MyID PIV

Version 12.13

Microsoft Windows Certificate Authority Integration Guide

Lutterworth Hall, St Mary's Road, Lutterworth, Leicestershire, LE17 4PS, UK
www.intercede.com | info@intercede.com | @intercedemyid | +44 (0)1455 558111

Document reference: INT1957-12.13.0-PIV

December 2024

Copyright

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.

3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:

(a) You must give any other recipients of the Work or Derivative Works a copy of this License; and

(b) You must cause any modified files to carry prominent notices stating that You changed the files; and

© You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and

(d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.

6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.

7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.

8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.

9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

APPENDIX: How to apply the Apache License to your work.

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets "[]" replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same "printed page" as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License. ---

Conventions used in this document

- Lists:
  - Numbered lists are used to show the steps involved in completing a task when the order is important.
  - Bulleted lists are used when the order is unimportant or to show alternatives.
- **Bold** is used for menu items and for labels.

  For example:
  - Record a valid email address in **'From' email address**.
  - Select **Save** from the **File** menu.
- *Italic* is used for emphasis:

  For example:
  - Copy the file *before* starting the installation.
  - Do *not* remove the files before you have backed them up.
- ***Bold and italic*** hyperlinks are used to identify the titles of other documents.

  For example: "See the ***Release Notes*** for further information."

  Unless otherwise explicitly stated, all referenced documentation is available on the product installation media.
- A `fixed width` font is used where the identification of spaces is important, including filenames, example SQL queries and any entries made directly into configuration files or the database.
- **Notes** are used to provide further information, including any prerequisites or configuration additional to the standard specifications.

  For example:

  Note: This issue only occurs if updating from a previous version.
- Warnings are used to indicate where failure to follow a particular instruction may result in either loss of data or the need to manually configure elements of the system.

  For example:

  Warning: You must take a backup of your database before making any changes to it.

Contents

1 Introduction

This document provides a step-by-step guide to configuring MyID® to integrate it with a Microsoft Windows 2019 or 2022 Certification Authority (CA).

2 Before installing MyID

This section contains information on setting up your environment so that the CA is ready for integration with MyID.

MyID will detect all available Microsoft CAs in the domain when it is installed and these will be added to MyID.

2.1 RSA support

MyID has been tested with the following RSA capabilities of the Microsoft certificate authority:

- Smart card key generation using RSA using 1024, 2048, 3072, and 4096 bit keys.

Note: Support for key sizes is limited by smart card type – see the ***Smart Card Integration Guide*** for details. All the above listed RSA key sizes are supported on Android, iOS, and soft certificates.

2.2 ECC support

MyID has been tested with the following ECC capabilities of the Microsoft certificate authority:

- Smart card key generation using ECC using P256, P384, and P521 curves.

Note: Support for this feature is limited by smart card type – see the ***Smart Card Integration Guide*** for details.

The following features are not currently supported with the Microsoft certificate authority:

- Issuing certificates with ECC keys to a software local store (CSP).
- Issuing certificates with ECC keys as a .pfx file.
- Issuing certificates with ECC keys to a mobile device.
- Issuing certificates with ECC keys using the MyID SCEP interface.
- Issuing certificates with ECC keys to a Microsoft Virtual Smart Card.
- Issuing or recovering certificates with archived keys that use ECC.

2.3 Hardware and software requirements

Refer to your Windows documentation for recommendations of the hardware and software needed for the Microsoft CA.

MyID supports the following:

- Windows Server 2019
- Windows Server 2022

If you need to work with an older version of Microsoft Certificate Services, contact Intercede quoting reference SUP-305.

Warning: The Microsoft CA can be installed in one of two modes – Enterprise and Standalone. MyID requires the Enterprise CA configuration.

2.3.1 User Account Control

If you are requesting a certificate from the `certsrv` web page, you may experience an error similar to:

```
Result: The RPC Server is unavailable. 0x800706ba (Win32:1722)
```

This is due to User Account Control (UAC) preventing the action. You must disable UAC on the server to correct the problem.

2.3.2 Failover clustering

MyID supports setting up a cluster of Microsoft CAs for failover purposes. The cluster appears to MyID as a single CA, so in the event of failover to a redundant CA, the process is transparent to MyID. See your Microsoft documentation for details of configuring failover clustering.

2.3.3 Firewall configuration

You must make sure that the firewall between the application server and your Microsoft CA or CAs is configured for port 135 (for RPC) as well as a DCOM range.

2.3.3.1 DCOM port ranges

To force the RPC system to use a specific range for its dynamic ports:

1. From the Windows **Administrative Tools**, select **Component Services**.
2. Browse to **Console Root > Component Services > Computers**.
3. Right-click **My Computer** and select **Properties**.
4. Select the **Default Protocols** tab, ensure **Connection-oriented TCP/IP** is selected in the list and click the **Properties** button.
5. Set a port range.

   You should ensure the base port is above 1024. You need a range of at least 100 ports; for example, `5000-5099`.
6. Add the range, then click **OK**.

The port limit is not active until you reboot; however, you should set up the firewall before you reboot the machine.

2.3.3.2 Firewall configuration

You must open ports for the following:

- The DCOM port range you have set up (for example, 5000-5099).
- The RPC port (135). There is a predefined rule for port 135 called **COM+ Network Access** that you can enable.

See the documentation for the firewall you are using to open the necessary range of ports.

For example, to set up the default Windows firewall to use ports 5000-5099:

1. From the Windows **Administrative Tools**, select **Windows Firewall with Advanced Security**.
2. Select **Inbound Rules** and add a new rule using the **Actions** on the right.
3. In the wizard that appears, select **Port** for the rule type and click **Next**.
4. Select **TCP**.
5. Provide a list of the ports you specified in **Component Services**.

   You can specify a range; for example:

   ```
   5000-5099
   ```
6. Click **Next**.
7. Select **Allow the Connection** then click **Next**.
8. Make sure all three **Apply** rules are selected then click **Next**.
9. Type a name for the rule.
10. Finish the wizard.
11. Ensure the firewall is switched on, then reboot the machine

Note: You must carry out this procedure on both the CA server and the application server.

2.4 Domain considerations

You must evaluate the domain requirements for MyID when integrating with a Microsoft CA.

- The simplest option, with no compatibility or configuration issues, is to use a Microsoft Enterprise CA in the same domain as the MyID system.
- If you integrate with a Microsoft Enterprise CA in a trusted split domain in the same forest, be aware of the following:
  - You must establish trust so that the MyID COM user from the MyID domain can be issued an EA certificate (and KRA if needed) from the CA in the trusted domain.
  - You must set up additional permissions on the CA templates so that the MyID COM user from the MyID domain has permission to enroll certificates and so on in the trusted domain.
  - You must make sure the MyID application server can communicate with and resolve the IP address of the CA by using the fully-qualified domain name – for example, by DNS configuration that was established by creating the trust.
- If you integrate with a Microsoft CA in an untrusted domain, see section *4*, *Remote Microsoft Certificate Authority*.

- If you integrate with a Microsoft CA in domain from a separate forest, see section *3.5*, *Multiple forest support for Microsoft Enterprise CAs*.

2.4.1 Certificate policy domain considerations

For Supply in Request policies, the subject of the certificate can be anything recorded or calculated in MyID from any source; it must conform to the standard requirements of DN, email, and so on. No Active Directory integration is required to obtain user data.

For these Supply in Request policies, you must also make sure the **Publish certificate in Active Directory** option is *not* selected; this is because the user is not in a contactable directory.

For policies that build the subject name from Active Directory information, the CA must be able to obtain details of the certificate subject from the directory. For a user in the same domain as the CA, this is straightforward; for a user in a trusted domain, you may need to provide extra details to identify the user and the domain they come from. See the *Storing the NETBIOS name for a person* section in the ***Administration Guide*** for details.

2.5 Naming and special characters

You are recommended to use standard ANSI characters when naming the CA and its templates. If possible, avoid using special characters (for example, `&` or `#`). If your system has already been set up without following these recommendations, you may experience problems using MyID; contact customer support for more information, quoting reference SUP-94.

2.6 MyID user account

The MyID COM+ user account must have sufficient permissions to use the current CA. To do this:

1. Start the **Certification Authority** application.
2. Right-click on the CA node in the tree and select **Properties** from the menu displayed.
3. Click the **Security** tab.
4. Add the MyID COM+ user account, ensuring it has these permissions:
   - Issue & Manage Certificates.
   - Request Certs.

2.7 Certificate expiry

MyID requires an Enrollment Agent (EA) certificate and, if you are using key archiving, a Key Recovery Agent (KRA) certificate. You must monitor the expiry and replacement of these certificates; if you allow the certificates to expire, you will see errors reported. For example, if the EA certificate has expired, you may see an error similar to the following:

```
Error Verifying Request Signature or Signing Certificate. A required certificate is not within its validity period when verifying against the current system clock or the timestamp in the signed file. 0x800b0101 (-2146762495)
```

If the EA certificate has expired, MyID will automatically request another certificate. However, you must log on as the MyID COM user and remove the EA certificate from the certificate store (named `edefice` by default) before it can be replaced. You are recommended to move the certificate to the Personal store instead of simply deleting it.

2.8 Enrollment Agent certificate

The MyID connector automatically attempts to acquire an Enrollment Agent Certificate, if it does not already exist, and place it in the Edefice certificate store. This certificate must be published and the MyID COM+ account must have enrollment privileges for it to allow MyID to manage certificates.

If you have an advanced configuration that requires the use of named credentials or an HSM, or if your enrollment agent template is not called `EnrollmentAgent`, you can request the EA certificate manually. See section *2.8.1*, *Manually requesting the Enrollment Agent certificate* for details.

To check your template is configured correctly:

1. In the MMC Snap-in for managing Certificate Templates for Microsoft CA, select properties for the EA template.
2. On the **Cryptography** tab, set the **Provider Category** to **Legacy Cryptographic Service Provider** (for CSP) or **Key Storage Provider** (for CNG/KSP).

2.8.1 Manually requesting the Enrollment Agent certificate

1. Request the Enrollment Agent certificate using the certificate manager snap-in.
   a. Log on to the MyID application server using the MyID COM+ user account.
   b. From the Windows **Start** menu, run `certmgr.msc`.
   c. Expand **Certificates – Current User > Personal**.
   d. Right-click on **Personal** folder, then from the pop-up menu select **All Tasks > Request New Certificate**.
   e. Click **Next**, then click **Next** again.
   f. Select the **Enrollment Agent** certificate, click **Details**, then click **Properties**.
   g. On the **General** tab, provide a friendly name and description as required.
   h. On the **Private Key** tab, change the CSP/KSP and key length as required.

i. On the **Certification Authority** tab, select the issuing authority from which you want to issue the Enrollment Agent certificate, then click **OK**.

j. Click **Enroll**.

k. Click **Finish** to complete the request.

2. Export the certificate and add it to the Edefice store.

a. In the Windows Control Panel, select **Internet Options**.

b. On the **Content** tab, click **Certificates**, then select the certificate you installed.

