KeyTalk Firmware 4.2

Administrator Appliance Manual:

Installation and settings

KeyTalk Documentation

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Table of contents

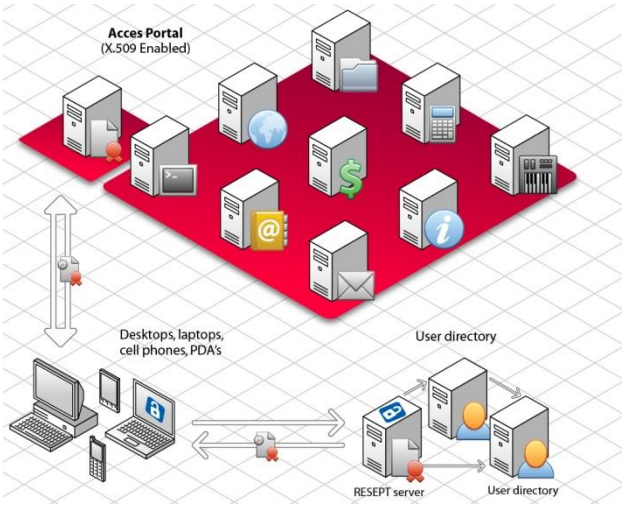
1. Introduction

Thanks for choosing KeyTalk (formerly known as RESEPT). This device has been designed to make safe communication the next generation security a reality. On top of that KeyTalk has many additional benefits.

With our patented KeyTalk technology, you can easily provide your entire user community, whether internal or external, with on demand short life X.509v3 certificates.

All built upon your existing infrastructure, so there is no need to change backup procedures, or to teach your community of users new authentication methods.

The KeyTalk appliance simply makes it happen.



KeyTalk provides you with advanced features, which make your life as a user easier and more secure when making use of your company's or partner's online environment.

Common usages:

- Single Sign-On to web-based environments
- Digital signing of internal documents
- Highly secure connections to web-based environments
- Protection of your authentication credentials against Man-in-the-Middle attacks
- Optionally binding the computer device(s) to the user or company

X.509v3 user certificates have been the standard since 1988, and are commonly accepted by all Operating Systems. As a result not only do these user certificates enable you the highest level of **safe encrypted communication**, as well as many **more features** with the same ease of management, such as:

- Single Sign-On
- Federated Identity
- 802.1x EAP/TLS

Certificates issued by the KeyTalk appliance work natively with all major and minor network and client brands, such as, but not limited to:

- CISCO
- Juniper
- F5
- Fortinet
- Checkpoint
- SAP
- Microsoft
- Oracle
- Novell

KeyTalk is a product which seamlessly fits into your existing network infrastructure. In a highly secure manner, it automatically creates, distributes, and (de)installs, short living X.509v3 user certificates on the user's device, for the purpose of user credentialing and secure access control.

X.509 is the industry standard since the 80's and is supported by all major network components and enterprise application solutions, and is now made available for short living certificates, making it the perfect unified access control solution. Managing X.509v3 certificates has thus far been one of the greatest cost factors in high secure environments. Cost is now minimized as a direct result of short living certificates, making administrative efforts on Certificate Revocation Lists obsolete.

By re-using your existing authentication environment, optionally leveraging it with trusted corporate hardware recognition, reducing the lifecycle of the certificate, and ultimately automating the certificate requests, creation, distribution and (de)installation, certificate management has become easy as pie with our KeyTalk product.

In Short:

KeyTalk protects your data in motion by providing secure access for machine-to-machine communication and data transmissions between devices, corporate networks and cloud applications. It prevents common attacks such as man-in-the-middle.
KeyTalk generates, distributes and installs short living client certificates on the client device in a fully automated manner, leveraging your existing authentication methodology. Optionally it uses the device hardware characteristics to strengthen the authentication process.

This document describes how to use the KeyTalk Appliance.

This document is part of the documentation that comes standard with KeyTalk products:

- User manual
- Installation manual
- Prerequisites and Technical requirements
- Quick Reference Guide
- Release notes

1.1. Getting started

In the following subsections the KeyTalk product is described.

1.2. Installation

All our products are delivered with an Installation manual. This manual provides instructions for installing and de-installing the KeyTalk software and gives an overview of the system requirements necessary to run the software. More detailed technical requirements can be found in the Prerequisites and Technical requirement documents.

1.2.1. Using the software

How to use KeyTalk products and an explanation of terminology and icons used in the software are described in detail in the User manual. Next to describing the hardware, the functionalities of the software are also described in full detail. In case of product upgrades an overview of the new functionalities is incorporated in the User manual as well as listed in the product's Release Notes.

For new users of our products, a full training is available for both functional and technical aspects of the solution. Please consult your KeyTalk supplier or KeyTalk partner for more information.

1.2.2. Support

In case you encounter issues when using our products, please contact your KeyTalk supplier. Contact details have been made available to you directly by our partner.

KeyTalk also has a service desk reachable 24/7, but they only provide 3rd line support. They can be contacted by e-mail or telephone.

Contact details KeyTalk Service desk 3rd line only

E-mail: support@keytalk.com

Tel.: +31 64 672 67 94

1.3. System configurations

You can have one or more KeyTalk devices configured in **high availability** mode.

1.3.1. Optional configurations

KeyTalk can be used in combination with KeyTalk's DevID appliance.

Within an organization DevID allows the binding up to 10 different hardware signatures of a user's devices to a single unique user. All is done according to the offered authentication service. DevID can be set to automatically learn up to the maximum number of hardware signatures that is allowed per user (setting).

Moreover, DevID is multi-tenant, allowing multiple user groups to be defined per specific KeyTalk authentication services. Each user-group can be separately managed by one or more service operators, allowing one to deploy and manage DevID in a very flexible manner. This way, your Admin does not have to do all the work by themselves.

2. Front Panel Components

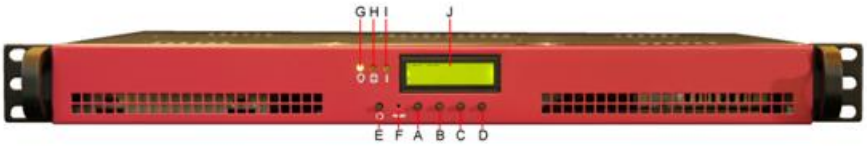


Figure 1: Front panel KeyTalk (color of front bezel may vary)

	Component	Description
A	Display navigation button A	Controls the navigational controls for the LCD information menu (see section 24 'LCD information display').
B	Display navigation button B	Controls the navigational controls for the LCD information menu (see section 24 'LCD information display').
C	Display navigation button C	Controls the navigational controls for the LCD information menu (see section 24 'LCD information display').
D	Display navigation button D	Controls the navigational controls for the LCD information menu (see section 24 'LCD information display').
E	Power button	Press to start the device when switched off. Press and hold for several seconds to switch off the appliance.
F	RESET button	Press (using a paperclip) and hold for several seconds to stop the device. The RESET button only needs to be used when normal switch off using the Power button is not working.
G	Power indicator	Lights up when the power is switched on.
H	Disk indicator	Data is stored on the Solid State Disk. When this indicator flashes the Solid State Disk is active.
I	Information indicator	Lights up when important messages require your attention.
J	LCD Display	Displays the state the device is in and displays menu items for local administration.

Do not replace any components as this will void your KeyTalk warranty.

Note: *replacing hardware components will result in malfunctioning of the system.*

3. Back Panel Components

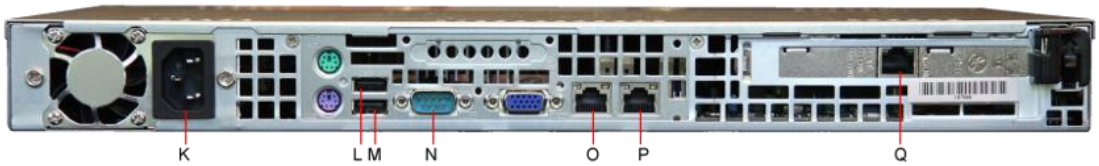


Figure 2: Back panel KeyTalk

	Component	Description
K	Power port	Connector port for the power cable.
L	USB port 1	It is possible to perform functional upgrades via a USB key using this USB port.
M	USB port 2	It is possible to perform functional upgrades via a USB key using this USB port.
N	RS232 port	Manufacturer trouble shooting connector.
O	Network Interface Connector (NIC)	For connection to other KeyTalk appliances in high availability mode, including DEVID. The default IP for this connector is 172.16.1.1.
P	Network Interface Connector (NIC)	For connection to the local management device. The default IP for this connector is 10.1.1.1.
Q	Network Interface Connector (NIC)	For connection to the external network. The default IP for this connector is 192.168.1.1.

Do not replace any components as this will void your KeyTalk warranty.

Note: *replacing hardware components will result in malfunctioning of the system.*

4. Top Panel Components

On the top panel of the appliance, between the front bezel and the appliance top cover, you will find a blue label.

Figure 3: Blue label with appliance's tamper evident serial number

This security label displays the unique appliance tamper evident serial number and should not be removed. It is used for identification purposes in case support is requested.

Removing or otherwise manipulating this label will cause the label to permanently change. KeyTalk advises you to check this label on a regular basis to make sure it is undamaged. Should the label be damaged, please contact your KeyTalk supplier who can provide you with a new label.

In case the label is damaged without your knowledge, be warned that your KeyTalk may have been opened and tampered with. Please report such incident to your KeyTalk administrator and/or security officer.

When the device needs to be sent to the manufacturer for repair, open the device by breaking the label and remove the hard disk. This hard disk contains your company data and should not be sent to the manufacturer. When the device has been repaired, you will receive it back with a new hard disk and label. This hard disk will be in the initial state. Your settings and company data can be restored from a backup. Please refer to the 'Backup and Restore' section for more information on how to do this.

5. Quick Start Guide

Assumptions:

- The KeyTalk appliance is by default delivered in DEMO configuration and should work immediately after applying the configurations described below.
- For this quick start configuration the default KeyTalk Client should be used together with the DEMO RCCD file. (RCCD: the Remote Configuration Client Data)
- For security reasons the DEMO key and certificate material must always be replaced with production material before taking the solution into a production environment.
- When using production key and certificate material, a corresponding production KeyTalk client RCCD file must be used, otherwise communication will fail. An RCCD file can be generated by your organization itself. This functionality is described in Chapter 5 of the Client Administrator Manual.
- DNS, NTP, HTTP, HTTPS, SysLog, port 3000, and optionally icmp ping 0,8 are assumed to be available for connection purposes.

5.1. Step 1: Powering the appliance

a) Remove the appliance from its box.
b) Plug the black power cord into the appliance back power-port 'K'.
c) Plug the power cable into a power socket-connector.
d) Press the power-on button (button 'E').

5.2. Step 2: Connecting the appliance to the internal network

The KeyTalk appliance has 3 active Network Interface Connectors (NIC) 'O', 'P' and 'Q' in Figure 2: Back panel KeyTalk.

The NIC 'P' is 10.1.1.1 and is assigned to the KeyTalk management interface. This NIC should only be accessible to the system administrator.

e) Connect the administrator PC/Laptop by UTP cable.

f) Configure the administrator PC/Laptop to the 10.1.1.x network so that you may be able to connect to 10.1.1.1.
Pick for example the 10.1.1.50 address (address must be 10.1.1.x with x>4) for the administrator PC and use network mask 255.255.255.0.

NOTE: By default pre-configuration is based on IPV4, however IPV6 is fully supported. The focus for manuals and training is, however, on IPV4 and will not go into detail for IPV6 configuration.

Sample screenshots on a Windows 7 (64) PC on how to configure your IP:

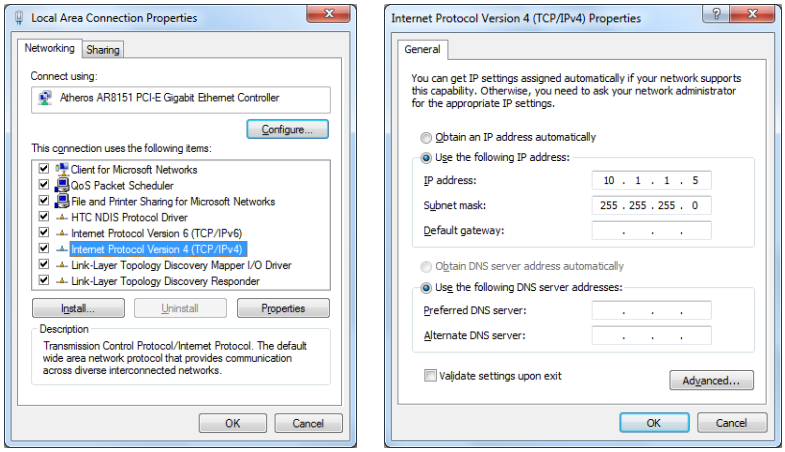


Figure 4: IP configuration on a Windows 7 (64bit) PC

5.3. Step 3: Connecting to the appliance administrator interface

The KeyTalk appliance Graphical Admin Interface can be accessed by browser over the following URL: https://10.1.1.1:3000.
Note: Pay attention to the S in HTTPS and port 3000!

Because the appliance is configured using a self-signed SSL certificate by default, you will likely get a warning that the security certificate was not issued by a trusted certificate authority.

In this case, ignore the warning and continue to the website. This is a workaround!!; a trusted certificate should be obtained from a known certificate authority such as VeriSign, GoDaddy and Cybertrust, or from the KeyTalk Certificate Authority, before going into production. When the certificate is installed, no warning should occur.

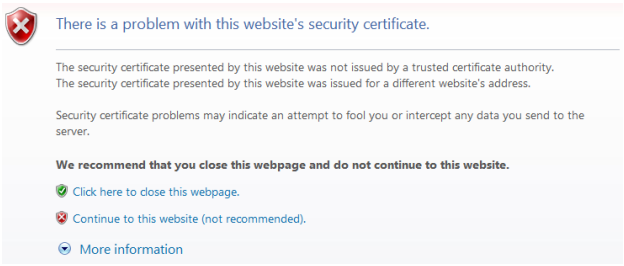


Figure 5: Sample warning

You will then go to the login page for KeyTalk.

5.4. Step 4: Authenticating to the administrator interface

The default authentication credentials to access the KeyTalk administrator interface role are:

User: reseptadmin
Password: change!

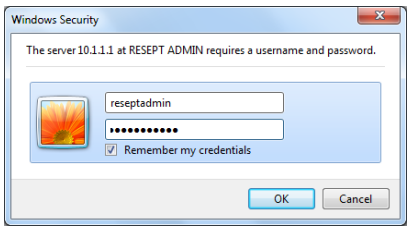


Figure 6: Login to KeyTalk administration page after ignoring the certificate warning

This user has full access to all the options on the KeyTalk device.

The homepage of KeyTalk will open:

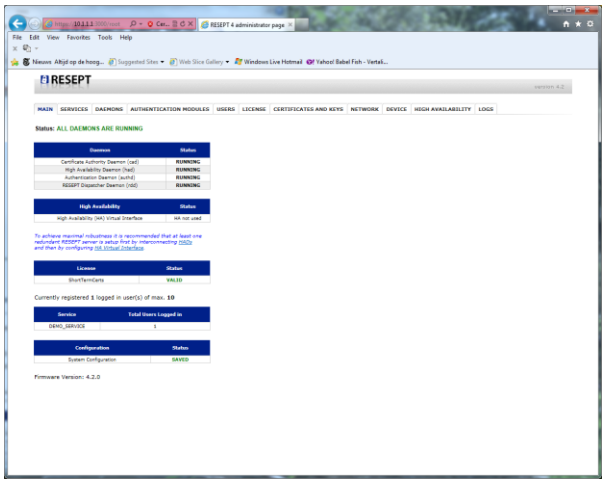


Figure 7: Homepage KeyTalk

5.5. Step 5: Set network configuration

For configuring the network, network administration knowledge is required.

