters, go to **Auditing** > **Troubleshooting** > **Certificates** and click **Re-push certificates**. Then update all devices in the cluster.

# 11 Post-Import Configuration Tasks

After importing the Identity Server configuration data, you must perform configurations that are specific to the target system and that are not part of the exported data.

- After the import process is complete, the system displays a list of certificates that you need to create manually. Identity Server key stores are imported, but you must create the certificates referenced in them on the server where you have imported the configuration data. The new certificate name must exactly match with the names listed. For more information about how to create certificates, see "Creating Certificates"in the *NetIQ Access Manager 4.0 Administration Console Guide*.
- Configure user stores for the newly added clusters. After the import process is complete, the system displays a list of Identity Server clusters for which you need to configure user stores. A place holder user store entry will be created. You must enter the IP address, search context, and the password for the target system user stores. For more information, see "Configuring Identity User Stores"in the *NetIQ Access Manager 4.0 Identity Server Guide*.
- Distribute the policy extension JARs to devices in the Administration Console under **Policy** > **Extensions**. For more information, see "Distributing a Policy Extension" in the *NetIQ Access Manager 4.0 Policy Guide*.
- Update service providers with the new metadata. (Conditional)

  The identity provider certificate is different in the exported and imported systems. Hence, you must re-import the identity provider metadata to all service providers in that cluster for federation to work. For more information, see "Viewing and Reimporting a Trusted Provider's Metadata" in the *NetIQ Access Manager 4.0 Identity Server Guide*.
- Copy customization files from the exported setup into the devices in this setup. This includes the Identity Server custom Authorization classes, custom JSP files, and so forth.
- Persistent federation identities and shared secrets are not imported. These are to be shared between the Identity Servers in your exported setup and service providers only. They do not apply to the Identity Servers in the imported system. You must configure these on the server after you import the configuration data.

# 12 Exporting the Access Gateway Configuration Data

1. In the Administration Console, click **Devices** > **Access Gateway** > **[Name of Access Gateway]**.
2. Click **Configuration** > **Export**.
3. (Conditional) If you want to encrypt the file, specify the following details:

   **Password protect:** Select this option to encrypt the file.

   **Password:** Specify a password to encrypt the file. You require the same password during decrypting the file on the target system.
4. Click **OK**, then select to save the configuration to a file.

   The filename is the name of the Access Gateway with an `xml` extension.
5. (Conditional) If you want to change the names of the proxy services and their DNS names from a staging name to a production name, complete the following:

   **5a** Open the configuration file in a text editor.

   **5b** Search and remove the staging suffix.

   If you have specified DNS names with a staging suffix (for example, `innerwebstaging.provo.novell.com`), you can search for `staging.provo.novell.com` and remove `staging` from the name.

In particular, you need to change the following:

- Any fully qualified DNS names from the staging name to the production name (DNSName elements in the file)
- The cookie domains associated with each proxy service (AuthenticationCookieDomain elements in the file)
- The URL masks in pin lists that contain fully qualified names (URLMask elements in the file)

Depending upon your naming standards, you might want to change the names of the following:

- UserInterfaceID elements (proxy service, pin list, and protected resource user interface ID's)
- Description elements (proxy service, pin list, and protected resource descriptions)
- Name (proxy service, pin list, and protected resource names)
- SubServiceID elements
- MultiHomeMasterSubserviceIDRef elements
- LogDirectoryName elements
- ProfileIDRef elements
- ProtectedResourceID elements
- ProfileID elements (TCP Listen options name)

**5c** (Conditional) If your Web servers in the staging area have different IP addresses and hostnames than the Web Servers in the production area, you can search and replace them in the configuration file or wait until after the import and modify them in the Administration Console.

6 Click **Export** and modify the proposed filename if needed.

7 Copy the Access Gateway configuration file to a place accessible by the target system.

8 Continue with Importing the Access Gateway Configuration Data.

# 13 Importing the Access Gateway Configuration Data

1 Verify that the Access Gateway meets the conditions for an import:

- The Access Gateway should not be a member of a cluster. If it is a member of a cluster, remove it from the cluster before continuing.

  In the Administration Console, click **Devices** > **Access Gateways**, select the Access Gateway, then click **Actions** > **Remove from Cluster**.

  You can create a cluster and add this machine to the cluster as the primary server after you have completed the import.

- Delete reverse proxies if any configured.

  In the Administration Console, click **Devices** > **Access Gateways** > **Edit** > **Reverse Proxies / Authentication**. In the **Reverse Proxy List**, select **Name**, then click **Delete**. Update the Access Gateway and the Identity Server.

2 Click **Access Gateways** > **[Name of Access Gateway]** > **Configuration** > **Import**.

3 Browse to the location of the configuration file, select the file, enter the password if you specified while exporting the configuration, then click **OK**.

4 When the configuration import has finished, verify the configuration for your reverse proxies.

**4a** Click **Access Gateways** > **Edit** > **[Name of Reverse Proxy]**.

**4b** Verify the listening address.

This is important if your Access Gateway has multiple network adapters. By default, the IP address of eth0 is always selected as the listening address.

**4c** Verify the certificates assigned to the reverse proxy.

The Subject Name of the certificate should match the published DNS name of the primary proxy service in the **Proxy Service List**.