The certificate will have the type Certificate Request Agent, for example.

c. Click **Export**.

d. Use the Certificate Export Wizard to save the file. Do not export the private key. Select the **DER encoded binary X.509 (.CER)** format and give the file the name `my_ea.cer`.

e. Open a command prompt and navigate to the folder containing `my_ea.cer`.

f. Type the following:

```
certutil -addstore -user edefice my_ea.cer
```

If the Edefice store does not exist, you must use the `-f` parameter to force it:

```
certutil -addstore -f -user edefice my_ea.cer
```

2.9 Published certificates

The MyID COM+ user account must have enrollment privileges for all published certificates to manage certificates, and you must set the properties for the certificates for the subject names and the application policy.

For each certificate template you want to use with MyID:

1. Start the **Certification Authority** application.
2. Open the current CA.
3. Right-click **Certificate Templates** and select **Manage** from the menu.

   This opens the Certificate Templates Console.
4. Right-click the relevant certificate and select **Properties** from the menu.
5. The **Properties** dialog box for the certificate is displayed.

a. Click the **Security** tab.

b. Click **Add** and add the MyID COM+ user account. Ensure it has **Read** and **Enroll** permissions.

c. Click the **Security** tab. By default the Microsoft CA certificates can be set to either get the Subject Name from the request or from the directory server. In a PIV installation, or an installation where MyID is requesting certificates for users that do not exist in the directory, select the **Supply in the Request** option.

d. Click the **Issuance Requirements** tab, then, from the **Application policy** drop-

down list, select **Certificate Request Agent**.

6. Click **OK** to save the changes to the certificate template.

2.10 Encryption key recovery

When using a CA with certificate templates configured for encryption key recovery, the MyID application server must trust the issuing CA. It must also be able to resolve and access the CA Certificate Revocation List (CRL).

To enable this, import the CA certificate into the **Trusted Root Certificate Authorities** store and ensure that the URL specified in the CA certificate for the CRL is available and can be accessed by the MyID application server.

Note: If your MyID system has been upgraded from a pre-8.0 SR1 system, the trust must exist between the client card issuance station and the issuing CA as well as between the MyID application server and the issuing CA.

2.11 Enable key archiving

If MyID is configured to use an HSM, and the HSM supports key export, any archived keys will be generated on the HSM.

Additional configuration is required for the CA to support key archiving. If you do not require the key archive functionality, you may skip this section.

To request a certificate that is configured for key archival through MyID, the MyID application server must have access to download the CRL (Certificate Revocation List) for the issuing CA and all parent CAs when the certificate is requested.

- If the MyID application server is in the same domain as the CA, it should automatically be able to download the CRL.
- If the MyID application server is *not* in the same domain as the CA, the CA may need configuring to publish the CRL to an additional location that is accessible from the MyID server.

Note: If your MyID system has been upgraded from a pre-8.0 SR1 system, the MyID client card issuance station must also have access to download the CRL.

Warning: One of the KRA private keys that were configured at the time the key to be recovered was issued must be available (along with its corresponding KRA certificate) to decrypt, and hence recover, the user's private key.

2.11.1 Additional MyID application servers

If you replace or add additional MyID application servers, the new server must have access to suitable KRA certificates and private keys.

When you obtain the KRA certificates, you need a backup strategy to account for this future possibility.

If KRA are stored in software, the private key can be made exportable, and the certificate/private key exported to a password protected PFX file. This allows the subsequent import of the KRA onto new application servers. Due to the sensitive nature of the KRA, additional protection must be given to this PFX and associated password; for example, store the PFX and password in a safe.

If the KRA private keys are stored in an HSM, the private key will not be exportable, and a different backup strategy, specific to the HSM, is required to ensure the KRA private key is fully protected.

2.11.2 Key Recovery Agent certificate requirements

To check your template is configured correctly:

1. In the MMC Snap-in for managing Certificate Templates for Microsoft CA, select properties for the KRA template.
2. On the **Cryptography** tab, set the **Provider Category** to **Legacy Cryptographic Service Provider** (for CSP) or **Key Storage Provider** (for CNG/KSP).

2.11.3 Publishing the Key Recovery Agent (KRA) certificate

For MyID to manage key archival and recovery, the KRA certificate must be published and the MyID COM+ user account must have enrollment privileges for it.

1. Start the **Certification Authority** application.
2. Open the current CA.
   a. Right-click **Certificate Templates** and select **Manage** from the menu.
      This will start the **Certificate Template** application.
   b. Right-click the **Key Recovery Agent Certificate** and select **Properties** from the menu.
3. The **Key Recovery Agent Certificate Properties** dialog box is displayed.
   a. Click the **Security** tab
   b. Click **Add** and add the MyID COM+ user account. Ensure it has **Read** and **Enroll** permissions.
   c. Click **OK**.
4. In the **Certification Authority** application, expand the current CA.
   a. Right-click **Certificate Templates** and select **New** from the menu.
   b. Click **Certificate Template To Issue** and select the **Key Recovery Agent Certificate**.

2.11.4 Obtaining the Key Recovery Agent (KRA) certificate

2.11.4.1 Requesting the Key Recovery Agent certificate(s)

1. Log on to the MyID application server using the MyID COM+ user account.
2. Run the `certmgr.msc` snapin.
3. Expand **Certificates – Current User > Personal**.
4. Right-click the **Personal** folder, then from the pop-up menu select **All Tasks > Request New Certificate**.
5. Click **Next**, then click **Next** again.
6. Select the Key Recovery Agent certificate and click the down arrow next to **Details**.
7. Click **Properties**.

8. Click the **Certification Authority** tab.
9. Deselect the certificate authorities you do not want to use then click **OK**.
10. Click **Enroll**.
11. When the certificate request has completed, click **Finish**.

2.11.4.2 Approving the KRA request

1. Log on to the CA as the domain administrator.
2. Run the **Certification Authority** MMC console.
3. In the **Pending Requests** folder, right-click the KRA certificate, then from the popup menu select **All Tasks > Issue**.

   The certificate is issued and moved to the **Issued Certificates** folder.
4. In the **Issued Certificates** folder, double-click the KRA certificate.
5. Click the **Details** tab, then click **Copy to File**.
6. In the Certificate Export Wizard, click **Next**.
7. Ensure that the DER encoded binary X.509 (.CER) option is selected, then click **Next**.
8. Enter a filename and location, then click **Next**.
9. Click **Finish**.
10. Click **OK**.
11. Locate the file you exported then copy it to a location where you can access it using the MyID COM+ user.

2.11.4.3 Importing the KRA certificate

1. Log on to the MyID application server using the MyID COM+ user account.
2. Right-click the exported KRA certificate then from the pop-up menu select **Install Certificate**.
3. Follow the on-screen prompts and install the certificate to the Current User location.

   Note: Make sure that you choose the option to place all certificates in the Personal store when asked.

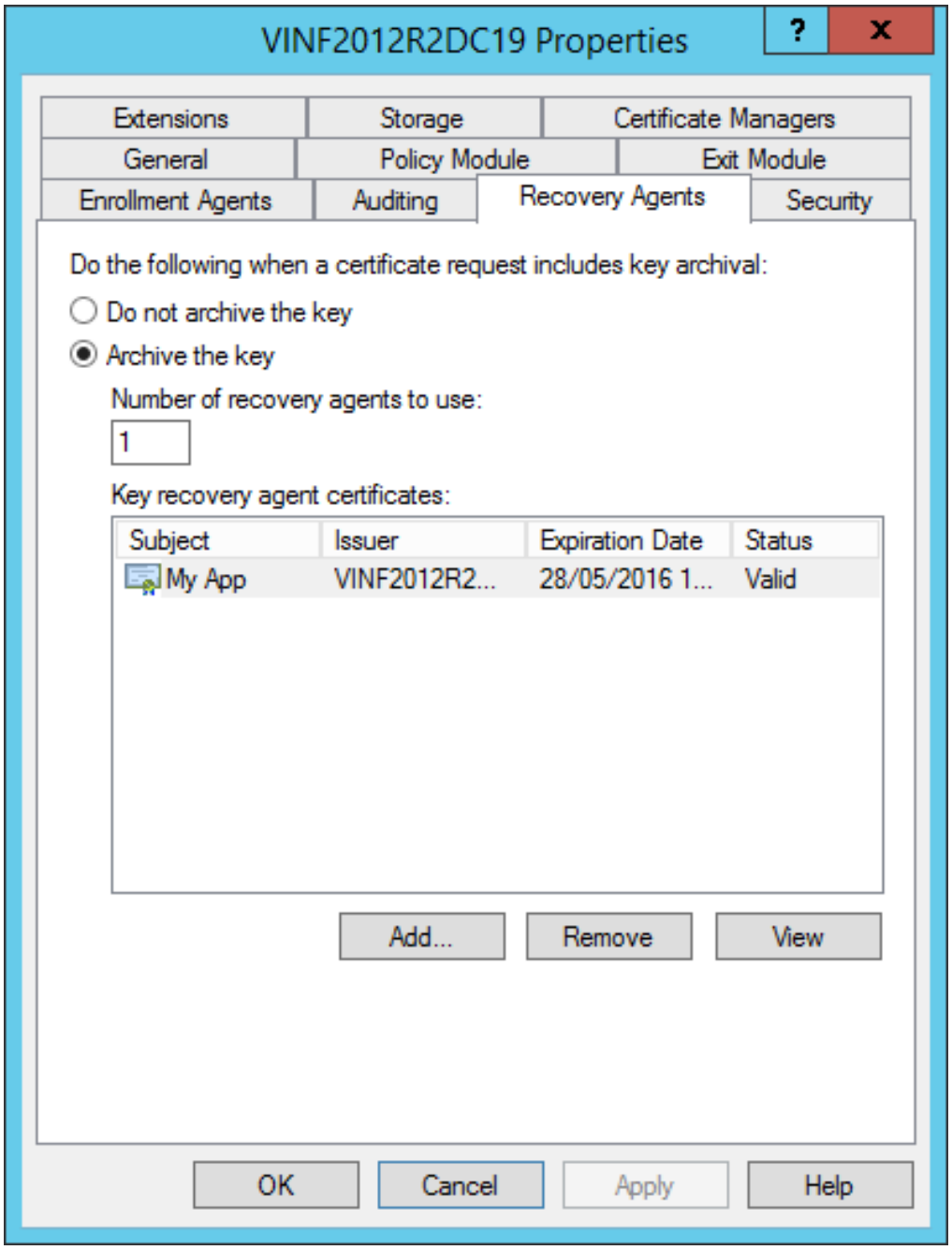
You can now proceed to section *2.11.5*, *Enable key archiving and load the KRA certificate into the CA*.

2.11.5 Enable key archiving and load the KRA certificate into the CA

1. On the machine hosting the CA, run the **Certification Authority MMC** console.

   To do this, you must have 'Certificate Manager' access rights.
2. Select the CA node. Right-click it and select **Properties** from the menu.

3. Click the **Recovery Agents** tab.



Note: If you have invalid certificates in this list, you are recommended to remove them before continuing.

