DigiCert® Autoenrollment Server Deployment Guide

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Abstract

This document describes the installation and configuration steps for DigiCert Autoenrollment Server Deployment Guide.

Revision History

No.	Date	Summary
1.	2021/08/26	• Removed PKI Enterprise Gateway and Autoenrollment Server dependencies within the PKI Manager portal. • Updated the section "Importing the Autoenrollment Configuration file" as per the new User Interface.
2.	2021/12/06	• Added support for Windows Hello for Business: o Added new section "1.5 About Integration with Windows Hello for Business" o Added template v4 support at "5.4 About the Preparation of Certificate Templates" • Product renamed from "DigiCert PKI Enterprise Gateway Autoenrollment Server" to "DigiCert Autoenrollment Server" and removed reference to PKI Enterprise Gateway throughout the document. • At "2.2 Required Software ", required VC version changed from "Visual C++ 2015 Redistributable Update 3 (x64)" to "Visual C++ Redistributable for Visual Studio 2015, 2017 and 2019 (x64)". • The Autoenrollment Server zip package has now been separated from Enterprise Gateway zip package. Fixed section "3.1 Install the Autoenrollment Server" with current information. • Moved "3.6 Setting the Autoenrollment Permissions" to "3.3 Setting the Autoenrollment Permissions" and added screenshots for clarification. • Registration Authority certificates has been removed from the zip package and moved to https://knowledge.digicert.com/solution/ca-hierarchies-for-production-and-test-drive-ra-certificates.html. Section

		"4.2.1 Obtaining an RA Certificate to Store in an HSM" has been fixed to accommodate the change.
		• Log configuration support using log4cpp added:
		o Added new section "4.4 Log Properties Configuration Options"
		o Cleaned up and consolidated logging information from following sections:
		▪ "7.1 About Troubleshooting" removed
		▪ "7.2 Format of Log File Messages" removed
		▪ Fixed following sections:
		▪ "5.2 Files Written by the Autoenrollment Process"
		▪ "7.1 Repeating an Action with a Higher Log Level"
		▪ "7.2.6 Catastrophic Error When Restarting the Autoenrollment Server"
		o Added "6.2 Configuring Autoenrollment Server for Syslog"
		• Added information about how to create profile for AE Server at "4.5 Creating Autoenrollment Certificate Profile".
		• Fixed references to wrong pages and links at multiple locations.
3.	2022/05/25	• Support for Windows Server 2022 • Support for EOBO (Enroll On Behalf Of)
4.	2022/06/28	• New binary with new UI, updated the section "Setting the Autoenrollment Configuration Utility" as per the new UI. • Support for authenticated proxy server. • Updated the section "Importing the Autoenrollment Configuration File" as per the new UI. • Added the section "Configuration utility events logging in AEConfig.log"
5.	2023/02/15	• Removed references to unsupported operating systems.

CHAPTER 1

1 Introduction

This chapter includes the following topic:

- About DigiCert PKI Platform
- Intended Audience
- About the DigiCert Autoenrollment Server Deployment
- About the Autoenrollment Process
- About Integration with Windows Hello for Business

1.1 About DigiCert PKI Platform

You can use DigiCert® PKI Platform to issue certificates to end users. These certificates can be used for smart card logon, SSL connections, encrypted file system (EFS) transactions, and to exchange encrypted mail, among other applications. By specifying group policy settings for domains, users, and machines, you can define the certificate templates that automatically enroll your users for certificates when they log on to Windows operating systems.

The DigiCert Autoenrollment Server connects the network infrastructure with the DigiCert Certification Authority (CA). Therefore, you can easily create certificate templates and issue certificates automatically using the PKI Cloud Service.

1.2 Intended Audience

It is assumed that you have a thorough knowledge about Windows domain and network administration, as well as an understanding of PKI components, workflows, and cryptographic systems. However, it is not necessary to have an in-depth knowledge about how cryptographic algorithms or other technical details work.

1.3 About the DigiCert Autoenrollment Server Deployment

The DigiCert Autoenrollment Server handles the following aspects of the autoenrollment process:

- Requesting certificates
- Tracking pending requests and certificate renewals
- Renewing a certificate

DigiCert Autoenrollment Server enables you to provide your network computers and end users with certificates issued by DigiCert PKI Platform.

DigiCert Autoenrollment Server needs to be installed on a supported Windows server within a Windows domain. DigiCert Autoenrollment Server includes a domain controller and an Active Directory (AD) server to provide information on policies, certificate templates, and users. The operating system uses the Windows autoenrollment client to automatically request certificates for users of the domain when they log onto the network. The system keeps track of the certificates' validity and requests a renewal when a certificate is about to expire.

See "Supported Windows Operating Systems".

1.4 About the Autoenrollment Process

The Windows autoenrollment client sends a certificate request to the Autoenrollment server. The server verifies the information that is contained in the request against the user's account details. Autoenrollment Server can retrieve information from Active Directory to perform further checks or to enforce restrictions regarding the certificate's content. The Autoenrollment server then submits the request to the DigiCert Certificate Authority (CA) and waits for the request to be processed.

The DigiCert CA processes the request, issues the certificate, and returns it to the Autoenrollment server. The Autoenrollment server then returns it to the client. If configured to do so, the Autoenrollment server also publishes the certificate to the Active Directory.

1.4.1 About Interoperation with Active Directory

Your installation of the Autoenrollment server interacts with your Active Directory server as follows:

- When users log on to the system, the Windows autoenrollment client contacts your Active Directory to see which certificates are required. This applies to new as well as renewal certificates. The information that is contained in the templates identifies the CA that the client must use to obtain the required certificates.
- The client passes the request on to the Autoenrollment server, which validates the information that is contained within the request. The server may correct or add data it obtains from the Active Directory.
- Once the DigiCert CA has issued the certificate, the Autoenrollment server populates the Active Directory with the newly-created certificates.

Figure1-1 illustrates the data flow that is involved with the autoenrollment process.
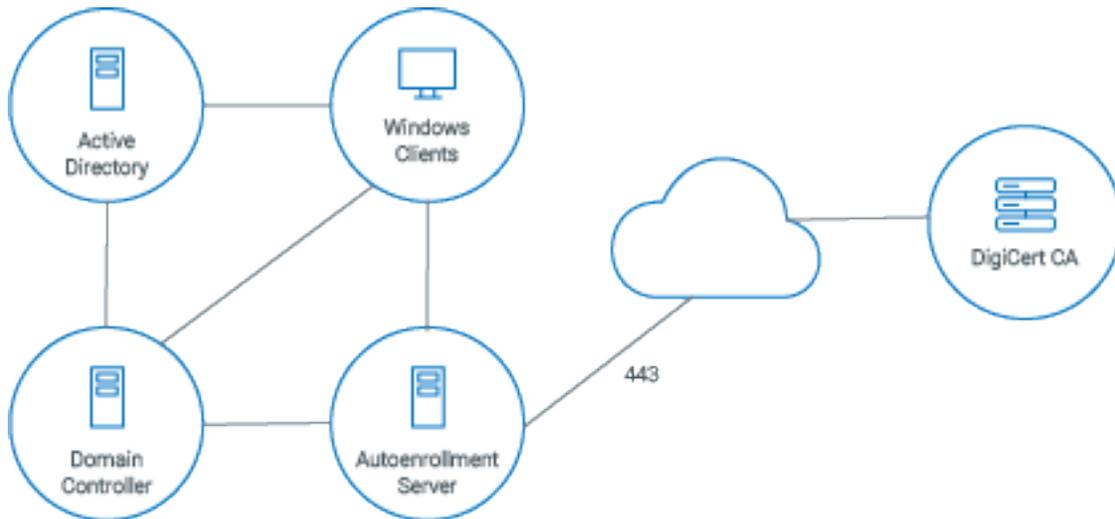
Figure 1-1   Autoenrollment Process

1.4.2 About Renewal of Certificates and Private Keys for Autoenrollment Clients

The process of renewing expiring certificates is nearly identical to the process of requesting a new certificate. The only exception is that the autoenrollment client includes a reference to the certificates that must be renewed. You configure the certificate renewal period in PKI Manager. The Windows autoenrollment client automatically requests renewal of certificates when 80% of the certificate's validity period has expired. Autoenrollment client also requests for renewal when the certificate renewal period has been reached, whichever time frame is smaller.

1.4.3 Autoenrollment Deployments

Figure 1-2 illustrates how the Autoenrollment server is typically deployed. Although this diagram illustrates a single-server deployment, the Autoenrollment server deployment is identical for both the single server and the multiple server deployments.
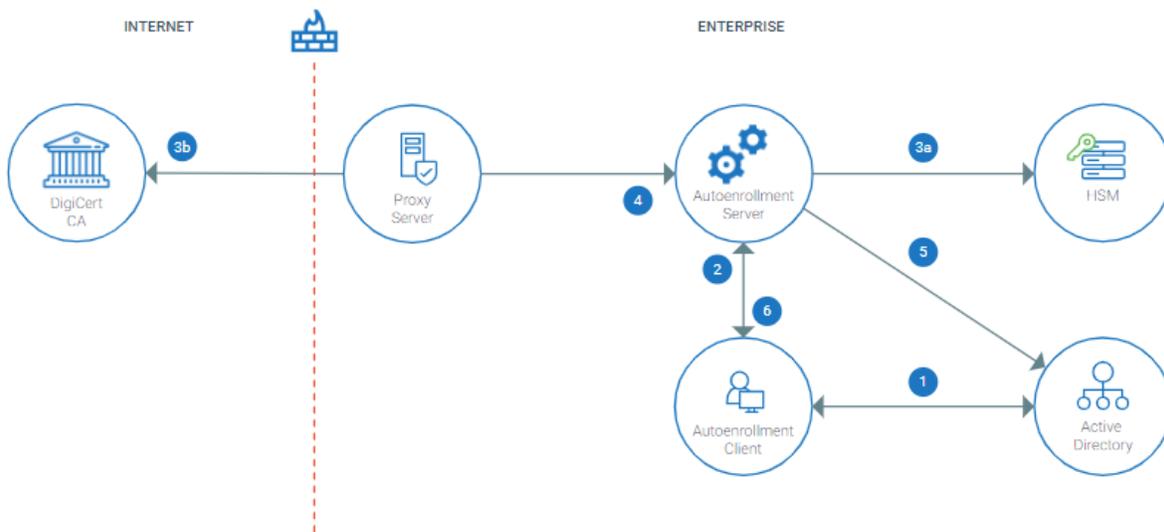
Figure 1-2 Autoenrollment server in an Enterprise deployment

A typical certificate enrollment flow would be as follows:

1. When an end user logs into a computer, the autoenrollment client checks the Active Directory. Or, when a certificate policy is pushed to an end-user computer, the autoenrollment client checks the Active Directory. It then checks the local certificate store to determine the certificate template to which the end user can enroll.
2. Based on this determination, the autoenrollment client requests the Autoenrollment server to initiate an enrollment request for the appropriate certificate type.
3. The Autoenrollment server requests a certificate from the DigiCert CA:

 a) The Autoenrollment uses the RA certificate that is stored on the HSM to secure communications with the DigiCert CA.
 b) The Autoenrollment server sends a Web service call to the DigiCert CA to request the certificate.

4. If the user data and certificate request are correct, the DigiCert CA returns the end-user certificate to the Autoenrollment server.
5. If the Autoenrollment server is configured to do so in the certificate profile, it publishes the certificate to the Active Directory.
6. The Autoenrollment server provides the certificate to the autoenrollment client for installation into the end user's certificate store.

1.5 About Integration with Windows Hello for Business

The Autoenrollment Server has the potential to integrate with Windows Hello® for Business, a feature by Microsoft® starting from Windows 10, and issue certificates from the DigiCert PKI Platform hosted Certificate Authorities.

Refer to https://knowledge.digicert.com/solution/integration-for-windows-hello-for-business.html for more details.

1.6 About support for Enroll On Behalf Of

The Autoenrollment Server now supports EOBO (Enroll On Behalf Of) feature, with v2.21.7 and onwards.

Refer to https://knowledge.digicert.com/generalinformation/digicert-autoenrollment-server-support-for-eobo.html for more details.

CHAPTER 2

2 Prerequisites

This chapter includes the following topics:

- Supported Windows Operating System
- Required Software
- Supported HSMs
- Firewall Settings

2.1 Supported Windows Operating Systems

Table 2-1 lists the versions of Windows operating systems for client and server installations on which the Autoenrollment server can operate.