To set the network configuration, select the 'NETWORK' tab in the upper menu, select "Configuration Interface", enable the 'External' checkbox and select "CHANGE".

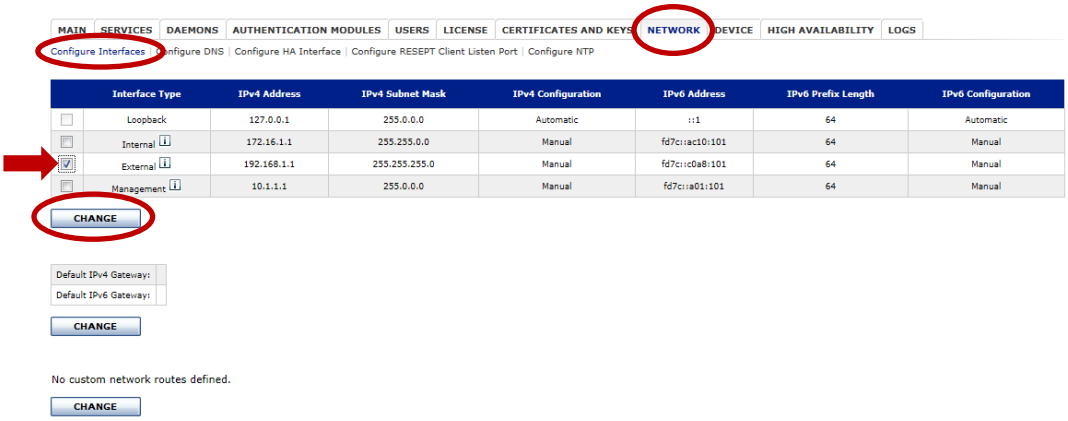


Figure 8: Setting network configuration

5.6. Step 6: Edit network interface settings

Configure 'IP Address', 'Subnet Mask' and the 'Default Gateway' to match your own network topology and click 'OK' to save these settings.

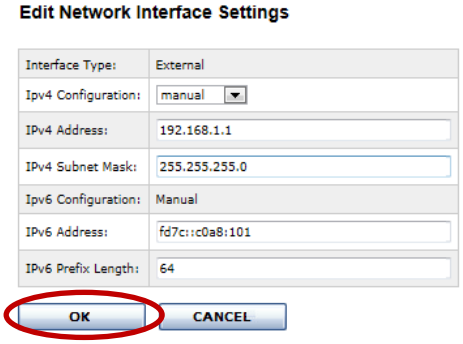


Figure 9: Network Interface Settings

Note: *Optionally you can set a gateway for each NIC separately.*

5.7. Step 7: Change administrator password

To guarantee the best security possible, it is important to change all user passwords before step 10 'Connecting the appliance to the external network'.

The Graphical Administrator Interface can be used, when required, for maintenance.

The Admin authentication credentials are by default set to:
Graphical Administrator Interface (Admin GUI):
User: reseptadmin
Password: change!

In order to change the Graphical Administrator Interface password, do the following:
In the upper menu select the 'DEVICE' tab and select 'Admin Password'.

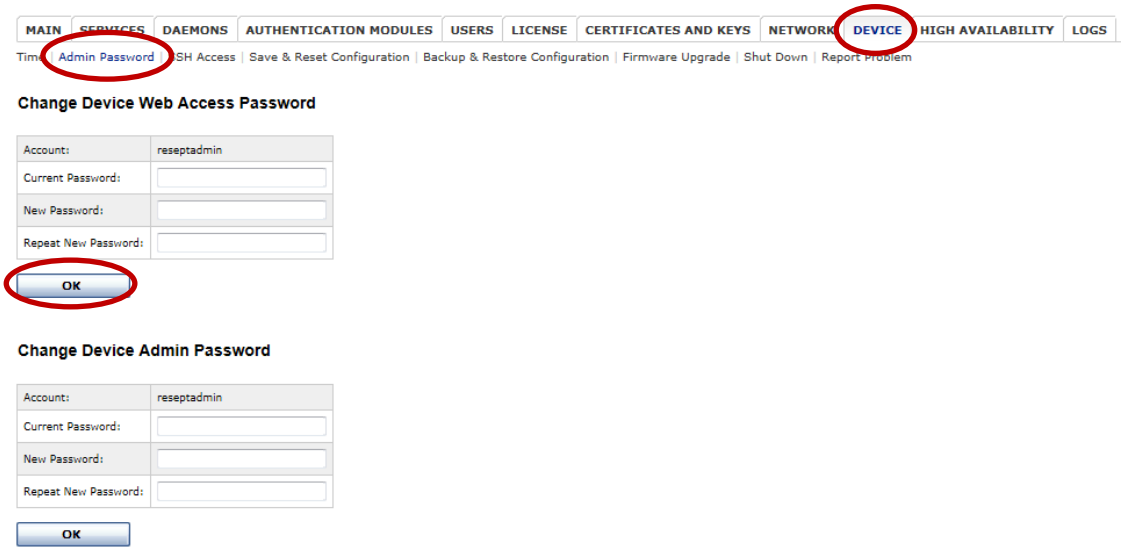


Figure 10: Changing Graphical Administrator Interface password

Enter both current and new password and confirm the new password in the Change Device Web Access Password fields. Press "OK" to activate the new password.
Note: *It is important to remember this password.*

The KeyTalk appliance also has a more powerful user, the device admin, for low level administrator maintenance. This user is not enabled by default. If required, contact your KeyTalk supplier or partner.

5.8. Step 8: DNS & NTP/Date Time customization

To set your applicable **DNS**, select the "NETWORK" tab in the upper menu and select "Configure DNS".
It is possible to ping the IP in order to check if the IP maps to a living machine.
Note:
The firewall might block the ping (icmp echo request/reply).

Enter the IP addresses of your DNS and select 'OK'.

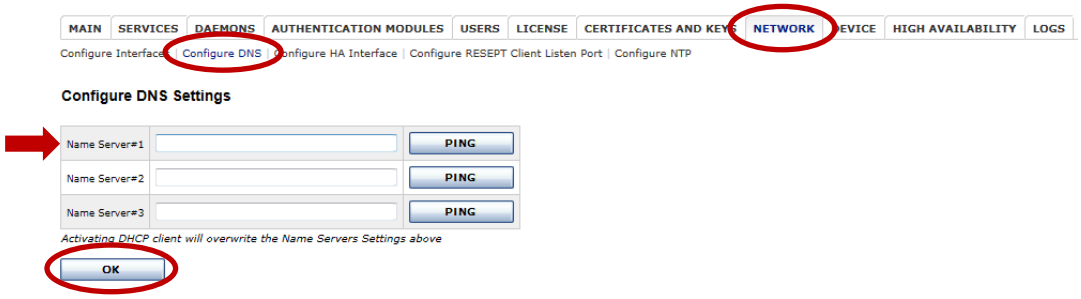


Figure 11: Setting the applicable DNS

To set the applicable **date/time**, go to the tab "DEVICE" and select "Time".
Enter the current date and time in UTC(!), and select "SET".

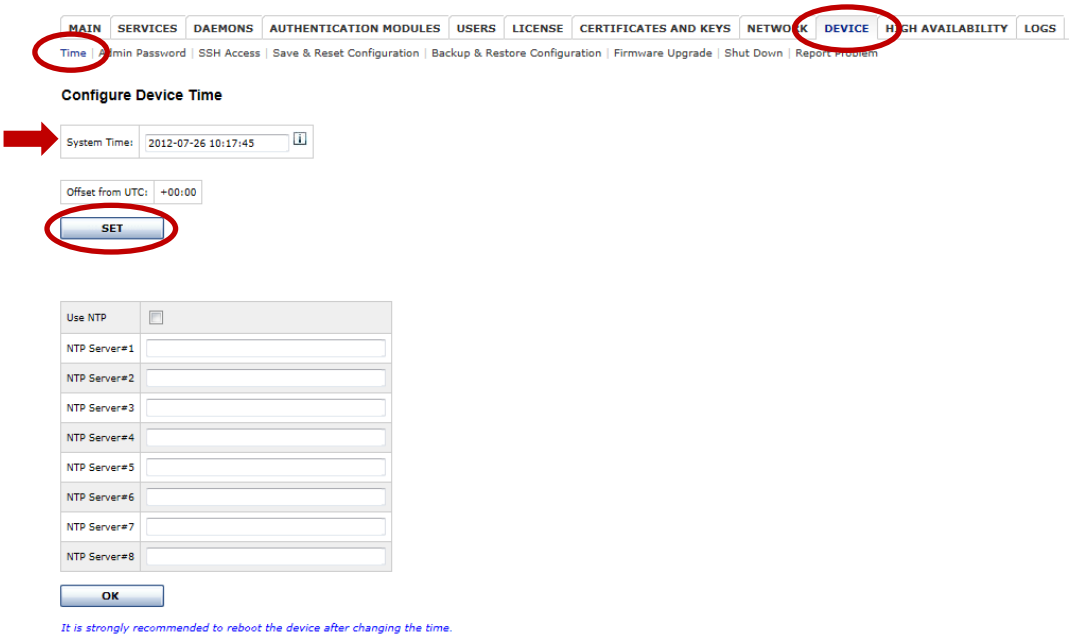


Figure 12: Setting the applicable date/time

Note: *The Netherlands is UTC+1 (during summertime UTC+2); CST = UTC-6 (during summertime UTC-5); EST = UCT-5 (during summertime UTC-4).*

Preferably set your applicable **NTP server(s)**. When using NTP server(s) also check the 'Use NTP' box. Confirm by selecting "OK".

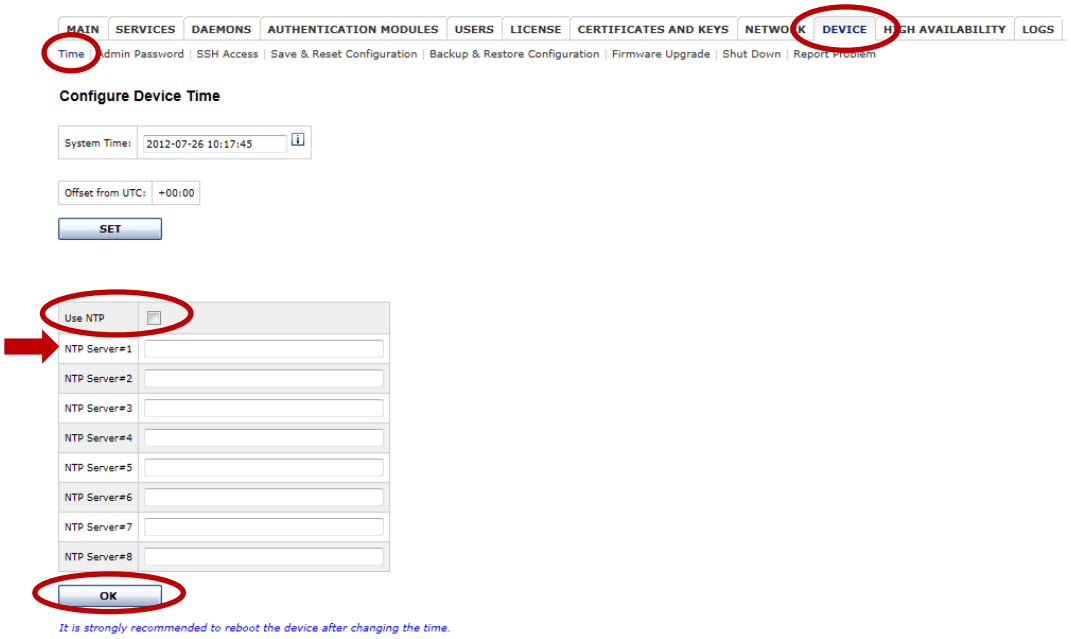


Figure 13: Setting your applicable NTP server(s)

Possible problems

Please make sure the firewall rules allow connection of NTP services (UDP123). Also keep in mind that NTP will only slowly correct the time settings. This is standard NTP behavior and to avoid a delay, manually set the time before enabling NTP. Manually setting the time cannot be done after enabling NTP.

Also see section 14 'Date/time & NTP settings'. There are two menu items to configure the time, but both function identically. One menu item is located in the 'Network configuration', the other in 'Device configuration'. Both direct you to the same function.

5.9. Step 9: Save the current configuration

In the main menu select the 'DEVICE' tab and select 'Save & Reset Configuration".
Select "SAVE" to save the System Configuration.

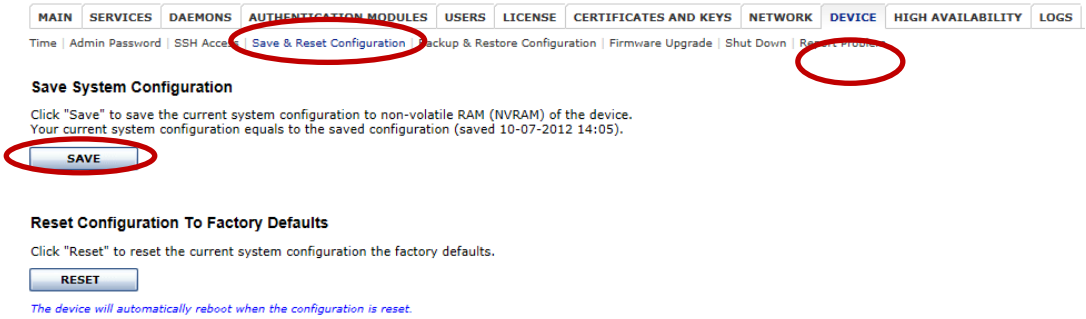


Figure 14: Saving current system configuration

In case a system reboot is necessary the standard configuration will be used unless the changes have been saved. See section 8 'KeyTalk Admin GUI' for details about making changes to the KeyTalk Admin GUI and saving the changes.

5.10. Step 10: Connecting the appliance to the external network

The KeyTalk appliance has 3 active Network Interface Connectors (NIC). These are 'O', 'P' and 'Q' (see section 3 'Back Panel Components').

NIC 'Q' is by default assigned to 192.168.1.1 and to be connected to the external network. This NIC should be used for regular KeyTalk client-server communication.

5.11. Step 11: Testing the KeyTalk solution

Now that the installation is complete, the KeyTalk solution can be tested using the provided demo KeyTalk Client in combination with the DEMO RCCD file.

Update the KeyTalk client configuration: start the RESEPT Configuration Manager from the Windows START menu:

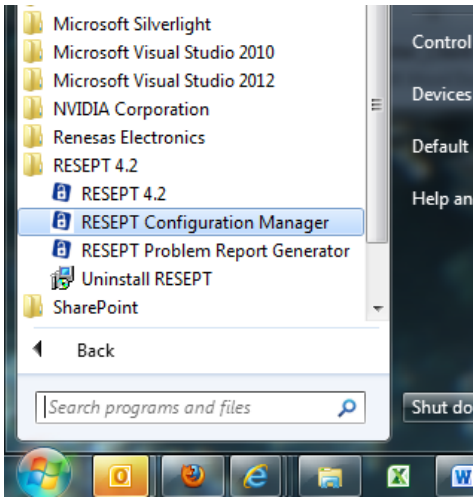


Figure 15: KeyTalk Configuration Manager

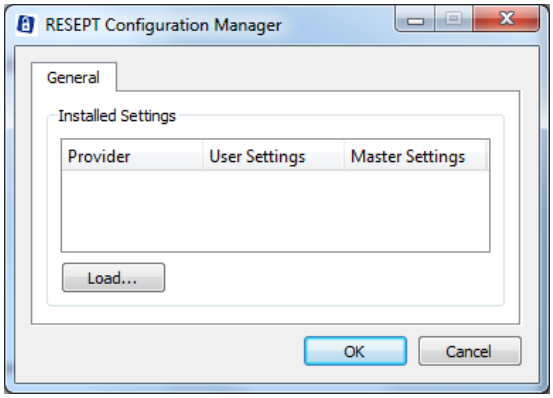


Figure 16: RESEPT Configuration Manager

Load the RCCD file to test the KeyTalk appliance by clicking on "Load…"

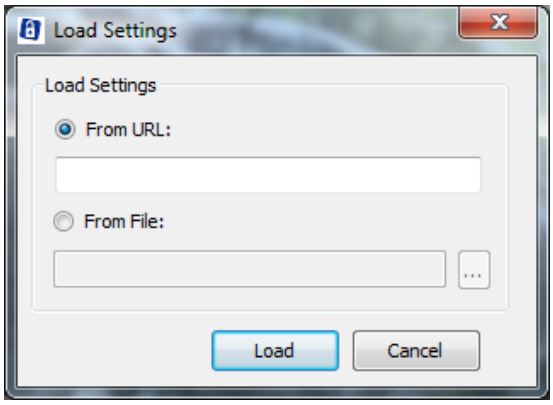


Figure 17: Selecting the setting to load a RCCD file

Browse to the location where the RCCD is saved, either via your browser or from your local system.

