Test: SafeNet Data Protection on Demand from Gemalto

On-Demand Key Management and Encryption in the Cloud

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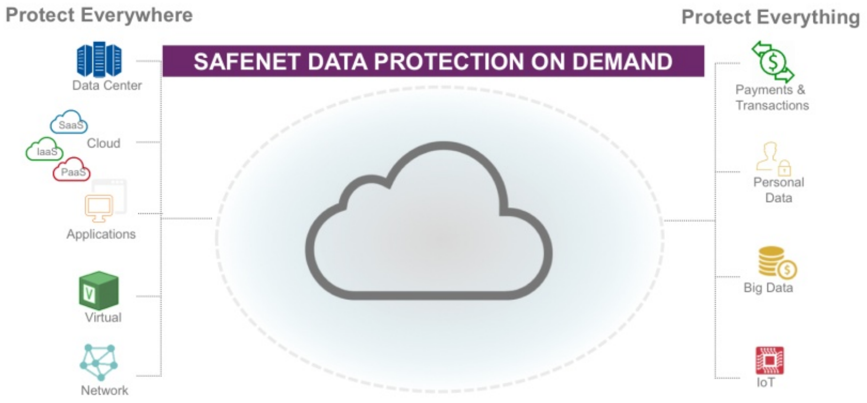
With SafeNet Data Protection on Demand, Gemalto offers a cloud-based platform that encompasses a large number of on-demand code signing, key management and encryption services which are usable via an online marketplace. Gemalto's platform is intended to make security management simpler and less costly for its clients because no hardware needs to be purchased and operated. Gemalto claims that the platform's central management tool can accomplish all work steps via point and click. We tested the product to find out if this really works.

SafeNet Data Protection on Demand encompasses a whole series of services offered according to a pay-as-you-grow principle. This assures flexible usage for the client and guarantees that he must pay only for the features he actually uses. In this way, the service seamlessly adapts to suit the requirements of each individual company.



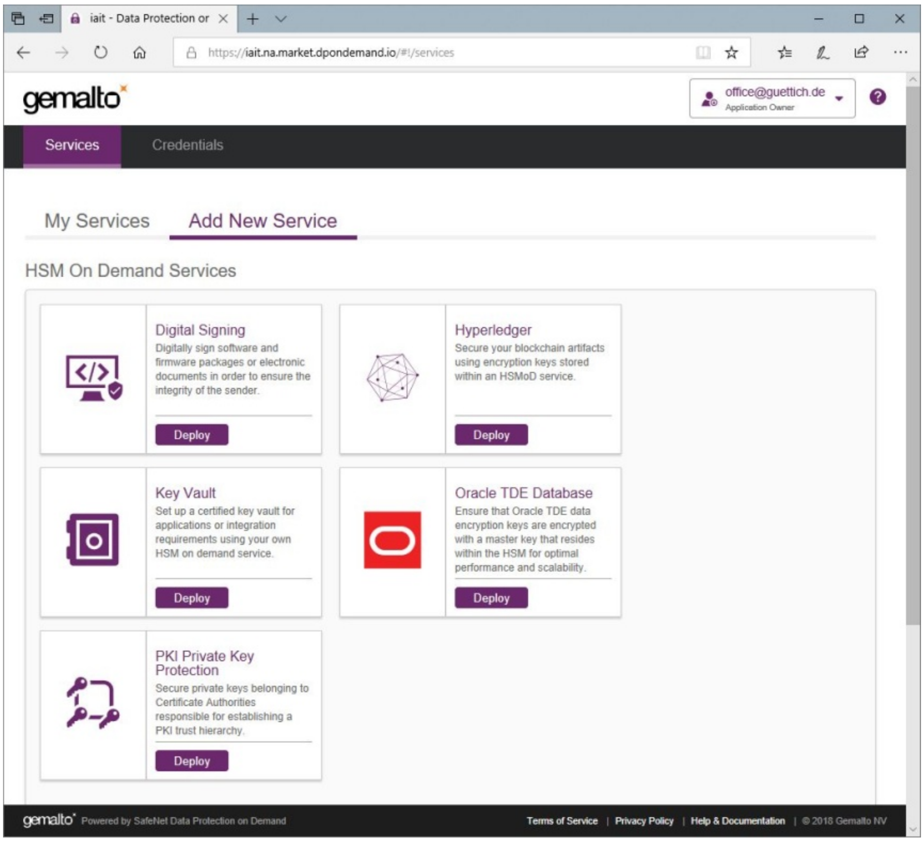
The platform, which builds upon Gemalto's SafeNet Identity and Data Protection solutions, enables its users to secure critical data in every environment, i.e. also in the cloud, on the premises or in virtual installations. Moreover, it helps its users to implement security policies and to comply with compliance regulations. Furthermore, it enables IT managers to administrate their encryption keys from a central location across all cloud services. APIs also help administrators to integrate on-demand services for encryption, key management and HSM (Hardware Security Module) in their surroundings, thus securing their applications and data. If necessary, an availability of 99.95% can be guaranteed by a service level agreement. An automatic failover function and key backups are delivered along with the platform. Comprehensive reporting functions complete the scope of the service offer.

