

Autoenroll PKI

Introduction

1. Introduction

true-Xtender Autoenroll PKI connects the Microsoft Autoenrollment function with a public PKI service of your choice. This lets you issue and manage certificates in-house as usual without having to set up, operate and maintain your own Microsoft CA.

Together with the keyon true-Xtender extensions from SITS, the Microsoft PKI is a comprehensive solution for the issuance and management of X.509 certificates.

Based on Microsoft PKI, X.509 certificates are issued and managed for comprehensive identity and access solutions.

The Autoenrollment function of the Microsoft PKI can be significantly extended with the true-Xtender Autoenroll PKI solution.

- Autoenrollment of public certificates. Any public CA that offers a web service interface can be integrated.
- Autoenrollment based renewal of certificates in the case of modifications of user or server attributes. Extended autoenrollment allows the update and renewal of certificates at any time.
- Rule based automated certificate revocation
- Flexible lifecycle management of user and server certificates
- Key archival and recovery
- Key history import
- Credential importer
- Certificate publishing to Intune managed accounts
- Account management web service

This document describes the features of true-Xtender Autoenroll PKI solution.

2. Architecture

Below diagram outlines the involved components to enable Autoenroll PKI.

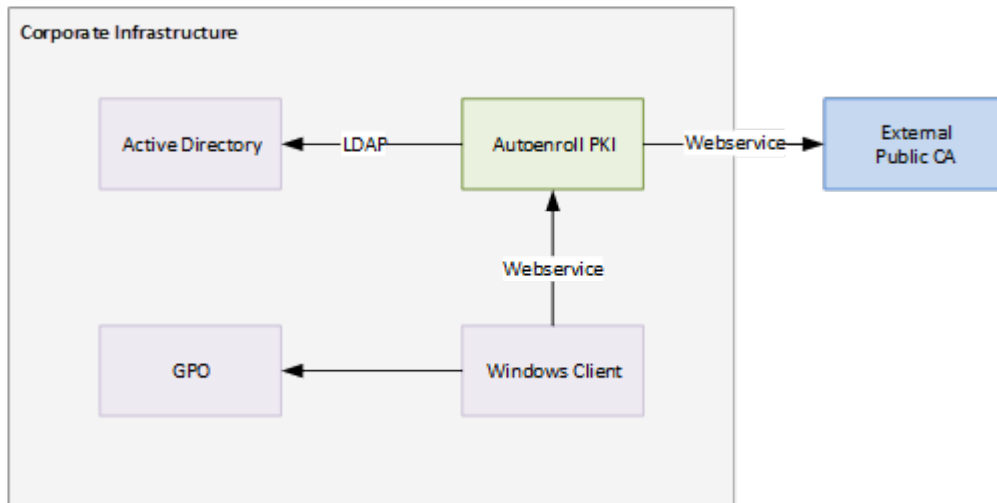


Image 1 - architecture overview

Component	Description
Active Directory	Used to authenticate accounts Used to retrieve account attributes for certificate content (any LDAP server possible)
GPO	Autoenrollment is configured via Group Policy
Windows client	Accounts receive certificates on their windows client
External Public CA	The CA that issues the certificates
Autoenroll PKI	The true-Xtender Autoenroll PKI enables certificate autoenrollment.