Table 2-1 Supported Windows Operating Systems

User	Supported Operating Systems
Client	- Windows 10 - Windows 11 - Windows Server 2016 - Windows Server 2019 - Windows Server 2022
Server	- Windows Server 2016 - Windows Server 2019 - Windows Server 2022

2.1.1 About Preparing the Windows Environment

The Autoenrollment server integrates with the Windows operating system. Autoenrollment Server handles the certificate requests that the native Windows autoenrollment client software generates. Autoenrollment Server passes them on to the DigiCert's CA and stores the issued certificates in your domain's Active Directory.

DigiCert recommends that you carefully plan the forest structure of your network. The recommended best practice is to install CAs as a member of the root domain in the forest to provide centralized administration and control of the PKI services.

For additional best practices, see the Microsoft documentation.

Additionally:

- The Autoenrollment server machine must be in a Microsoft Windows domain that runs Active Directory and contains at least one domain controller.
- If you have installed Microsoft Certificate Service, do not install the Autoenrollment server on the same machine.
- If you install your RA certificate as a P12/PFX file (not recommended), you must install OpenSSL.

    See "Obtaining the RA Certificate".

- The user configuring and running processes on the Autoenrollment server machine requires the appropriate permissions to the Active Directory. Typically, the Enterprise Administrator group has the required permissions.

    NOTE: DigiCert recommends that you create a group with these permissions and assign all administrators who need access to the Active Directory to this group (alternatively, this user can be a member of the Enterprise Administrators group). For the purposes of the documentation, this user is called the AE Administrator.

2.1.2 Supported Windows Topologies

Autoenrollment server is supported on the following windows topologies:

- Single Forest with Single Domain
- Single Forest with Multiple Domains
- Multiple Forest with Single Domain in each
- Multiple Forests with Multiple Domains in each

For sample steps followed to create trust between forests in QA environment, refer: KB article.

2.2 Required Software

If the server machine that runs the Autoenrollment installer has access to internet, it will acquire and install them. If not, you need to acquire the following from Microsoft and install them to the server machine before the installation of Autoenrollment installer.

- .NET Framework V4.7.1
- Visual C++ Redistributable for Visual Studio 2015, 2017 and 2019 (x64)

2.3 Supported HSMs

Refer to https://knowledge.digicert.com/tutorials/hsm-configuration.html for details.

2.4 Firewall Settings

See "Adapting the Firewall Settings".

CHAPTER 3

3 Installing the Autoenrollment Server Software

This chapter includes the following topics:

- Install the Autoenrollment Server
- Configuring DCOM Access Rights
- Setting the Autoenrollment Permissions
- Adapting the Firewall Settings
- Setting the Group Policies
- Adding the Certificate Template Snap-In
- Allow Publishing to Active Directory
- Uninstall the Autoenrollment Server

3.1 Install the Autoenrollment Server

To install the Autoenrollment Server, perform the following steps:

1. Access PKI-Manager as administrator, and then click ![icon] at lower-left corner of the window.

2. Click **Autoenrollment Server** and click **Download** installer package (digicert-pki-aes-<version>.zip). The link "DigiCert PKI Enterprise Gateway & Autoenrollment Server Deployment Guides (External Link)" will take you to DigiCert hosted web page where this this guide can be downloaded.
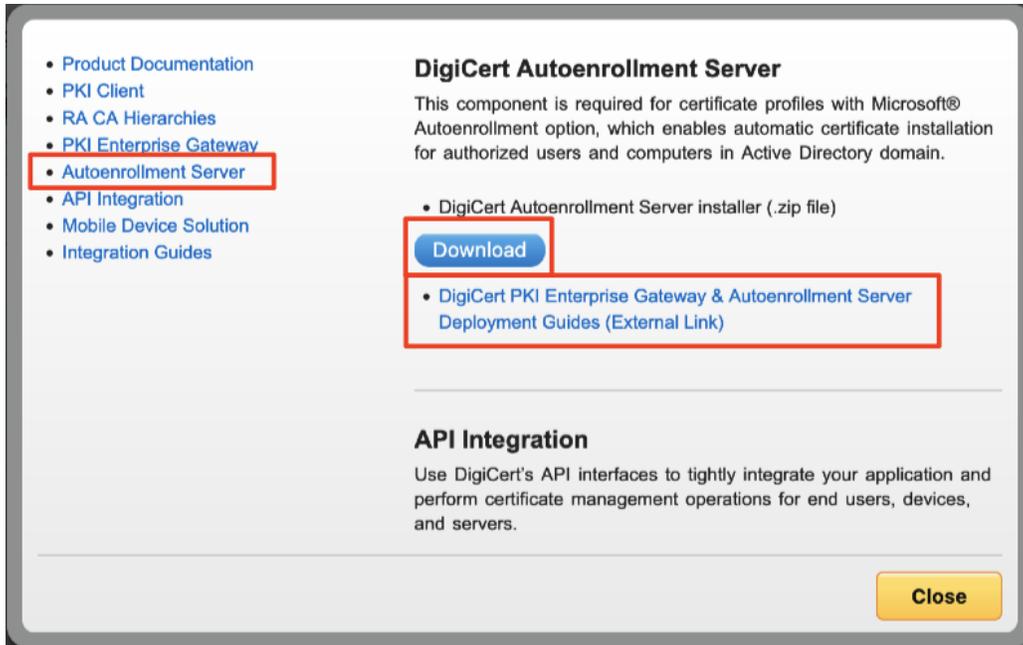
3. Extract the installer package to your preferred destination.
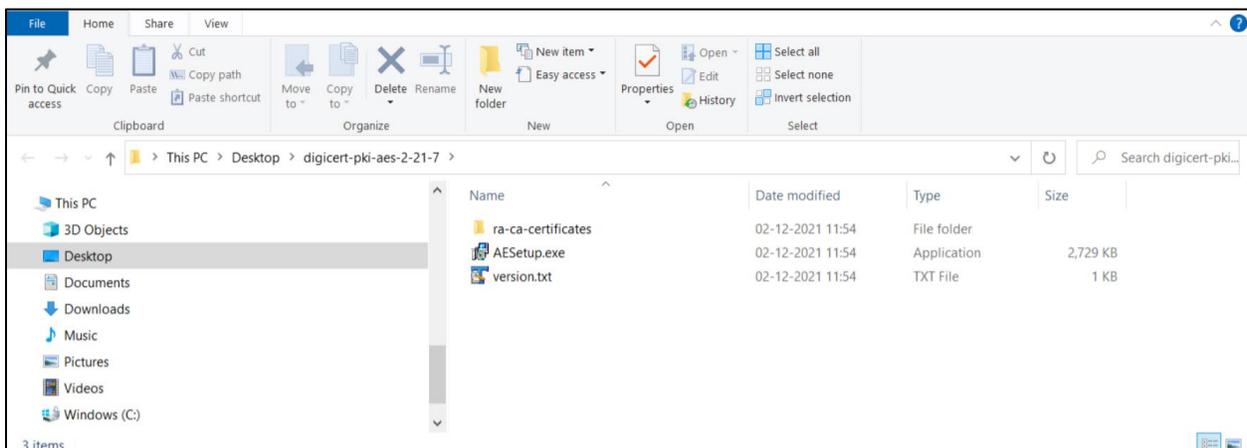
4. Launch "**AESetup.exe**" as administrator (Local Admin), and then click **Install**.
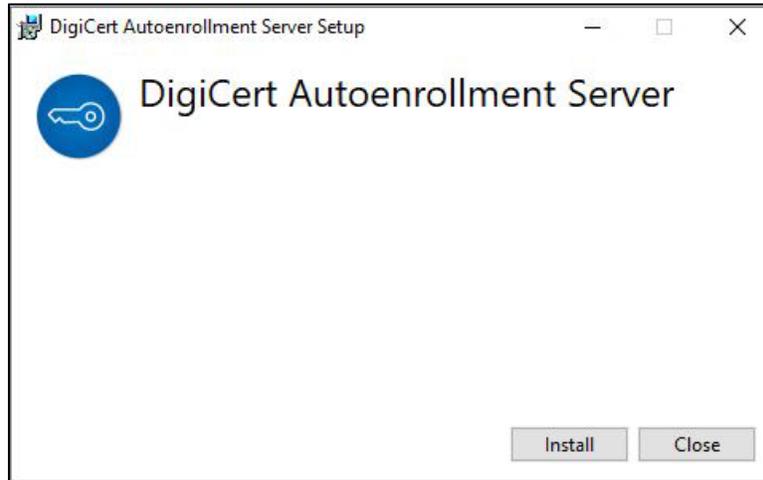
NOTE:

- "Enterprise Admin" is not required during installation.
- If there is no internet access, install the "Required Software" before you launch **AESetup.exe**.

5. Click **Next**.
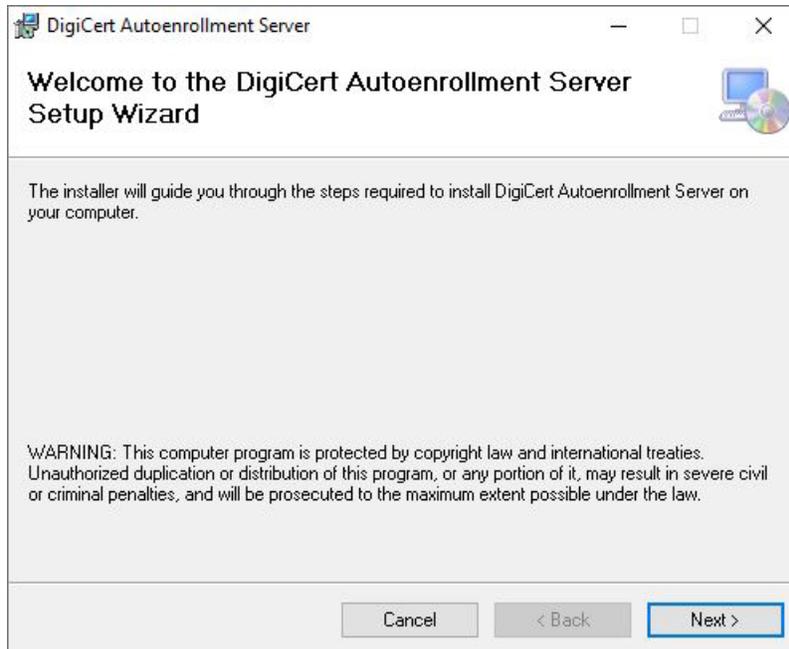
6. Click **Browse** to select the installation folder, and then click **Next**.
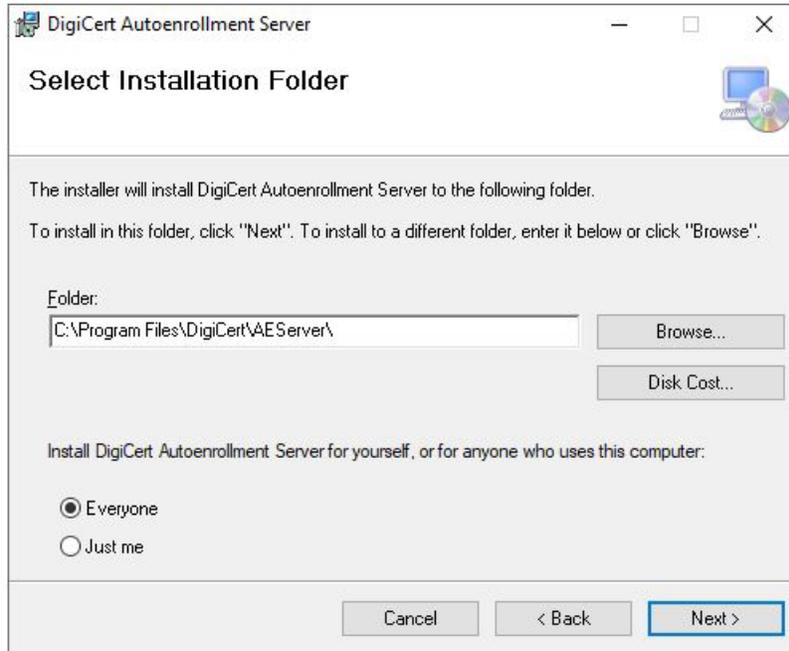
NOTE: The default location of the installer folder is **"C:\Program Files\DigiCert\AEServer\"**.

