



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.

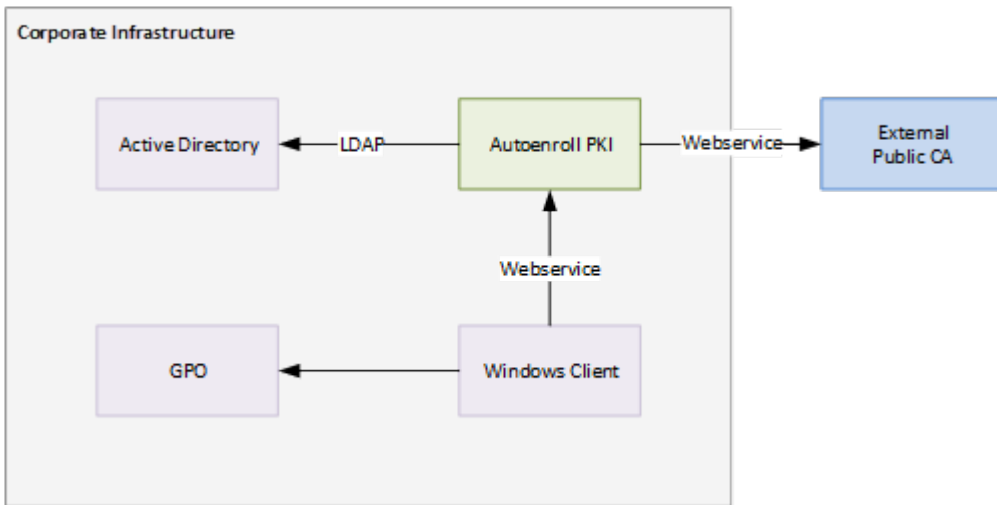


Image 1 - architecture overview

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.

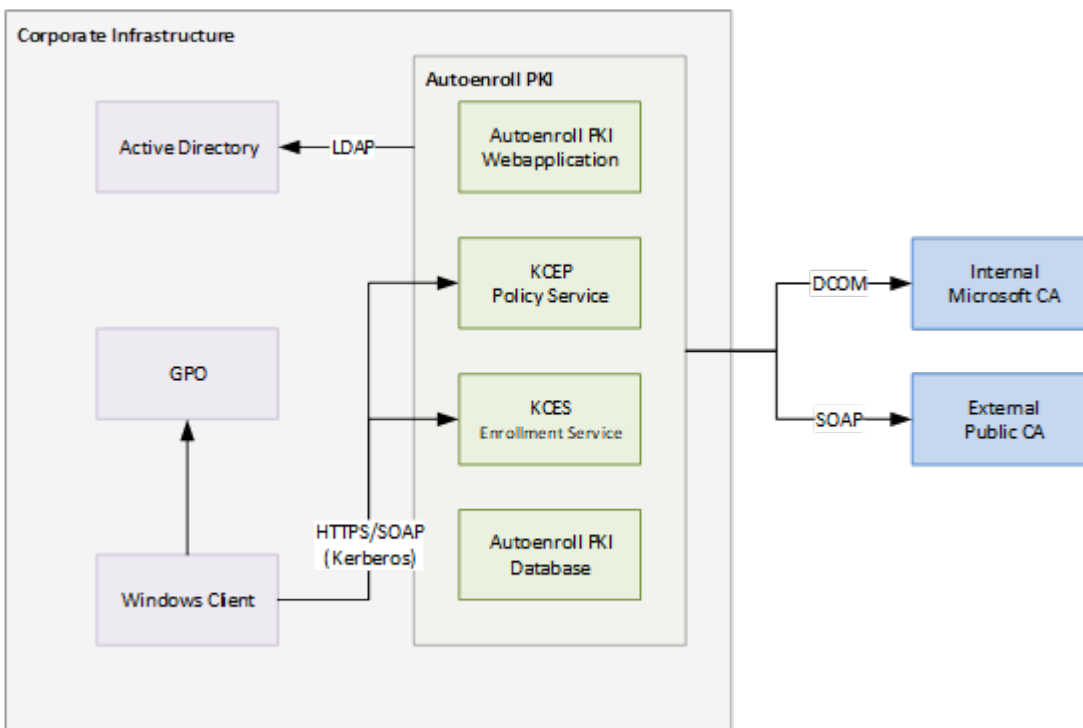


Image 2 - detailed architecture overview

- 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.