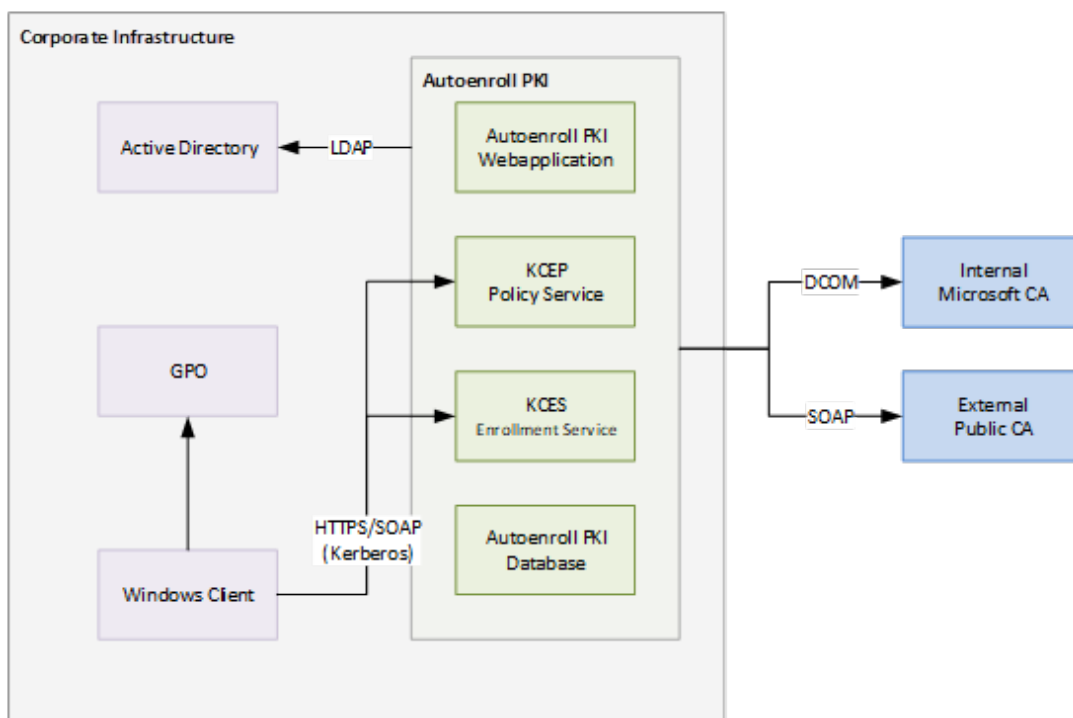


Image 2 - detailed architecture overview

- Autoenroll PKI connects to any LDAP server to retrieve account attributes which build the content of the certificate.
- The client connects to Autoenroll PKI application via HTTPS.
- The Autoenroll PKI connects to the Public CA via HTTPS over the internet.

3. Supported protocols and clients

The following protocols and Windows Client versions are supported.

Enrollment Protocol	Comment
CEP/CES including Key Archival	Windows 10 Windows 11
RPC/DCOM	To simulate an AD CS CA

4. Features

True-Xtender Autoenroll PKI has the following features:

1. Multiple certificate profiles
 1. Configuration of certificate profile per AD group
 2. Multiple AD groups for same certificate profile
2. Configurable notification thresholds per certificate profile
 1. Causes notification as threshold is reached
3. Configurable subject name and subject alternate name per certificate profile
 1. Dynamic content from account attributes and static content
 2. Account attribute changes can optionally enforce to re-issue certificates
4. Certificate Revocation
 1. Configurable auto revocation (revokes certificates where the account is no longer a member of an assigned AD group of configured certificate profile).
 2. Manual revocation per account and certificate
5. Key archival: Each issued certificate can be archived
 1. For installation on additional windows clients. If Active Directory credential roaming cannot be activated, the integrated credential importer application can be used instead.
 2. For installation on other devices
 3. Key recovery (e.g. for audit purposes, four-eye principle)
6. Certificate issuance status view

7. Real time certificate count per certificate profile
 1. Pending certificates (new, renew, modify)
 2. Issued certificates (new, renew, modify)
 3. Revoked certificates
8. Account and certificate search
9. Expiring certificate list (optionally exclude the accounts with already renewed certificates)
10. Email notification
11. Web Service for account administration
 1. Triggering of publishing tasks
 2. Creation of shared accounts (e.g. for shared mailbox scenario)
12. Import of certificate history (per account) from archived from ADCS CA database or any PKCS#12 data.
13. Logging to log files and to the Windows event log

4.1. Feature Details

4.1.1. Feature Key Archival

Especially for encryption keys it is important, to be able to have the encryption key archived, so it can always be recovered for decryption purposes, even after the certificate was revoked or has expired. With Key Archival enabled, there is a Key Recovery process available that allows to download the archived keys of a specific account as a PKCS#12 file (PFX), e.g. for audit purposes by using an four-eye principle within the Autoenroll PKI application.