7. Click **Next**.
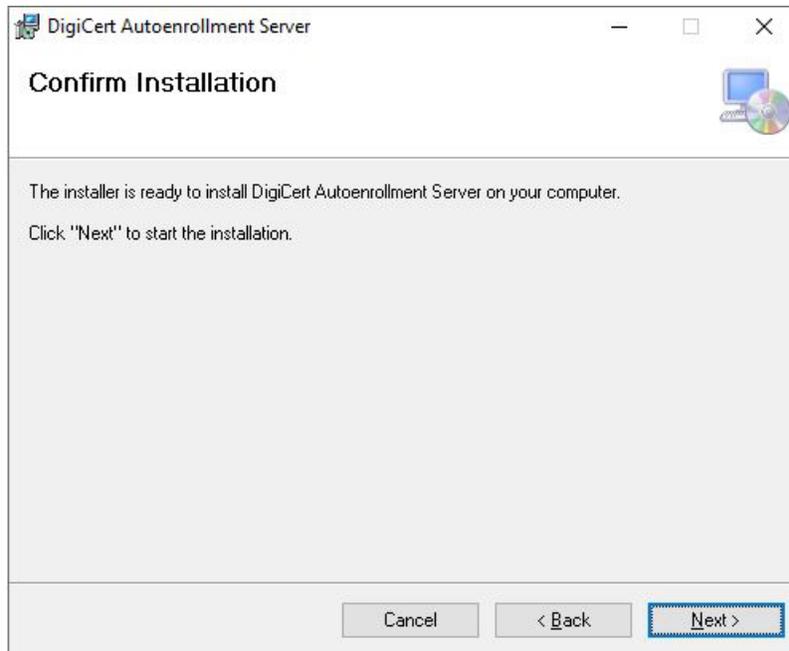
8. Click **I Agree** on the **License Agreement** window, and the click **Next**.
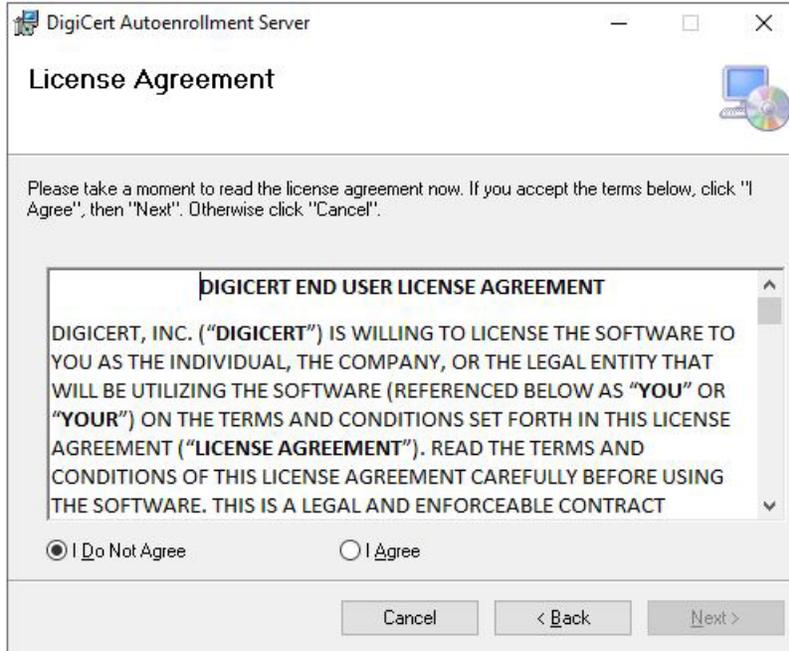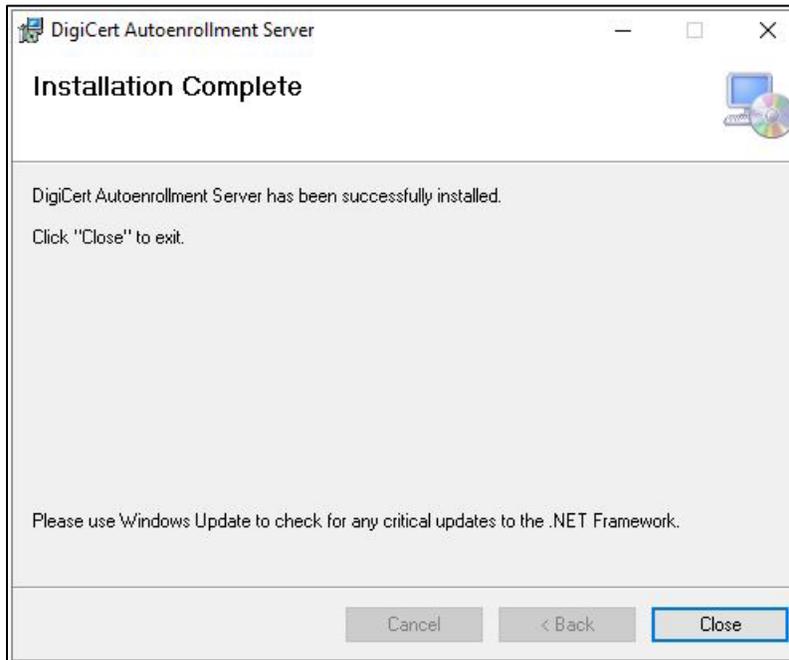
9. Click **Close**.

NOTE: This window will appear only when installation is successfully completed.

10. Click **Close**.
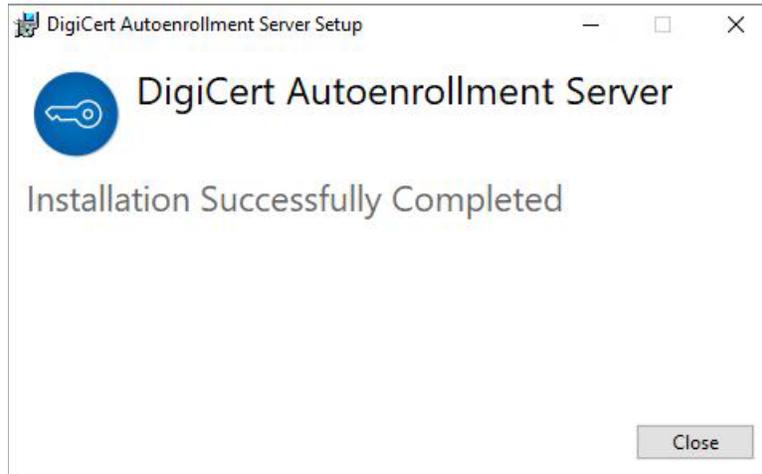
3.2 Configuring DCOM Access Rights

The Autoenrollment server is invoked by using the Distributed Component Object Model (DCOM). It is important to ensure that Microsoft Windows is configured for local DCOM access for system processes and accounts with administrative privileges.

On the **My Computer > Default Properties** tab, select the **Enable Distributed COM** check box. Then, use certutil to ping "config", and autoenrollment works fine. If you do not enable DCOM, then autoenrollment fails with the error "RPC server unavailable."

The usage of certutil command is as follows:

- To find the value of the config attribute, run the following command:

  C:> certutil -dump
  The command will list name-value pairs including "config". For example,
  `'SERVER\my ca'`. You must ignore the single quotes while copying the value.

- In the config file, enter the name-value pair value within double quotes if there are any spaces:

  C:> certutil -ping -config "SERVER\my ca"
  For example, the output will be displayed as follows:
  ```
  Connecting to SERVER\my ca Server "<serverName>" ICertRequest2 interface is
  alive CertUtil: -ping command completed successfully
  ```

If you want to use the autoenrollment services, you need to configure the system to allow global DCOM object access. You must also allow remote DCOM access to use the Autoenrollment server across multiple machines.

To Configure DCOM access rights as the domain administrator on the machine on which the Autoenrollment server is installed

1. In the **Administrative Tool > Component Services**, click **Component Services** in the left pane, and expand the tree view to the left of **Computers**.
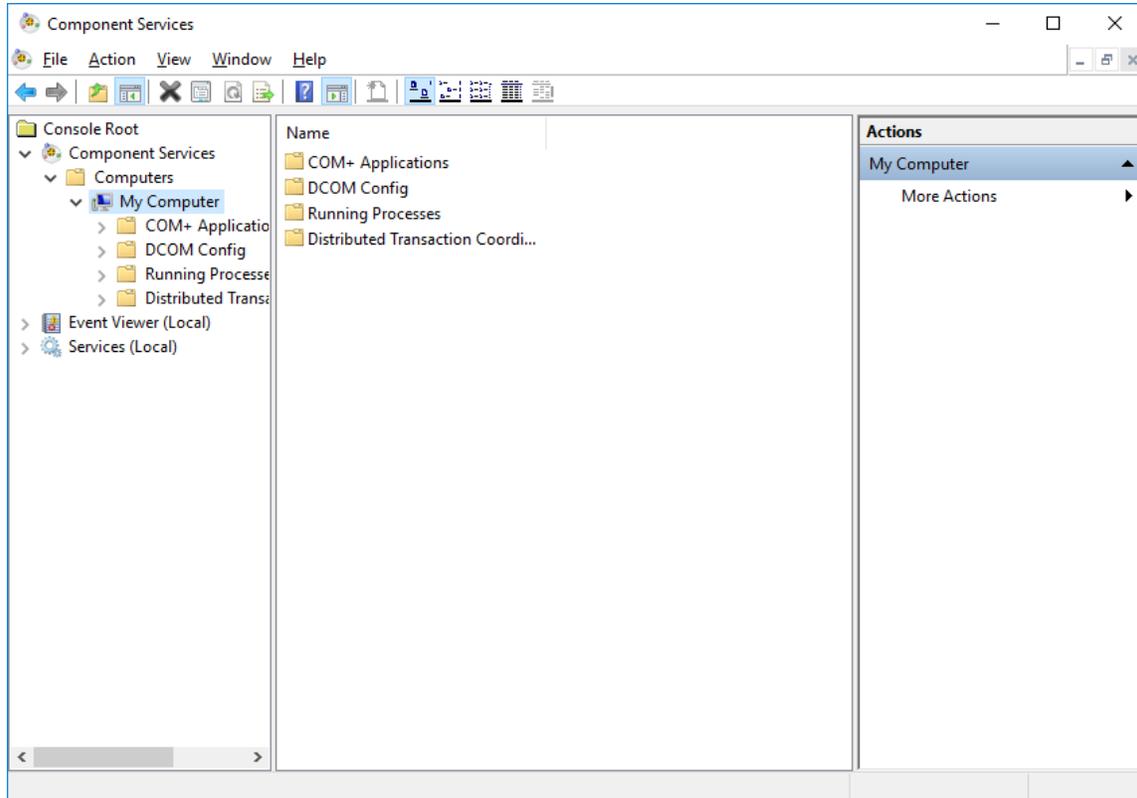
2. Right-click **My Computer** and select **Properties**.
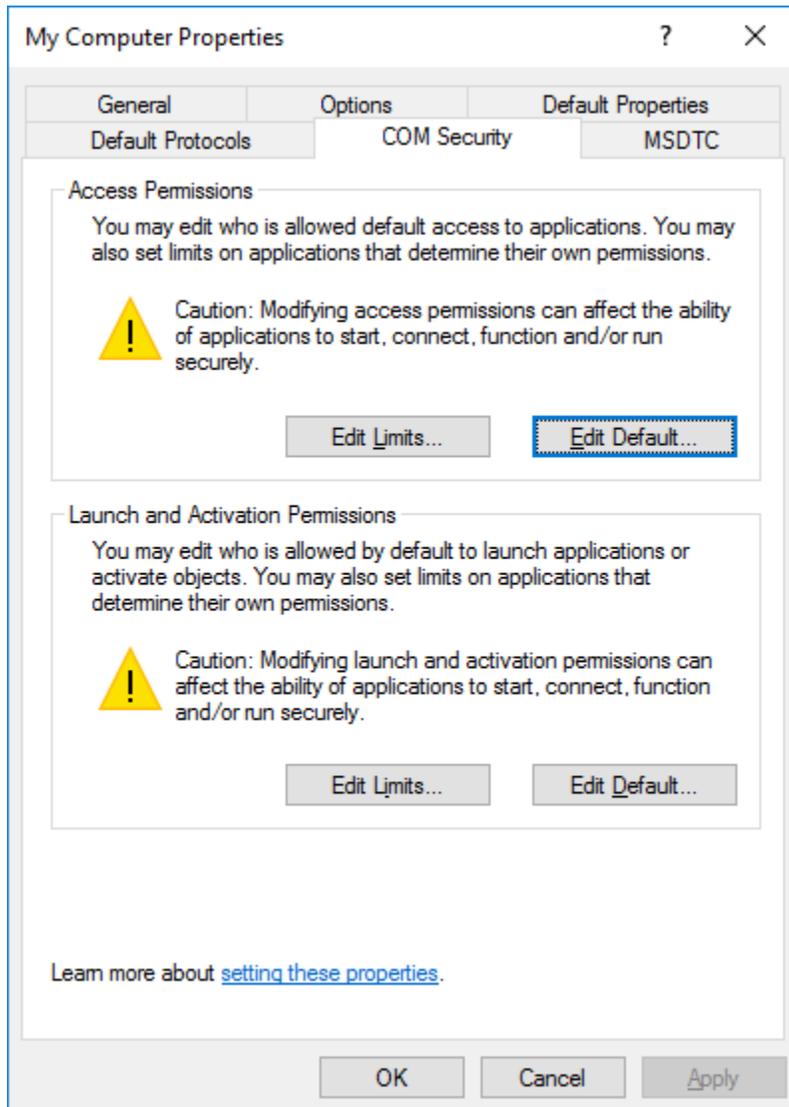
3. Select the **COM Security** tab.
4. Modify the access permissions:

- In the **Access Permissions** dialog, click **Edit Limits**.
- Set **Configure Domain Computers: Allow Local and Remote Access**.
- Set **Configure Domain Controllers: Allow Local and Remote Access**.
- Set **Configure Domain Users: Allow Local and Remote Access**.