4. Click **Archive the key** to enable key archiving for this CA.

5. The **Number of recovery agent certificates to use** indicates how many entries will *actually* be selected from the list of KRA certificates available in the list. If there are more KRA certificates in the list than the number to be used, they will be randomly selected. The simplest scenario is to have the **Number of recovery agents to use** equal to the number of KRA certificates in the list.

   Note: If you do not have the **Number of recovery agents to use** equal to the number of KRA certificates in the list (for example, if you have 17 KRA certificates, and the **Number of recovery agents to use** option is 15) you will experience problems when the KRA certificate you require is not included in the arbitrary list of 15 certificates. A card issuance will appear to have completed successfully, but the **System Events** workflow will list an error similar to:

   ```
   2009-10-02 11:53:20 VMSANDPIT EdeficeBOL BOL Caught Exception in
   Function RecoverKey, Error Description BOL ComException catch handler
   for function : RecoverKey
   Unspecified error
   Error Recovering Key from Microsoft KeyStore - Error decrypting key
   data - KRA Private Key Not Available
   0x8009200c - Cannot find the certificate and private key to use for
   decryption.
   (std), Error Number 0x80004005
   ```

6. To add a KRA certificate to the list:
   a. Click **Add**.
   b. Select the KRA certificate that was issued previously.

      This should now appear in the list on the **Recovery Agents** page.

      You can add as many KRA certificates as you need. Every time a certificate request that includes key archiving is submitted to this CA, *potentially* all KRA certificates in the list will be given the ability to recover the key at a later date.
7. Click **Apply**. Certificate services will be restarted.

2.11.6 Define certificate templates that support key archival

Microsoft Windows CA does *not* ship with certificate templates that support key archival. These must be created.

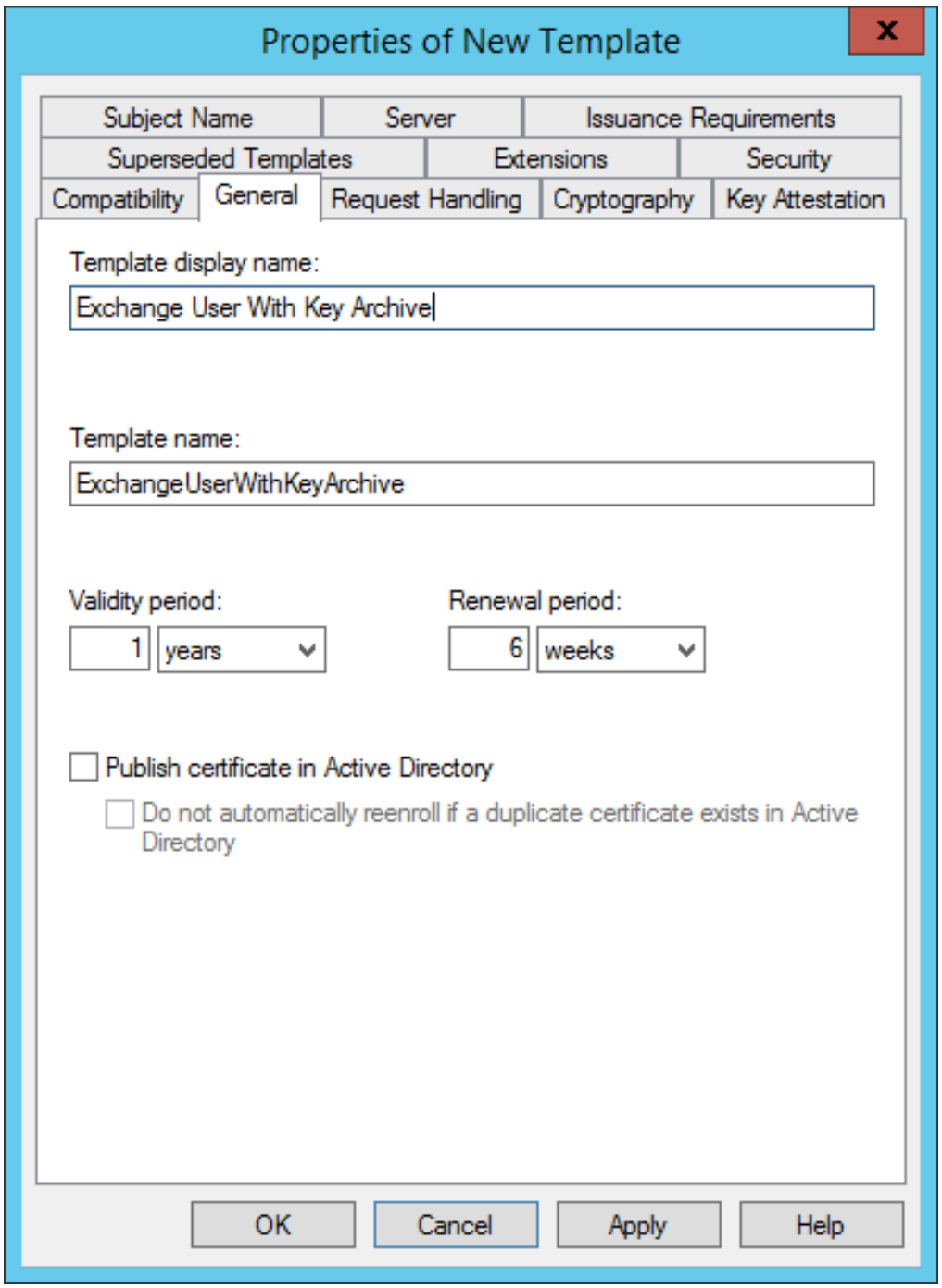
1. On the CA, start either:
   - The **Certificate Templates** MMC console.
   - The **Certification Authority** application.
2. Open the current CA, right-click **Certificate Templates** and choose **Manage**.
3. Select a template that is similar to the template that is to be created.

   Right-click this template and select **Duplicate Template** from the list.

   Note: If your account does not have include permissions to create and modify certificate templates, then the option will not be displayed.

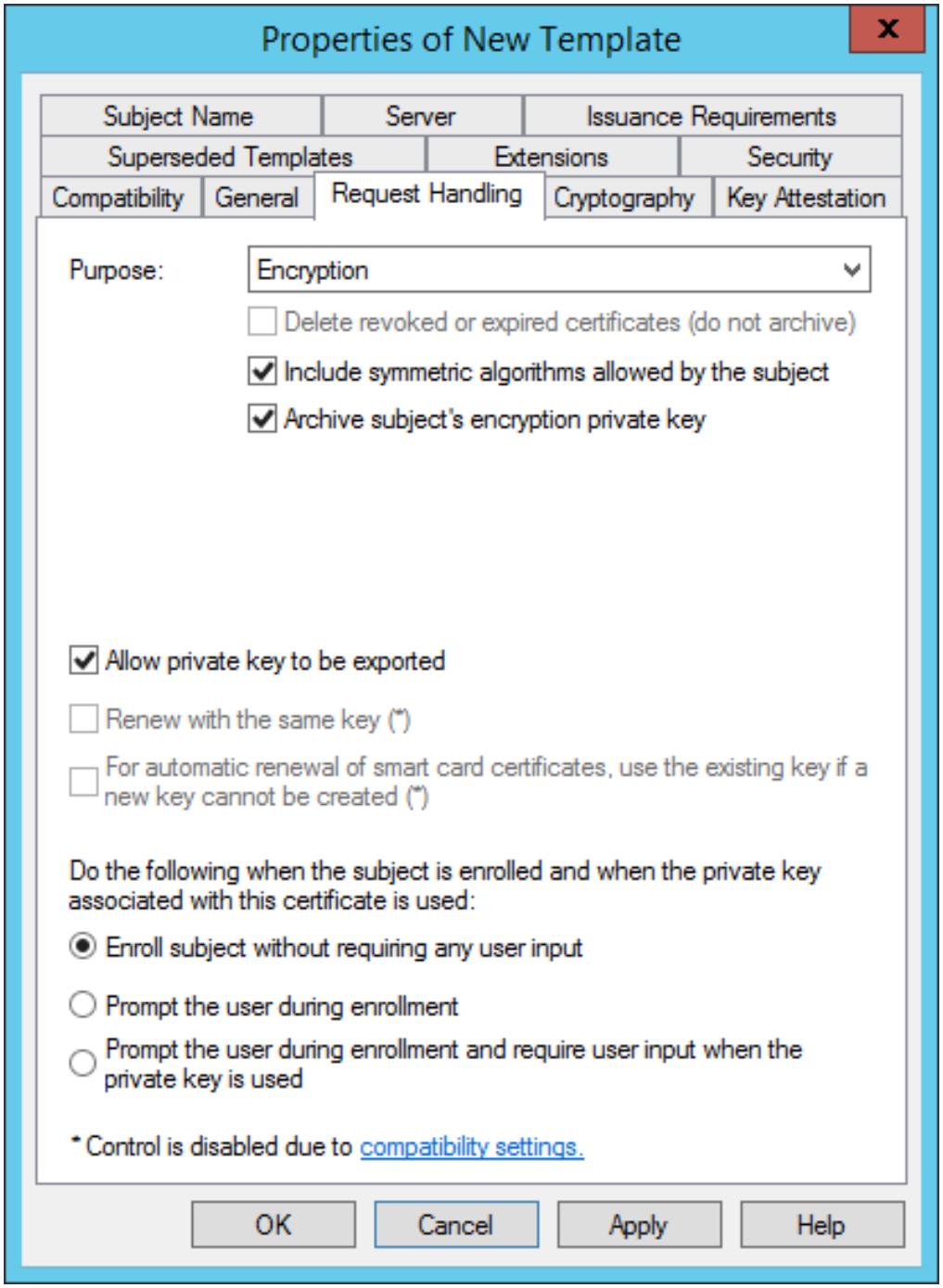
   This will create a new template that is identical to the selected template, which can be customized as required.

4. Right-click the new template and select **Properties** from the menu.
   a. On the **General** page, enter a name for the new template.



b. On the **Request Handling** page, click the **Archive subject's encryption private key** check box to specify this template for key archival, then click **OK** on the message box.

Note: This should only be enabled for encryption certificates – never for signing certificates.