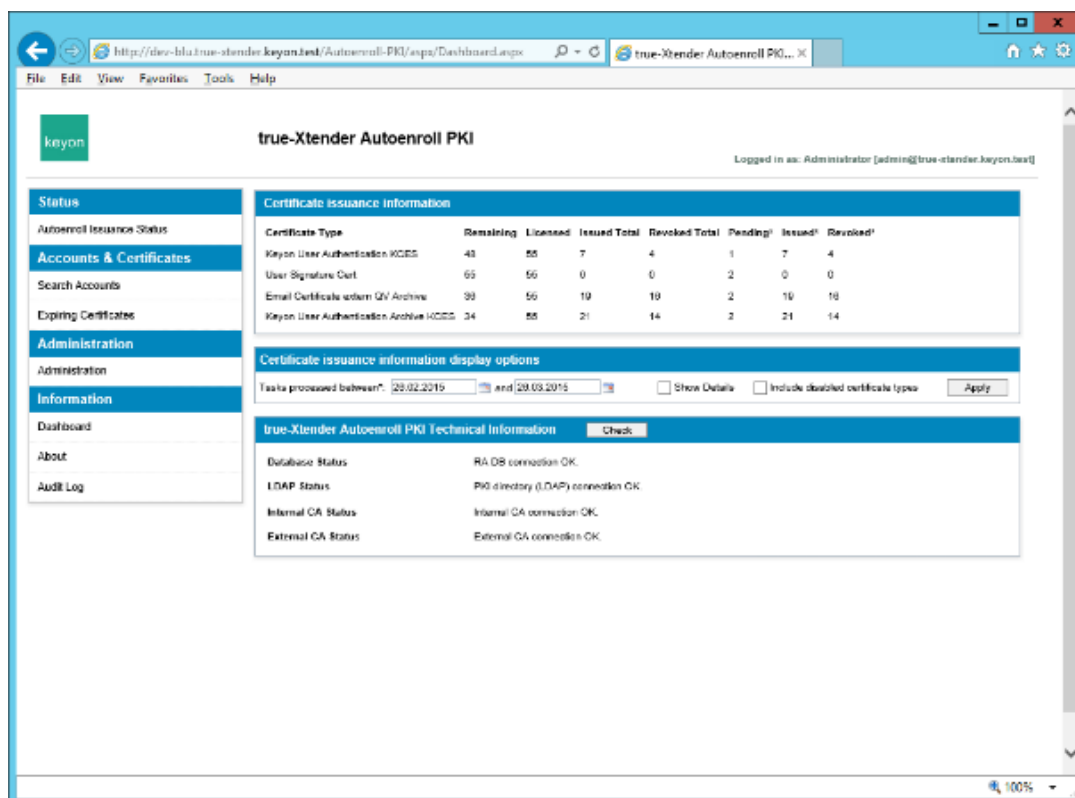
4.1.2. Feature Credential Importer

Certificates including private keys in the certificate store of a Windows account are automatically made available for the same account on multiple computers, if Windows Credential roaming is enabled. If for any reason (e.g. storage capacity) this Active Directory feature can't be enabled, Credential Importer provides a similar functionality. Credential Importer is an application that runs once for autoenroll enabled accounts on each user login, it verifies with Autoenroll PKI which certificates belongs to that account and installs missing certificates into the accounts certificate store. This works only for certificates with Key Archival enabled.

5. Administration web application

The following screenshots illustrate a set of the web application administration functions.