Click on "Load" to upload the selected RCCD file. After successful upload the following message will appear on screen:

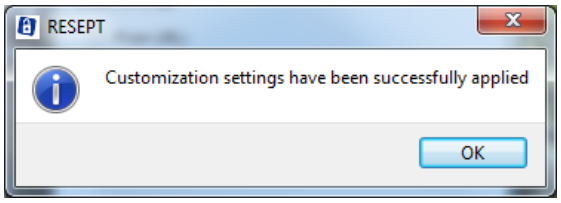


Figure 18: RCCD file was successfully uploaded and applied

If the screen above does not appear, the RCCD file you tried to upload may be corrupt. Please recreate the RCCD file and upload again.

After clicking "OK", the screen below will open:

Select the "Provider Settings" tab and enter the appropriate KeyTalk Appliance server, which can be specified by IP address or DNS name. When done, select "OK".

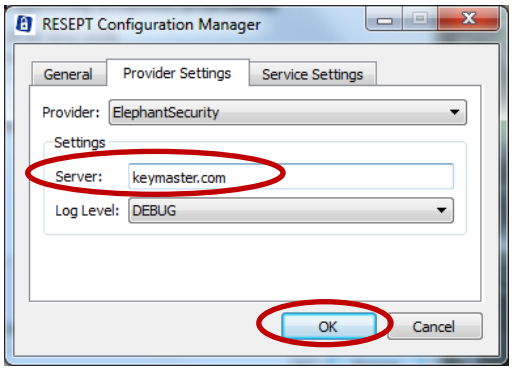


Figure 19: Sample provider settings

For testing purposes the KeyTalk internal user database is already configured with a 'DemoUser'. Additional users can be easily added using the Admin GUI, see section 19 'Authentication modules' for more information.

6. IPv4 and IPv6

The KeyTalk appliance fully supports IPv4 and IPv6.

Out-of-the-box demo configurations are based on IPv4.

Admins who wish to make use of IPv6 will need to configure the appropriate IPv6 settings.

7. Setting up the appliance

7.1. Powering the appliance

1. Remove the appliance from its box.
2. Plug the black power cord into the appliance back power-port ('K').
3. Plug the power cable into a power socket-connector.
4. Press the power-on button ('E').

7.2. Connecting the appliance to the internal network

The KeyTalk appliance has 3 active Network Interface Connectors (NIC) ('O', 'P' and 'Q').

The address of 'P' is by default 10.1.1.1 and is assigned to the KeyTalk administrator interface.

Follow these steps to connect the appliance to the internal network:

- Connect the administrator PC/Laptop by UTP cable.
- Configure the administrator PC/Laptop to the 10.1.1.0 network so that you are able to connect to 10.1.1.1.
- Sample screenshots on a Windows 7 (64) PC on how to configure your IP from Local Area Connection Properties:

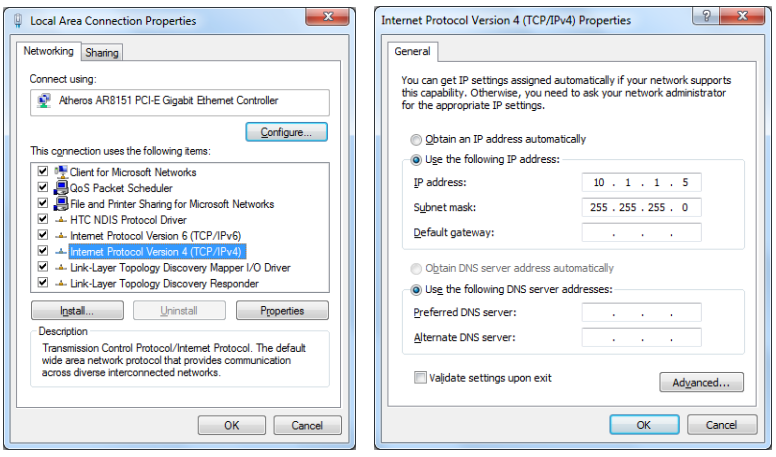


Figure 20: Configure your IP

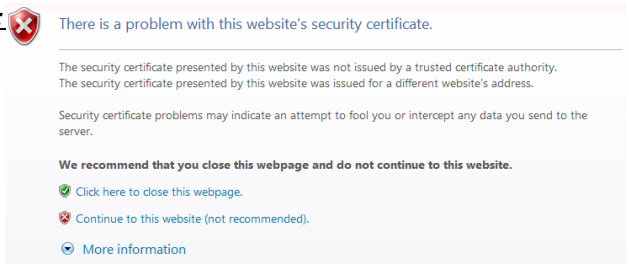
8. KeyTalk Admin GUI

The KeyTalk appliance Graphic Admin Interface can be accessed with a browser using the following URL: https://10.1.1.1:3000
Note: Pay attention to the S in HTTPS and port 3000!

User: reseptadmin
The default password was 'change!', but this was changed under section 10 'Changing KeyTalk passwords'. Please remember to use your new password.

Because the appliance is configured to use a self-signed SSL certificate by default, you will likely to get a warning that the security certificate was not issued by a trusted certificate authority. In this case, ignore the warning and continue to the website.

Sample warning:



To avoid this warning you must install a certificate from a trusted party such as VeriSign, GoDaddy, GlobalSign, Cybertrust, or from your own KeyTalk Certificate Authority. See following section for details.

8.1. Replacing Admin GUI SSL-certificate

By default a self-signed SSL certificate is used to access the appliance over https://10.1.1.1:3000

You should replace this SSL certificate with your own. A certificate can be obtained from a well-known party such as VeriSign, GoDaddy, Globalsign and Cybertrust.

In the main menu, select "CERTIFICATES AND KEYS" and select "WebUI". Upload your own SSL certificate by clicking on "Browse…", selecting the SSL certificate and clicking on "UPLOAD".

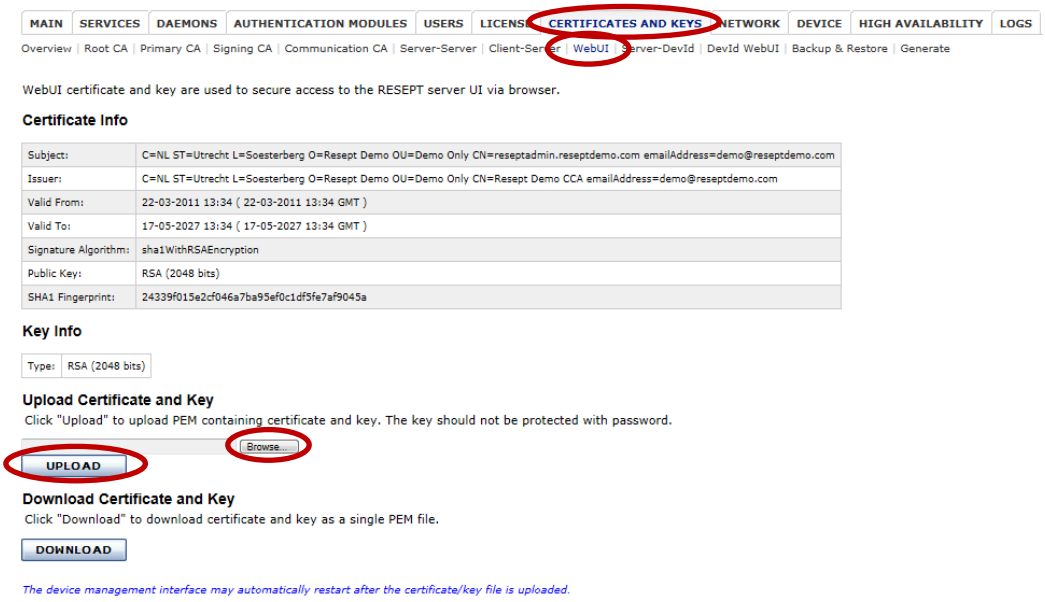


Figure 21: Replacing the SSL-certificate

Make sure that the SSL certificate you wish to make use of, also contains the private key, and is in a PEM file format.

Select the file by pressing BROWSE and press UPLOAD to replace the existing SSL certificate.

After a successful UPLOAD the device management subsystem will automatically restart to effectuate the new SSL certificate.

To make the changes permanent, please refer to section 8.2 'Saving changes & reboot'.

8.2. Saving changes & reboot

Changes made in the Admin GUI will be effective, as long as the KeyTalk appliance does not lose its electric power. In order to make changes permanent, the changes must be saved by the administrator.

SAVING: In the main menu select the "DEVICE" tab and select "Save & Reset Configuration". Select "SAVE" to save the System Configuration.

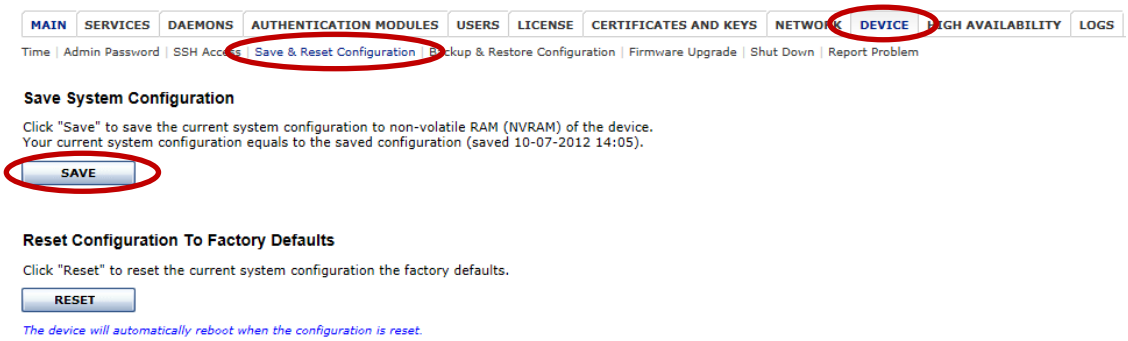


Figure 22: Saving System configuration

REBOOT: In the main menu select the "DEVICE" tab and select "Shut Down". Select "REBOOT" to reboot the system.

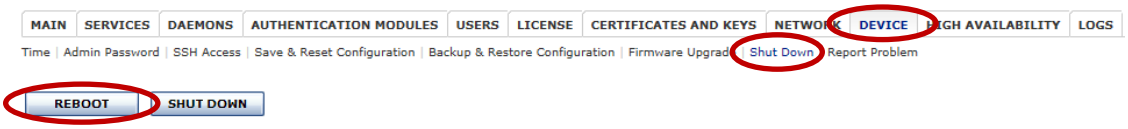


Figure 23: Rebooting the system

9. SSH

SSH is by default disabled on the KeyTalk appliance. Should there be a need to activate it, please contact your KeyTalk supplier for an updated KeyTalk license with activated SSH.

10. Changing KeyTalk passwords

The Graphical Administrator Interface can be used, when required, for administrator maintenance.

The Admin authentication credentials are by default set to:
Graphical Administrator Interface (Admin GUI):
User: reseptadmin
Password: change!

In order to change the Graphical Administrator Interface password, do the following:
In the upper menu select the 'DEVICE' tab and select 'Admin Password'.

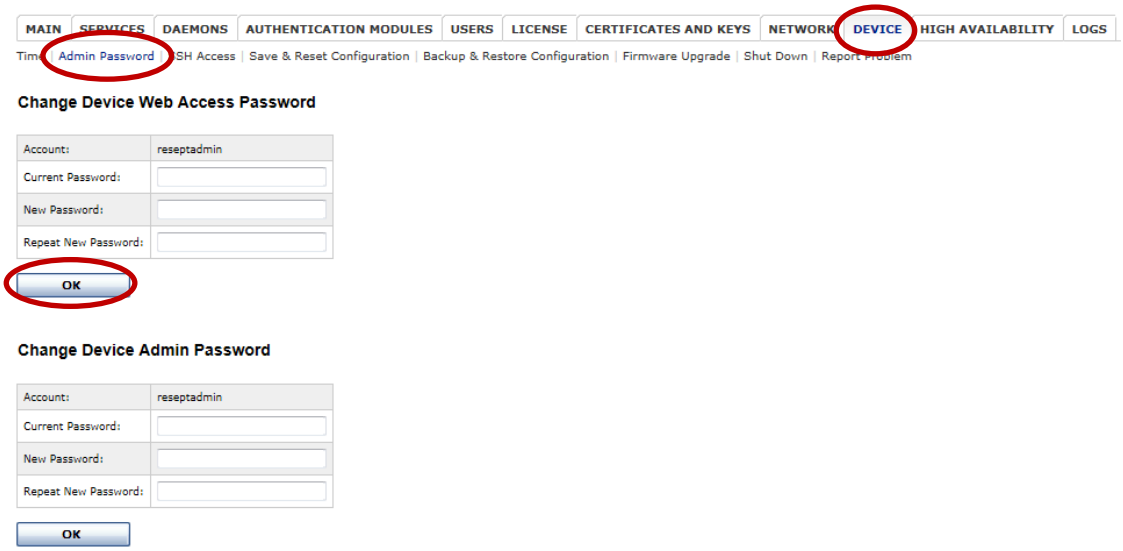


Figure 24: Changing Graphical Administrator Interface password

Enter both current and new password, and confirm the new password, in the Change Device Web Access Password fields. Press "OK" to activate the new password.
Note: *It is important to remember this password.*

The KeyTalk appliance also has a more powerful user, the device admin, for low level administrator maintenance. This user is not enabled by default. If required, contact your KeyTalk supplier or partner.

11. Backup and Restore

To make a full backup of your current system configuration to your computer, select "DEVICE" from the main menu, select "Backup & Restore Configuration" and select "BACKUP".

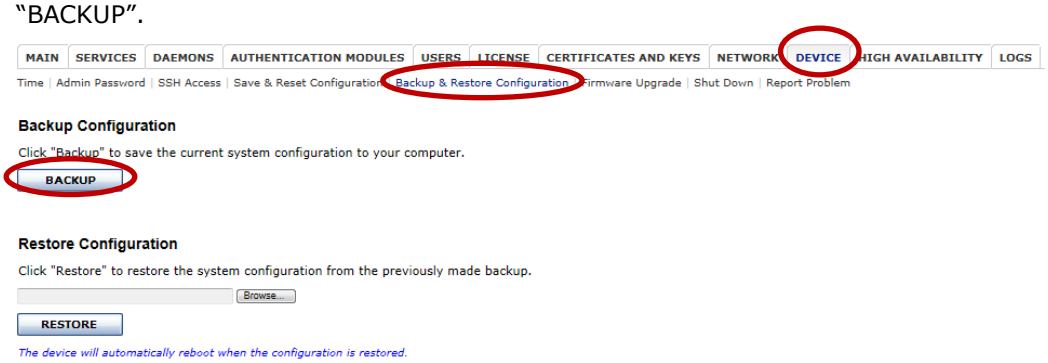


Figure 25: Making a backup of the system configuration

Save the backup file "resept.config_dat" in a location of your choice.