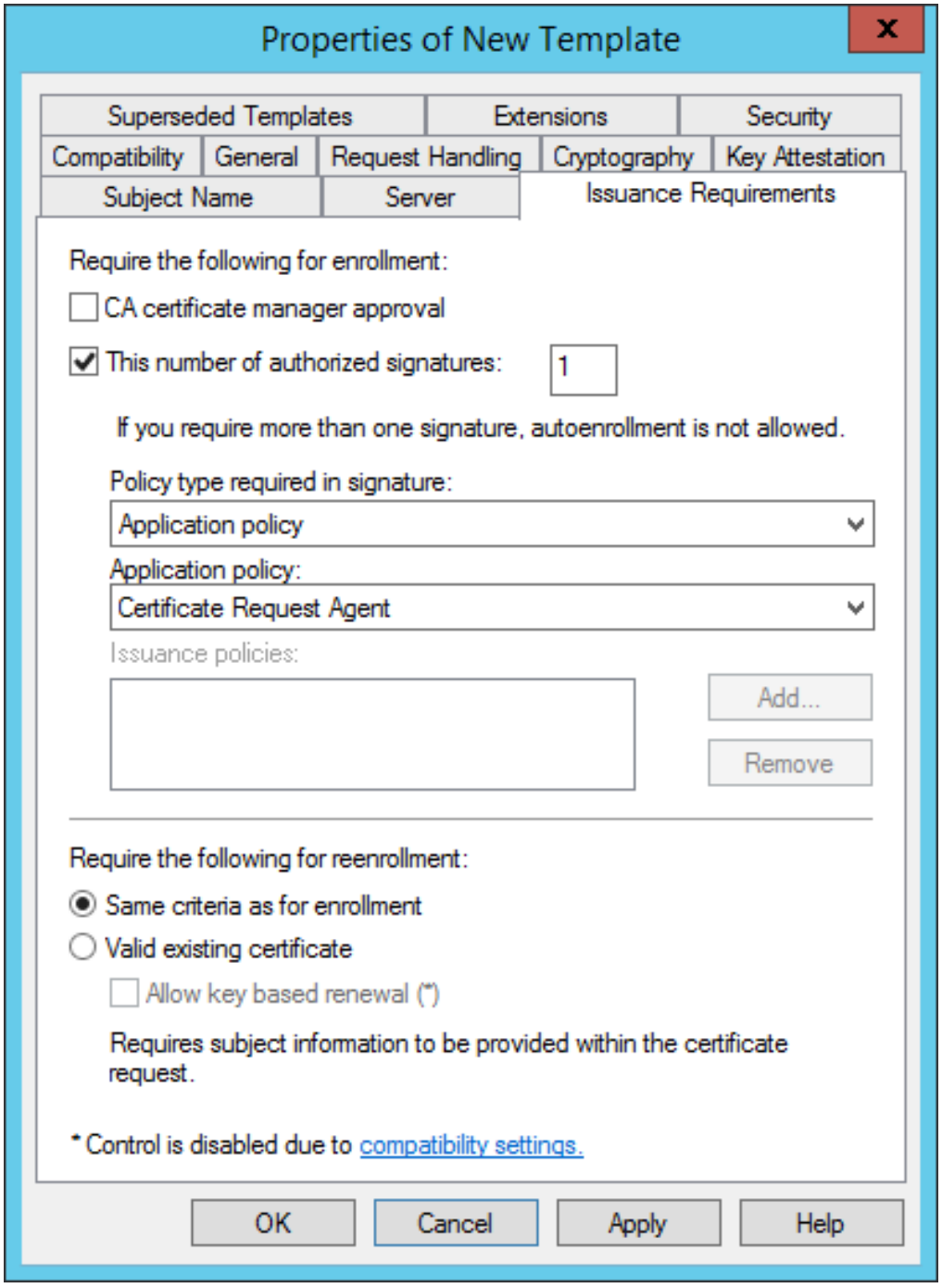
c. On the **Issuance Requirements** page:

   i. Click the **This number of authorized signatures** box to select it.

   ii. Enter the digit **1** into the box.

The signature of an enrollment agent will be required to issue a certificate of this template type.

Set up any other parameters necessary for your environment, referring to the Microsoft documentation for further details.



5. On the **Security** page, click **Add** and add the MyID COM+ user account. Ensure it has `Read`, `Write` and `Enroll` permissions.
6. Click **OK** to save the template.

   The template is now saved to the Active Directory store but is not available for issuance yet.

2.12 Enable certificate templates for issuance to the CA

In the default installation of a CA, a minimal subset of the available certificate templates is available for issuance. Any user-defined templates are not enabled for issuance yet.

To enable user-defined templates for issuance:

1. On the machine hosting the CA, run the **Certification Authority MMC** console.

   To do this, you must have 'Certificate Manager' access rights.
2. Click **Certificate Templates**.

   The right hand pane will display the certificate templates that are available for issuance.

   a. Right-click **Certificate Templates**.

   b. Select **New > Certificate Template to Issue** from the menu.

   c. Select the template that is to enabled and click **OK**.

      This should now appear in the right hand side of the Certificate Templates screen.

2.13 Role separation

Note: This section is relevant only if you are implementing role separation on your CA. See the Microsoft TechNet documentation for details of using role separation.

The standard setup for MyID to work with a Microsoft CA requires the following permissions:

- Issue & Manage Certificates
- Request Certs

See section *2.6*, *MyID user account* for details.

If you are implementing role separation, any user cannot have more than one role.

If you attempt to use MyID with role separation enabled, you will see an error similar to the following:

```
Failed RevokeCertificate.0x80094008 – The operation is denied. The user has multiple roles assigned and the certification authority is configured to enforce role separation.
```

Note: Make sure that you do not already have an EA cert in your certificate store. Contact customer support for more information.

To use MyID with a Microsoft CA that implements role separation, request an EA certificate for the MyID user manually, then set the following permission (and only the following permission) on the MyID COM+ user:

- Issue & Manage Certificates

See section *2.8.1*, *Manually requesting the Enrollment Agent certificate* for details of requesting the EA certificate.

2.14 Using the DeviceSerialNumber X500 attribute

By default, a Microsoft CA does not allow certificates to be issued that contain the `DeviceSerialNumber` X500 attribute (OID 2.5.4.5) in the subject Distinguished Name. If you need support for this attribute (for example, for the auth cert for PIV or PIV-I cards) you must carry out manual configuration on the CA.

To set up the `DeviceSerialNumber` X500 attribute:

1. At the command line on the CA, run the following command:

   ```
   certutil -getreg ca\SubjectTemplate
   ```

   This queries which X500 attributes are enabled, and the order they appear in the DN.

   By default this returns the following:

   ```
   HKEY_LOCAL_
   MACHINE\SYSTEM\CurrentControlSet\Services\CertSvc\Configuration\<CAName
   >\SubjectTemplate:

   SubjectTemplate REG_MULTI_SZ =

   0: EMail

   1: CommonName

   2: OrganizationalUnit

   3: Organization

   4: Locality

   5: State

   6: DomainComponent

   7: Country

   CertUtil: -getreg command completed successfully.
   ```

2. Run the following command to insert `DeviceSerialNumber` into this list:

   ```
   certutil -setreg ca\SubjectTemplate "<list of attributes>"
   ```

   The list of attributes is separated with `\n`. For example:

   ```
   certutil -setreg ca\SubjectTemplate
   "EMail\nDeviceSerialNumber\nCommonName\nOrganizationalUnit\nOrganizatio
   n\nLocality\nState\nDomainComponent\nCountry"
   ```

   This inserts `DeviceSerialNumber` into the list of attributes. If your system has already been modified, you may want to use a different list; use the output from the `-getreg` command above to determine what attributes you want to use.

3. Restart the CA service.

4. Run the following command to confirm that the configuration has been made correctly:

   ```
   certutil -getreg ca\SubjectTemplate
   ```

   This should now return the following:

   ```
   HKEY_LOCAL_
   MACHINE\SYSTEM\CurrentControlSet\Services\CertSvc\Configuration\<CAName
   >\SubjectTemplate:
   ```

```
SubjectTemplate REG_MULTI_SZ =
0: Email
1: DeviceSerialNumber
2: CommonName
3: OrganizationalUnit
4: Organization
5: Locality
6: State
7: DomainComponent
8: Country
CertUtil: -getreg command completed successfully.
```

The `DeviceSerialNumber` has been added near the beginning of the list. This is the position it will appear in the DN for the issued certificate.

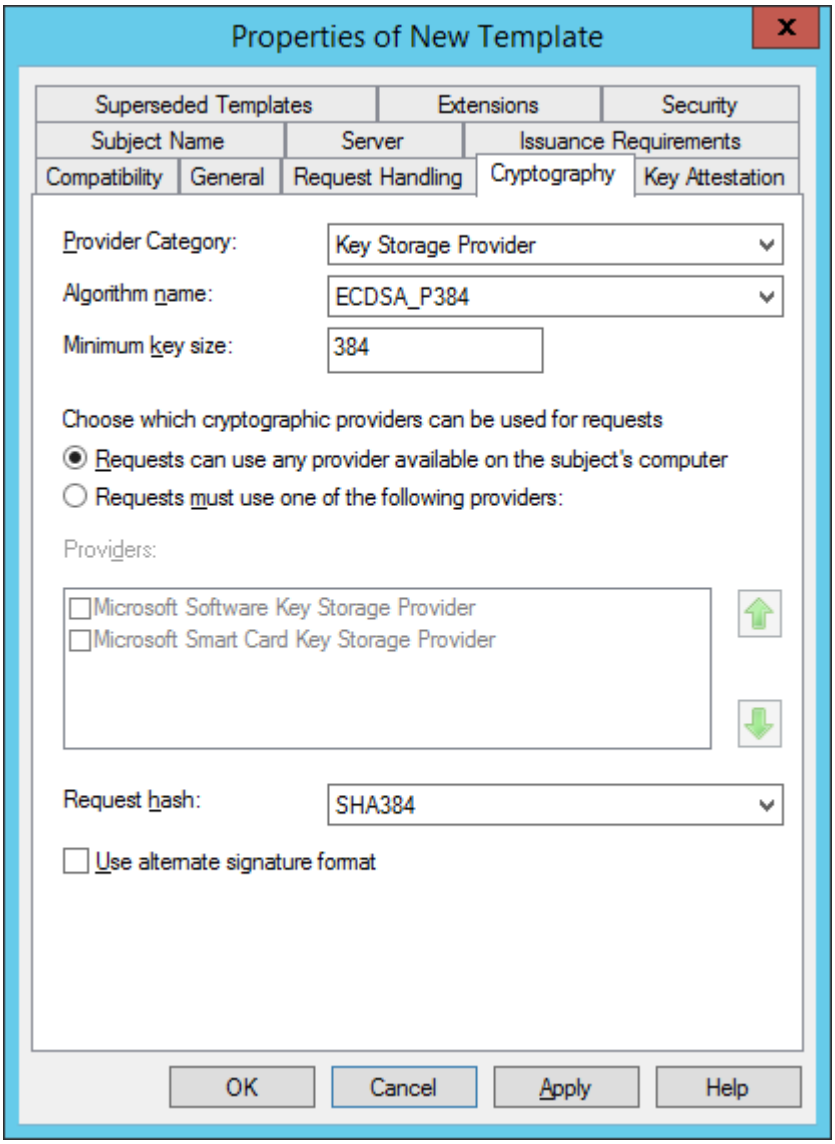
Note: The list and order of attributes may differ on your system if the CA has already been customized.