If the groups for which you want to configure access permissions are not listed, you must add them (click **Add** and enter the group names). If you are not able to add the desired groups, you may need to add the object type by clicking **Object Types**.
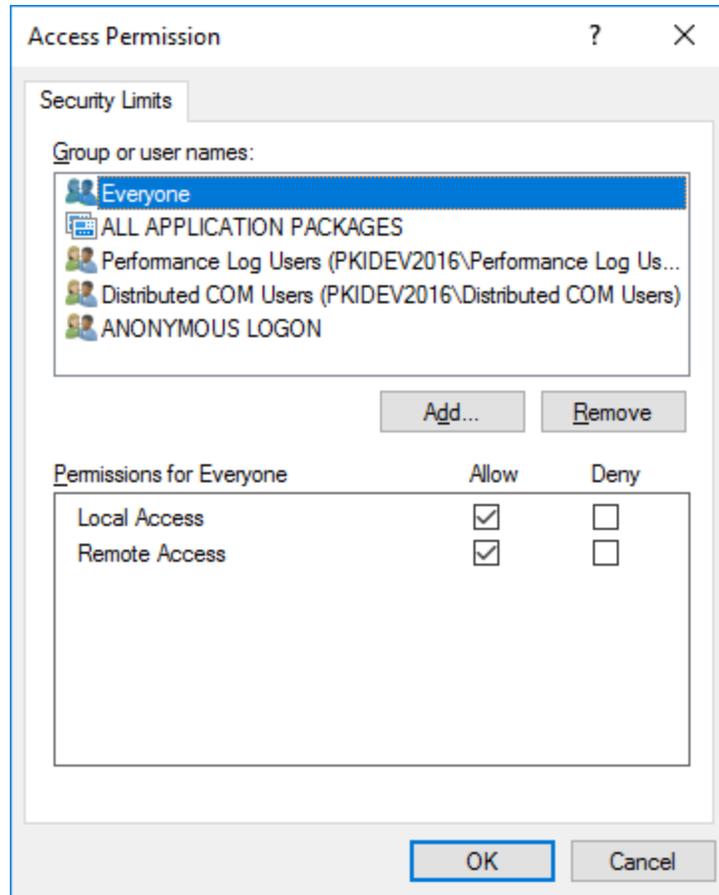
5. Perform the following steps to adjust the launch and the activation permissions:

- Click **Edit Limits** under the **Launch and Activation Permissions** group.
- Set **Configure Domain Computers: Activate Local Activation and Remote Activation**, and clear the **Local Launch and Remote Launch** check box.
- Set **Configure Domain Controllers: Activate Local Activation and Remote Activation**, and clear the **Local Launch and Remote Launch** check box.
- Set **Configure Domain Users: Activate Local Activation and Remote Activation**, and clear the **Local Launch and Remote Launch** check box.

NOTE: You can add Active Directory users or groups that are authorized for configuring client certificate profile. Once added, assign them appropriate permissions similar to Domain Computers.

3.3 Setting the Autoenrollment Permissions

You need to set the permissions to allow the Autoenrollment server to perform autoenrollment

NOTE: Any time that you update or reinstall the Autoenrollment server, you must re-apply the changes as described in this section.

To set autoenrollment permissions as the domain administrator,

1. Click **Start > Administrative Tools > Component services** and navigate to **DCOM Config**.
2. In the right pane, right-click **AutoEnrollmentDCOMSrv**. Select **Properties**.
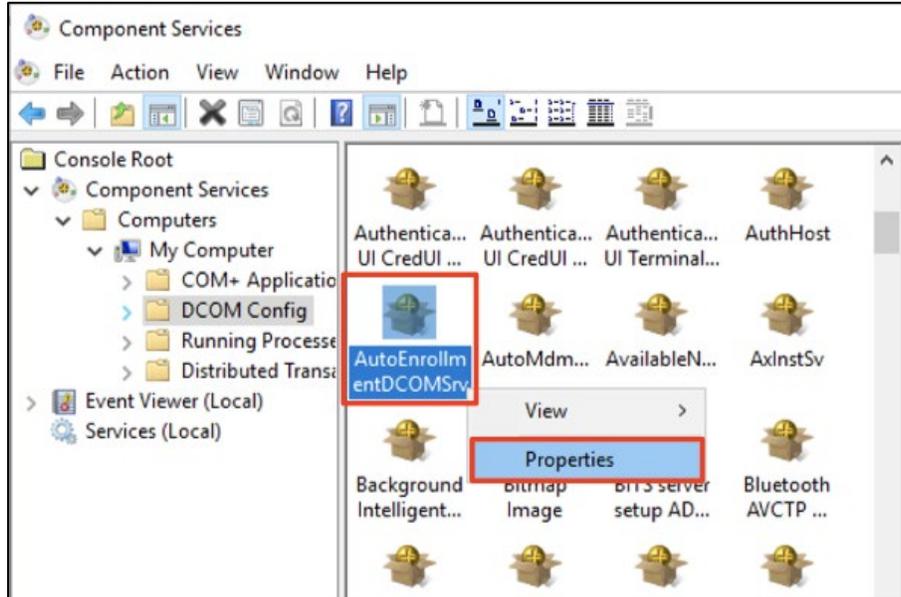
3. Select the **Security** tab.
4. Under **Launch and Activation Permissions**, select **Customize** and click **Edit**.
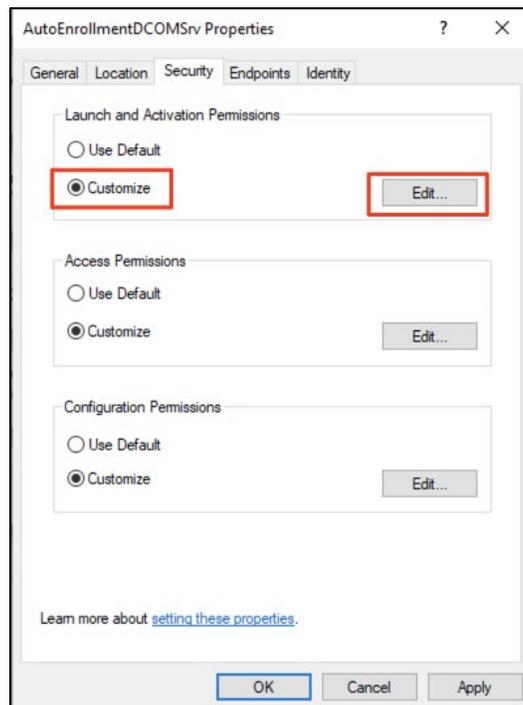
5. Select the **Local Activation** and **Remote Activation** check box and clear the **Local Launch** and **Remote Launch** check box for each group of users and computers that you want to be able to enroll for certificates.
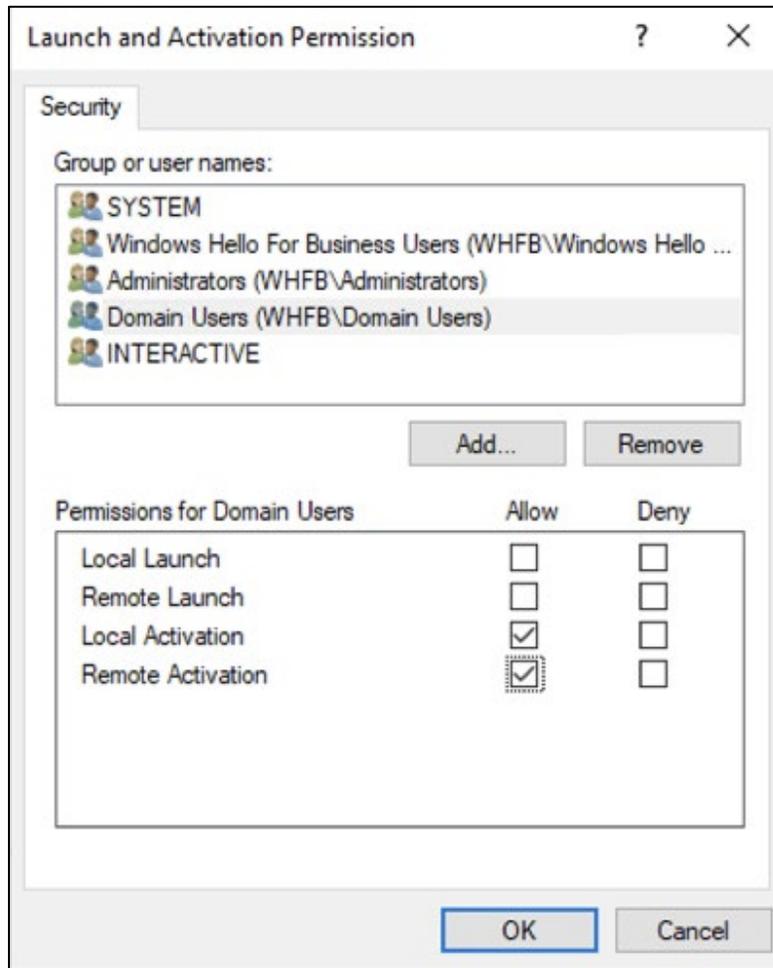
If the groups for which you want to configure launch and access permissions are not listed, you must add them (click **Add** and enter the group names).
If you have no special security requirements, you may want to grant local and remote activation to the group **Everyone** and remove the other trustees from the list.

6. Under **Access Permissions**, select **Customize** and click **Edit**.
7. Check **Local Access** and **Remote Access** for each group of users and computers that you want to enroll for certificates.
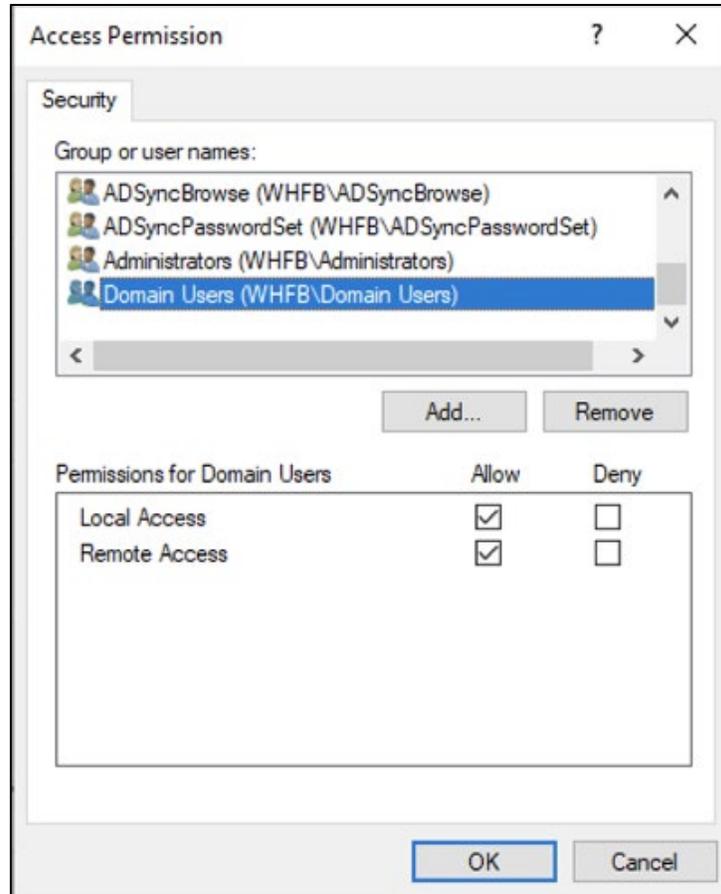
If the desired groups are not listed, click **Add** and supply their names in the dialog box. If you have no special security requirements, you may want to grant local and remote access to the group **Everyone** and remove the other trustees from the list.

8. Click **OK** to close the dialog and apply the changes.

3.4 Adapting the Firewall Settings

To enable an exception on the firewall of the computer on which the Autoenrollment server runs

1. Open **Start > Control Panel > System and Security > Windows Firewall**.
2. Select **Allow a program or feature through Windows Firewall**.
3. Select **Allow another program**.
4. Click **Browse**.
5. Navigate to the directory where you installed the Autoenrollment server and select the `AutoEnrollmentDCOMSrv.exe` file.
6. Click **Add**.