To restore your backup of your system configuration, select "DEVICE" from the main menu, select "Backup & Restore Configuration" and select "Browse" under 'Restore Configuration'.

Select your "resept.config.dat" backup file, and select "RESTORE". The KeyTalk appliance will reboot afterwards, to effectuate the changes.

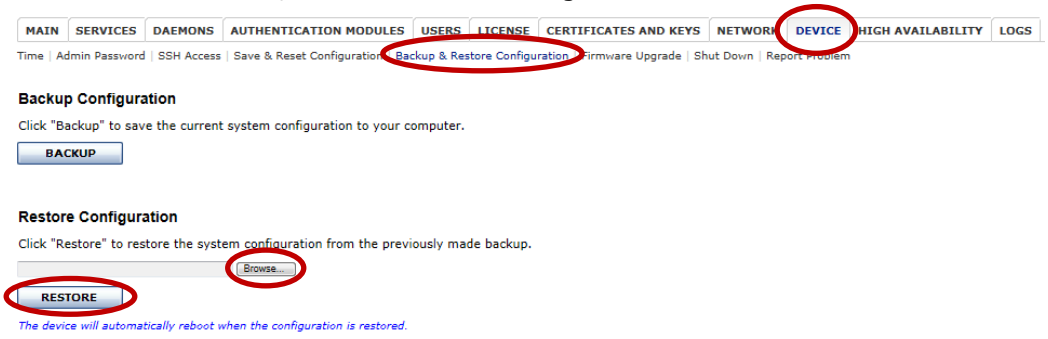


Figure 26: Restoring the system configuration backup file

12. Factory Reset

Should you ever want to reset the KeyTalk appliance to its original factory settings, the steps described below must be followed.

Select from the main menu the "DEVICE" tab and select "Save & Reset Configuration". Select "RESET" to restore default factory configuration settings.

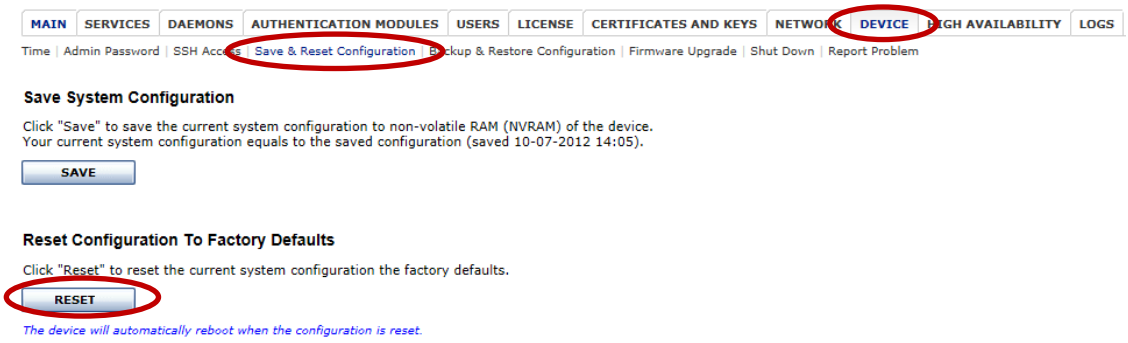


Figure 27: Resetting the Factory Defaults

Note: *When resetting the default factory configuration settings, this will also affect your set IP addresses!! In case your KeyTalk device is off premise, remote communication with the device will be impossible after a factory reset.*

13. Firmware upgrade

KeyTalk BV releases periodically new firmware for the KeyTalk appliance.

New firmware can fix bugs as well as add new functionality.

Upgrading requires you to go from one version to the next in full sequential order. Skipping a firmware version in between may result in the malfunctioning of the KeyTalk appliance.

Note: *Before upgrading your firmware, make sure the Daemons are stopped. See section 17 '**Configuring daemons**' in case you update a live system.*

Upgrading the KeyTalk firmware can be done in two different ways:

1. For remote upgrading, you can upload the upgrade-file via the administrator graphical interface (Admin GUI).

   Within the KeyTalk Admin GUI, go to "DEVICE", select "Firmware Upgrade", click on 'Browse' to select the upgrade-file and click on "UPLOAD" to start the upgrade process.

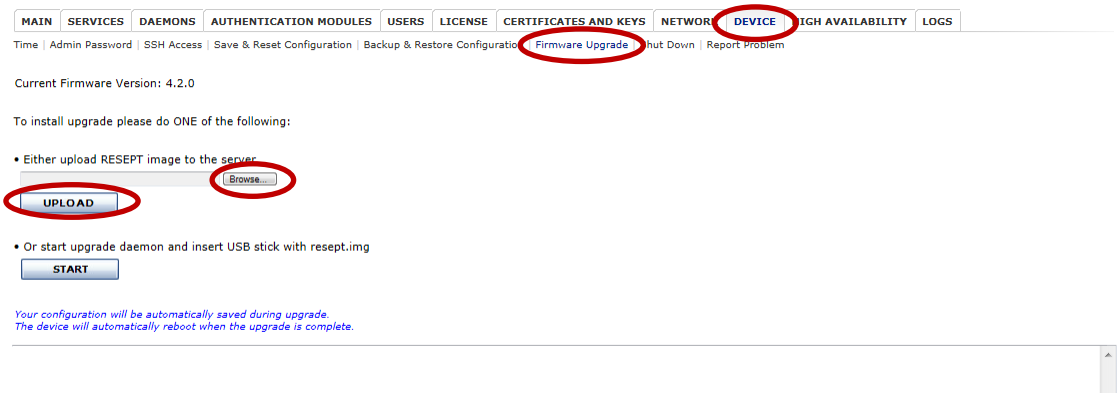


Figure 28: Firmware upgrade - remote

2. If you have physical access to the appliance, you can use a USB-stick for the upgrade.

   Within the KeyTalk Admin GUI, go to "DEVICE", select "Firmware Upgrade", insert the USB stick with the upgrade-files on it into one of the USB ports 'L' or 'M', the LCD menu will be activated. Click on "START" to upgrade. The system will HALT after an upgrade, requiring an additional reboot.

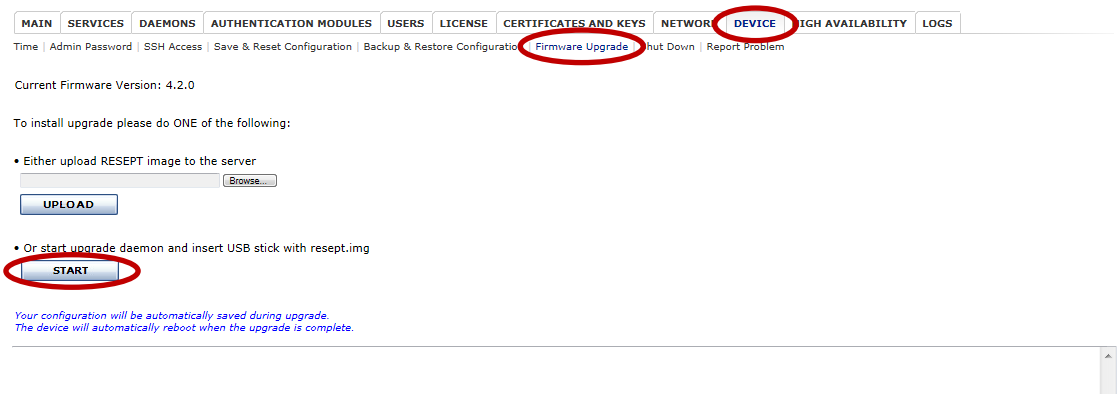


Figure 29: Firmware upgrade – on premise

As a result the upgrade will start. The progress of the upgrade will be shown in the Admin GUI.

On successful upgrade, the appliance will automatically REBOOT to apply the new firmware.

14. Date/time & NTP settings

To set the applicable **date/time**, go to the tab "DEVICE" and select "Time".
Enter the current date and time in UTC (!), and select "SET".
The KeyTalk appliance will do all required time zone calculations.

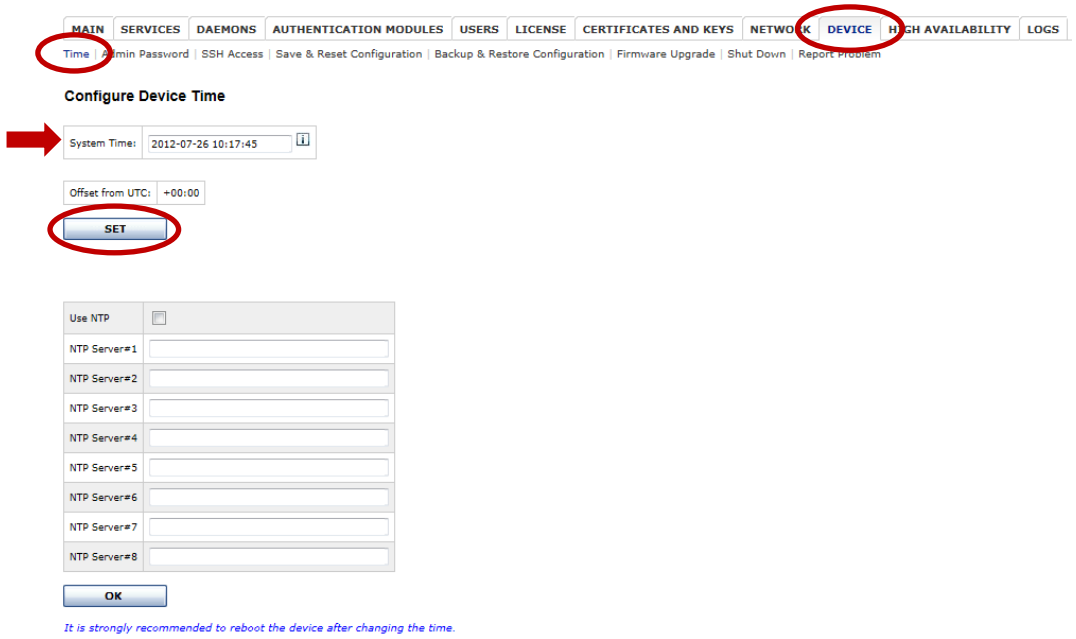


Figure 30: Setting the applicable date/time

Note: *The Netherlands is UTC+1 (during summertime UTC+2); CST = UTC-6 (during summertime UTC-5); EST = UCT-5 (during summertime UTC-4).*

It is highly recommended to set your applicable **NTP server(s)**.
When using NTP server(s) also check the 'Use NTP' box. Confirm by selecting "OK".

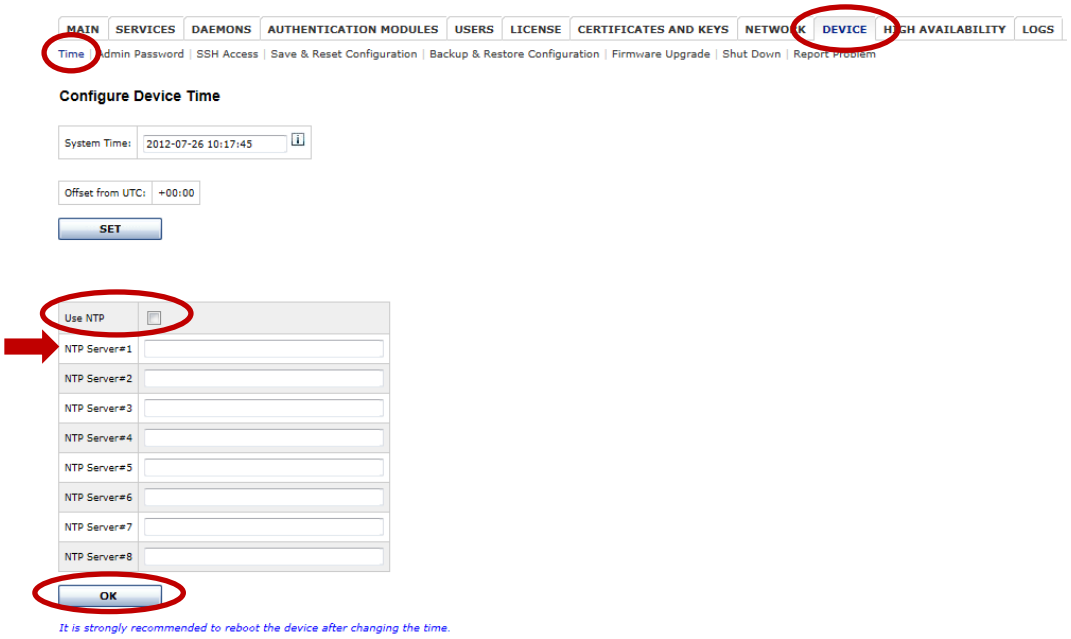


Figure 31: Set your applicable NTP server(s)

See section 5.8 'Step 8: DNS & NTP/Date Time customization' for details on setting the time for DNS and NTP. There are two menu items to configure the time, but both function identically. One menu item is located in the 'Network configuration', the other in 'Device configuration'. Both direct you to the same function.

15. Log files

The log files of the four main Daemons and the Web UI can be accessed from the tab "LOGS" in the upper menu:

- AUTHD Logs – Authentication daemon logs
- CAD Logs – Certificate Authority daemon logs
- HAD Logs – High Availability daemon logs
- RDD Logs – RESEPT Distribution daemon logs
- WebUI Logs – Web interface logs

For example, from the main menu, select the "LOGS" tab and select "AUTHD Logs".

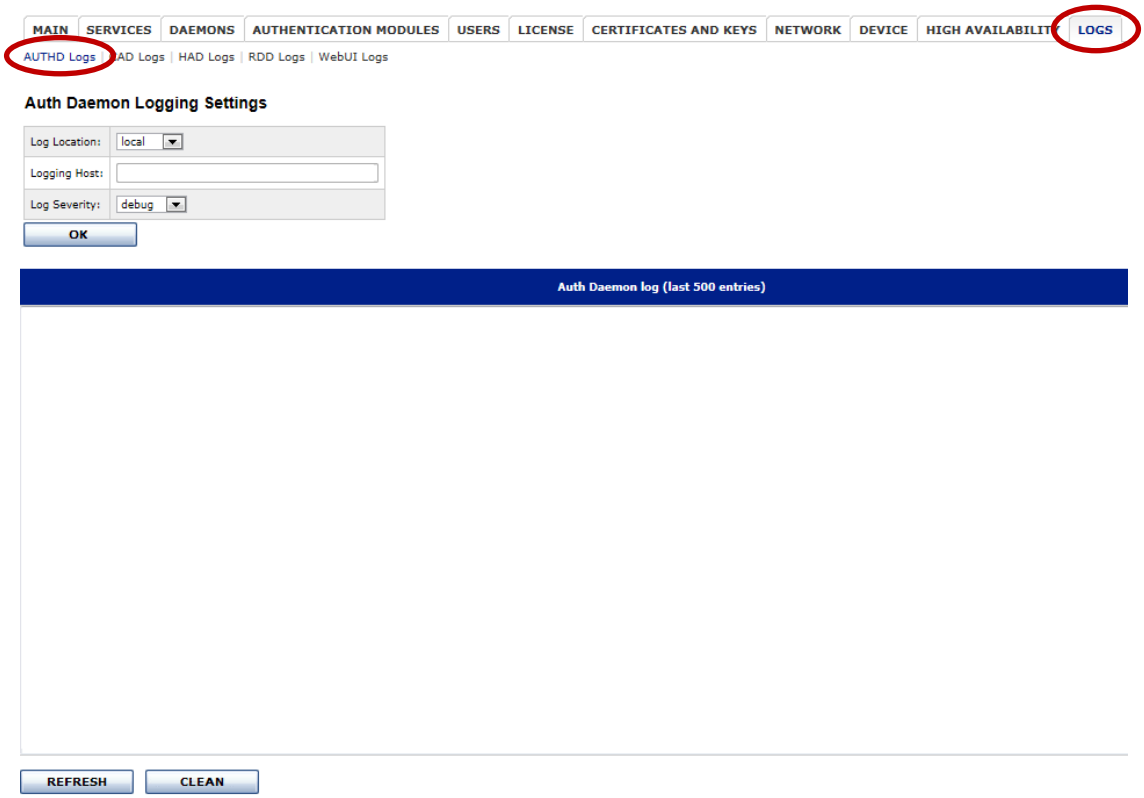


Figure 32: Authentication daemon logs

15.1. Daemon logging settings

Each Daemon and the Web UI have their own log file that can be configured individually.