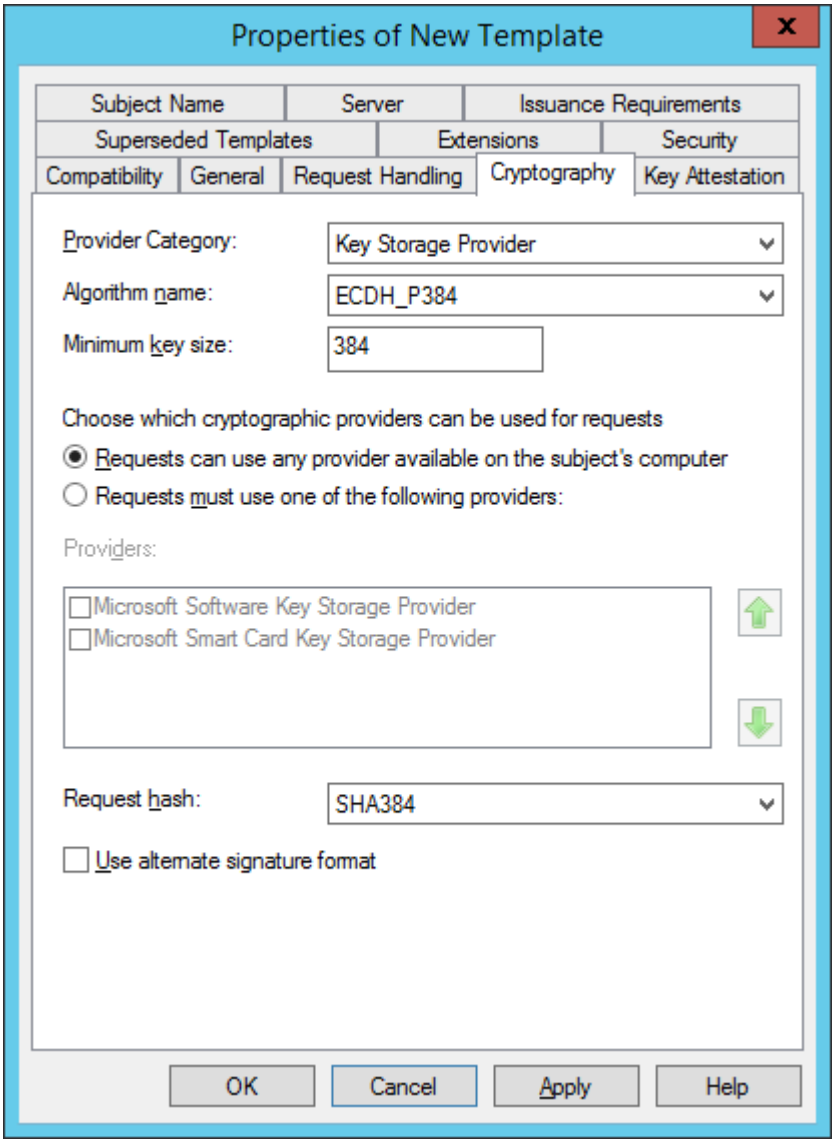
2.15 Configuring ECC certificates

MyID supports the issuance of certificates based on elliptic curve cryptography (ECC) as well as RSA. You must set up a certificate template on the CA to use the appropriate algorithm.

Note: ECC support is available on a restricted set of compatible devices. If you want to make use of this feature, contact Intercede for further details quoting SUP-237.

Microsoft CA supports Elliptic Curve Digital Signature Algorithm (ECDSA), a signing algorithm that uses ECC, and Elliptic Curve Diffie–Hellman (ECDH), an encryption algorithm that uses ECC.





When configuring the templates for issuance within MyID, you must select an ECC type of the appropriate size from the **Key Algorithm** drop-down list; for example for an **ECDSA_P384** or **ECDH_P384** certificate template, select **ECC P384** from the **Key Algorithm** drop-down list.

Note: ECC is not supported for archived certificates.

See section *3.3*, *Enable certificate templates for issuance within MyID* for details.

Note: ECC certificates may not be available for use on your clients in their default configuration; for example, you may have to enable the **Allow ECC certificates to be used for logon and authentication** group policy (in **Windows Components > Smart cards**) before Windows will recognize the certificates.

Note: Currently ECC 521 certificates are not supported by the FIPS 201-3 standard.

3 After installing MyID

This section contains details of the configuration that you must carry out after installing MyID.

3.1 Registering a Microsoft CA within MyID

MyID will detect all available Microsoft CAs in the domain when it is installed and these will be added to MyID.

All certificate templates available for issuance, including locally defined templates, will also be detected and added to MyID.

3.1.1 Manually registering a Microsoft CA within MyID

If you add a new Microsoft CA to your network, or add more certificate templates to an existing CA, you can use the `pkiconfig` utility to re-scan for CAs and templates.

To run the `pkiconfig` utility:

1. On the MyID application server, open a Windows command prompt.
2. Navigate to the MyID `Utilities` folder.

   By default, this is:

   ```
   C:\Program Files\Intercede\MyID\Utilities
   ```

3. Type the following:

   ```
   pkiconfig /verbose >pkiconfig.txt
   ```

   The `/verbose` flag provides extra information on the actions the utility is carrying out, and the `>pkiconfig.txt` writes out this information to a file called `pkiconfig.txt`; if you experience any problems, you can send this file to customer support.

The `pkiconfig` utility scans your network for available CAs and adds any new CAs and certificate templates to the MyID database. It does not, however, remove any old CAs from the MyID database; you must disable them within MyID using the **Certificate Authorities** workflow.

3.1.2 Enabling the mapping of extended attributes

MyID automatically picks up the appropriate extended attribute mapping settings from a file on the application server. If you require additional mapping, you can customize this file; for information, contact customer support, quoting reference SUP-316.

3.2 Setting a certificate store

If you want to specify a separate certificate store for your EA certificates, you can specify this in the **Certificate Authorities** workflow.

1. From the **Configuration** category, select **Certificate Authorities**.
2. From the **CA Name** drop-down list, select the certificate authority you want to work with.

3. Select the **Set Certificate Store** option, then type the name of the certificate store you want to use in the **Certificate Store** box.

   This **Certificate Store** name must be unique across your available CAs. Do not use the name `Edefice`, as this is reserved by MyID for internal use.

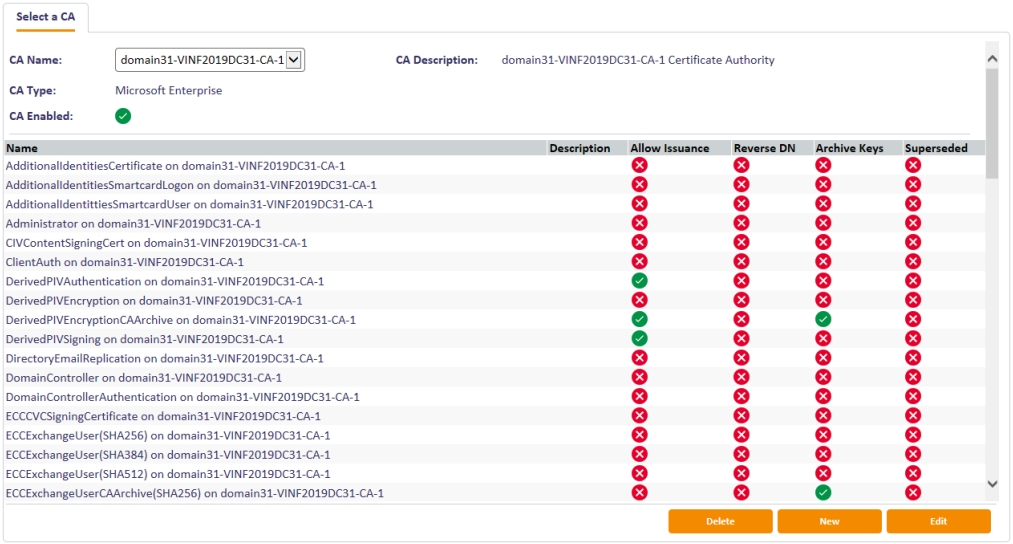
   MyID requests an EA certificate from your CA. You must make sure that your EA certificate policy is available to be requested. MyID creates a certificate store with the name you provided in the **Certificate Store** field, and stores the EA certificate in this store.

4. Click **Save**.

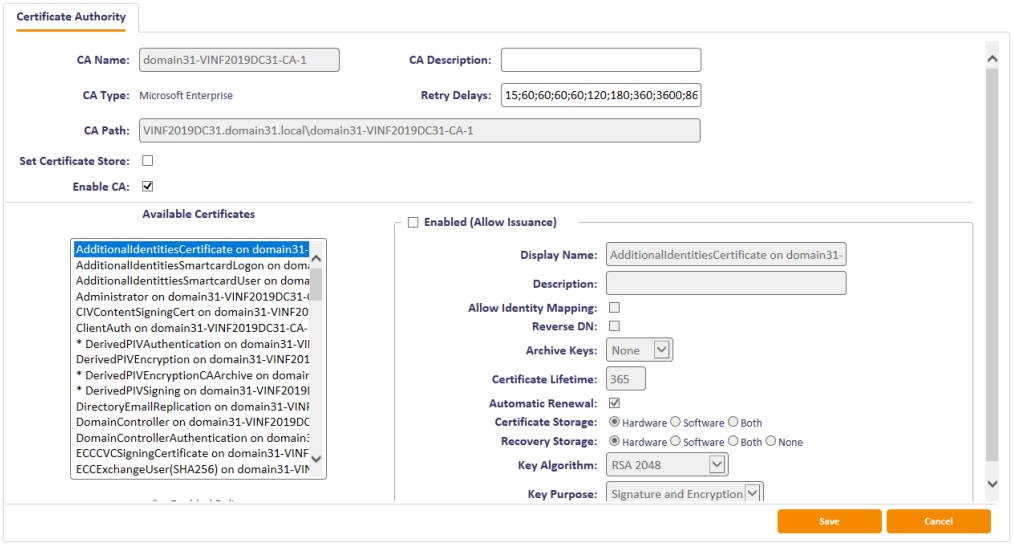
3.3 Enable certificate templates for issuance within MyID

Although all certificate templates are detected during the installation of MyID, they are all initially disabled. To enable them:

1. From the **Configuration** category, select **Certificate Authorities**.
2. From the **CA Name** drop-down list, select the certificate authority you want to work with.



3. Click **Edit**.



4. Make sure **Enable CA** is selected.
5. Select a certificate template you want to enable for issuance within MyID in the **Available Certificates** list.
6. Click the **Enabled (Allow Issuance)** checkbox.
7. Set the options for the policy:
   - **Display Name** – the name used to refer to the policy.
   - **Description** – a description of the policy.
   - **Allow Identity Mapping** – used for additional identities. See the *Additional identities* section in the ***Administration Guide*** for details.
   - **Reverse DN** – select this option if the certificate requires the Distinguished Name to be reversed.

     Microsoft CAs sort DN components at an OID Group level, not at the OID level. This means that if a DN contains two components with the same OID, such as `ou`, the resultant order of these components may be unexpected. If this is being experienced, set the **Reverse DN** option on the certificate policy and MyID will perform the OID ordering.

     Note: MyID does not recognize this option when using the **Issue Card** workflow to issue a card.
   - **Archive Keys** – select whether the keys should be archived.