The Existing Security Services

Let's take a quick look at the scope of services that are included in SafeNet Data Protection on Demand. According to its manufacturer, the offer undergoes continual expansion. It currently encompasses six services. First, there's the "Key Vault," which IT managers can use as their own HSM on-demand service for their applications. By contrast, "PKI Private Key Protection" protects private keys which belong to certificate authorities (CAs). "Digital Signing" enables IT staff to digitally sign software packages, firmware packages and electronic documents, thus guaranteeing the server's integrity. The "Oracle TDE Database Key Vault," on the other hand, assures the encryption of the

Oracle TDE data-encryption keys with a master key deposited within the HSM on-demand service. With the aid of the “Hyperledger,” responsible staff members secure blockchain artifacts via keys, which likewise land in the HSM on-demand service.

The last service is the “Salesforce Key Broker on Demand.” It generates tenant secrets for Salesforce and facilitates the administration of keys and security policies in collaboration with Salesforce Shield.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Application Owner
Services
Credentials
My Services
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HSM On Demand Services
Deploy
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Digital Signing
Digitally sign software and firmware packages or electronic documents in order to ensure the integrity of the sender.

Hyperledger
Secure your blockchain artifacts using encryption keys stored within an HSMoD service.

Key Vault
Set up a certified key vault for applications or integration requirements using your own HSM on demand service.

Oracle TDE Database
Ensure that Oracle TDE data encryption keys are encrypted with a master key that resides within the HSM for optimal performance and scalability.

PKI Private Key Protection
Secure private keys belonging to Certificate Authorities responsible for establishing a PKI trust hierarchy.

The solution’s Web interface with the existing services

The Test

For our test, Gemalto made available to us a test account which we could use to scrutinize the functionality of the solution. We created several test users on this account and activated various services to secure our test data, e.g. the key of a certificate authority. We especially concentrated on the management of the solution and the work in ongoing operation.