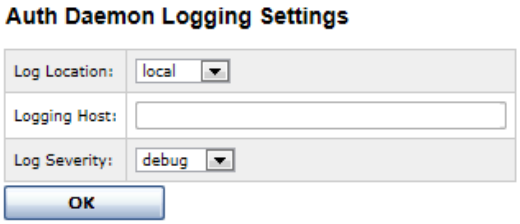


Figure 33: Daemon logging settings, e.g. for the authentication daemon log

Log Location allows the Admin to choose between local logging (default) and remote logging.

When local logging is chosen, the appropriate Daemon's log file will be stored on the local KeyTalk appliance until it reaches a 250k size. After that the local log file rotates to a fresh log file.

Choosing remote logging requires setting a host. Remote logging will allow for a continuous log file on your syslog-server.

Log Severity allows from minimal logging using the "emerg" (= emergency), to the standard log level of "err" (=error), up to the most comprehensive log file under the "*" setting.

16. Network settings

16.1. Configure interfaces

To configure the network, network administration knowledge is required.

The KeyTalk appliance makes use of four interfaces. These can be configured by selecting from the main menu "NETWORK", followed by selecting "Configure Interfaces".

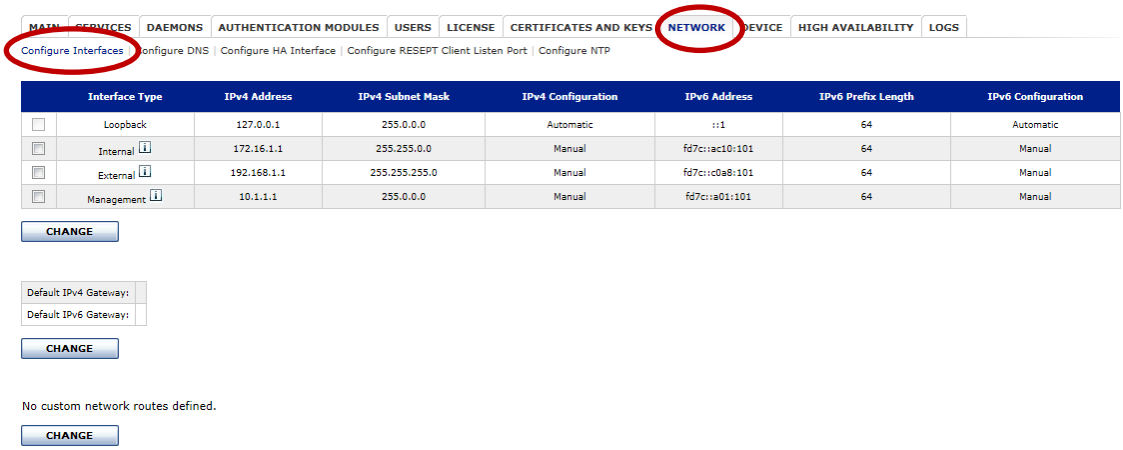


Figure 34: Configuring interfaces

Interface Types

Loopback: cannot be configured from the Admin GUI

Internal: corresponds to NIC "O", see Section 3 'Back Panel Components'

External: corresponds to NIC "Q", see Section 3 'Back Panel Components'

Management: corresponds to NIC "P", see Section 3 'Back Panel Components'

To configure a specific interface, select the appropriate box and click on "CHANGE".

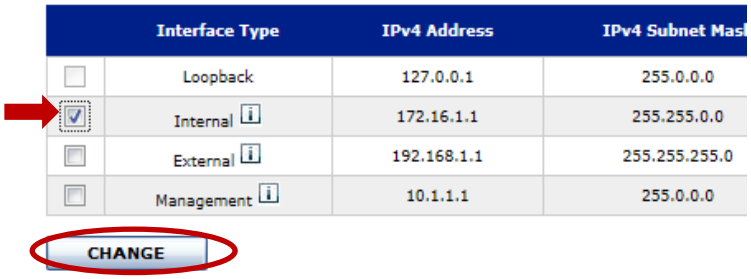


Figure 35: Changing the Internal Interface type

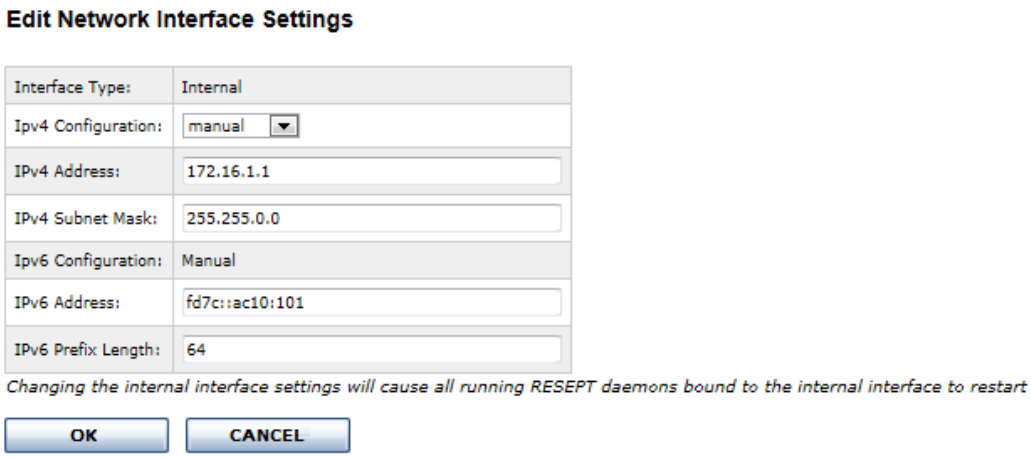


Figure 36: Edit Network interface settings

Configure the items you wish to change and select "OK" to save these changes.

To change the KeyTalk appliance default gateway, select from the main menu "NETWORK", select "Configure Interfaces" and select "CHANGE".

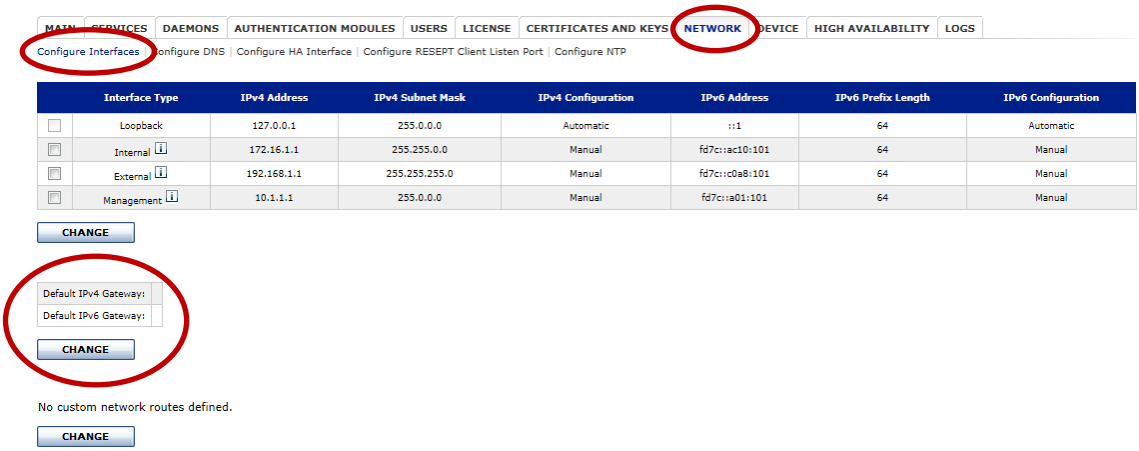


Figure 37: Changing default Gateway

On the screen that opens, configure the default gateway IP and select "OK".

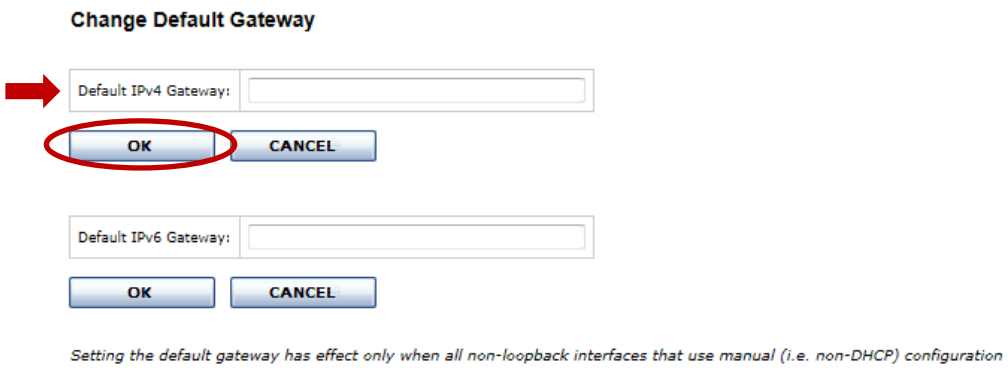


Figure 38: Changing the default gateway

Note: *Optionally you can set a gateway for each NIC separately.*

16.2. Configure DNS

To set your applicable DNS, from the upper menu select "NETWORK" and select "Configure DNS".

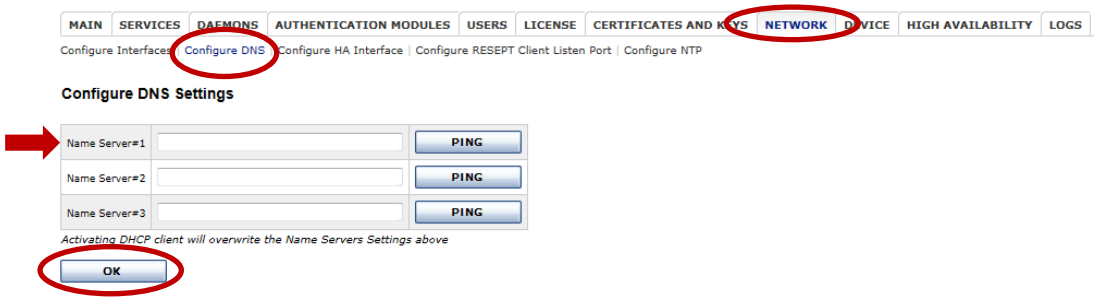


Figure 39: Configuring your DNS

Enter the IP addresses of your DNS and select 'OK'.

Note: *Do not enter your host name, but your IP addresses.*

16.3. Configure High Availability Virtual Interface

When running multiple KeyTalk chains (i.e. split daemons on multiple KeyTalk appliances) you may wish to setup a redundancy group. For more info on KeyTalk chains refer to section 17.2.1 'In depth HA chain'.

One logical KeyTalk server consists of one or more physical KeyTalk appliances (servers) grouped by the same redundancy group ID. From the KeyTalk Client perspective it behaves as one server with one IP address. This IP address is provided by a virtual interface called High Availability (HA) interface.

On one appliance the daemons are configured in chains. If the chain breaks, the master appliance will communicate this to the other appliances within the same redundancy group in order to elect a new master.

High Availability is not a substitute for load balancing. The current limitation of the High Availability for the KeyTalk appliance is that it is bound to one network ip-range.

To configure the High Availability, from the main menu select "NETWORK", then select "Configure HA Interface".

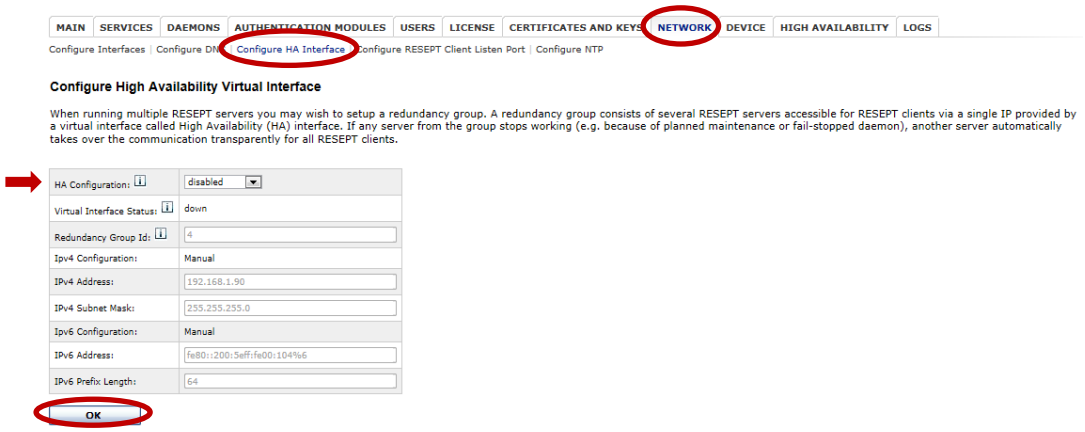


Figure 40: Configuring the High Availability Virtual Interface

Make the appropriate configuration changes and select "OK".

16.4. Configure KeyTalk client listening port

It is very unlikely that you will have to change the port number on which the KeyTalk appliance listens to the KeyTalk Client; as the default 80 port will pass most firewalls. If you would like to change the port, select from the main menu "NETWORK", and select "Configure RESEPT Client Listen Port".

Figure 41: Configuring the KeyTalk client listening port

Change the port number and select "OK" to save the change. Additionally you must change the KeyTalk client RCCD file to contain the corresponding port number for the INI file(s).

17. Configuring daemons

In Unix and other multitasking computer operating systems, a daemon is a computer program that runs as a background process, rather than being under the direct control of an interactive user (*source: Wikipedia.org*).

The following daemons are important for proper functioning of the KeyTalk appliances:

- **AUTHD – Authentication daemon**
  Responsible for the user authentication process. It will connect to the applicable authentication database.
- **CAD– Certificate Authority daemon**
  The actual creator of the certificate. It will be invoked after successful authentication.
- **HAD– High Availability daemon**
  Responsible for the high availability functionality of the KeyTalk solution.
- **RDD – RESEPT Distribution daemon**
  User traffic connects to the RDD. This daemon will sanitize the user input, perform some checks and when correct, will take responsibility for the distribution of the workflow to the other daemons.

Next to the above mentioned daemons, there is also an Admin GUID daemon running on the KeyTalk appliance.

Two daemons, CAD and HAD, can be configured in the tab "DAEMONS".

Figure 42: Configuring daemons

In the next sub-sections it is described how these two daemons can be configured.

17.1. Certificate Authority daemon (CAD) settings

To configure the Certificate Authority daemon, select "CAD Settings" in the "DAEMON" tab.

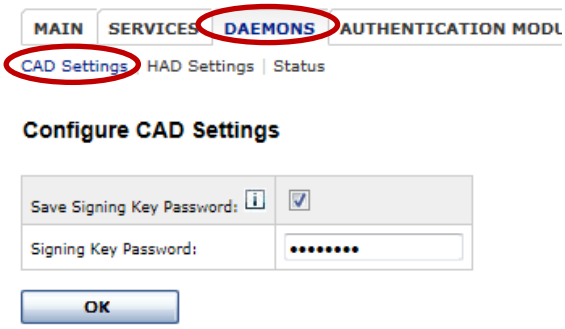


Figure 43: Configuring the CAD Settings

The CAD is responsible for the creation of the user certificates and keys.

When a password is present on your CAD Signing Key you may wish to store it for REBOOT purposes. The default password on the KeyTalk DEMO is blank.

Select "OK" to save.

17.2. High Availability daemon settings

To configure the High Availability daemon, select "HAD Settings" in the "DAEMON" tab.