     If you have MyID SecureVault installed, you can select **Secure Vault** to archive the keys in the MyID SecureVault database. For more information, see the *MyID SecureVault* section in the ***Administration Guide***.

- **Certificate Lifetime** – the life in days of the certificate. You can request a certificate from one day up to the maximum imposed by the CA. For example, type `365` to request one-year certificates.

  Note: You must make a change on the Microsoft CA to use this option; see section *3.9*, *Setting certificate lifetime* for details.
- **Automatic Renewal** – select this option if the certificate is automatically renewed when it expires.
- **Certificate Storage** – select one of the following:
  - **Hardware** – the certificate can be issued to cards.
  - **Software** – the certificate can be issued as a soft certificate.
  - **Both** – the certificate can be issued either to a card to as a soft certificate.
- **Requires Validation** – select this option if the certificate requires validation.

  Note: This option is available only if you select **Software** or **Both** for the **Certificate Storage** option.
- **Recovery Storage** – select one of the following:
  - **Hardware** – the certificate can be recovered to cards.
  - **Software** – the certificate can be recovered as a soft certificate.
  - **Both** – the certificate can be recovered either to cards or to a soft certificate.
  - **None** – allows you to prevent a certificate from being issued as a historic certificate, even if the **Archive Keys** option is set. If the **Certificate Storage** option is set to **Both**, the certificate can be issued to multiple credentials as a shared live certificate, but cannot be recovered as a historic certificate.
- Additional options for storage:

  If you select **Software** or **Both** for the **Certificate Storage**, or **Software**, **Both**, or **None** for the **Recovery Storage**, set the following options:
  - **CSP Name** – select the name of the cryptographic service provider for the certificate. This option affects software certificates issued or recovered to local store for Windows PCs.

    The CSP you select determines what type of certificate templates you can use. For example, if you want to use a 2048-bit key algorithm, you cannot select the Microsoft Base Cryptographic Provider; you must select the Microsoft Enhanced Cryptographic Provider. See your Microsoft documentation for details.
  - **Requires Validation** – select this option if the certificate requires validation.
  - **Private Key Exportable** – when a software certificate is issued to local store, create the private key as exportable. This allows the user to export the private key as a PFX at any point after issuance.

    It is recommended that private keys are set as non-exportable for maximum security.

    Note: This setting affects only private keys for software certificates – private keys for smart cards are never exportable.

- **User Protected** – allows a user to set a password to protect the certificate when they issue or recover it to their local store.

  This means that whenever they want to make use of the soft certificate, they will be prompted for a password before they are allowed to use it. This is a CSP feature that is enabled when you set this option, and affects only software certificates that are issued or recovered to local store for Windows PCs.

- **Key Algorithm** – select the type and length of the key-pairs used for certificate generation. A longer key length is more secure but certain manufacturers' CSPs do not support longer lengths. Select the appropriate key length from the list. This must match the key type and length set up in your CA.

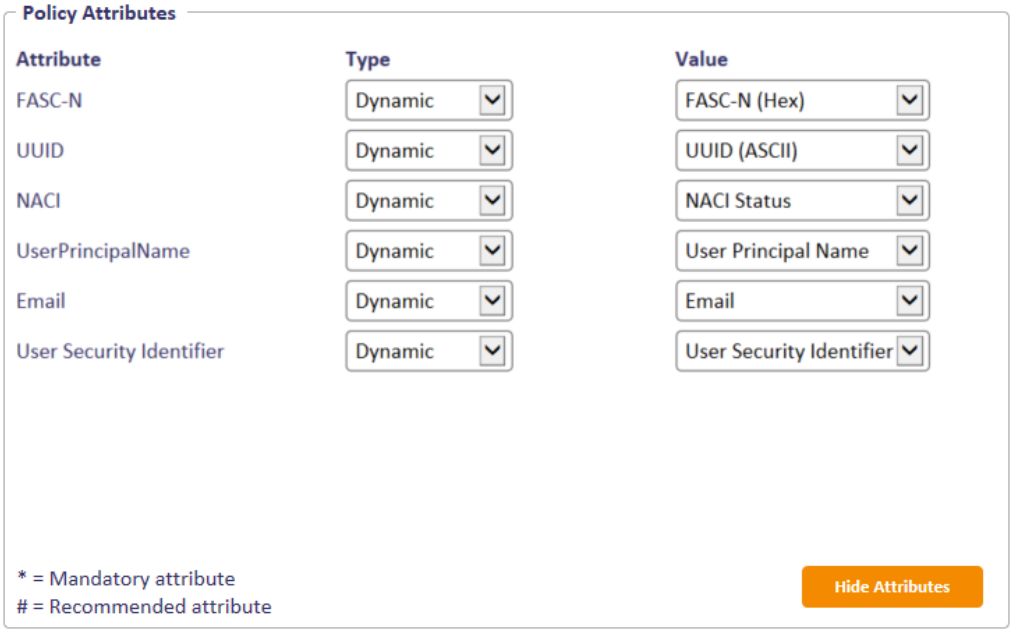
  You can select RSA or ECC types.

  Important: The devices to which you want to write the certificates must support the type and length of keys. See the ***Smart Card Integration Guide*** for details. You cannot currently issue ECC certificates as software certificates or to mobile devices.

- **Key Purpose** – select one of the following:
  - **Signature** – the key can be used for signing only.
  - **Signature and Encryption** – the key can be used for either signing or encryption.

  Note: The **Key Purpose** option has an effect only where the device being issued supports the feature. PIV cards do not support this feature, while smart cards issued with minidrivers and software certificates issued to local store for Windows PCs do support this feature.

8. If you need to edit the policy attributes, click **Edit Attributes**.



For details of adding the User Security Identifier or NACI extension to your certificates, see section *3.10*, *Adding extensions to certificate templates*.

a. For each attribute, select one of the following options from the **Type** list:
   - **Not Required** – the attribute is not needed.
   - **Dynamic** – select a mapping from the **Value** list to match to this attribute.
   - **Static** – type a value in the **Value** box.

b. Click **Hide Attributes**.

9. Click **Save**.

Note: Changes made to certificate profiles do not take effect immediately, as the normal interval for MyID to poll for updates is 50 minutes. To force MyID to poll for changes immediately, you must manually restart the **eKeyServer** service, and then restart the **eCertificate** service.

3.4 Deleting a CA

You can delete a CA from the list of available CAs if you no longer need to be able to work with it, or if you created it in error.

See the *Deleting a CA* section in the ***Administration Guide*** for details.

3.5 Multiple forest support for Microsoft Enterprise CAs

MyID supports Microsoft Enterprise CAs in multiple domains/forests. This includes cross-issuing certificates between domains.

To enable multiple forest support, you must first configure your domains and CA to work in this environment.

1. Make sure that mutual trust relationships are set up between the domains.
2. Set up forward and reverse DNS forwarding between the domains.

3. Configure the CAs for LDAP referral at issuance:
   a. On each CA, start a command prompt.
   b. Run the following command:

      ```
      certutil -setreg Policy\EditFlags +EDITF_ENABLELDAPREFERRALS
      ```

   c. Stop the CA.
   d. Restart the CA.

You must also configure MyID to work in a multiple forest environment.

3.5.1 Setting up MyID for multiple forest support

By default, MyID searches the domain that it resides in for enterprise CAs and automatically adds these to the MyID database.

This means that in a multiple forest environment, MyID will recognize only the CAs in its own domain. You must configure all other CAs manually using the **Certificate Authorities** workflow. It is important that the value entered into the **Certificate Store** field is unique, as this is the name of the store used to hold the enrollment agent certificates used when requesting certificates from the CA.

It is recommended that you use the same value for the **CA Name** and the **Certificate Store** fields; for example, you can use the short form of the **CA Path** for both. If your CA Path is `myCAServer.example.domain.local\myCAServer`, you can use `myCAServer` in both the **CA Name** and the **Certificate Store** fields.

You must also add each CA host machine to the `CertPublishers` group in every domain to which you want to request and issue certificates.

3.5.2 Publishing the root certificate into the account forest

The availability of the root CA certificate is mandatory to establish a trust relationship between a certificate enrollee and an issuing certification authority. Therefore, the root CA certificate that the issuing CA's certificate chains up to must be published into each account forest.

To publish a root CA certificate into the enterprise-wide configuration of an Active Directory environment, export the latest root CA certificate into a file by running the following command:

```
certutil -config <CA machine name>\<CA Name> -ca.cert <file name>
```

For example:

```
certutil -config Cont-CA1\ContosoCA -ca.cert ContosoCA1.cer
```

Next, perform the following command in every account forest. Run this command with Enterprise Admins permissions in that forest:

```
certutil -dspublish -f <RootCACertificateFile> RootCA
```

For example:

```
certutil -dspublish -f ContosoCA1.cer RootCA
```

To confirm that certificate has been added to the store, use the following command:

```
certutil -viewstore "ldap:///CN=Certification Authorities,CN=Public Key Services,CN=Services,CN=Configuration,DC=<ForestRootNameSpace>?cACertificate?one?objectClass=certificationAuthority"
```

To delete a certificate from the store, use the following command:

```
certutil -viewdelstore "ldap:///CN=Certification Authorities,CN=Public Key Services,CN=Services,CN=Configuration,DC=<ForestRootNameSpace>?cACertificate?one?objectClass=certificationAuthority"
```

The command shows the list of certificates that are currently stored in the store. Select a certificate then click OK to remove it from the certificate store.

3.6 Attribute mapping for PIV and PIV-I systems

For PIV systems, you must set up the attributes of the PIV certificate policies to have specific dynamic mappings.

Note: The FASC-N mapping is required for standard PIV cards, but is not permitted for PIV-I cards. The PIV Card Authentication certificate policy *must not* contain a mapping for Email.

3.6.1 Example attribute mapping for PIV systems

Certificate Policy	FASC-N	UUID	NACI	User Principal Name	Email
PIV Authentication	FASC-N (Hex)	UUID (ASCII)	NACI Status	User Principal Name	Not Required
PIV Card Authentication	FASC-N (Hex)	UUID (ASCII)	NACI Status	Not Required	Not Required
PIV Encryption	Not Required	Not Required	Not Required	Not Required	Email
PIV Signing	Not Required	Not Required	Not Required	Not Required	Email

3.6.2 Example attribute mapping for PIV-I systems

Certificate Policy	FASC-N	UUID	NACI	User Principal Name	Email
PIV Authentication	Not Required	UUID (ASCII)	Not Required	User Principal Name	Not Required
PIV Card Authentication	Not Required	UUID (ASCII)	Not Required	Not Required	Not Required
PIV Encryption	Not Required	Not Required	Not Required	Not Required	Email
PIV Signing	Not Required	Not Required	Not Required	Not Required	Email

3.7 Unpublishing the Enrollment Agent and Key Recovery Agent certificates

The Enrollment Agent and Key Recovery Agent certificates can be unpublished after:

- MyID has issued the first certificate and so has requested its Enrollment Agent Certificate.
- MyID has had a Key Recovery Agent Certificate issued (optional).