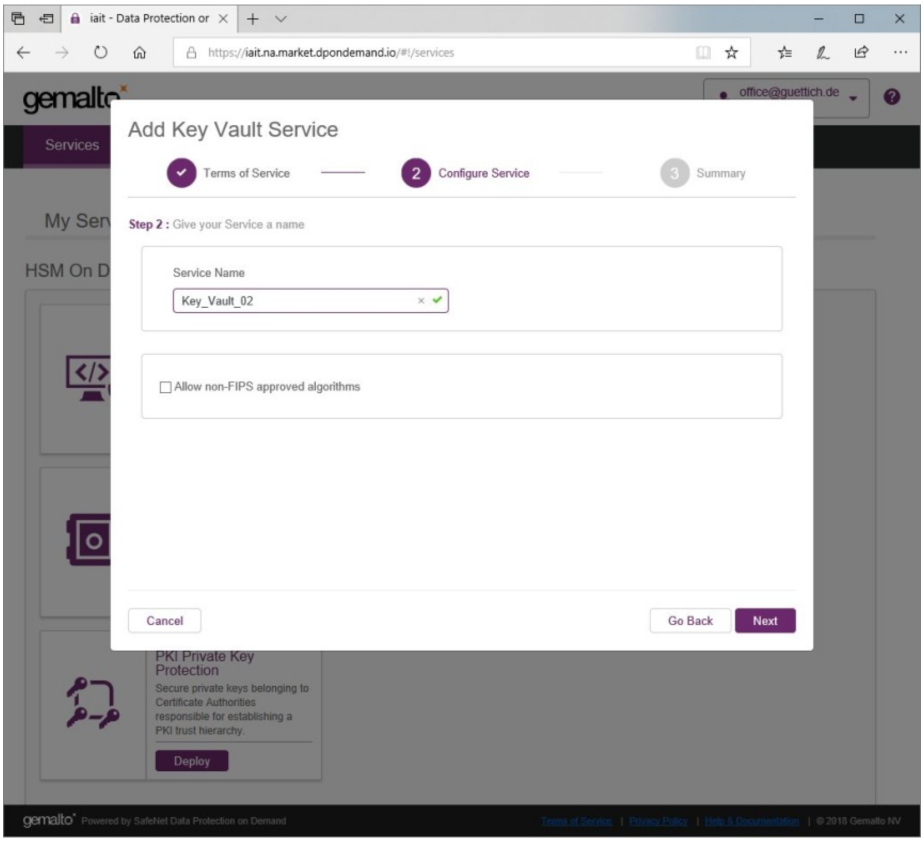
The First Work Steps

After the first login at the abovementioned test account, the solution began by requiring us to change the password that we had previously received via email. This is a good feature because the system thus assures that services cannot be accessed by someone with potentially insecure passwords.

As soon as we had modified our password, the management tool called our attention to the fact that no “application owners” were existent in the system. Our own test account worked as a “tenant administrator” and was consequently intended to manage the users and the administrators in the system. In the next step, we accordingly set up an application owner account. To accomplish this, the solution required a so-called “subscriber group.” The system immediately generated this group during the configuration of the account and afterwards added it to the user account. The accounts were defined by an email address and a password. The users of these new accounts were likewise required to change their passwords immediately after their first login.

The First Service

After a user logs in as “application owner,” he or she is shown an overview of the available services, i.e. “Digital Signing,” “Hyperledger,” “Key Vault,” “Oracle TDE Database,” “Salesforce Key Broker” and “PKI Private Key Protection.” In the first step, we wanted to generate a key vault. Adding the services to our own account always occurs according to the same principle. An employee first clicks on the entry of the desired service. Afterwards, the system show him or her the terms of service, which the employee is required to accept. Next, the solution asks for a name for the service and, in the case of the key vault, the solution also wanted to know whether to allow or deny algorithms that are not in conformity with FIPS. After the relevant details had been provided, the system showed an overview of the steps that needed to be performed and afterwards configured the service: this task took only a few seconds. Next, the solution also offered to immediately set up the client service, which is implemented on the target system in the enterprise. As soon as this task is complete, the responsible employees are able to download the client and install the client onto whichever computer they intend for this purpose.


iait - Data Protection or
https://iait.na.market.dpondemand.io/#!/services
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office@guettich.de
Services
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PKI Private Key Protection
Secure private keys belonging to Certificate Authorities responsible for establishing a PKI trust hierarchy.
Deploy
gemalto Powered by SafeNet Data Protection on Demand
Terms of Service | Privacy Policy | Help & Documentation | © 2018 Gemalto NV

Add Key Vault Service

✓ Terms of Service — 2 Configure Service — 3 Summary

Step 2 : Give your Service a name

Service Name: Key_Vault_02 ✓

□ Allow non-FIPS approved algorithms

Cancel | Go Back | Next

Setting up a service runs via a simple wizard

The Configuration of the Key Vault

After the download, we first unpacked the zip package with the client software onto our test computer, which ran under Windows Server 2012 R2. As software, we had imported onto this system only the current updates from Microsoft. Gemalto's documentation specified that the Microsoft Visual C++ 2015 Redistributable Update 3 package is indispensable for operating the client, so we installed that update too. In the next step, we had to unpack the contents of the "cvclientmin.zip" zip file (which was located in the original client zip package) into the same folder as the original installation package. Finally, it was also necessary to run the "setenv.cmd" file as administrator in order to set the environmental variable. Afterwards, we could start the service by calling up the "lunacm" file.