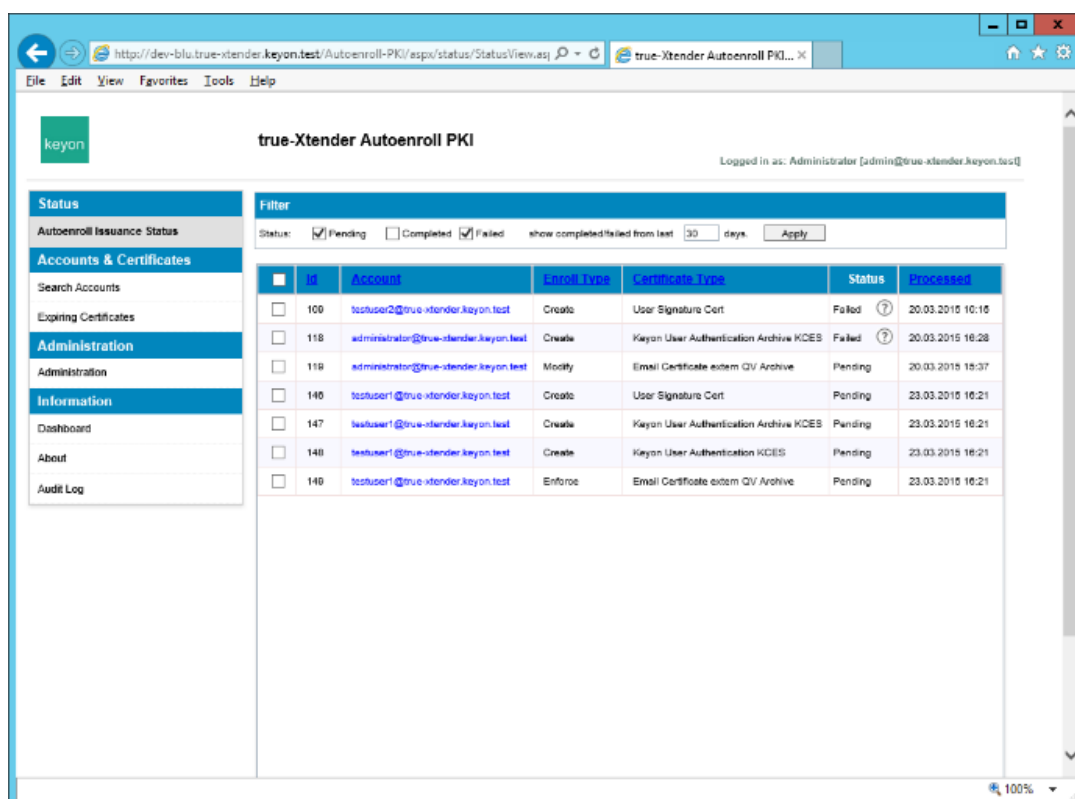
Dashboard



The screenshot shows the 'true-Xtender Autoenroll PKI' dashboard. The left sidebar contains navigation links: Status, Accounts & Certificates, Administration, and Information. The main content area is titled 'true-Xtender Autoenroll PKI' and shows 'Logged in as: Administrator [admin@true-xtender.keyon.test]'. The 'Certificate issuance information' section displays a table with columns: Certificate Type, Remaining, Licensed, Issued Total, Revoked Total, Pending, Issued, and Revoked. The table lists four certificate types: Keyon User Authentication KCES, User Signature Cert, Email Certificate extem QV Archive, and Keyon User Authentication Archive KCES. Below this, the 'Certificate issuance information display options' section allows filtering by date range (20.02.2015 to 20.03.2015) and checkboxes for 'Show Details' and 'Include disabled certificate types'. The 'true-Xtender Autoenroll PKI Technical Information' section shows a 'Check' button and status for Database, LDAP, Internal CA, and External CA.

Certificate Type	Remaining	Licensed	Issued Total	Revoked Total	Pending	Issued	Revoked
Keyon User Authentication KCES	43	55	7	4	1	7	4
User Signature Cert	65	55	0	0	2	0	0
Email Certificate extem QV Archive	38	55	19	19	2	19	18
Keyon User Authentication Archive KCES	34	55	21	14	2	21	14