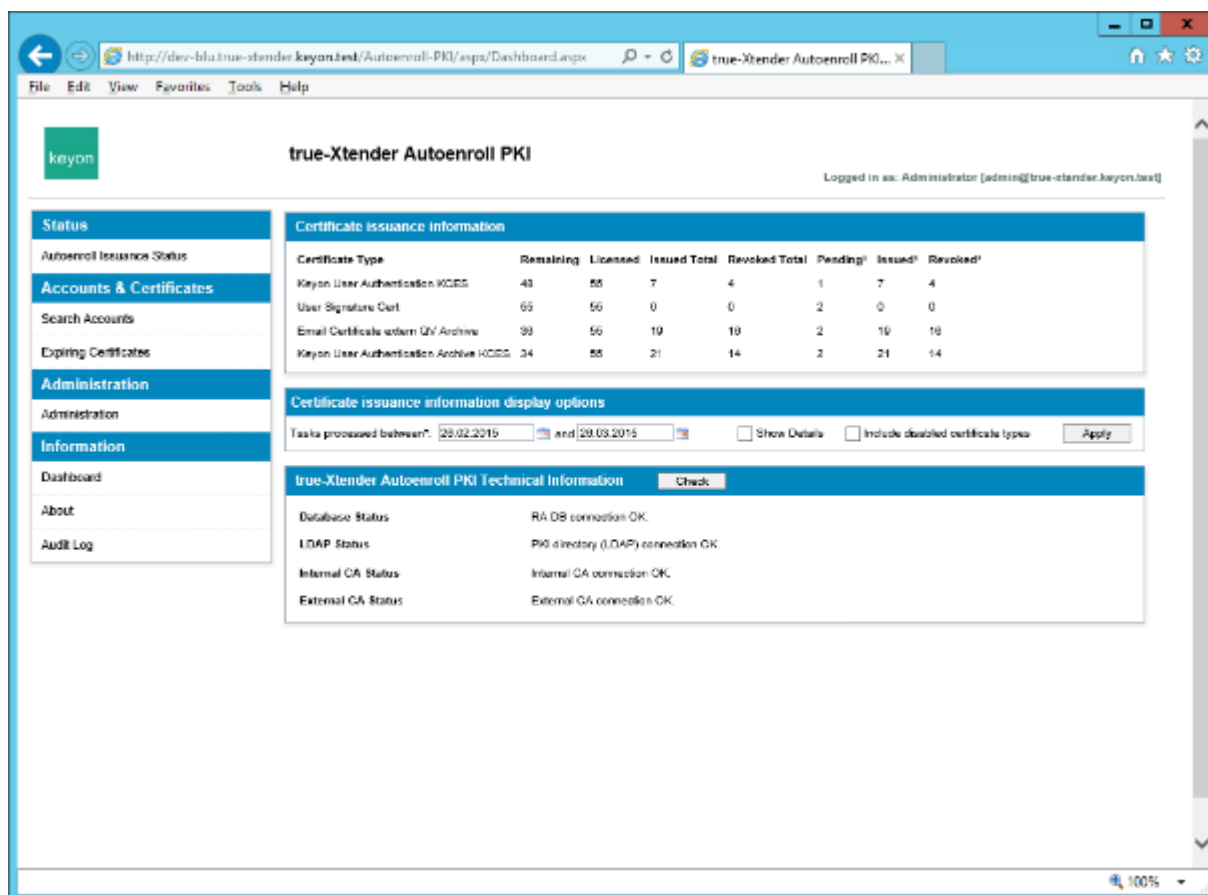
4.1.2. Feature Credential Importer

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 page title is 'true-Xtender Autoenroll PKI' and the user is logged in as 'Administrator [admin@true-stander.keyon.bea]'. The dashboard is divided into several sections:

- Status:** Autoenroll Issuance Status
- Accounts & Certificates:** Search Accounts, Expiring Certificates
- Administration:** Administration
- Information:** Dashboard, About, Audit Log

The main content area displays 'Certificate issuance information' with the following table:

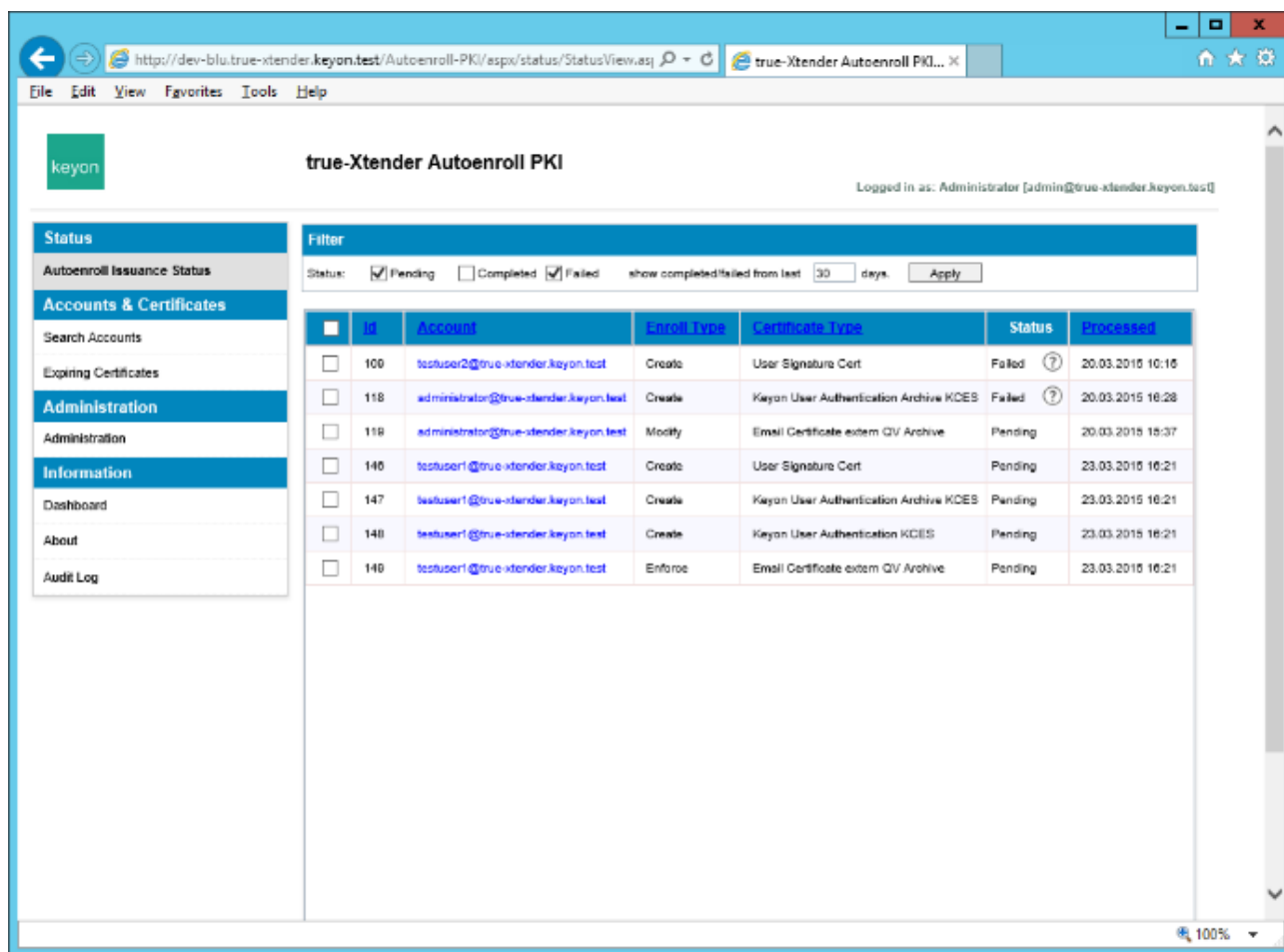
Certificate Type	Remaining	Licensed	Issued Total	Revoked Total	Pending ¹	Issued ²	Revoked ³
Keyon User Authentication KCES	43	85	7	4	1	7	4
User Signature Cert	65	56	0	0	2	0	0
Email Certificate system QV Archive	39	56	19	18	2	19	18
Keyon User Authentication Archive KCES	34	85	21	14	2	21	14

Below the table is the 'Certificate issuance information display options' section, which includes a date range filter (Tasks processed between: 28.02.2015 and 28.03.2015) and checkboxes for 'Show Details' and 'Include disabled certificate types'. An 'Apply' button is also present.

The 'true-Xtender Autoenroll PKI Technical Information' section shows the following status:

- Database Status: RA DB connection OK.
- LDAP Status: PKI directory (LDAP) connection OK.
- Internal CA Status: Internal CA connection OK.
- External CA Status: External CA connection OK.