3.5 Setting the Group Policies

In addition to assigning groups access to templates, you must set autoenrollment permissions for the groups to which your users and computers belong. For example, you must configure the permission settings for the respective domain or user group to enable the autoenrollment mechanism for its members.

To set up group policies as the domain administrator on the domain controller,

1. Click **Start > Administrative Tools > Group Policy Management** and navigate to the relevant Group Policy Object (GPO). Right-click the object and select **Edit**.
2. Access the relevant GPO settings by double-clicking **Certificate Services Client - Auto-Enrollment** under **User Configuration > Policies > Windows Settings > Security Settings > Public Key Policies**.
3. You must configure the following options to enable certificate management and publishing in Active Directory:

   - Enable **Configuration Model**.
   - Select **Renew expired certificates, update pending certificates, and remove revoked certificates**.
   - Select **Update certificates that use certificate templates**.

Repeat these steps for any additional site, domain, or OU object for which you want to enable autoenrollment.

Repeat this procedure under **Computer Configuration > Policies > Windows Settings > Security Settings > Public Key Policies** if you plan to autoenroll Computer certificates, such as domain controller certificates.

NOTE: GPOs are valid within a single domain. If you have set up a forest domain structure you need to copy the GPO to every domain controller to which the GPO should apply.

3.6 Adding the Certificate Template Snap-In

You must install the Certificate Template Snap-In for mmc to edit certificate template permissions.

To add the certificate template snap-on as a domain administrator

1. Select **Start > Administrative Tools > Server Manager**, right click **Server Manager** and choose **Add Features**.
2. Open **Remote Server Administration Tools > Role Administration Tools > Active Directory Certificate Services Tools** and select **Certification Authority Tools**.
3. Click **Next**, and then click **Install**.

3.7 Allow Publishing to Active Directory

The computer that runs the Autoenrollment server must be a member of the Active Directory group Cert Publishers for all domains, including the root domain. This allows the computer to publish newly issued certificates to the Active Directory.

To make the server's computer a member of the Cert Publishers group on the machines which have the AD Domain Services role enabled

1. Log on as the AE Administrator or as another user who is a member of the Enterprise Administrator group.
2. Select **Administrative Tools > Active Directory Users and Computers**.
3. Expand the tree view on the left to display your domain and click **Users**.
4. Double-click the **Cert Publishers** group in the right panel and select the **Members** tab.
5. Click **Add** and add the computer running the server.

    You may have to add **Computers** to the **Object Types** to search for the computer's name.

Repeat these steps for the Cert Publishers group of every domain in your forest, including the root domain. For the new group membership to take effect,
`run gpupdate /force` from the machine where the Autoenrollment server is installed.

3.8 Uninstall the Autoenrollment Server

To uninstall the Autoenrollment Server, perform the following steps:

1. Go to **Control Panel > Program and Features**.

   Right-click **Autoenrollment Server**, and then click **Uninstall**.
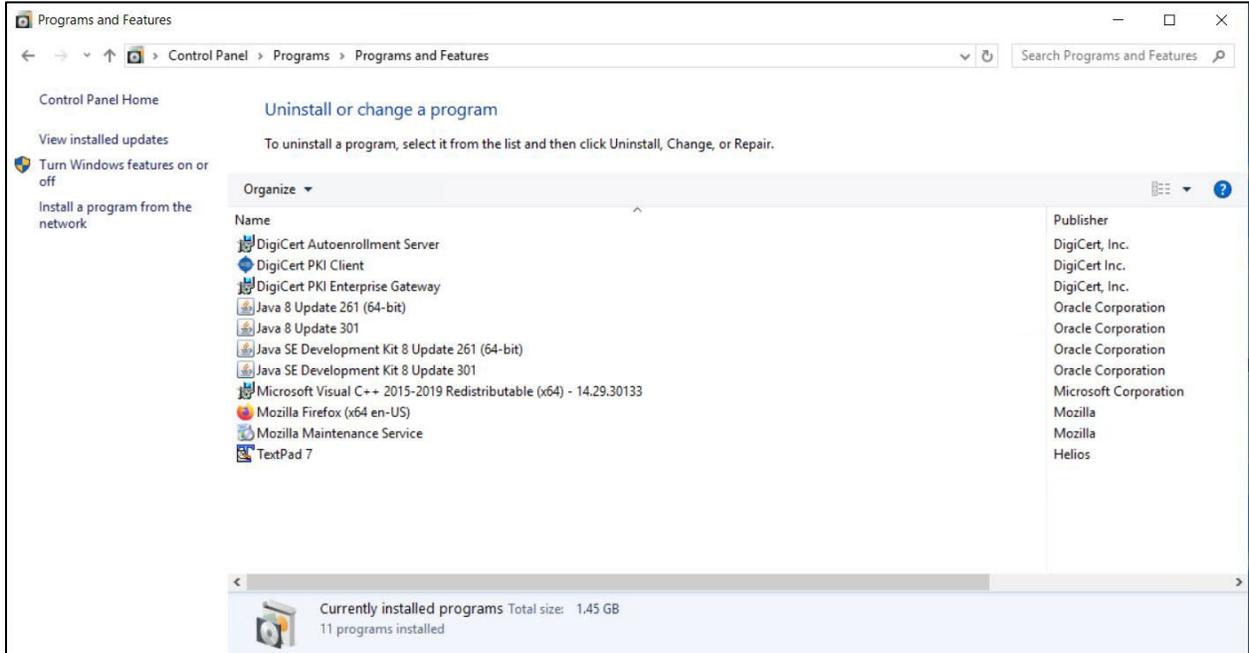
2. Click **Uninstall**.
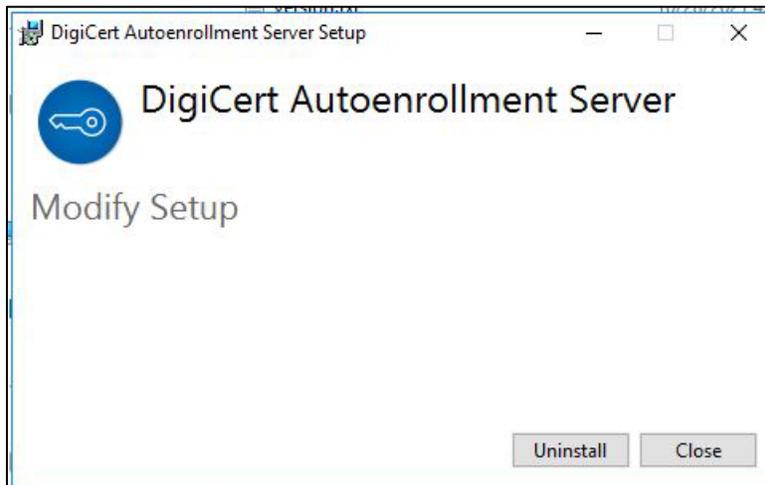
NOTE: If other users are logged on to this computer. Click **Continue** if you want to enforce the uninstallation.
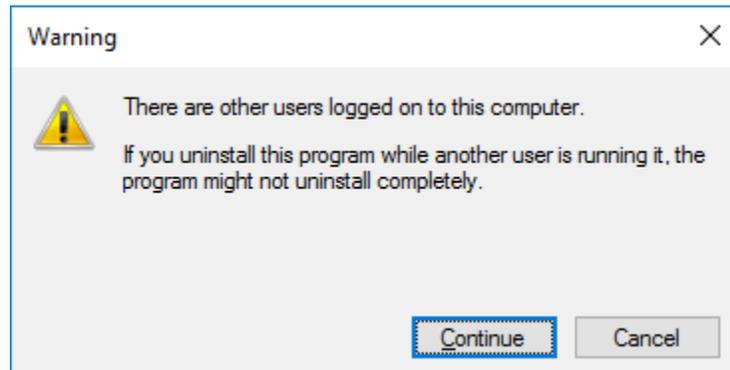
3. Click **Close**.
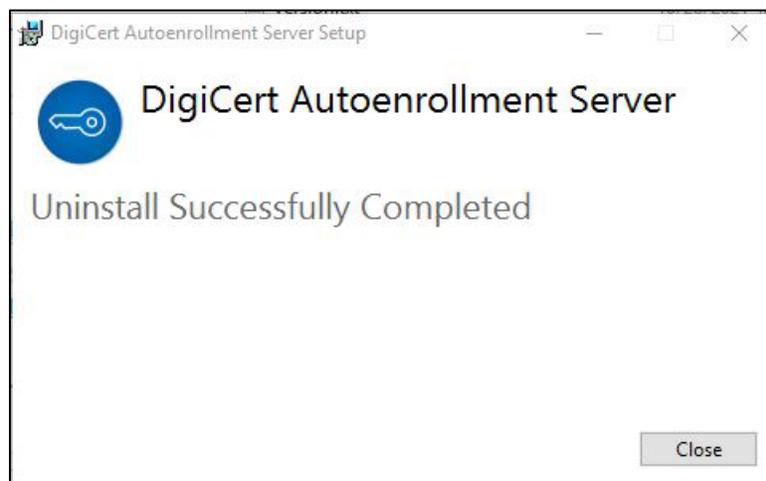
CHAPTER 4

4 Configuring the Autoenrollment Server

This chapter includes the following topics:

- About the Configuration of the Autoenrollment Server
- Obtaining the RA Certificate
- Setting the Autoenrollment Configuration Utility
- Log Properties Configuration Options
- Creating Autoenrollment Certificate Profile
- Importing the Autoenrollment Configuration File

4.1 About the Configuration of the Autoenrollment Server

After you install the software and setting up autoenrollment permissions, you need to configure the DigiCert Autoenrollment Server for your enterprise. This chapter guides you through the following steps to configure your new Autoenrollment server.

- Obtaining the RA certificate
- Setting the configuration utility
- Importing the autoenrollment configuration file

4.2 Obtaining the RA Certificate

You need a Registration Authority (RA) certificate to secure communications and identify yourself to the DigiCert Certificate Authority. The RA certificate you obtain for PKI Enterprise Gateway is also valid for autoenrollment. You do not need to obtain a separate RA certificate.

You have the option of storing your RA certificate in a software key store or on a hardware security module (HSM). The method that you choose in storing your RA certificate has implications on how you obtain your RA certificate.

NOTE: DigiCert recommends the use of a hardware security module to ensure the security of the RA certificate and its corresponding private key. You must secure your RA certificate and private key. Anyone who has access to the RA certificate and private key can act on your organization's behalf.

- You may want to familiarize yourself with procedures that describe how to obtain and install an RA certificate if you store your RA certificate on an HSM.

  See "Obtaining an RA Certificate to Store in an HSM".

- You may want to familiarize yourself with procedures on how to obtain an RA certificate if you store your RA certificate as a software P12 or PFX file.

  See "Obtaining an RA Certificate as a Software File".

4.2.1 Obtaining an RA Certificate to Store in an HSM

Refer to https://knowledge.digicert.com/tutorials/hsm-configuration.html for details.

The root and issuing CAs for the RA certificate can be found in the web page at https://knowledge.digicert.com/solution/ca-hierarchies-for-production-and-test-drive-ra-certificates.html. You must import these CAs as trusted root CAs into the Microsoft Certificate Store. This ensures that the RA certificate that you install is correctly trusted.

1. On the machine on which you installed the Autoenrollment server, generate a CSR in `.pem` format:

   - Create a text file named `newRAreq-csp.inf` that contains the following information.

     ```
     [NewRequest]
     KeyUsageProperty = "NCRYPT_ALLOW_ALL_USAGES"
     Providertype = 1
     RequestType = PKCS10
     ProviderName = <PROVIDER-NAME>
     Subject = "C=DE,O=Your Org, CN=Registration Authority"
     KeyContainer = "racertificate-1"
     MachineKeySet = true
     HashAlgorithm = sha256
     KeyAlgorithm = RSA
     KeyLength = 2048
     ```

     If the `<PROVIDER-NAME>` is not clear, refer to https://knowledge.digicert.com/tutorials/hsm-configuration.html.

   - Generate a PKSC10 request using the command:

     ```
     certreq -new newRAreq-csp.inf ra-request.req
     ```

2. Copy the created CSR file (`ra-request.req`) to the machine that has access to the PKI Manager. Get an RA certificate from PKI Manager using this CSR file. In PKI Manager, click the **Tasks** icon and select **Get an RA certificate**.
3. Import the new certificate into your local machine's CSP. To do this:

   - Open mmc and click on **Certificates (Local Computer) > Personal > Certificates**.
   - Right click on **Certificates** and select **All Tasks > Import**.
   - Browse for the `.p7b` certificate file downloaded from PKI Manager.
   - Complete the import.