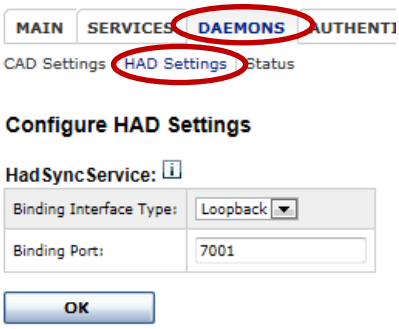


Figure 44: Configuring the HAD Settings

The HAD is responsible for discovery and synchronization between the other physical KeyTalk appliances.

Select the Binding Interface Type:

- Loopback
  (See Section 16.1 ´Configure interfaces´ for the description of this interface type)
- Internal
  (See Section 16.1 ´Configure interfaces´ for the description of this interface type)

Select "OK" to save the new settings.

Note: *High Availability daemons from other KeyTalk chains will need to be made known to the KeyTalk in order for HAD to work properly.*

Figure 45: HADs from other KeyTalk servers need to be made known

Select "ADD" to add a new KeyTalk appliance.

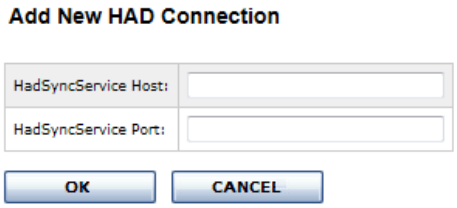


Figure 46: Add new HAD connection

Enter the HadSyncService Host and Port.

Select "OK" to save the settings.

17.2.1. In depth HA chain

The KeyTalk High Availability chain allows for a complete set of KeyTalk daemons, to be made available in case of redundancy requirements.

Each chain is a self-supporting chain running on a single KeyTalk appliance. When one component of the chain fails, the HAD will assume the entire chain to be invalid.
On initial power-up all appliances will boot up in 'slave-status'. If there is no master in the group, it will be elected automatically. One KeyTalk appliance will become the master. If the master dies the election will be done again as described earlier.

Note: *High Availability functionality is not a replacement for load balancing functionality.*

An example of a HA implementation could be:

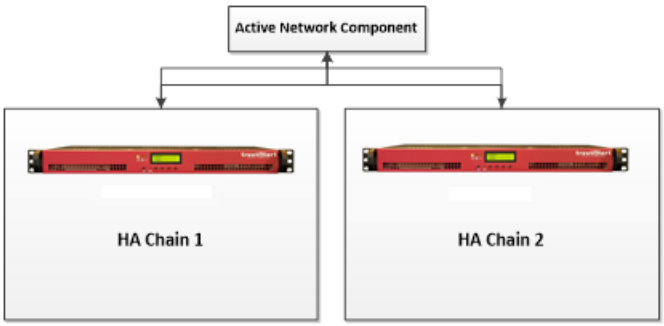


Figure 47: Example HA implementation

Each chain must be configured with the static information. All dynamic information (certificate serials, users etc.) is automatically synchronized, as soon as the chains have been configured to be aware of each other.

To ease configuration, it is a good starting point to always configure one single KeyTalk appliance, and make a backup of its configuration.

Note: *A configured copy might cause conflicting IP's, so configure with care.*

17.3. Stop/start daemons & status

The main daemons can be stopped / started from the status panel.

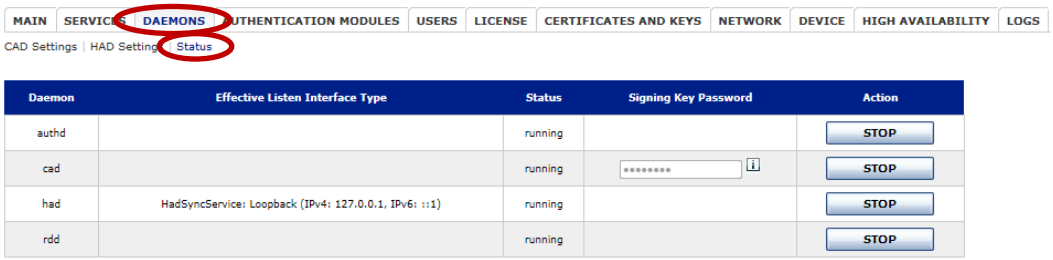


Figure 48: Stop/start daemons & status

When the CAD is started the Signing Key password may need to be entered when the password has been implemented.

To alleviate work for the Admin, it is possible to store the password. This can have security implications, but it has been made available to fit the company's security policy.

How to store the CAD signing key password is described in section 17.1 'Certificate Authority daemon (CAD) settings'.

18. Services

A service is a group of users that follow the same authentication method and certificate time-to-live. Usually this group of users belongs to the same department/organization.

Services define default values you wish to make available in the client X.509v3 certificates created, distributed and installed by KeyTalk. An example value for the organization attribute is 'O' = 'Example.com'.

Additionally attributes in the certificate can be mapped to AD fields.

Multiple services can be configured, allowing you to set up a multitude of services on a single KeyTalk instance.

18.1. Creating/modifying a service

To manage services, select from the main menu "SERVICES".

An overview of the existing services is displayed. In this overview, you will find a summary of the services' settings and applicable comments.

The following options are available for Services:

- Add
  Click on "ADD"
- Modify
  Select the existing service and click on "CHANGE"
- Delete
  Select the existing service and click on "REMOVE"

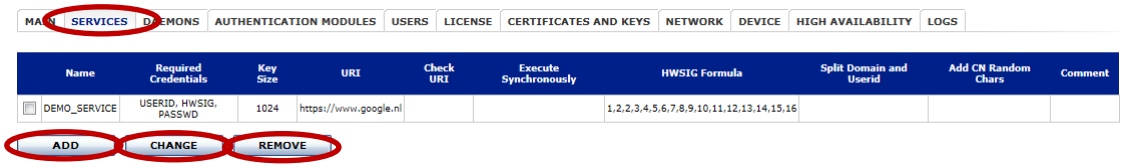


Figure 49: Adding/modifying/deleting a service

The following pages describe all the fields of the service.

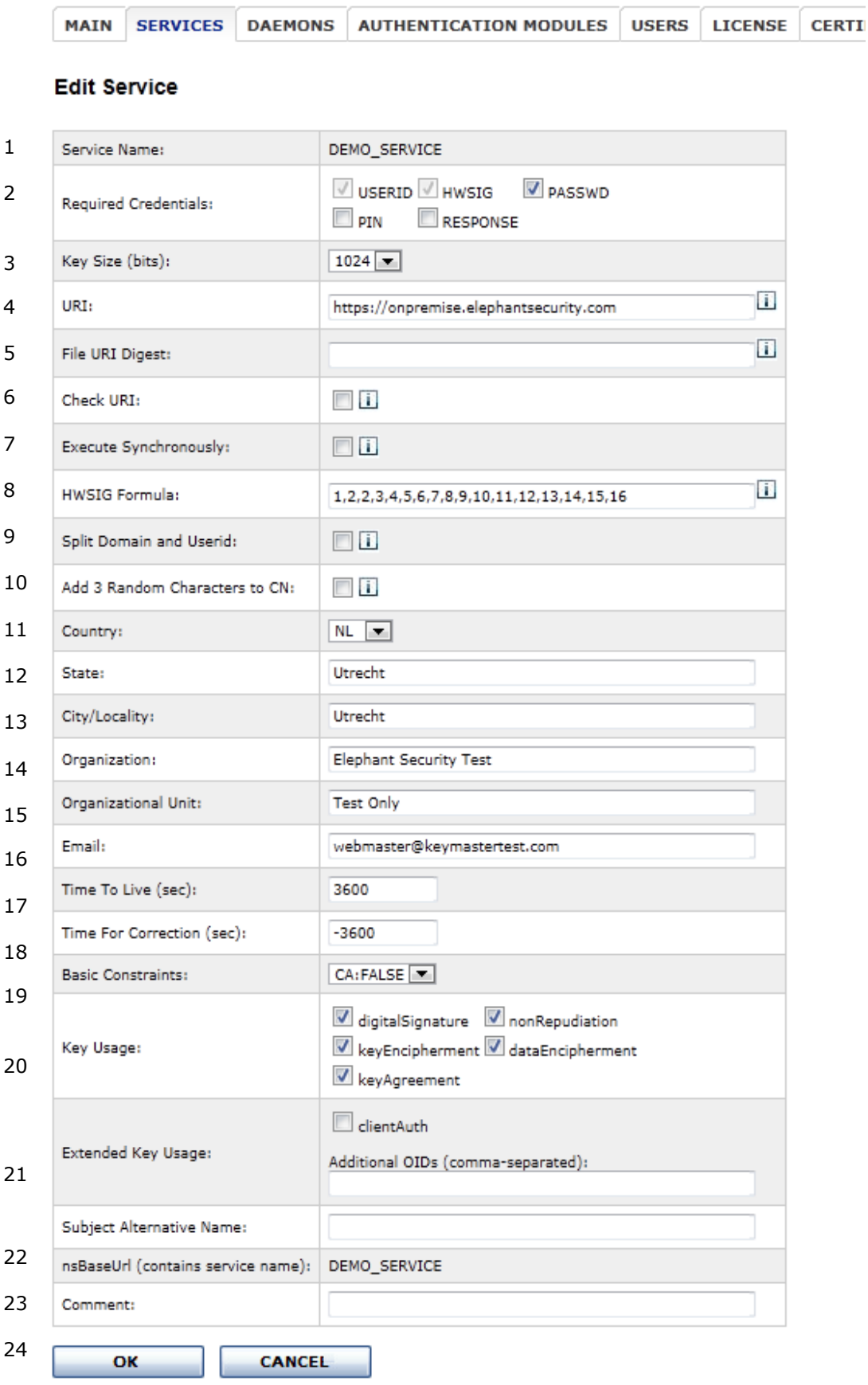


Figure 50: Edit a service

1	Service Name	The name assigned to the Service.
2	Required Credentials	Select what authentication process and credentials are required. UserID and HwSig (Hardware signature) are always on and will be sent from the client to the server; PASSWD (password), PIN, and (Challenge)RESPONSE are all optional.
3	Key Size (bits)	Use the dropdown list to select the preferred RSA key length: 512, 1024, 2048 or 4096 bits. Note that the key size should not exceed the chosen key length of the CAD daemon signing certificate. If in doubt about the correct key size, consult your KeyTalk supplier or partner.
4	URI	This is the URI pushed from the KeyTalk appliance to the KeyTalk Client using the specific service. Leave empty when nothing needs to be invoked. When using a URL it can be used to trigger the KeyTalk client when an appropriately supported browser goes to the specific base URL. For example: https://webdemo.reseptdemo.com. Alternatively when the KeyTalk client has obtained the certificate, the client will start the specified URI. Instead of a URL the URI can also contain a reference to a local file or program. For example file://yourfilelocation/yourfilename. ***Note:*** *environment variables are respected.* Starting a program filename can also be done using parameters. Note that " " must be used when spaces are included in a path or using space separated parameters. ***Note:*** *Be careful not to use http:// addresses as these are not secure.*
5	File URI Digest	Optional field containing the SHA-256 of "file://" URI
6	Check URI	Tick to force a verification of the URI. When a URL is used, the IP needs to match both server and client side. When an executable is started the SHA-256 will be calculated and verified. For all the other URI schemes, including empty URI, no verification is performed.
7	Execute Synchronously	When the URI is an executable, this option allows you to set the client to run synchronously (KeyTalk client will run until executable finishes) when selected or a-synchronously when not selected.

8	HwSIG Formula	The HwSig formula results in a hash calculated over the chosen components. This hash is optionally used provided the feature is activated in the "Required Credentials" of the Service. The formula is comma separated and can contain the HwSig component number references in any order and as often as you like. Do note that order and repetition of component numbers matter. For example: 0,1,2,3,4,5 or 0,0,0,6,7,3,3,8,9,14,11 For more information on the HwSig, please refer to Section 18.2 'Hardware Signature'.
9	Split Domain and Userid	Indicates whether an authentication module should split a fully-qualified userid supplied as domain\userid on two separate credentials. Currently only LDAP authentication module supports domain credentials.
10	Add 3 Random Characters to CN	When selected three random characters are added to the Common Name of the generated user certificate. This option is only needed for backward compatibility.
11	Country	The default value of the country code (ISO 3166 standard) as it should occur in the user certificate.
12	State	The default value of the state, county or province as it should occur in the user certificate.
13	City/Locality	The default value of the city/locality as it should occur in the user certificate.
14	Organization	The default value of the organization as it should occur in the user certificate.
15	Organizational Unit	The default value of the organizational unit as it should occur in the user certificate.
16	Email	The default value email address of the organization as it occurs in the user certificate.
17	Time To Live (sec)	The default amount of time, expressed in seconds, that a certificate is valid from the time it was issued.
18	Time For Correction (sec)	The default time correction factor, expressed in seconds, to correct problems when the Client system time is slightly off.
19	Basic Constraints	CA:FALSE = The generated certificate is a user certificate. CA:TRUE = The generated certificate is a CA certificate and is allowed to issue certificates (for advanced use only).
20	Key Usage	digitalSignature = *Allows for digital signing* nonrepudiation = *Qualifies a digital signature for non-repudiation* keyEncipherment = *Allows for encryption of keys* dataEncipherment = *Allows for encryption of data* keyAgreement = *Allows for SSL/key handshaking*
21	Extended Key	Used for 802.1x EAP/TLS user certificate based authentication.

	Usage	Additional OIDs (comma-separated): Refer to http://www.openssl.org/docs/apps/x509v3_config.html#Extended_Key_Usage for more information.
22	Subject Alternative Name	The default value of the alternative subject name. For more values refer to: http://www.openssl.org/docs/apps/x509v3_config.html#Subject_Alternative_Name for more information.
23	nsBaseURL (contains service name)	Optional Netscape Base URL extension (see MSDN topic: http://msdn.microsoft.com/en-us/library/aa378149%28v=vs.85%29.aspx for more information.
24	Comment	Free text allowing for comments for Admin support purposes. This field will not be added to the certificate.

Note: *Key Usage fields should only be manipulated when you are familiar with their exact functionality and the impact they might have on application/server functionality.*
For more information refer to RSA-Labs (http://www.rsa.com/rsalabs/) and RFC 5280 (http://tools.ietf.org/html/rfc5280).

Note: *If not familiar with the exact functionality, it is advised to use the KeyTalk default values for the certificate attributes.*

18.2. Hardware Signature

KeyTalk can optionally determine the state of hardware of a user's device, by calculating a hash over several components of the user's computer hardware.

The components can be chosen from the list below, and are applied in the HwSig formula as described in section 18.1 'Creating/modifying a service'.

The following component IDs are supported:

0 Predefined value.
1 Primary HDD Serial. On Windows primary HDD is defined by minimal i for which \\.\PhysicalDrive<i> or \\.\Scsi<i> is accessible.
2 Primary NIC MAC-address. On Windows primary NIC is the NIC listed first in the "Network Connections" folder-> Advanced menu -> Advanced settings list.
3 HDDs Device Instance IDs. Only HDDS attached to IDE and SCSI are considered to avoid pluggable disks e.g. USB, PCI. Note SATA and eSATA, or PCMCIA will be used when available.
4 NICs Device Instance IDs. Only NICs attached to PCI are considered to avoid pluggable NICs e.g. USB.

5 IDE ATA/ATAPI controllers Device Instance IDs, excluding hot-pluggable one's like e.g. PCMCIA.
6 USB Root Hubs Device Instance IDs.
7 Display Adapters Device Instance IDs.
8 Amount of physical memory.
9 CPUs device instance IDs.
10 Interrupt controller device instance ID.
11 System timer device instance ID.
12 DMA controller device instance ID.
13 System speaker device instance ID.
14 OS Product ID.
15 OS registered owner.
16 User Security Identifier.