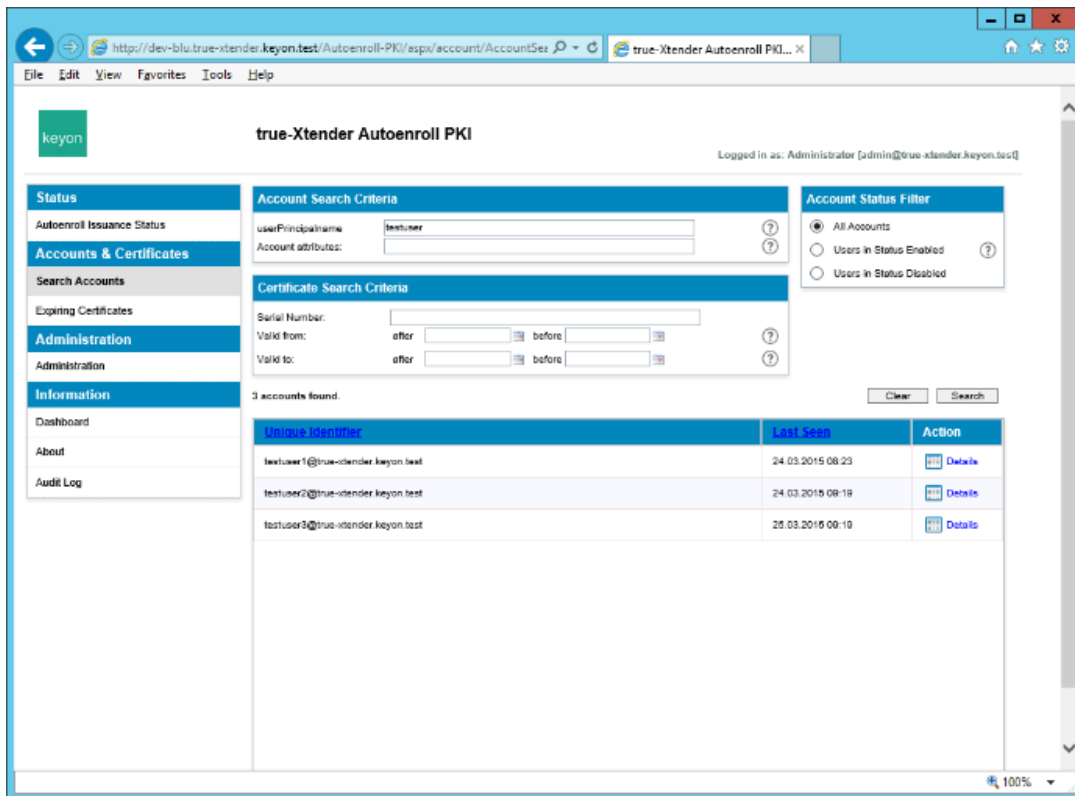
Certificate issuance status



The screenshot shows the 'true-Xtender Autoenroll PKI' status view. The left sidebar is the same as the previous screenshot. The main content area is titled 'true-Xtender Autoenroll PKI' and shows 'Logged in as: Administrator [admin@true-xtender.keyon.test]'. The 'Filter' section allows filtering by status (Pending, Completed, Failed) and a date range (show completed/failed from last 30 days). The table below lists search results with columns: ID, Account, Enroll Type, Certificate Type, Status, and Processed. The table shows eight entries with various statuses (Failed, Pending) and timestamps.

ID	Account	Enroll Type	Certificate Type	Status	Processed
100	testuser0@true-xtender.keyon.test	Create	User Signature Cert	Failed	20.03.2015 10:16
118	administrator@true-xtender.keyon.test	Create	Keyon User Authentication Archive KCES	Failed	20.03.2015 16:28
119	administrator@true-xtender.keyon.test	Modify	Email Certificate extem QV Archive	Pending	20.03.2015 15:37
140	testuser1@true-xtender.keyon.test	Create	User Signature Cert	Pending	23.03.2015 16:21
147	testuser1@true-xtender.keyon.test	Create	Keyon User Authentication Archive KCES	Pending	23.03.2015 16:21
148	testuser1@true-xtender.keyon.test	Create	Keyon User Authentication KCES	Pending	23.03.2015 16:21
149	testuser1@true-xtender.keyon.test	Enforce	Email Certificate extem QV Archive	Pending	23.03.2015 16:21

Search functions



keyon true-Xtender Autoenroll PKI

Logged in as: Administrator [admin@true-xtender.keyon.test]

Account Search Criteria

userPrincipalName: ?

Account attributes: ?

Certificate Search Criteria

Serial Number:

Valid from: after before ?

Valid to: after before ?

3 accounts found.