4. Make sure that the RA certificate appears in the Certificates list, and then double click the certificate and make sure that the following message appears:

```
You have a private key that corresponds to this certificate
```

Importing CAs as trusted root CAs

Copy the root and issuing CAs for the RA certificate from https://knowledge.digicert.com/solution/ca-hierarchies-for-production-and-test-drive-ra-certificates.html to a directory on the local machine.

1. Open Microsoft Management Console (mmc) and add the Certificates snap-in for the local computer. To do this select **Add Snap in for Certificates**, select **Computer Account**, and click **OK**.
2. Click **Certificates > Local Computer > Trusted Root Certification Authorities > Certificates**.
3. Click **All Tasks > Import**.
4. Select the root CA you copied to your local machine at the beginning of this step and click **OK**.
5. Click **Certificates > Local Computer > Trusted Intermediate Certification Authorities > Certificates**.
6. Click **All Tasks > Import**.
7. Select the issuing CA you copied to your local machine at the beginning of this step and click **OK**.

Continue to Step 2 of "To obtain an RA Certificate to store in an HSM".

NOTE: The RA hierarchy will be updated in the Knowledge Base article at https://knowledge.digicert.com/solution/ca-hierarchies-for-production-and-test-drive-ra-certificates.html when RA hierarchy gets updated. Make sure you download and import the latest chain for your RA certificate.

4.2.2 Obtaining an RA Certificate as a Software File

If you store your RA certificate in a software P12 or PFX file, you must generate and convert your RA certificate. You will need to install OpenSSL.

To obtain an RA certificate as a software file

1. On the machine on which you installed the Autoenrollment server, run the following command to generate a CSR.

   ```
   openssl req -out ra-request.req -new -newkey rsa:2048 -nodes -keyout ra-request.key
   ```

2. Copy the created CSR file (`ra-request.req`) to a machine that has access to the PKI Manager
3. Get an RA certificate from PKI Manager using this CSR file. In PKI Manager, click the **Tasks** icon and select **Get an RA certificate**.
4. Download the PKCS7 file from PKI Manager and save it to the directory where you created the CSR as listed in Step 2.
5. Convert the PKCS7 received from PKI Manager:

   ```
   openssl pkcs7 -print_certs -in <certificate downloaded from PKI Manager> -out RAcertificate.pem
   ```

6. Run the following commands from the directory where you created the CSR as listed in "To obtain an RA Certificate to store in an HSM".

   ```
   openssl pkcs12 -export -out myRA.pfx -inkey < Private Key File Name> -in RAcertificate.pem -passout pass:password
   ```

   These commands output your RA certificate to the file myRA.pfx. You need this file and password when you set the RA certificate in the Autoenrollment Config utility. See "Setting the Autoenrollment Configuration Utility".

4.3 Setting the Autoenrollment Configuration Utility

Use the Autoenrollment Config utility to set the Autoenrollment server configuration values. You must have administrator rights to use this utility to write data to Active Directory.

The Autoenrollment server runs as a Windows service. You must set the configuration settings in the utility before you start the Autoenrollment service.

To set the Autoenrollment Configuration utility

1. Log on to the computer as AE Administrator or as another user who is a member of the Enterprise Administrators group.

   You need write access to `CN=Public Key`

`Services,CN=Services,CN=Configuration` in the Configuration partition of Active Directory.

2. Access the machine on which you have installed the Autoenrollment Server.
3. On the **Start** menu, click **All Programs > DigiCert > AutoEnrollmentServer > Autoenrollment Configuration**.
    (AutoEnrollmentServer directory will only appear in classic Start Menu).

4. Complete or review the following settings:

- Select the **DigiCert PKI Platform 8** radio button in the **CA Platform**
- **Credential** Section:
  - Click **Store…** to set the RA certificate and select your RA certificate from the drop-down list. For HSMs, leave the PIN field empty. Optionally, Click **File…** to use the software certificates that are stored as a P12 or as a PFX file. This is for test or demonstration purposes and is not recommended for production systems.
  - The validity of the RA certificate is displayed. You can also check the RA certificate by clicking **View**.
- **Endpoint** Section:
  - Populate **Server Name** and **Server Port** with the URL and the port number of the DigiCert PKI Platform 8 web service, Enter Server Name = *pki-ws.symauth.com* and Server Port=*443*
  - If Autoenrollment Server is communicating with DigiCert PKI Platform 8 via a proxy server, populate the **Proxy Server** (including the proxy server port, in **<server:port>** format), **Proxy Username**, and **Proxy Password** fields with your proxy server details.
- **Configuration** Section:
  - Populate the **Config File** location (see Import the autoenrollment configuration file).
  - Verify the location and contents of the Log Properties file.
    This file defines the logging configuration such as log file path and log level. The default is specified as **logger.properties** in the installation directory of Autoenrollment Server. Click Browse to choose a different log properties file. Click **View** to check and modify the log properties file contents. Refer to section "Log Properties Configuration Options" for details about the configuration.

5. Once all the configuration details have been populated, the Autoenrollment Server's connection to DigiCert CA can be tested using the **Test** button next to **Connection**. The connection test will result in one of the following message dialogs:

- If Autoenrollment Server establishes a connection, "Success: The connection could be established" is displayed.
- If connection fails, "Failure: The connection could not be established" is displayed. For any configuration errors, refer to the log file located at **C:\User\<AE Administrator>\AEConfig.log**

6. Click **OK** to save the configuration settings and exit the configuration utility.

Do not start the service until after you import the autoenrollment configuration file from PKI Manager.

See "Importing the Autoenrollment Configuration File".

4.3.1 Additional Configuration Utility Options

You can perform the following additional operations with the Autoenrollment Config utility:

- **Service state** indicates whether the Autoenrollment service is currently running or not. You must manually start the service after initial configuration.
- **Start/Stop Service** allows you to start or stop the Autoenrollment service. You must restart the Autoenrollment service whenever you make changes to the configuration settings using this utility.
- **Pending Requests in Queue**: This indicates the number of pending certificate requests. Click Refresh to update the number.
- **Cancel** enables you to exit the utility without saving the configuration.

4.4 Log Properties Configuration Options

This section includes information about configuring the log properties file. You can skip this section if there is no need to change the logging configuration.

The log properties file is specified using the Autoenrollment Configuration utility **Log Properties** setting. Following shows the contents of the default properties file:

```
# A line starting with # is a comment and ignored.
# Define with log-level (DEBUG, INFO, WARN, or ERROR) and appender name
log4cpp.rootCategory=INFO, DAILY
# Configured appender type
log4cpp.appender.DAILY=DailyRollingFileAppender
# File name and path
# AE Server requires write permission, and directory must exist
log4cpp.appender.DAILY.fileName=C:\Program
Files\DigiCert\AEServer\logs\AEServer.log
# Max days to keep the old log files
log4cpp.appender.DAILY.maxDaysKeep=30
# Output pattern (see http://log4cpp.sourceforge.net/#faq for format details)
log4cpp.appender.DAILY.layout=PatternLayout
log4cpp.appender.DAILY.layout.ConversionPattern=%d{%Y-%m-%d %H:%M:%S} %-5p [%t]
%m%n
```

Table 4-4 shows the details about each property.

Table 4-4 Log Property Details

Property Key	Description

log4cpp.rootCategory	Specifies log level and name to use for the configuration.
	
	The value is in following format:
	
	`<log_level>, <logger_name>`
	• **log_level** describes the logging level.
	
	    o This can be set to **DEBUG**, **INFO**, **WARN**, or **ERROR**, with **DEBUG** log level being the most verbose.
	
	    o Setting the level to **DEBUG** will increase the amount of log output significantly, so should be careful when using this in production environment.
	
	• **logger_name** describes the name of the configuration, which is also used in other property keys. This can be any value, but **DAILY** is used as default.

log4cpp.appender.<logger_name>	Specifies the type of log appender. Currently `DailyRollingFileAppender` and `SyslogAppender` are supported. Using `DailyRollingFileAppender` appender will allow the log file to rotate daily at 0 AM (local time) every day, creating a log file with name **<log_filename>.yyyy-MM-dd**. **Note**: Log file rotation occurs only when there is new log entry after 0 AM. Using `SyslogAppender` appender will allow the Autoenrollment server to dump log messages to the configured syslog server. See "Configuring Autoenrollment Server for Syslog" for more details about this appender.
log4cpp.appender.<logger_name>.fileName	Specifies the log file name with path. Default location will be `<installation directory>\AEServer.log`. This will change

Property Key	Description
	depending on where Autoenrollment Server was installed. **Notes**: • The log file directory must exist. • Autoenrollment service requires write permission for the file.
log4cpp.appender.<logger_name>.maxDaysKeep	Specifies the days to keep for the log files. The log entries exceeding the max days will be deleted from the file system.
log4cpp.appender.<logger_name>.layout	Specifies the log layout class. Currently only `PatternLayout` is supported.
log4cpp.appender.<logger_name>.ConversionPattern	Specifies the output format of the logs. See http://log4cpp.sourceforge.net/#faq for details about possible format characters for the custom log messages. The default log format is set as **"<Date{yyyy-mm-dd}> <Time{hh:mm:ss}> <LogLevel> [<TheadID>] <LogMessage>"**. Example below: `2021-09-22 04:15:28 INFO [6176] Using CA backend at pki-ws.symauth.com:443`

Notes:

- Any modifications in the file contents will only become effective after restarting the Autoenrollment service.
- Line starting with # is ignored.

4.5 Creating Autoenrollment Certificate Profile

Once you have configured the RA certificate and prepared the configuration utility you will need to create a certificate profile in the PKI Manager.

To create a certificate profile:

1. Login to PKI-Manager with your administrator certificate. The administrator needs **Certificate profile manager** role and at least **Manage profiles** permission to create certificate profiles.

2. Go to **Manage certificate profiles** page and click **Add certificate profiles** at the top menu.
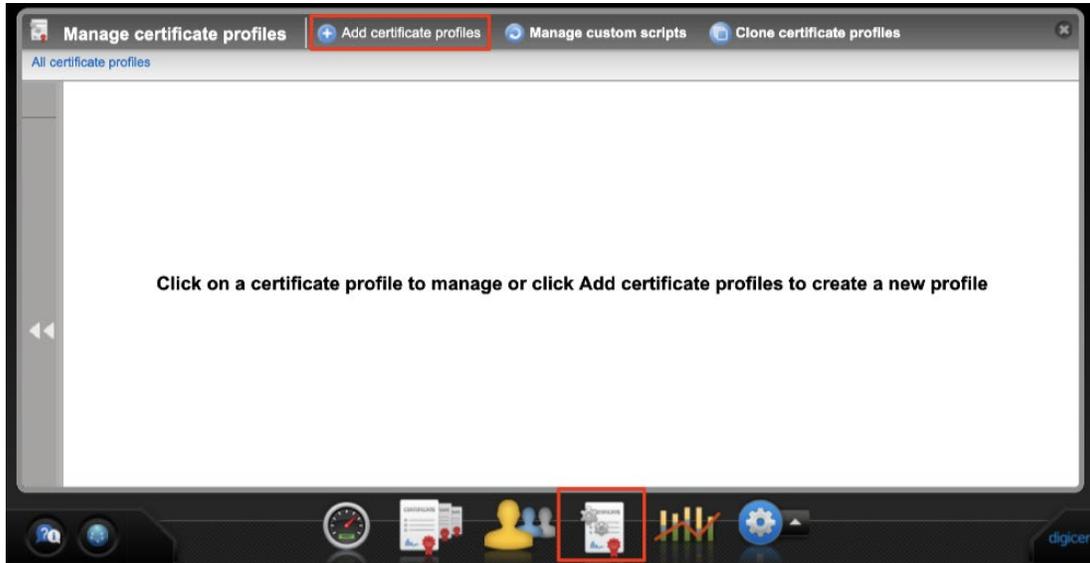
3. Select mode radio button and click **Continue**.

a) Test mode - Mode for testing purpose
b) Production mode - Mode for daily usage

4. Select **Certificate template** from the list and click **Continue**. Example shows selecting **Client Authentication** certificate.

NOTE: For full list of available certificate profile templates, see document "*DigiCert® PKI Platform Overview*" section "*2.5.1 Available Certificate Profile Templates*". This document is downloadable from Resources section in the lower left corner of PKI Manager.

5. In the **Customize certificate options** page, enter **Certificate friendly name**. Also, make sure to select **Microsoft® Autoenrollment** for **Enrollment method**. For **Authentication method**, only **Active Directory** is allowed for Autoenrollment profile, so it is locked.

6. Selecting **Yes** for **Publish to company directory** will publish the issued certificates into your Active Directory.