**4d** Verify the Web Server configuration. In the **Proxy Service List**, click the **Web Server Addresses** link. Check the following values:

- **Web Server Host Name:** If this name has a staging prefix or suffix, remove it.
- **IP addresses in the Web Server List:** If the IP addresses in the production area are different from the IP addresses in the staging area, modify the IP addresses to match the production area.
- **Certificates:** If you have configured SSL or mutual SSL between the proxy service and the Web servers, configure the **Web Server Trusted Root** and **SSL Mutual Certificate** options. The export and import configuration option does not export and import certificates.

**4e** Click **OK** > **OK**.

5 (Conditional) If you have multiple reverse proxies, repeat Step 4 for each proxy service.

6 On the Configuration page, click **Reverse Proxy / Authentication**, then select the **Identity Server Cluster** configuration.

7 If you have multiple reverse proxies, verify that the Reverse Proxy value in the **Embedded Service Provider** section is the reverse proxy you want to use for authentication, then click **OK** twice.

8 Click **Access Gateways** > **Update**.

9 Click **Identity Servers** > **Update**.

If your Identity Server does not prompt you for an update, complete the following steps to trigger the update:

**9a** In the Administration Console, click **Devices** > **Access Gateways** > **Edit** > **Reverse Proxy / Authentication**.

**9b** Set the **Identity Server Cluster** field to **None**, then click **OK**.

**9c** Click **Reverse Proxy / Authentication**.

**9d** Set the **Identity Server Cluster** field to the correct value, then click **OK**.

**9e** Update the Access Gateway.

**9f** Update the Identity Server.

10 Configure the keystores for the Access Gateway.

If you have configured the Access Gateway for SSL between the Identity Server and the Access Gateway and between the Access Gateway and the browsers, verify that the trust stores and the keystores contain the correct certificates.

**10a** In the Administration Console, click **Security** > **Certificates**.

**10b** Find the certificate for the Access Gateway.

The subject name of this certificate should match the DNS name of the Access Gateway. If this certificate is not in the list, you need to create it or import it.

This certificate should be in use by the ESP Mutual SSL and Proxy Key Store of the Access Gateway.

**10c** If the certificate is not in use by the required keystores, select the certificate, then click **Actions** > **Add Certificate to Keystores**.

**10d** Click the **Select Keystore** icon, select **ESP Mutual SSL** and **Proxy Key Store of the Access Gateway**, then click **OK** twice.

**11** Configure the trust stores for the Access Gateway.

**11a** In the Administration Console, click **Security** > **Certificates** > **Trusted Roots**.

The trusted root certificate of the CA that signed the Access Gateway certificate needs to be in the NIDP-truststore.

The trusted root certificate of the CA that signed the Identity Server certificate, needs to be in the ESP Trust Store of the Access Gateway.

**11b** If you need to add a trusted root to a trust store, select the trusted root, click **Add Trusted Roots to Trust Stores**.

**11c** Click the **Trust Store** icon, select the required trust store, then click **OK** twice.

**12** If you made any keystore or trust store modifications, update the Access Gateway and the Identity Server.

**13** (Optional) Create a cluster configuration and add this server as the primary server.

# 14 Known Issues

The following are known issues in the Early Access build of Code Promotion:



## 14.1 Import as a New Cluster Fails to Import Form Fill Policies with Shared Secret

When you import an Identity Server cluster by using the **Import as a New Cluster** option, the new cluster is created and policies are enabled. However, the Form Fill policies with Shared Secret having remote secret store do not work.

## 14.2 Import as a New Cluster Overwrites Existing Identity Server Cluster Role Policies

When you import an Identity Server cluster by using the **Import as a New Cluster** option, the new cluster is created and policies are enabled. But, the existing Identity Server cluster role policies are overwritten.

## 14.3 Overwriting the Existing Cluster Results in Inaccessible Identity Server Role Policies

When you import the Identity Server cluster by using the **Overwrite Existing Cluster** option, the existing cluster is overwritten with the imported cluster. But, you cannot view the Identity Server role policies.

To resolve this issue, perform the following steps:

1. Ensure that you have imported the Access Gateway configuration data into the target system. If not, first import it.

   For more information, see Section 13, “Importing the Access Gateway Configuration Data,” on page 10.
2. In the Administration Console, click **Devices** > **Policies** > **Refresh References**.

## 14.4 The Import Wizard Does Not Display a Confirmation Page with the Summary of Imported Configuration Data

The import wizard should display a summary page with the changes being imported before performing the actual import.

## 14.5 No Context-Sensitive Is Available for Code Promotion

The Administration Console does not contain context-sensitive help for Code Promotion configuration pages.

# 15 Troubleshooting

### Importing Configuration Fails

Explanation: While importing the configuration data, the Import Configuration wizard displays the `Configuration Import Failed` message.

Action: See the details of the failure the Administration Console tomcat logs at the following location:

```
/opt/novell/nam/adminconsole/logs/catalina.out
```

Collect the error details and contact the Technical Support team.

To restore your system, go to **Access Manager** > **Code Promotion**. You will find the backup file that was created as part of import. Download the file and then click **Import Configuration** on the same page. Re-import this backup configuration to restore to the previous configuration.

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