3.8 Controlling the content of subject alternative names

Microsoft Certificate Services maintains and uses certificate templates stored in Active Directory when processing certificate requests and issuing certificates.

By default, the content for subject alternative names is controlled by the CA, and additional attribute mappings that can specify the subject alternative name are not required, and not accepted. As the MyID application server requests certificates on behalf of the end users, if you want to use additional attribute mappings to control the content of the subject alternative name, you must modify the configuration of the CA to give MyID the ability to specify the subject alternative name content.

Warning: This is a global setting and is not limited to a single template. The CA will accept attributes for subject alternative names for all certificate requests. You are recommended to set up a dedicated CA for MyID to prevent other clients from requesting certificates from the CA. Also, you are recommended to disable any certificate templates that you do not intend to issue using MyID.

To ensure that only the MyID application server can issue certificates, configure the CA to require the use of an enrollment agent certificate.

To enable MyID to specify the content of subject alternative names:

1. Log on to the CA as an Administrator.
2. To display a list of the current settings, at the command prompt type:

   ```
   CERTUTIL -getreg policy\EditFlags
   ```

3. If `ATTRIBUTESUBJECTALTNAME2` is not included in the list, at the command prompt, type:

   ```
   CERTUTIL -setreg policy\EditFlags +EDITF_ATTRIBUTESUBJECTALTNAME2
   ```

4. Restart the CA by entering the following commands, pressing Enter after each one:
   a. `NET STOP certsvc`
   b. `NET START certsvc`

   MyID can now control the content of the “Subject Alternative Name” (`SubjectAltName2`) until you return control to the CA.

To return control of the content of subject alternative names to the CA:

1. Log on to the CA as an Administrator.
2. To display the current settings, at the command prompt type:

   ```
   CERTUTIL -getreg policy\EditFlags
   ```

3. At the command prompt, type:

   ```
   CERTUTIL -setreg policy\EditFlags -EDITF_ATTRIBUTESUBJECTALTNAME2
   ```

4. Restart the CA by entering the following commands, pressing Enter after each one:
   a. `NET STOP certsvc`
   b. `NET START certsvc`

Control of the content of “Subject Alternative Name” (`SubjectAltName2`) returns to the CA.

3.9 Setting certificate lifetime

By default, the Microsoft CA ignores the settings for certificate lifetime from MyID. The default validity period for the CA is two years, and no certificate issued will exceed this. If you want to change the global certificate lifetime limit, you can do so on the CA.

To specify certificate lifetime on the CA:

1. Log on to the CA as an Administrator.
2. At the command prompt, type:

   ```
   certutil -setreg CA\ValidityPeriodUnits 3
   ```

   This sets the certificate lifetime to three years.
3. Restart the CA by entering the following commands, pressing Enter after each one:
   a. `NET STOP certsvc`
   b. `NET START certsvc`

Note: This set the maximum lifetime for any certificate. Individual certificate templates may have lifetimes that are shorter; if the certificate template has a lifetime that is longer than the CA validity period, the certificates issued will be restricted to the CA validity period. For example, if the CA validity period is 2 years, and the certificate template has a lifetime of 5 years, the certificates issued will have a lifetime of 2 years.

3.9.1 Controlling the certificate lifetime from MyID

You can set the CA to allow MyID to pass requests for specific certificate lifetimes.

To allow MyID to specify certificate lifetime:

1. Log on to the CA as an Administrator.
2. At the command prompt, type:

   ```
   certutil -setreg Policy\EditFlags +EDITF_ATTRIBUTEENDDATE
   ```

3. Restart the CA by entering the following commands, pressing Enter after each one:
   a. `NET STOP certsvc`
   b. `NET START certsvc`

Note: If you set this option on the CA, MyID can override the default `ValidityPeriodUnits` setting on a certificate-by-certificate basis. However, MyID can only reduce the validity period of a certificate – you cannot increase the validity period by specifying a value in MyID.

If you request a certificate with a longer period than is permitted by the CA, the request will be rejected by the CA.

3.9.2 Specific certificate expiry time

MyID can specify the expiry time for certificates. If the expiry time for the certificate is later than the expiry date for the device, and the **Restrict certificate lifetimes to the card** option (on the **Certificates** page of the **Operation Settings** workflow within MyID) is set to `Yes`, the certificate lifetime is reduced to match the lifetime of the device.

For example, if you issue a device at 09:18:44 GMT on Tuesday, 03 May 2011 with a lifetime of 6 days, the device will expire at 09:18:44 GMT on Monday, 09 May 2011. MyID requests a certificate for this device with the following details:

- `ValidityPeriod: Days`
- `ValidityPeriodUnits: 6`
- `ExpirationDate: Mon, 09 May 2011 09:18:44 GMT`

The certificate expiration date will be as specified in the request: `09/05/2011 09:18:44`. This matches the expiry date of the device. The `ValidityPeriodUnits` setting is ignored.

However, if the `ExpirationDate` is not present in the request, the `ValidityPeriodUnits` setting is used instead.

3.9.2.1 A note on the display of certificate dates within MMC

The certificate request is in GMT, but in the Microsoft Management Console Certification Authority snap-in, the certificate expiry date is displayed in the local time; for example, BST or MDT.

The Microsoft Management Console Certification Authority displays certificate dates to the minute, but the CA works with certificate dates to the millisecond; for example, in the MMC the date may be displayed as `09:18`, but the certificate may actually be configured to expire at `09:18:44.000`.

Note: You may see an anomaly in the Windows user interface, where the column displaying the certificate requests may be truncated without any indication; view the request properties dialog to display the full request.

3.10 Adding extensions to certificate templates

You can add extensions to the attributes for your certificate templates; these are then available for attribute mapping.

3.10.1 User SID extensions

To set up your Certificate Authority to issue certificates with user security identifier (user SID) extension for Windows authentication, you must configure the certificate template with manager approval.

For information on user SIDs, see the *Including user security identifiers in certificates* section in the ***Administration Guide***.

1. Open the Certificate Authority MMC Snapin.
2. Expand the list for your certificate authority.
3. Right-click on **Certificate Templates**, then select **Manage** from the pop-up menu.
4. Select the template you want to add the user security identifier extension to, then right-click and select **Properties** from the pop-up menu.
5. Click the **Subject Name** tab.
6. Set the **Supply in Request** option.
7. Click **OK**.
8. Click the **Issuance Requirements** tab.
9. Set the **CA certificate manager approval** option, then set the **This number of authorized signatures** box. Make sure the number of signatories is set to `1`.
10. Click **OK**.
11. Click **OK** to close the property sheet.
12. Open a command prompt on the certificate authority server and type the following:

    ```
    certutil -setreg policy\EnableRequestExtensionList
    +1.3.6.1.4.1.311.25.2
    ```

13. Restart the certificate authority.

3.10.2 NACI extensions for PIV cards

To set up your Certificate Authority to issue certificates for PIV cards, you must also add a NACI extension to the certificate template.

1. Open the Certificate Authority MMC Snapin.
2. Expand the list for your certificate authority.
3. Right-click on **Certificate Templates**, then select **Manage** from the pop-up menu.
4. Select the template you want to add the NACI extension to, then right-click and select **Properties** from the pop-up menu.
5. Click the **Subject Name** tab.
6. Set the **Supply in Request** option.
7. Click **OK**.
8. Click the **Issuance Requirements** tab.
9. Set the **CA certificate manager approval** option, then set the **This number of authorized signatures** box. Make sure the number of signatories is set to `1`.
10. Click **OK**.
11. Click **OK** to close the property sheet.
12. Open a command prompt on the certificate authority server and type the following:

    ```
    certutil -setreg policy\EnableRequestExtensionList
    +2.16.840.1.101.3.6.9.1
    ```

13. Restart the certificate authority.

3.11 Setting up certificates for imported users

If you want to issue certificates to users who have not been imported from LDAP, but have been imported using (for example) the MyID Lifecycle Management API, MyID may not be able to match the users to an entry in the LDAP. You must set the subject name to **Supplied in Request**.

1. Open the Certificate Authority MMC Snapin.
2. Expand the list for your certificate authority.
3. Right-click on **Certificate Templates**, then select **Manage** from the pop-up menu.
4. Select the template you want to issue.
5. Click the **Subject Name** tab.
6. Set the **Supply in Request** option.
7. Click **OK**.

3.12 Setting the effective revocation date

You can configure MyID to set the Effective Revocation Date on the CA to one of the following:

- The date and time the CA received the request.
- The date and time MyID revoked the certificate.

This may make a difference if the CA is temporarily unreachable.

For example:

1. The MyID operator revokes the certificate at 0900.
2. MyID sends the request to the CA at 0900.
3. The CA is offline, so does not receive the request until 1000.
4. At 1000, the certificate is marked as revoked on the CA.
5. The effective revocation date is set as follows:
   - If the **Effective Revocation Immediate** option is `Yes`, the effective revocation date is set to 1000 – the time the CA received the request.
   - If the **Effective Revocation Immediate** option is `No`, the effective revocation date is set to 0900, the time the operator revoked the certificate in MyID.

   The difference determines whether any operations that were carried out using the certificate between 0900 and 1000 are valid.

To set the effective revocation option:

1. From the **Configuration** category, select **Operation Settings**.
2. On the **General** tab, set the following option:
   - **Effective Revocation Immediate** – set to one of the following:
     - `Yes` – the effective revocation date on the CA is set to the time the CA receives the request.
     - `No` – the effective revocation date on the CA is set to the time the certificate is revoked in MyID.
3. Click **Save changes**.

3.13 Known issues

This section contains known issues that may occur when working with a Microsoft CA.

- **Unable to issue certificates**

  Under some circumstances, you may be unable to issue certificates. The certificates fail to issue with an "Unspecified Error". This error is caused by the Enrollment Agent certificate not being requested.

  As a workaround, you can request the Enrollment Agent certificate manually. See section *2.8.1*, *Manually requesting the Enrollment Agent certificate* for details.

- **Certificates fail to issue if the DN is too long**

  If you enter a DN for a user that is too long for the Microsoft CA, the certificates will fail to issue on the Write Certificates stage of the **Collect Card** workflow, displaying an error similar to the following for each certificate:

  ```
  CertificateName has failed to issue
  ```

  If you see this error, check the length of the user's DN. Check your CA configuration to determine the maximum length the CA can support.

- **CAs not detected**

  Occasionally, you may find that MyID has not detected all the available Microsoft CAs in the domain when you install it. If so, you can run the `pkiconfig` utility to add the CAs. See section *3.1.1*, *Manually registering a Microsoft CA within MyID* for details.

4 Remote Microsoft Certificate Authority

MyID supports the use of a Microsoft CA on a remote domain.

To set up a remote Microsoft CA, you must install the MSCAWebService installer on a server on the same domain as the remote Microsoft Certificate Authority servers. This installs a web service on a remote server, with which MyID communicates directly over HTTP or HTTPS, bridging the gap between the domain in which MyID resides and the domain in which the Certificate Authorities reside.

You are recommended to set this service up with two-way SSL.