Screenshot below shows published certificate for Administrator using **Advanced** property in **Active Directory Users and Computers** Tool.
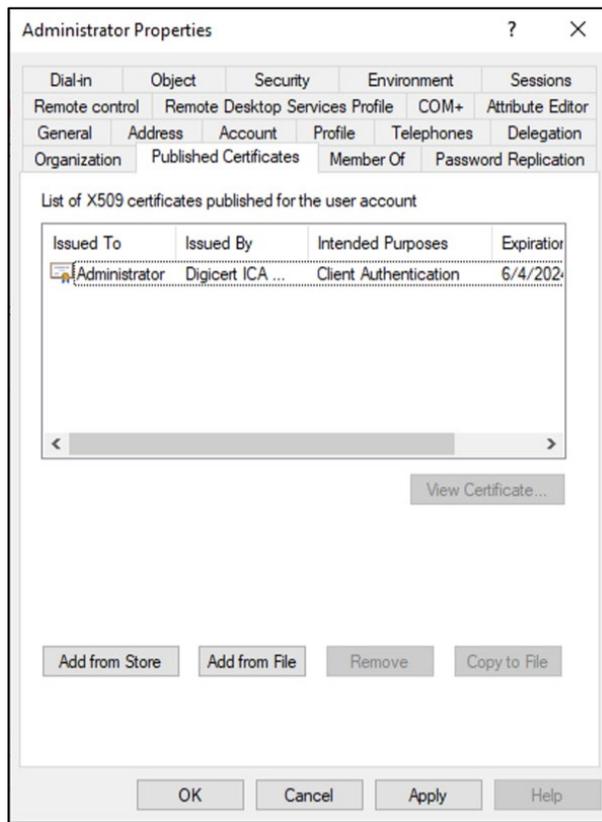
When selecting **Yes**, you will need to assign a special permission to the Autoenrollment Server afterwards to allow publishing. Refer to section "Allow Publishing to Active Directory" for more details.

7. Configure other options accordingly. For details about these options, refer to "*DigiCert® PKI Platform Overview*" section "*2.5.2 Primary Certificate Options* ", "*2.5.3 Certificate Fields* ", and "*2.5.4 Additional Certificate Options* "for details.

8. Click **Save** to save the profile and finish the creation process.

4.6 Importing the Autoenrollment Configuration File

Once you have configured the RA certificate, prepared the configuration utility, and created the Autoenrollment certificate profile, import the Autoenrollment configuration file. You can download the configuration file from PKI Manager.

The autoenrollment configuration file publishes data to the Active Directory, which includes:

- Details about the enrollment service and the templates it supports.
- The list of certificate templates that CA offers.

- DigiCert's trusted CA certificates.

NOTE: The user running the Autoenrollment Config utility must have administrator rights to successfully store the configuration data in Active Directory and the system's registry. If the user has insufficient privileges to write to these resources, the Autoenrollment Config utility cannot publish and install the configuration data.

To import the Autoenrollment configuration file:

1. Download the autoenrollment configuration file by clicking the **Download AE Config** link on the **Manage certificate profiles** page of PKI Manager.
2. Choose the profiles by clicking checkbox and Click on **Download** button.
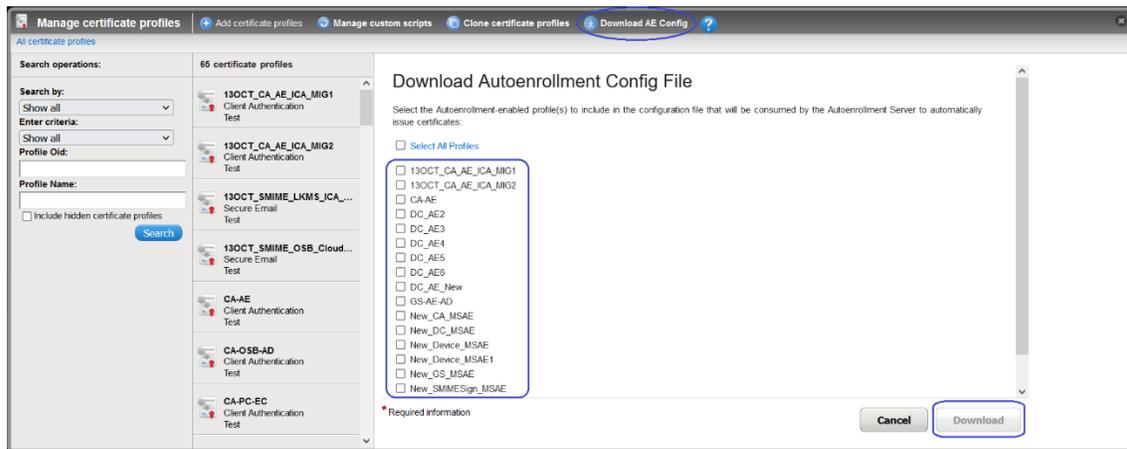
3. Store the configuration file in the installation directory of Autoenrollment server.

   This file must be accessible by the Autoenrollment service.

4. Log on to the computer as AE Administrator or as another user who is a member of the Enterprise Administrators group.
5. On the **Start** menu, open the Autoenrollment Config utility by clicking **All Programs > DigiCert > AutoEnrollmentServer > Autoenrollment Configuration**. (AutoEnrollmentServer directory will only appear in classic Start Menu).
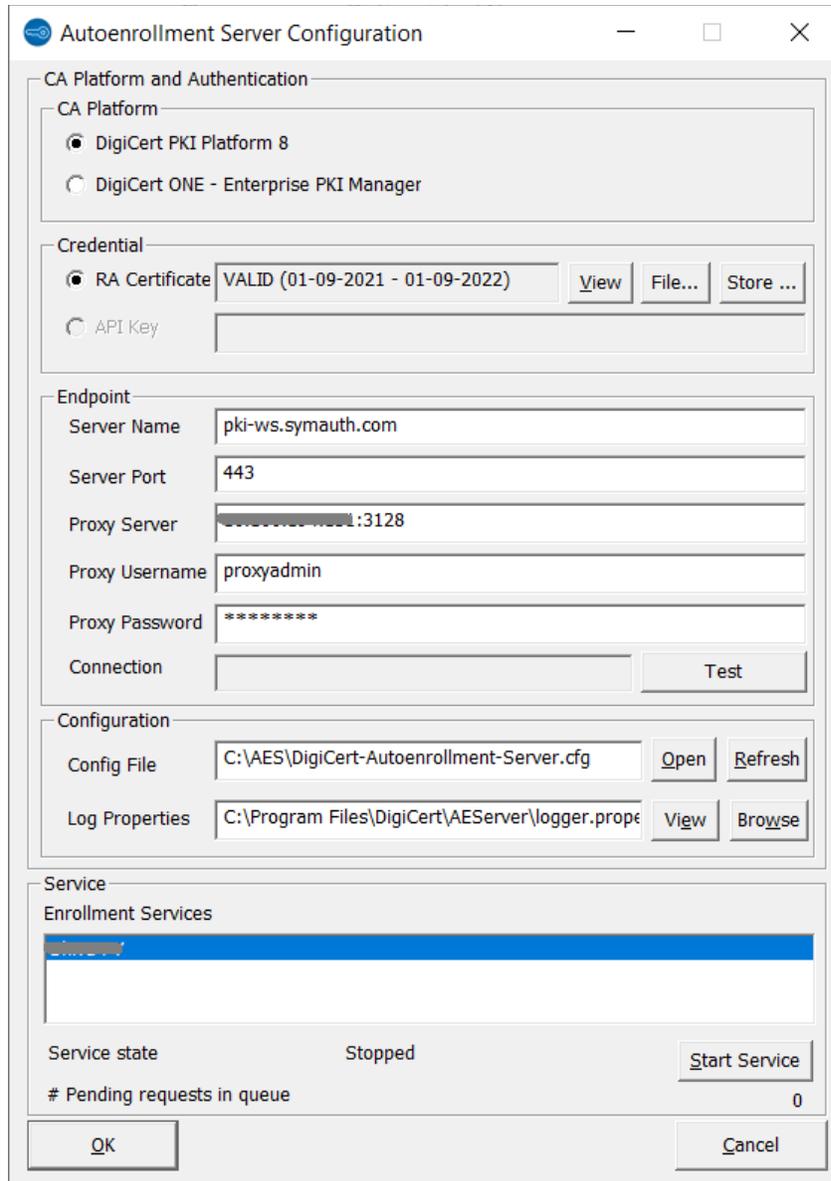
6. In the **Configuration** section, select **Open** to the right of **Config File**. Navigate to the location of the configuration file downloaded in step 2 above and select it (or specify the absolute path to the file manually in the textbox next to **Config File**).

   The utility displays a dialog with the message:

   "Do you really want to import the configuration (enrollment service, templates) and publish them to Active Directory?

   Note: This operation may take several minutes depending on system workload and imported configuration."

7. Select **OK** to proceed or **Cancel** to abort.

CHAPTER 5

5 Using the Autoenrollment Server

This chapter includes the following topics:

- About Using the Autoenrollment Server
- Files Written by the Autoenrollment Process
- Starting and Stopping the Autoenrollment Server
- About the Preparation of Certificate Templates
- About the Replication of Certificate Templates and Policies
- Testing Certificate Enrollment
- Monitoring Enrollment Activities

5.1 About Using the Autoenrollment Server

After you install and configure the DigiCert Autoenrollment Server, you can start to use the service to request certificates from the DigiCert CA.

5.2 Files Written by the Autoenrollment Process

While running and processing requests, the autoenrollment process writes the following files:

- The file **RequestBufferFile.dat** that is located in the installation directory. This file includes information about certificate requests.
- The log file as configured in Autoenrollment Config Log Properties configuration file. Refer to section "Log Properties Configuration Options" for details.

5.3 Starting and Stopping the Autoenrollment Server

You can start and stop the Autoenrollment server by starting and stopping the Autoenrollment service.

NOTE: Although you can use Windows Service Manager to start and stop the Autoenrollment service, the service status may not always display accurately. DigiCert recommends that you use the Autoenrollment Config utility to start and stop the service. Optionally, click **Refresh** in the utility to display the current status.

By default, the Autoenrollment service is started automatically upon system startup. You cannot configure the Autoenrollment Config tool or import an autoenrollment configuration file while the autoenrollment service is running.

To start and stop the Autoenrollment server,

1. Log on to the computer as the AE Administrator or as another user who is a member of the Enterprise Administrators group.
2. On the **Start** menu, run Autoenrollment Config by clicking **All Programs > DigiCert > AutoEnrollmentServer > Autoenrollment Configuration**.
   (AutoEnrollmentServer directory will only appear in classic Start Menu).
3. Depending on the service's current status, click **Start Service** or **Stop Service**, as appropriate.

5.4 About the Preparation of Certificate Templates

The set of certificate templates that you configured in PKI Manager is automatically installed in the Active Directory when you import the configuration file downloaded from PKI Manager. To deploy certificates, you must assign the enroll and/or autoenroll permissions to the appropriate groups or users for each certificate template separately.

See "About the Assignment of Group/User Access to Templates".

Autoenrollment server supports v2 and v4 certificate templates.

You cannot use the older v1 or v3 templates for autoenrollment as the Autoenrollment server has not been fully qualified for them. However, you can supersede older templates to newer templates.

5.4.1 About the Assignment of Group/User Access to Templates

Use the **mmc** and the **Certificate Templates Snap-In** to set the security settings (enroll/autoenroll rights) for the templates.

Note: Do not change any of the template values other than the security settings. Editing templates leads to failure of all requests for this template.

To change template settings, edit the corresponding certificate profile in PKI Manager, and then download and import a new autoenrollment configuration file.

The **Certificate Template** property page contains the **Security** tab. The **Security** tab allows you to define the DACL (Discretionary Access Control List) for a specific certificate template. The permissions that you assign to the certificate template define which security principals can read, modify, enroll, or auto-enroll for a specific certificate template.

The **Group or user names** dialog lists all groups and users holding privileges on the currently-opened certificate template.

You can add your own network-specific group names if you do not use the default group names (such as Domain Users and Domain Computers). Once you have added your domain-specific groups, assign the appropriate combinations of enroll and auto-enroll permissions to them.

Important permissions are:

- **Read**: This permission allows a security principal to see the certificate template when they enroll for certificates. It is required for a security principal to enroll or auto-enroll a certificate. The certificate server also requires finding the certificate templates in Active Directory.
- **Enroll**: This permission allows a security principal to enroll for a certificate based on the certificate template. To enroll for a certificate, the security principal must also have Read permissions for the certificate template.
- **Autoenroll**: This permission allows a security principal to receive a certificate through the auto-enrollment process. Autoenrollment permissions require that the user has both Read and Enroll permissions in addition to the Autoenroll permission.

Depending on the specific certificate template, you should assign the appropriate permissions to all of the desired groups of users or computers.