The Configuration of the Service

A few configuration steps were now necessary in order to be able to work with the service. To provide an HSP application partition to store cryptographic objects for the utilized applications, we needed to initialize the roles for the Security Officer (SO), the Crypto Officer (CO) and the Crypto User (CU). All steps necessary for this are described in the documentation, so there's no need to go into greater detail about them here. Suffice it to say that setting up the service took less than five minutes in our test and that the key vault was available for us to use afterwards.

Once we had put the service into operation, we used the "ckdemo" test program (which is included in the client's scope of delivery) to generate keys, retrieve session data, et cetera, thus assuring that everything functioned as intended. There were no unwelcome surprises.

The Work with the Private Key Protection

In the next phase of our test, we turned our attention to the "Private Key Protection" service. Here, we wanted to secure a CA key in order to take a closer look at the work with SafeNet Data Protection on Demand in praxis. For this purpose, we again logged onto our test account as application owner and used the "Add New Service" command to create a PKI Private Key Protection service.

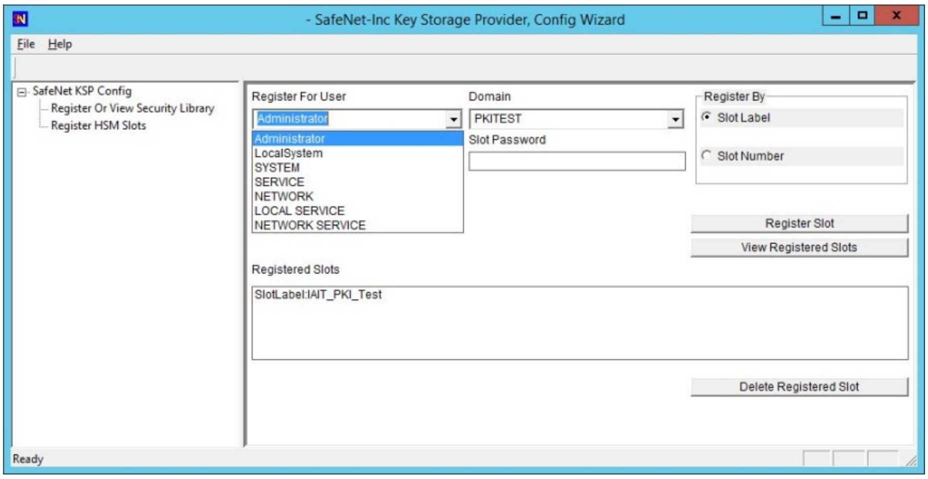
Here too we were first required to accept the terms of service. Afterwards, we could give a name to the service and specify whether we wanted it to permit or deny algorithms that are not in conformity with FIPS. After the service was created, we again generated the service client and downloaded the client onto our test system. The installation of the service runs exactly the same way here as it does with the key vault service. Incidentally: in operation, the client software sets up only one configuration through which the system can access the service and therefore does not always need to be active in ongoing operation. The appearance of the utilized configuration depends on the implemented application and is precisely described for the relevant applications in the documentation on the website of the Data Protection on Demand service.

We relied here on the “Microsoft Active Directory Certificate Services Integration Guide” and set up our CA so that its key would be secured by the service. To accomplish this, we first had to switch into the “KSP” subfolder of the client installation and register there our security library (a DLL that likewise belongs to the scope of delivery of the client) with the aid of the “KspConfig.exe” tool and the existing HSM slot (for the HSM on demand solution offered via the service). The slot must be registered twice to operate the solution: once for the administrator of the current domains and once again for the system account of the “NT Authority” domain.

As a slot password for the registration, we used the password of the previously created Crypto Officer because this officer has the right to write in the service partition. As soon as this task was accomplished, we began installing the active directory certification services on the server that we had set up as domain controller. To do this, we performed a standard installation of a certificate authority with the server manager.

Configuration of the Certificate Authority

After completing the setup, we configured the certificate authority with the aid of the intended wizard. In this context, we set up the system as an enterprise certification site and as “Root CA.” Afterwards, we attempted to create a new private key for the CA. Gemalto’s documentation states that for this purpose, one should select a Cryptographic Service Provider (CSP) from SafeNet from the corresponding drop-down menu. Unfortunately, no such provider appeared among the configuration choices shown to us, which were limited to providers from Microsoft.