Note: Currently, support for CNG/KSP requires that the CA is on the same domain as the MyID server; accordingly, you cannot use CNG/KSP with the remote Microsoft CA.

4.1 Setting up the server for the remote web service

The server on which you install the MSCAWebService must have .NET Framework 4.0 or greater installed.

You must also make sure that the server has IIS installed, and has been configured in the same way as the MyID web server – see the *Setting up server roles* section in the ***Installation and Configuration Guide*** for details.

4.2 Setting up the user account

You must create a user on the remote domain; this account is used to run the web service. You must provide the user name and password for this user to the installer when you install the web service.

4.2.1 Setting up the rights for the user account

This remote domain user must have Distributed COM rights on the server on which you are installing the web service, and must have the same rights as the MyID COM+ user account you use for certificate authorities on a local domain.

To grant the user the appropriate CA rights:

1. Start the **Certification Authority** application.
2. Right-click on the CA node in the tree and select **Properties** from the menu displayed.
3. Click the **Security** tab.
4. Add the remote domain user account, ensuring it has these permissions:
   - Issue & Manage Certificates.
   - Request Certs.

4.2.2 Setting up the certificate privileges for the user account

The MyID remote domain user account must have enrollment privileges for all published certificates to manage certificates.

To set up the certificate privileges:

1. Start the **Certification Authority** application.
2. Open the CA.
   a. Right-click **Certificate Templates** and select **Manage** from the menu.
      This will start the **Certificate Template** application.
   b. Right-click the relevant certificate and select **Properties** from the menu.
3. The **Properties** dialog box for the certificate is displayed.
   a. Click the **Security** tab.
   b. Click **Add** and add the MyID remote domain user account. Ensure it has **Read** and **Enroll** permissions.

4.3 Installing an Enrollment Agent certificate

You must obtain an Enrollment Agent (EA) certificate and install it on the remote server.

To request an EA cert for the MyID user manually, assuming your remote domain user is `my_user` and the certificate file you export is `my_ea.cer`:

1. Request the Enrollment Agent certificate using the certificate manager snap-in.
   a. Log on to the MyID remote domain web service server as `my_user`.
   b. From the Windows **Start** menu, run `certmgr.msc`.
   c. Expand **Certificates – Current User > Personal**.
   d. Right-click on **Personal** folder, then from the pop-up menu select **All Tasks > Request New Certificate**.
   e. Click **Next**, then click **Next** again.
   f. Select the **Enrollment Agent** certificate, click **Details**, then click **Properties**.
   g. On the **General** tab, provide a friendly name and description as required.
   h. On the **Private Key** tab, change the CSP and key length as required.
   i. On the **Certification Authority** tab, select the issuing authority from which you want to issue the Enrollment Agent certificate, then click **OK**.
   j. Click **Enroll**.
   k. Click **Finish** to complete the request.
2. Export the certificate and add it to the Edefice store.
   a. In the Windows Control Panel, select **Internet Options**.
   b. On the **Content** tab, click **Certificates**, then select the certificate you installed.
      The certificate will have the type Certificate Request Agent, for example.
   c. Click **Export**.

d. Use the Certificate Export Wizard to save the file. Do not export the private key. Select the **DER encoded binary X.509 (.CER)** format and give the file the name `my_ea.cer`.

e. Open a command prompt and navigate to the folder containing `my_ea.cer`.

f. Type the following:

```
certutil -addstore -user edefice my_ea.cer
```

If the Edefice store does not exist, you must use the `-f` parameter to force it:

```
certutil -addstore -f -user edefice my_ea.cer
```

4.4 Installing the web service

To install the MSCAWebService:

1. Copy the following files from the MyID application server to a server on the same domain as the remote CAs:
   - `GetWebSiteList.ps1`

     This is provided in the installation media for MyID. You can find the file in the following folder:

     `\Installer\InstallationScripts\`
   - `MSCAWebService.exe`

     This is copied by the MyID installation program to the `Utilities` folder on the MyID application server. By default, this is:

     `C:\Program Files\Intercede\MyID\Utilities\`
2. On the remote server, open a PowerShell prompt, and run the `GetWebSiteList.ps1` script.

   Note: This script is signed to confirm that it was provided by Intercede and has not been altered. If your server is configured to allow only signed PowerShell scripts to be run, you must trust Intercede as a publisher before you run the installation program. See the *Trusting the signed scripts* section in the ***Installation and Configuration Guide*** for details of how to trust the Intercede digital signature.

   This script obtains a list of the websites available in IIS. If you do not run this script before running the MSCAWebService installation program, the following error appears:

   ```
   OpenFile on WebSiteList.txt failed
   ```

   If this error occurs, close the installation program, run the PowerShell script, then run the installation program again.
3. On the remote server, run the `MSCAWebService.exe` installer.
4. Follow the on-screen prompts.

   For the user account, type the details for the user you created in the remote domain.
5. In Internet Information Services (IIS) Manager, set the following option for the **MyIDMSCAEnrollmentPool** application pool:
   - **Advanced Settings > Process Model > Load User Profile** – set to **True**.
6. Restart the server.

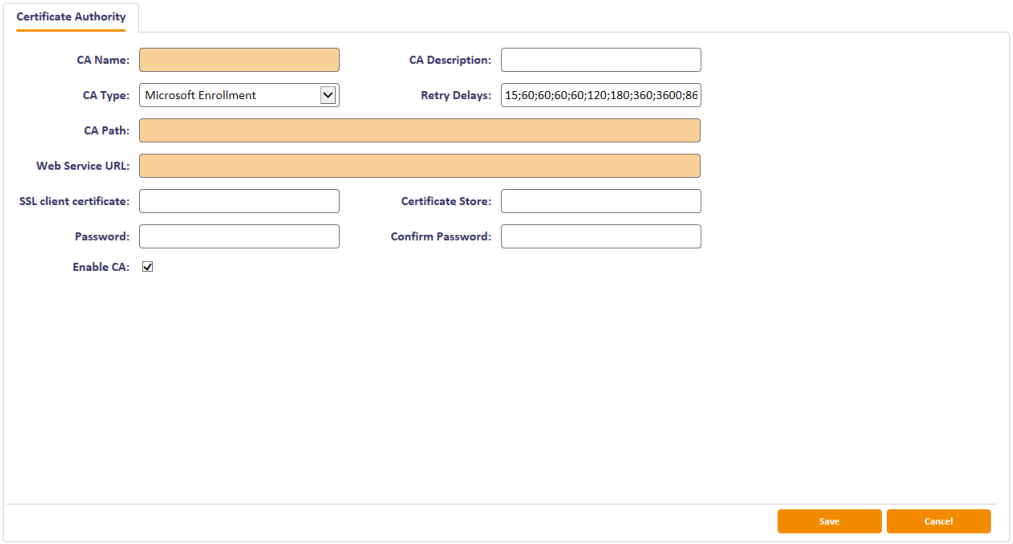
4.5 Adding a certificate authority

Once you have installed the MyID web service for the remote Microsoft CA, you can set up new CAs within MyID that point to this service and the Certificate Authorities it can access.

You can set up multiple CAs using the same web service.

To set up a new CA:

1. From the **Configuration** category, select **Certificate Authorities**.
2. Click **New**.
3. From the **CA Type** drop-down list, select **Microsoft Enrollment**.



4. Set the following options:
   - **CA Name** – The name of the CA. This is used to identify the CA within MyID.
   - **CA Description** – The description of the CA.
   - **Retry Delays** – A semi-colon separated list of elapsed times, in seconds.

     For example, `5;10;20` means:
     - If the first attempt to retrieve details from the CA fails, a second attempt will be made after a 5 second delay.
     - If this second attempt fails, the CA will be contacted again after 10 seconds.
     - Subsequent attempts will be made to retrieve information every 20 seconds, until a response is received.

     If you want to limit the number of retry attempts, enter 0 as the last number in the sequence.

     The default is:

     `15;60;60;60;60;120;180;360;3600;86400;0`

     This retries after 15 seconds, then after a minute four times, then two minutes, three minutes, six minutes, an hour, 24 hours, then stops.

- **CA Path** – The path of the CA relative to the server on which the service is installed.

  For example:

  ```
  MYSERVER\CANAME
  ```

  or:

  ```
  MYSERVER.EXAMPLE.COM\CANAME
  ```

- **Web Service URL** – The URL of the MyID web service. For example:

  ```
  https://myserver/myidmscaenrollment/myidmscaenrollment.asmx
  ```

- **SSL client certificate** – If you are using two-way SSL, the path to the SSL certificate on the MyID application server.
- **Certificate Store** – Type the name of the certificate store used for the enrollment agent certificate. The default is:

  ```
  edefice
  ```

- **Password** – The password for the SSL certificate.
- **Enable CA** – Make sure this option is selected. If you deselect this option, the CA will not be available within MyID.

5. Click **Save**.

Important: Make sure that you specify the CA machine name correctly in the **CA Path** for the CA's entry in the **Certificate Authorities** workflow. If you specify the name incorrectly, the CA will not appear in the drop-down list of CA names.

4.6 Setting up certificates

Once you have added the CA. you can enable the certificate policies for that certificate authority.

When setting up certificates, you must be aware of the following:

- Policies from the remote CA are not retrieved until the next policy synchronization period, which may take up to 50 minutes. To force MyID to poll for changes immediately, you must manually restart the **eKeyServer** service, and then restart the **eCertificate** service.
- In the CA, in the settings of each certificate policy, you must enable **Supply in the request**.
- If you want to archive certificates, you must archive them within MyID. Currently, archiving certificates on the remote CA is not supported.

See section *3.3*, *Enable certificate templates for issuance within MyID* for details of enabling certificate policies.

Note: RSA 3072 and 4096 bit keys have not been tested with the remote CA.

4.7 Troubleshooting a remote Microsoft CA

- Make sure you restart the target server after installing the MSCAWebService.
- Make sure that you are using `edefice` as the name of the certificate store.
- Make sure that you can resolve the target URL for the remote web service from the MyID application server while logged on as the MyID COM+ user.

- If you are using a remote server from an untrusted domain, make sure that the SSL certificate is trusted on the application server; copy the CA certificate that issued the SSL certificate into the Trusted Root store for the MyID COM+ user.
- If you experience problems using TLS 1.2, configure the registry to allow .NET 4.0 components to make TLS 1.2 connections:
  1. On the MyID servers hosting the web services, in each of the following keys:

     `HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\Microsoft\.NETFramework\v4.0.30319`

     and:

     `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\.NETFramework\v4.0.30319`
  2. Set or create a DWORD `SchUseStrongCrypto` and set the value to 1.
- To identify problems at the transport level making the connection, enable machine-level .NET tracing; see the Microsoft documentation for details:

  docs.microsoft.com/en-us/dotnet/framework/network-programming/network-tracing

  docs.microsoft.com/en-us/dotnet/framework/network-programming/how-to-configure-network-tracing
- If you continue to have problems, see the *Registry logging* section in the ***Configuring Logging*** guide for information on setting up logging for the `MicrosoftConnector` component.