NOTE: You should use global or universal groups instead of individual users or computer accounts when assigning template access permissions. Especially in large infrastructures, this facilitates administration of access rights. This also helps minimize conflicts and inconsistencies across multiple domain controller contexts.

Additionally:

- Make sure that the Autoenrollment server belongs to a group that also has permission to enroll the template it uses to process requests.
- You should assign Read permission to Authenticated group for all certificate templates. Then all users and computers can read the certificate templates in Active Directory.
- Restrict Write and Full Control permissions to only those people who require them to ensure that the templates are not improperly configured.

5.5 About the Replication of Certificate Templates and Policies

Use Active Directory's replication mechanism to make certificate templates and policies available to multiple domain controllers existing in your domain. All domain controllers in the forest receive a copy of any updated configuration container automatically.

Certificates are also stored in Active Directory and they are replicated to each domain controller in the forest. The process of replicating data can take up to eight hours across Active Directory instances. Replication for all computers occurs earlier if the domain controller computer is rebooted. The policy information of a particular machine is refreshed whenever that computer is rebooted.

You can use the certutil tool to force a client to refresh its policy information:

```
certutil -pulse
```

You have to repeat this replication step each time that you modify your certificate templates to have the changes be effective immediately.

Automatic replication needs more time, especially if you are in a sub-domain.

5.6 Testing Certificate Enrollment

After you install the server and start the autoenrollment service, you need to request a few certificates from the DigiCert CA for testing purposes. This topic takes you through the process of manually triggering the certificate autoenrollment process.

To test certificate enrollment

1. Log on to the system as Administrator and click **Start > Run**.
2. Type **mmc** in the **Open** field and press **Enter**.
3. Click **File > Add/Remove Snap-in**. The available snap-ins are displayed.
4. Select **Certificates** and click **Add**.
5. Select **My user account** from the option group.
6. Click **Finish > Close > OK** to return to the MMC console.
7. Expand the tree view on the left to display **Console Root > Certificates - Current User > Personal > Certificates**.
8. Right-click in the right pane and then click **All Tasks > Request New Certificate**.

    The **Certificate Enrollment wizard** opens.

9. Select **Active Directory Enrollment** Policy.
10. Click **Next**. The list of available certificate templates displays. Mark every template you want to enroll.
11. Click **Enroll**.

    You are informed about the progress of the enrollment. After a successful enrollment, you can view your new certificate in the **Certificates** node of MMC.

5.7 Monitoring Enrollment Activities

The following topics describe how to monitor the Autoenrollment server's activities and ways to track activities and events of the autoenrollment process.

5.7.1 Analyzing the Log File

Both Autoenrollment Config and the Autoenrollment service write logging information to the configured log file.

To analyze the log file

● Check the log file as needed to track autoenrollment activities.

5.7.2 Displaying System Events with the Windows Event Viewer

You can use the Windows Event Viewer to display information about the certificate requests that have been created during the autoenrollment process.

To display system events with the Windows Event Viewer

1. Click **Start > Administrative Tools > Event Viewer**.
2. Highlight the **Application** node and search for entries that includes **Autoenrollment** in the **Source** column.

APPENDIX A

6   Additional Configurations for Autoenrollment Server

This appendix includes the following additional configurations for Autoenrollment Server:

- Configuring Autoenrollment Server for High Availability
- Configuring Autoenrollment Server for Syslog

6.1 Configuring Autoenrollment Server for High Availability

6.1.1 About Configuring the Autoenrollment Server for High Availability

The Autoenrollment server and DCOM protocol can support high availability by default. To configure multiple instances of the Autoenrollment server for high availability, you only need to configure the HSMs to recognize the same RA certificate across all instances of Autoenrollment server.

This appendix describes how to configure multiple instances of the Autoenrollment server for high availability.

6.1.2 Configuring the Autoenrollment Server for High Availability

To configure the Autoenrollment server for high availability

1.   On all machines hosting an instance of the Autoenrollment server, register the CSP. Refer to https://knowledge.digicert.com/tutorials/hsm-configuration.html for details.
2.   From your initial Autoenrollment server machine, obtain and install an RA certificate.

    This is a separate RA certificate from the one that you obtained for the PKI Enterprise Gateway.
    See "Obtaining the RA Certificate".

3.   Install the same RA certificate that you obtained in Step 2 on all of the other Autoenrollment server machines.
4.   From a command line, run the following command on all Autoenrollment server machines to associate the RA certificate in each machine with the private key on the initial HA partition:

    ```
    certutil -f -v -repairstore -csp <PROVIDER-NAME> My "<Certificate
    thumbprint>"
    ```

5.   On each of the Autoenrollment server machines, modify the registry setting under `HKEY_LOCAL_MACHINE/SOFTWARE/DigiCert/Autoenrollment`.

    The value of this entry is appended to the Name of the Enrollment Service (Service-CN). Set a different value for each of the instances. The main instance should

have an empty string. A registry key, named **ServiceCN-Postfix**, needs to be added with the type of string in the registry. Then this key needs to be set to a unique value.

6. Download the Autoenrollment server configuration file and install it onto each of the Autoenrollment server machines.

   See "Importing the Autoenrollment Configuration File".

7. Start the Autoenrollment server.

   See "Starting and Stopping the Autoenrollment Server".

6.2 Configuring Autoenrollment Server for Syslog

Autoenrollment server can use syslog as logging output by using the Autoenrollment Configuration **Log Properties** settings. Change the contents of the **logger.properties** file or change the target property file path to enable logging to syslog. See "Setting the Autoenrollment Configuration Utility" on how to configure this.

The sample syslog properties file can be found as **syslogger_sample.properties** in the installation directory of the Autoenrollment Server. The following shows the contents of the sample:

```
# A line starting with # is a comment and ignored.
# Define with log-level (DEBUG, INFO, WARN, or ERROR) and appender name
log4cpp.rootCategory=INFO, SYSLOG
# Configured appender type
log4cpp.appender.SYSLOG=SyslogAppender
# Remote syslog server IP address
log4cpp.appender.SYSLOG.syslogHost=192.168.1.1
# Remote syslog server port number
log4cpp.appender.SYSLOG.portNumber=514
# Syslog facility number
log4cpp.appender.SYSLOG.facility=1
# Output pattern (see http://log4cpp.sourceforge.net/#faq for format details)
log4cpp.appender.SYSLOG.layout=PatternLayout
log4cpp.appender.SYSLOG.layout.ConversionPattern=[AESRV]: %d{%Y-%m-%d %H:%M:%S}
%-5p [%t] %m%n
```

Table 6-2 shows the details about each property.

Table 6-2 Syslog Property Details

Property Key	Description
log4cpp.rootCategory	Default sets **logger_name** as **SYSLOG**. See Table 4-4 Log Property Details for more detailed description about this property.
log4cpp.appender.\<logger_name>	The value must be `SyslogAppender` to use for syslog. See Table 4-4 Log Property Details for more detailed description about this property.
log4cpp.appender.\<logger_name>.syslogHost	Specifies the remote syslog server IP address. **Note:** The remote syslog server must be accessible from the machine where Autoenrollment server is installed.
log4cpp.appender.\<logger_name>.portNumber	Specifies the remote syslog server port number.
log4cpp.appender.\<logger_name>.facility	Specifies the remote syslog server facility number. Default value is 1 (user-level messages).
log4cpp.appender.\<logger_name>.layout	See Table 4-4 Log Property Details for more detailed description about this property.

log4cpp.appender.\<logger_name>.ConversionPattern	The default log format is set as **"[AESRV]: \<Date{yyyy-mm-dd}> \<Time{hh:mm:ss}> \<LogLevel> [\<TheadID>] \<LogMessage>"**. Every log message is intentionally prepended with [AESRV]: string, to differentiate Autoenrollment server logs from other logs. The following shows an example:
	
	`[AESRV]: 2021-09-22 04:15:28 INFO  [6176]`
	`Service started, waiting for requests.`
	
	See Table 4-4 Log Property Details for more detailed description about this property.

APPENDIX B

7   Troubleshooting

This appendix includes the following topics:

- Repeating an Action with Higher Log Level
- Configuration utility events logging in AEConfig.log
- Common Problems

7.1 Repeating an Action with a Higher Log Level

The Autoenrollment server process keeps a log file to document its activities. When a problem occurs (for example, a certificate cannot be issued although apparently nothing is wrong with the corresponding request), you need to review the autoenrollment process log file. In most cases, it provides details about what went wrong.

However, sometimes the information in the log file may not be detailed enough to thoroughly investigate and resolve a specific problem.

In this case it can be useful to retry the failed action, but this time with a higher log level. The higher the log level the more information is stored in the log file about a particular action or error.

Use the Autoenrollment Config **Log Properties** file configuration to change the log file level. Refer to section "Log Properties Configuration Options" for details.

7.2 Configuration utility events logging in AEConfig.log

The Autoenrollment Server Configuration utility logs events in **AEConfig.log**, located at **C:\Users\<AE Administrator>**. This log is a useful troubleshooting tool during initial Autoenrollment Server configuration steps. When errors are encountered in the configuration utility, **AEConfig.log** provides additional information to troubleshoot and rectify possible configuration issues. Configuration utility error scenarios include a failure to establish connection during the Connection Test, or a failure to import the autoenrollment configuration file.

7.3 Common Problems

The following topics describes some common issues that may occur and provide some solutions.

7.3.1 Certificate is Pending in the Client or the Autoenrollment Config Utility

If the Autoenrollment server cannot complete a request with the DigiCert CA, (for example, due to connection problems or to heavy server traffic), it sends a pending response to the client. The Autoenrollment server retries the request periodically until a response is received from the DigiCert CA. The request also appears as pending in the Autoenrollment Config utility.

Once the Autoenrollment server can re-establish connection to the DigiCert CA, the request is processed normally.

7.3.2 Certificate Templates do not Appear for Autoenrollment

If your certificate templates do not appear for your end users after you have imported them with the Autoenrollment Config utility and configured the correct autoenroll permissions, you may need to import the root and the issuer CAs of your RA certificate into your enterprise Trust Store.

The root and issuing CAs for the RA certificate are provided in the `certificates` folder from the location where installer package is extracted.

As a member of the Enterprise Administrator group in the root domain, run the following commands to import these certificates:

```
certutil -f -dsPublish <root ca file name> RootCA certutil -f-dsPublish
<intermediate cert file name> SubCA
```

7.3.3 Certificates Cannot be Published (Permission Denied)

If your end-user certificates are not published to Active Directory and see the following error message in your log files, the Autoenrollment server does not have sufficient privileges in Active Directory.

ERROR in Publish Certificate: Cannot commit data to Active Directory: permission denied 0x80070005

Add the domain computer that runs the Autoenrollment server to the Active Directory group **Cert Publishers**. You may want to force Active Directory replication and perform a group policy update to make these changes available immediately.

7.3.4 Importing the Autoenrollment Configuration File Across Subdomains

While importing the autoenrollment configuration file, you may encounter an error that states that the objects that have previously been created cannot be accessed for setting the Discretionary Access Control List (DACL) on the new object. Your Autoenrollment server may be installed on a machine in part of a subdomain of your network. If this is the case, you need to force AD replication across your forest.

The following is a sample command that forces Active Directory replication for an Active Directory forest using the repadmin.exe utility. Use the appropriate command or mechanism for your implementation.

```
Repadmin /syncall
```

This command forces Active Directory replication between the root domain controller and any subdomain domain controllers.

Once replication is complete, click **OK** in the Autoenrollment Config utility to retry setting the DACL on the object.

7.3.5 Handling Multi-Valued Active Directory Attributes in the Autoenrollment Server

If you have mapped a multi-valued attribute to a certificate Subject Alternative Name or Subject Distinguished Name in PKI Manager, multiple values may be returned for these attributes from the Active Directory. In this situation, the Autoenrollment server does not pick any value from the list, and autoenrollment fails if this attribute is mandatory. The Autoenrollment server log displays a warning message similar to the following:

WARN Wed Oct 05 15:57:07 2011 [828] Attribute <CertificateProfile Configured AD attribute> has unexpected type: 8204

To avoid this issue, make sure that the multi-value attribute contains only one value.

7.3.6 Catastrophic Error When Restarting the Autoenrollment Server

If the Autoenrollment Server configuration file is not available when you restart the Autoenrollment Server, it does not start. The Windows services report a catastrophic error for the AutoEnrollmentDCOMSrv service.

Additionally, the following error is written to the log file:

AutoEnrollmentDCOMSrv: cannot run: AEException: Could not access CA interface (plugin): Could not initialize connection to CA. Check connection parameters and network connectivity!

If you want to avoid this issue, make sure that the location where you imported the configuration file when you configured the Autoenrollment Server is accessible to the server when you restart it.

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