Register For User: Administrator

Domain: PKITEST

Slot Password:

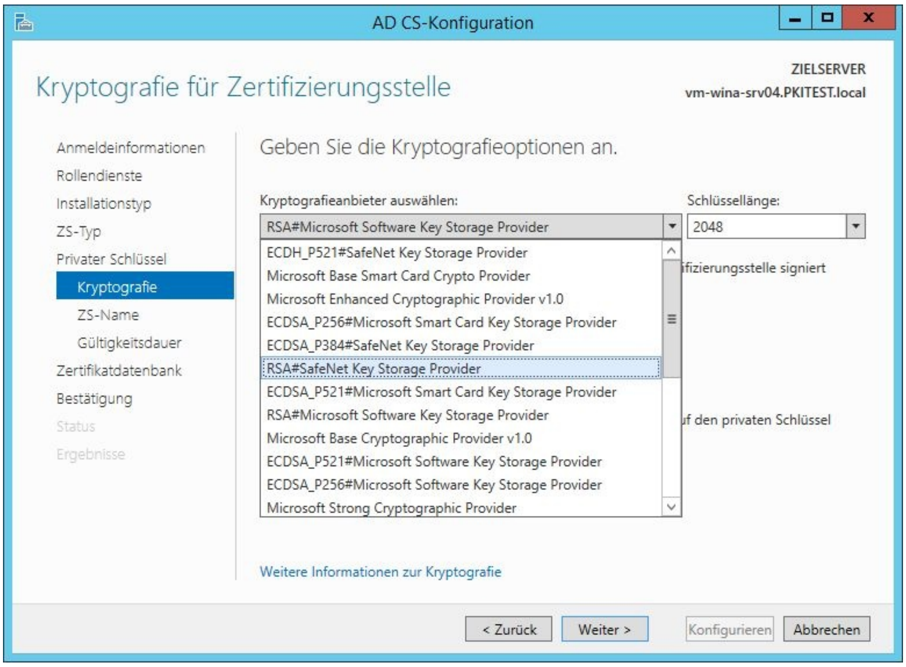
Register By: ● Slot Label ○ Slot Number

Registered Slots: SlotLabel:IAIT_PKI_Test

The “KspConfig” tool when registering the slot

We accordingly contacted the manufacturer’s support, who told us that it is not only possible to use the KSpConfig tool to register the utilized slot with one’s name (as we had done), but that it was also possible with one’s slot ID. The support person said that to solve the problem described here, it can sometimes help to perform the registration via the slot ID.

We then erased the existing registrations and performed them again with the aid of the slot ID. This unfortunately did not improve the situation, even after we had restarted the computer. The manufacturer’s support recommended that we check to see if the “SafeNetKsP.dll” file (which likewise belongs to the scope of delivery of the client) was listed in the “C:\Windows\System32” directory. This file was not listed in our test installation, so we copied the file into the aforementioned directory. Afterwards, we were indeed able to access the SafeNet CSPs. We then began finalizing the configuration. First, we needed to use the “sc query cert svc” command to check whether the CA service was active and to verify the CA key via “certutil -verify keys”. In this context, we noticed that the CA service on our system always stopped a few seconds after it started. Here again we needed to contact the manufacturer’s support, who told us that this was due to our German Windows Server 2012 R2. We had, however, previously registered our HSM slot for the administrator and system account with the aid of the KspConfig.exe tool. The corresponding domain in the system account is named “NT Authority” and the tool didn’t offer us any other name for this domain. But on one of the German servers, the correct name is “NTAutorität”. We solved the problem by registering the slot anew via the “ksp-cmd.exe password /s {partition name} /u SYSTEM /d NTAUTORITÄT” command-line command. Afterwards, the integration of the active directory certificate service in the HSM on demand service was complete and we could use the system to archive keys, recreate keys and perform similar tasks. The configuration basically proceeds quickly and it doesn’t confront the administrator with any insurmountable challenges. However, we suggested one modification to avoid potential misunderstandings. Gemalto responded to our suggestion after the test. The manufacturer told us that the configuration tools had been revised in the meantime.