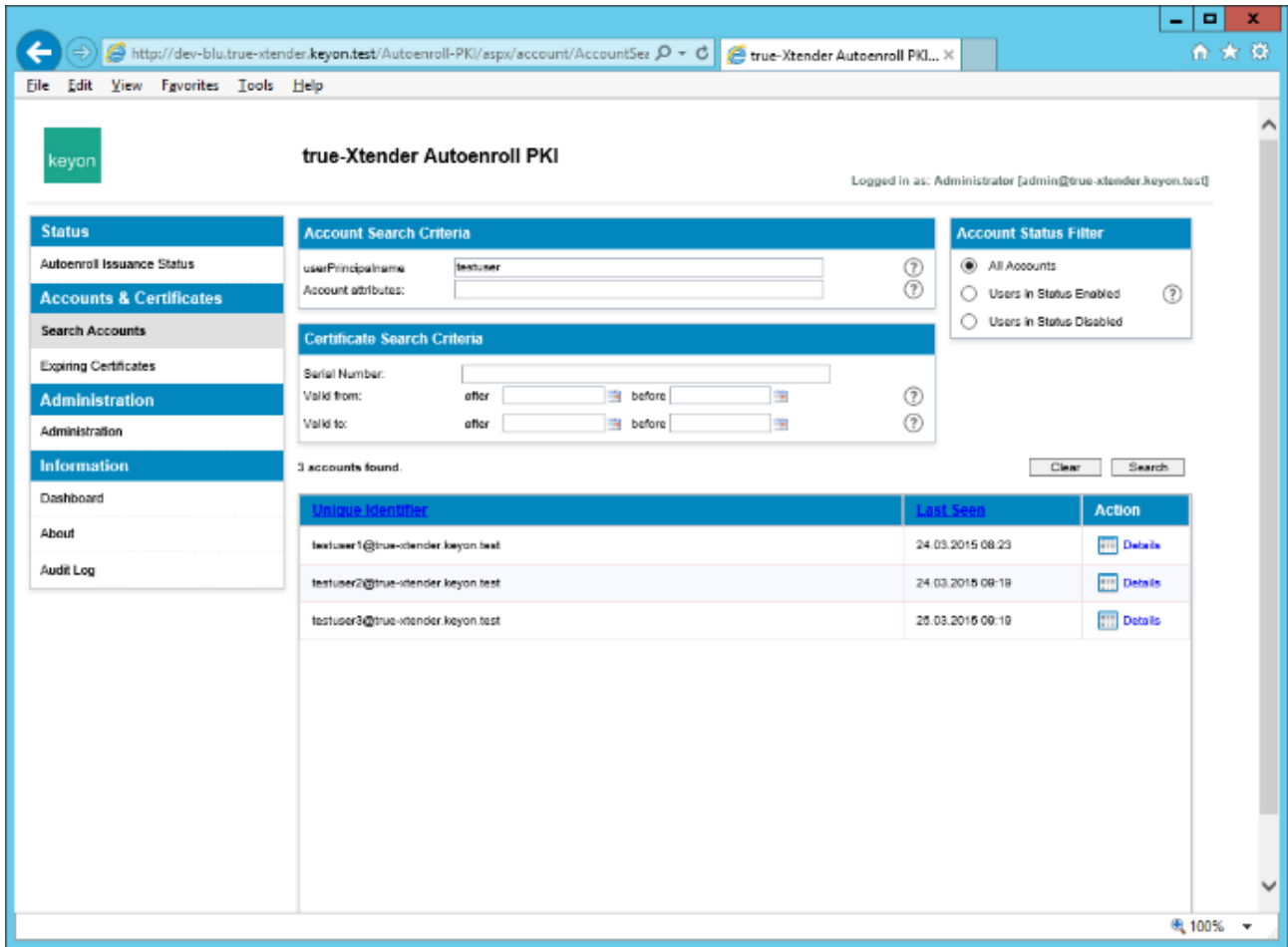
Certificate issuance status



The screenshot shows the 'true-Xtender Autoenroll PKI' web interface. The browser address bar shows the URL: `http://dev-blu.true-xtender.keyon.test/Autoenroll-PKI/espx/status/StatusView.aspx`. The page title is 'true-Xtender Autoenroll PKI' and the user is logged in as 'Administrator [admin@true-xtender.keyon.test]'. On the left, there is a navigation menu with sections: Status, Accounts & Certificates, Administration, and Information. The main content area features a 'Filter' section with checkboxes for 'Pending', 'Completed', and 'Failed', and a 'show completed/failed from last 30 days' option. Below the filter is a table with the following data:

ID	Account	Enroll Type	Certificate Type	Status	Processed
100	testuser2@true-xtender.keyon.test	Create	User Signature Cert	Failed	20.03.2015 10:15
118	administrator@true-xtender.keyon.test	Create	Keyon User Authentication Archive KDES	Failed	20.03.2015 16:28
118	administrator@true-xtender.keyon.test	Modify	Email Certificate extem QV Archive	Pending	20.03.2015 16:37
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 KDES	Pending	23.03.2015 16:21
148	testuser1@true-xtender.keyon.test	Create	Keyon User Authentication KDES	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 ?