Some components may or may not be preferred for your setup. Choose those you need or can use. Especially in environments where users for example change local access rights, or make use of dongles, you may or may not want to enforce one or more of the above mentioned components.

In some environments it is desirable to prohibit the user to insert anything in the USB socket as this will change the HW signature of that component.

19. Authentication modules

One or more authentication solutions can be connected to the KeyTalk appliance.

As a result you can use your existing infrastructure, without adding a new database.

Of course for testing purposes, or when you only have a small community, an onboard username/password database is available as well.

For example, companies with multiple branches, that manage their own authentication solution(s), such as RADIUS or LDAP/AD, can make use of a centrally available KeyTalk to turn their heterogeneous authentication environment into a funneled homogeneous authentication environment.
As a result each company may have their own preferred authentication type, but the network only needs to be configured for one X.509 certificate based solution, making the administration consistent and efficient.

By default KeyTalk has 3 authentication modules onboard. Each module can be used multiple times using its own specific configuration:

- Internal Sqlite based database
- LDAP/AD module
- RADIUS

Companies who wish to bind another type of authentication solution to KeyTalk can make use of an API, allowing an easy integration of solutions such as an Oracle Database.

19.1. Internal Sqlite database module

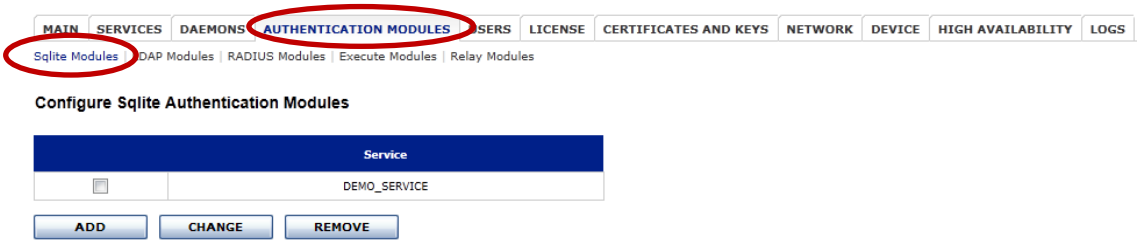


Figure 51: Configuring the Sqlite authentication modules

The Sqlite Modules section allows you to bind a service to a pre-configured internal database running on the KeyTalk appliance.

Typically this module is used for testing purposes or small user communities.

Though more user entries are possible, the maximum amount of users in the Sqlite should not exceed 100, if only to reduce administrative efforts.

By default the KeyTalk appliance will have the "DEMO_SERVICE" service enabled for testing purposes. The DEMO KeyTalk client comes pre-configured with this service and the default username "DemoUser". **This database should be removed prior to taking the KeyTalk appliance into production.**

19.1.1. Adding a Sqlite Module to a service

To add a Sqlite Module to a service, make certain the service exists (i.e. create it) and is not bound to another module.

Choose "ADD" and select one of the available services:

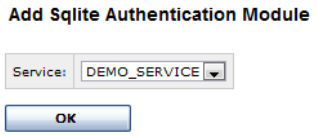


Figure 52: adding Sqlite Authentication Module

19.1.2. Changing Sqlite Module settings for a service

Go to tab "AUTHENTICATION MODULES", select "Sqlite modules", select the service you would like to change and click on "CHANGE".

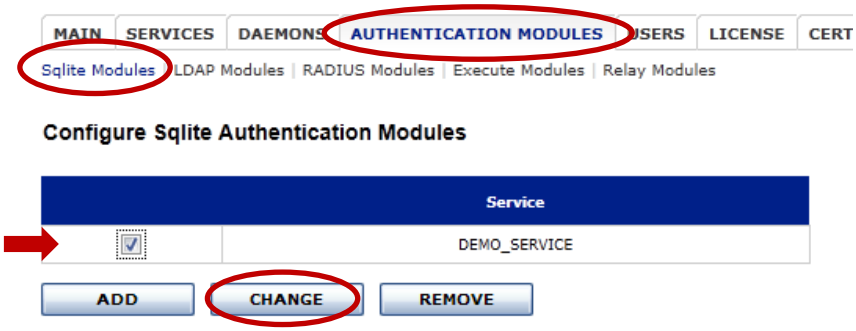


Figure 53: Configuring an Sqlite Authentication module

19.1.2.1. HwSig Verification settings

HwSig (see section 18.2 'Hardware Signature') verification settings allow for the optional configuration of HwSig verification for the specified service.

Go to tab "AUTHENTICATION MODULES", select "Sqlite modules", select the service you would like to set the authentication to and click on "CHANGE".

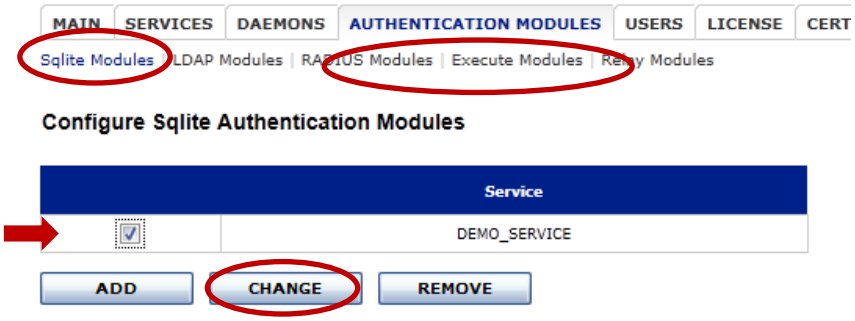


Figure 54: Configuring an Sqlite Authentication module

The following screen will open:

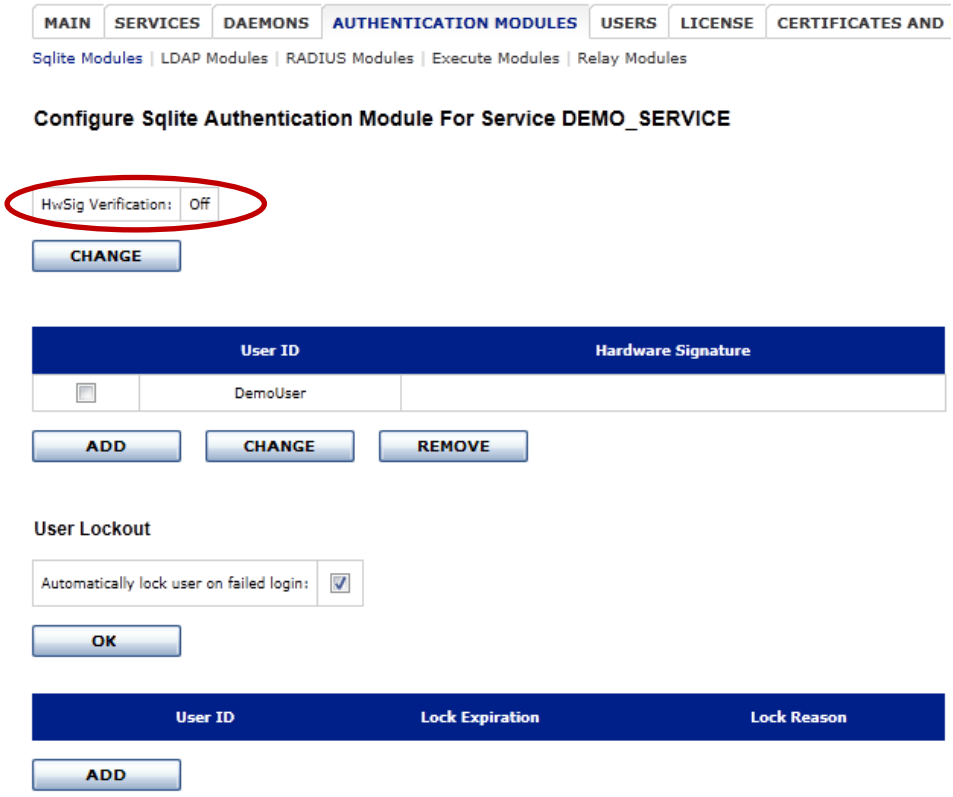


Figure 55: Configuring Sqlite Authentication module for a specific service

By default the HwSig verification is set to 'Off'.

Two other options are available for the HwSig verification:

- DevId: Obtain the user's HwId from the DevId product solution.
- Exit: Obtain the user's HwId using the settings of the authentication module.

For the option ‘Exit’, in the case of Sqlite Module, the HwSig is obtained from the user’s Hardware Signature field.

When the ‘DevId’ option has been chosen, make sure that the DevId Host & Port are properly set.

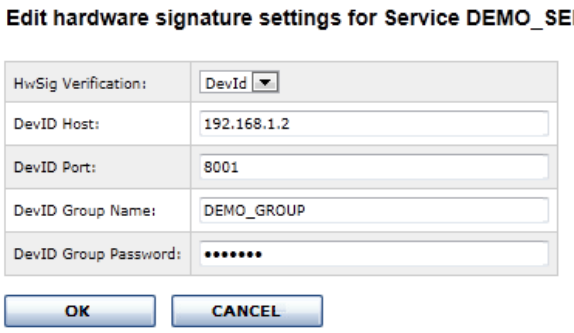


Figure 56: Hardware signature set to 'DevId'

NOTE:

The HwSig verification will FAIL, thus the user is not issued a certificate when:

- *The selected SERVICE is **NOT** configured to send the HwSig, and the module’s HwSig Verification is set to either Exit, or DevID.*

19.1.2.2. Add/Change/Remove user

A user can be added, changed or removed:

- Add
  Click on “ADD”.
- Modify
  Select the appropriate user and click on “CHANGE”.
- Delete
  Select the appropriate user(s) and click on “REMOVE”.

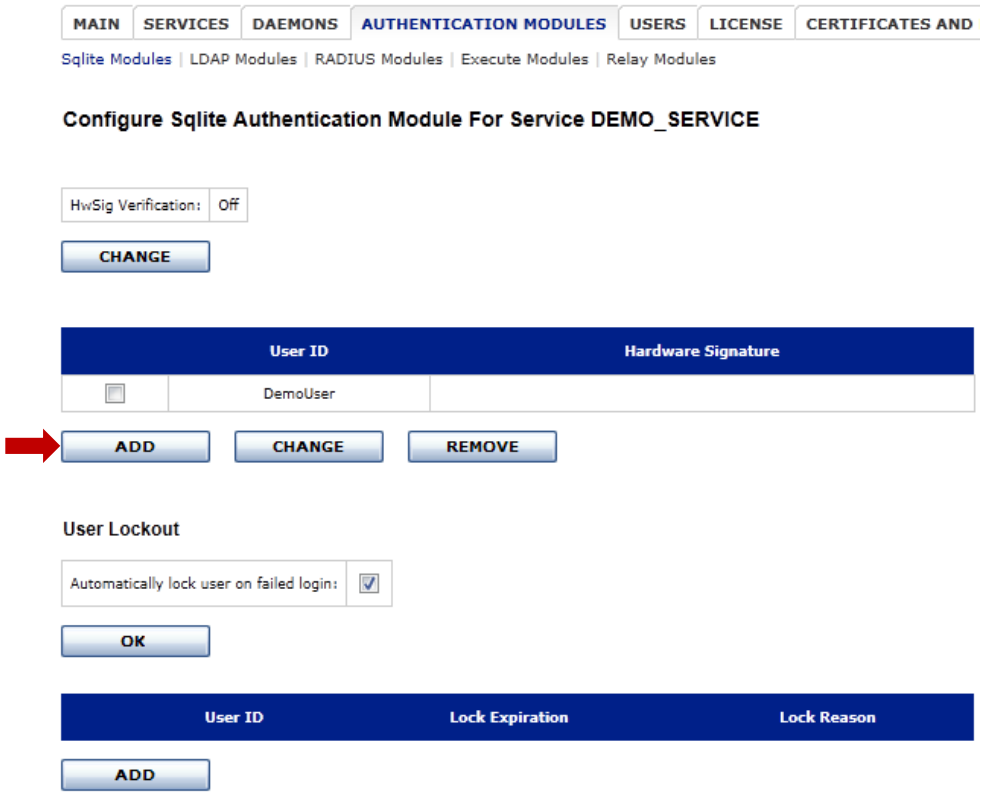


Figure 57: Adding/Changing/Removing a user

Adding or changing a user, allows for entering the basic details of a user:

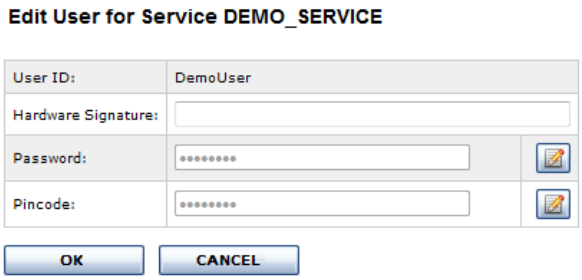


Figure 58: Edit user for a specific user

Setting/changing the optional password of a user, requires the selecting of the password "paper-pen"-icon:

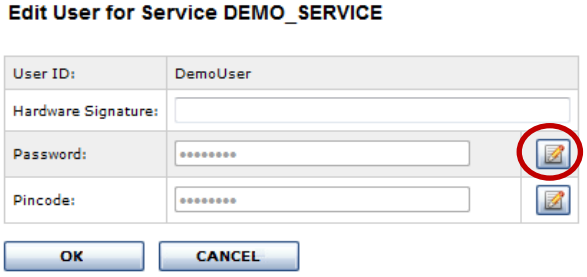


Figure 59: Setting/Changing a password for a user

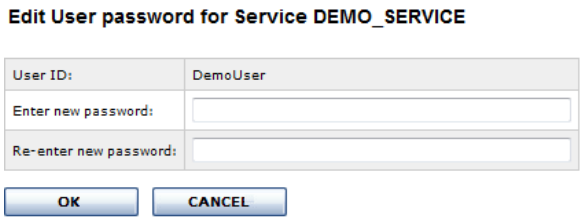


Figure 60: Edit user password

Setting/changing the optional Pincode of a user, requires the selecting of the Pincode "paper-pen"-icon:

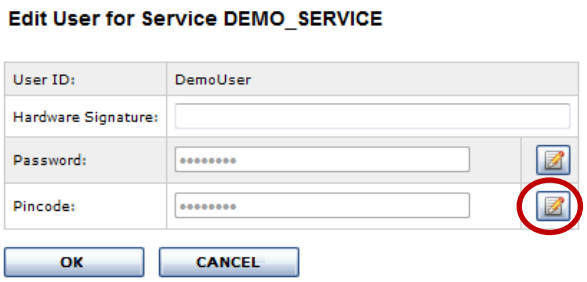


Figure 61: Setting/Changing the pincode for a user

Figure 62: Edit user pincode

19.1.2.3. LockOut

The User LockOut mechanism, allows for users to be locked-out from the system when they enter the wrong authentication credentials.

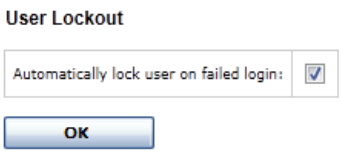


Figure 63: enable/disable user lockout

Automatic lockout can be selected or not. Click "OK" to save the settings.

When Automatic lockout is selected, the KeyTalk appliance will add, lock and release users automatically, based on an incremental time penalty.
The Admin can always manually release users before the time penalty expires, AND can manually add or remove users to the LockOut table.

When Automatic lockout is not selected, the system runs in a manual mode, allowing the Admin to add any usernames for a permanent lock, which can only be manually released.

Adding Users manually is done using the user ID. No actual check is performed by the system to see if the User actually exists in the database used by the services' authentication module.

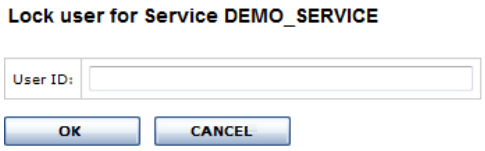


Figure 64: Manually adding a user to be locked out for a specific service

19.2. LDAP Module (Includes AD)

The LDAP module allows for Active Directories (AD) and LDAP's alike, to be easily connected to KeyTalk.