Kryptografie für Zertifizierungsstelle

ZIELSERVER
vm-wina-srv04.PKITEST.local

Geben Sie die Kryptografieoptionen an.

Kryptografieanbieter auswählen: RSA#Microsoft Software Key Storage Provider

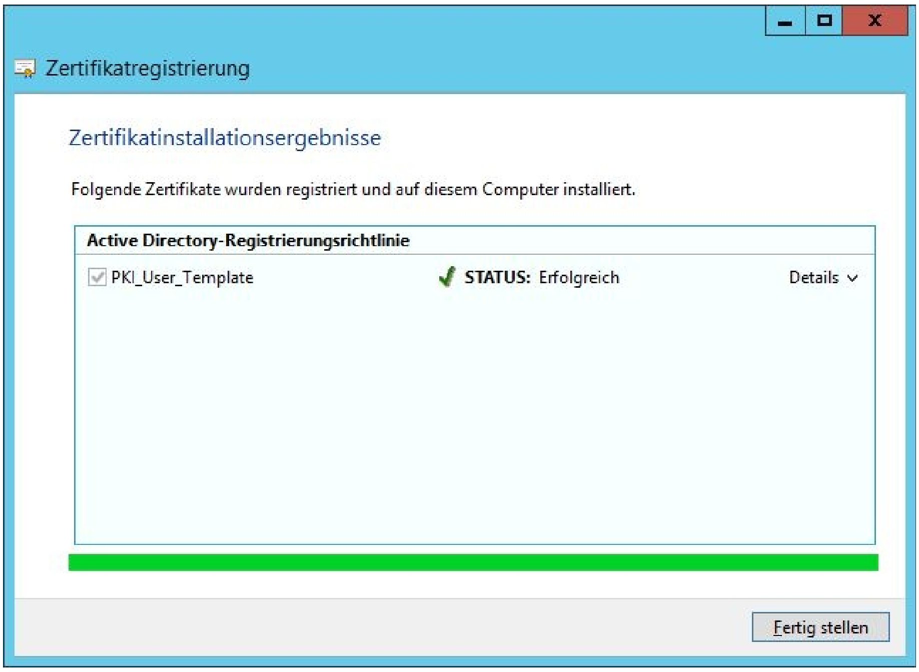
- ECDH_P521#SafeNet Key Storage Provider
- Microsoft Base Smart Card Crypto Provider
- Microsoft Enhanced Cryptographic Provider v1.0
- ECDSA_P256#Microsoft Smart Card Key Storage Provider
- ECDSA_P384#SafeNet Key Storage Provider
- RSA#SafeNet Key Storage Provider
- ECDSA_P521#Microsoft Smart Card Key Storage Provider
- RSA#Microsoft Software Key Storage Provider
- Microsoft Base Cryptographic Provider v1.0
- ECDSA_P521#Microsoft Software Key Storage Provider
- ECDSA_P256#Microsoft Software Key Storage Provider
- Microsoft Strong Cryptographic Provider

Schlüssellänge: 2048

ifizierungsstelle signiert

if den privaten Schlüssel

After a certain amount of back and forth, “SafeNet” also appeared as a cryptography provider in the certificate service configuration.



Zertifikatinstallationsergebnisse

Folgende Zertifikate wurden registriert und auf diesem Computer installiert.

Active Directory-Registrierungsrichtlinie

☑ PKI_User_Template ✓ STATUS: Erfolgreich

The user template after installation.

Summary
With SafeNet Data Protection on Demand, Gemalto offers an exceedingly interesting service which has the potential to also make code signing, encryption and key management available to companies for which the necessary efforts and the associated costs had previously been too much. Users of this service do not need to purchase and administrate any special hardware, and all clients pay only for the services they actually use. SafeNet Data Protection on Demand can also be a big help toward achieving GDPR conformity (in the context of the “right to be forgotten”) because stored data and keys can simply be erased whenever desired.

The solution was convincing in our test because it was comparatively quick to set up and relatively simple to use. The documentation is comprehensive and the manufacturer’s support was convincingly good. If the abovementioned issues with the configuration tools and the localization have not already been rectified, they will most probably be solved in the very near future.