Account Status Filter

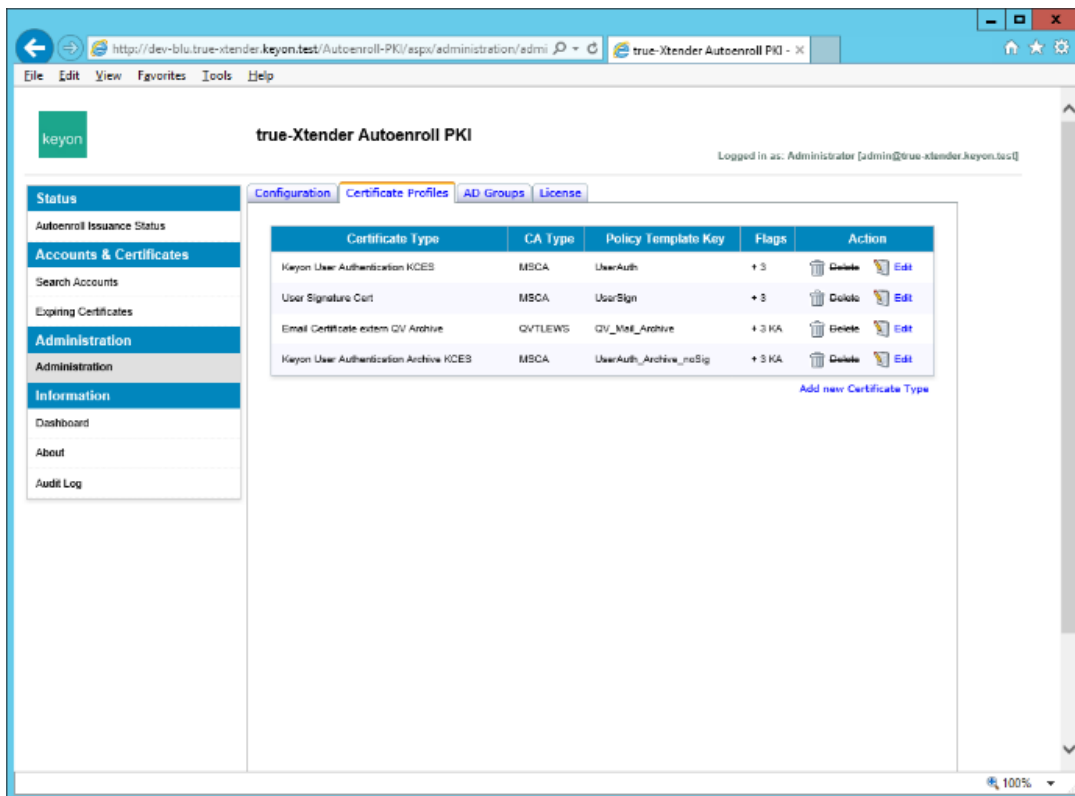
☒ All Accounts ?

☐ Users in Status Enabled ?

☐ Users in Status Disabled ?

Unique Identifier	Last Seen	Action
testuser1@true-xtender.keyon.test	24.03.2015 08:23	Details
testuser2@true-xtender.keyon.test	24.03.2015 08:19	Details
testuser3@true-xtender.keyon.test	25.03.2015 00:10	Details

Administration



keyon true-Xtender Autoenroll PKI

Logged in as: Administrator [admin@true-xtender.keyon.test]

Administration

[Configuration](#) [Certificate Profiles](#) [AD Groups](#) [License](#)

Certificate Type	CA Type	Policy Template Key	Flags	Action
Keyon User Authentication KCES	MSCA	UserAuth	+ 3	Delete Edit
User Signature Cert	MSCA	UserSign	+ 3	Delete Edit
Email Certificate exten QV Archive	QVTLWS	QV_Mail_Archive	+ 3 KA	Delete Edit
Keyon User Authentication Archive KCES	MSCA	UserAuth_Archive_noSig	+ 3 KA	Delete Edit

[Add new Certificate Type](#)

6. Security measures

The following security measures are implemented to prevent misuse of the Autoenroll PKI system.

1. Kerberos Windows Authentication for web service and web application authentication
2. Database encryption
3. Archived keys are encrypted using a symmetric database encryption key
4. The symmetric database encryption key is encrypted using encryption certificate(s) in HSM or soft token
5. Database integrity
6. Accounts and their stored archived keys are secured by database integrity means to detect and prevent misuse by copying database content
7. Integrity protected, comprehensive Audit log

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