Account Status Filter

All Accounts ?

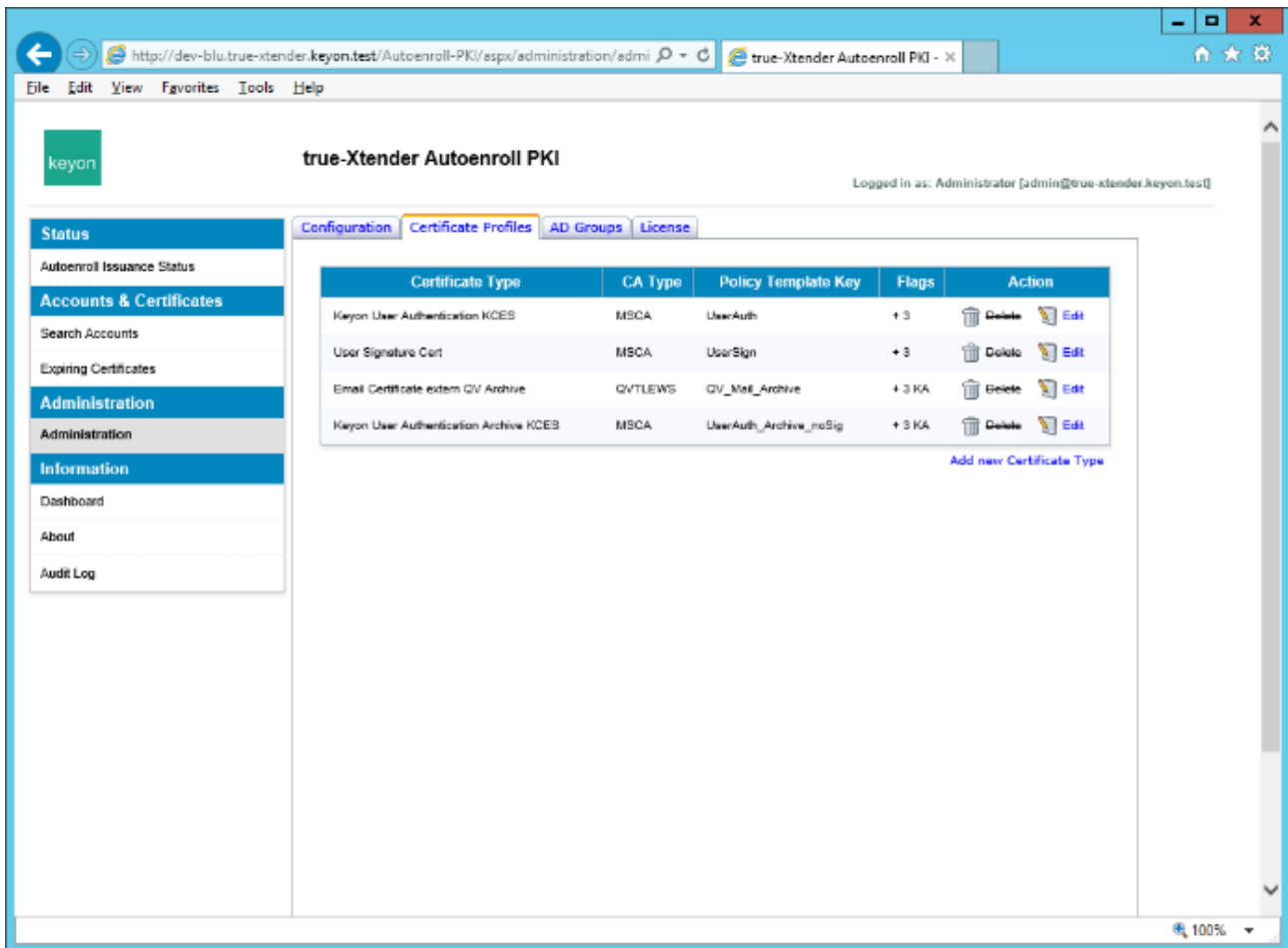
Users in Status Enabled ?

Users in Status Disabled ?

3 accounts found.

Unique Identifier	Last Seen	Action
testuser1@true-xtender.keyon.test	24.03.2015 08:23	Details
testuser2@true-xtender.keyon.test	24.03.2015 08:18	Details
testuser3@true-xtender.keyon.test	25.03.2015 00:10	Details

Administration



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

🔄Revision #2

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