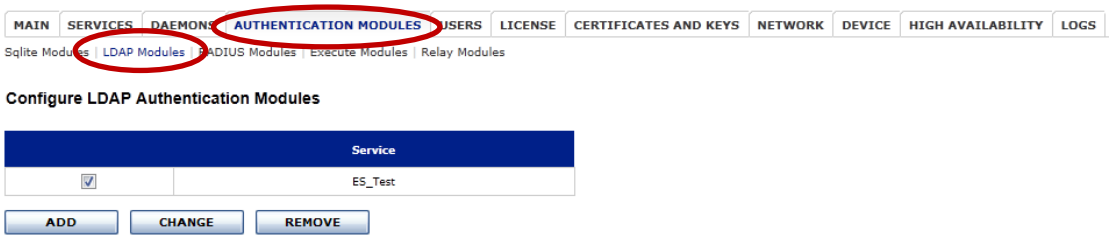


Figure 65: LDAP Authentication Modules

19.2.1. Adding an LDAP Module

Before adding an LDAP authentication module, a new service must be defined. This service may not be connected to another Authentication Module.

Select "ADD" and select the service you wish to connect:

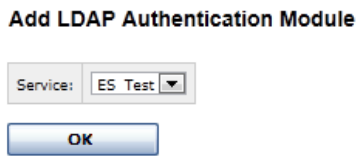


Figure 66: adding an LDAP Authentication Module

Click "OK" to save.

19.2.2. Changing an LDAP Module configuration

To change an LDAP Module configuration of a service, select the appropriate service from the LDAP Configuration Module list, and select “CHANGE”.

This brings up a large overview menu with several different LDAP Module configuration options:

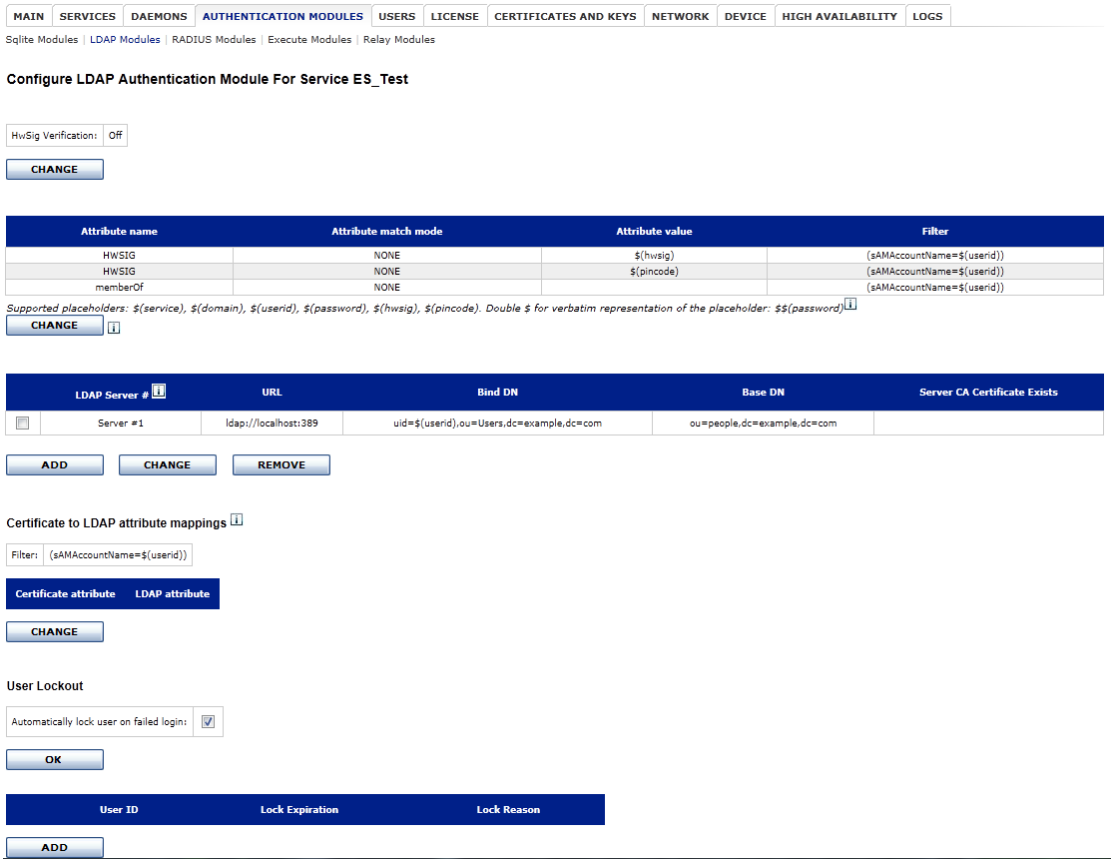


Figure 67: Configuring LDAP Authentication module for a specific service

19.2.2.1. HwSig Verification settings

HwSig (see section 18.2 'Hardware Signature') verification settings allow for the optional configuration of HwSig verification for the specified service.

By default the HwSig verification is set to 'Off'.

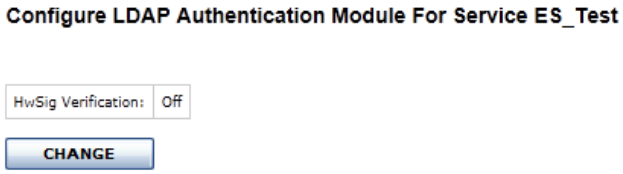


Figure 68: Hardware Signature verification setting

Select "CHANGE" to change the HwSig setting.

Two other options are available for the HwSig verification:

- DevId: Obtain the user's HwId from our DevId product solution.
- Exit: Obtain the user's HwId using the settings of the authentication module.

For the option 'Exit', in the case of Sqlite Module, the HwSig is obtained from the user's Hardware Signature field.

When the 'DevId' option has been chosen, make sure that the DevId Host & Port, as well as Group Name and Group password are properly set.

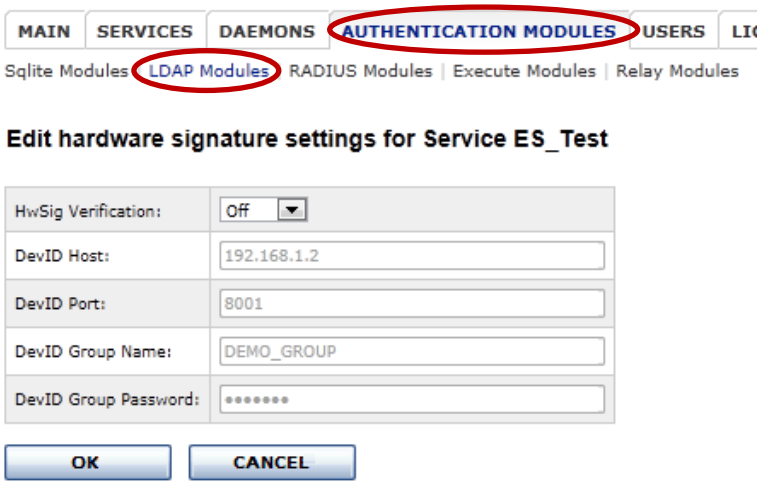


Figure 69: Editing Hardware signature settings for a specific service

NOTE:

The HwSig verification is considered a failed login, thus the user is not issued a certificate when:

- *The selected SERVICE is **NOT** configured to send the HwSig, and the module's HwSig Verification is set to either Exit, or DevID.*

19.2.2.2. LDAP Attribute Match Settings

To configure the LDAP attribute match settings, choose "CHANGE".

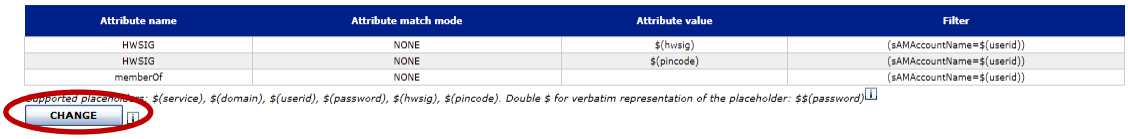


Figure 70: LDAP attribute match settings

The following menu will open:

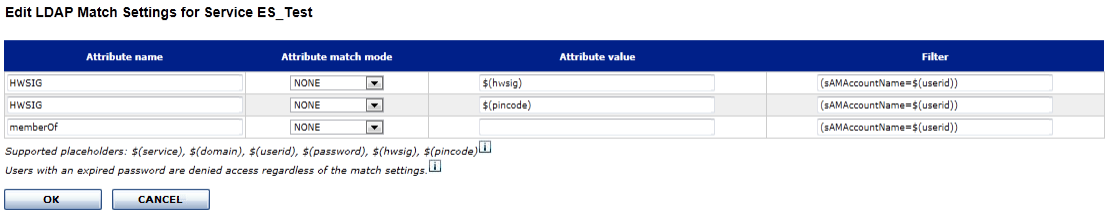


Figure 71: Configuring the LDAP attribute match settings

This overview explains the different fields and values:

	Attribute name	Attribute match mode		Attribute value	Filter
HwSig	The LDAP attribute name used for storing the Hardware Signature of the user. Default value = HWID	none	HwSig will not be checked	The variable for the HwSig attribute. Placeholders can be used for attribute values which will be substituted with the actual credentials provided by the KeyTalk Client. Supported placeholders are: $(service), $(domain), $(user id), $(password), $(hwsig), $(pincode)	Is the LDAP filter used to specify the record against which the criteria are matched? The filter may also contain the following placeholders which will be substituted with the actual credentials provided by the KeyTalk Client: $(service), $(domain), $(userid), $(password), $(hwsig), $(pincode)
		exact	HwSig needs to match exactly		
		nocaseexact	HwSig must match exactly but not case sensitive		
		subst	HwSig must be a substring of the attribute value		
		nocasesubst	HwSig must be a substring of the attribute value but not case sensitive		
Pincode	The LDAP attribute name used for storing the Pincode of the user. Default value = HWID	none	Pincode will not be checked	The variable for the Pincode attribute. Note: Adding a separator symbol after the variable, can be used to support multiple Pincode's per user. For Example: %PinCode	Is the LDAP filter used to specify the record against which the criteria are matched?
		exact	Pincode needs to match exactly		
		nocaseexact	Pincode must match exactly but not case sensitive		
		subst	Pincode must be a substring of the attribute value		
		nocasesubst	Pincode must be a substring of the attribute value but not case sensitive		
Group	The LDAP attribute name used for storing the Group of the user. Default value = memberOf	none	Group will not be checked	The variable for the Group attribute. Note: Adding a separator symbol after the variable can be used to support multiple Groups per user. For example: Admin	Is the LDAP filter used to specify the record against which the criteria are matched?
		exact	Group needs to match exactly		
		nocaseexact	Group must match exactly but not case sensitive		
		subst	Group must be a substring of the attribute value		
		nocasesubst	Group must be a substring of the attribute value but not case sensitive		

19.2.2.3. Configuring LDAP module Bind & LDAPS for a service

One or multiple LDAP servers can be bound to the KeyTalk appliance.
When a time-out occurs on the 1st LDAP, the KeyTalk appliance will try the 2nd etc.

To configure your LDAP module bind for your selected service: tick the LDAP server configuration entry and select "CHANGE", or select "ADD".

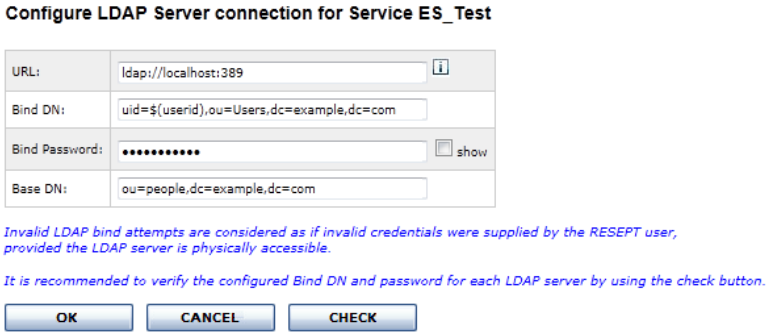


Figure 72: Configuring LDAP Server connection

Fieldname	Description
URL	The LDAP location and appropriate port number (for Global Catalog use port 3268).
Bind DN	The Bind DN. Setting appropriate parameters are described in the next sub-chapter.
Bind Pwd	Either a bind is done using the user's credentials, or when using anonymous a static password can be provided.
Base DN	The Base DN

To make a secure connection possible between your LDAP/AD and KeyTalk, the LDAPS protocol is supported.

Upload the appropriate certificate using the LDAPS CA Certificate interface.

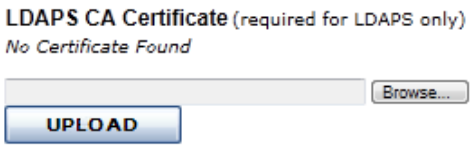


Figure 73: Uploading a LDAPS CA Certificate

NOTE: *The BIND DN is dependent upon the specific LDAP integration. Example: when using userPrincipalName '$(userid)' would suffice.*

19.2.2.4. Certificate to LDAP attribute mappings

The X.509 standard defines several fields in a certificate which must be filled in order to be RFC compliant.
By default these certificate fields are filled with the default values as set in the service. When using the default settings, your users will be provided with X.509 user certificates which are all unique based on the date/time of issuing, the serial number, and of course the username.

However, it might be prudent to have more unique user credentials in the certificate. When this is required, you can map your LDAP attributes to the certificate fields.
To map the LDAP attributes to the certificate fields: Select "CHANGE" under "Certificate to LDAP attribute mappings".

Field name	Description	LDAP attribute value
Filter	Is the LDAP filter used to specify the record against which the criteria are matched?	Any valid value
Country	The value of the country code as it should occur in the user certificate.	ISO 3166 standard value
City/Locality	The value of the city/locality as it should occur in the user certificate	Any value, except blank
Organization	The value of the organization as it should occur in the user certificate.	Any value, except blank
Common Name	The value of the Users name as it should occur in the user certificate.	Any value, except blank
Email	The value of the email address as it should occur in the user certificate.	Any value, except blank
Time To Live	The amount of time that a certificate is valid from the time it was issued.	Any positive value expressed in seconds, except blank. Can be 0
Time for Correction	The default time correction factor, expressed in seconds, to correct problems when the Client system time is slightly off.	Any negative value expressed in seconds, except blank. Can be 0 For example: -1800
Basic Constraints	The generated certificate is a user certificate. The generated certificate is a CA certificate and is allowed to issue certificates.	CA:FALSE CA:TRUE
Key Usage	Certificate Key Usage. Values should be	digitalSignature

	comma separated.	nonRepudiation keyEncipherment dataEncipherment keyAgreement
Extended Key Usage	Certificate Extended Key Usage	Refer to: OpenSSL
Subject Alternative Name	The value of the alternative username.	Refer to: OpenSSL

19.2.2.5. User LockOut

The User LockOut mechanism, allows for users to be locked-out from the system when they enter the wrong authentication credentials.

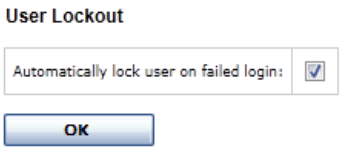


Figure 74: enable/disable user lockout

Automatic lockout can be selected or not. Click "OK" to save the settings.

When Automatic lockout is selected, the KeyTalk appliance will add, lock and release users automatically, based on an incremental time penalty.
The Admin can always manually release users before the time penalty expires, AND can manually add or remove users to the LockOut table.

When Automatic lockout is not selected, the system runs in a manual mode, allowing the Admin to add any usernames for a permanent lock, which can only be manually released.

Adding Users manually is done using a free text. No actual check is performed by the system to see if the User actually exists in the database used by the services' authentication module.

Figure 75: Manually adding a user to be locked out for a specific service

19.3. RADIUS Module

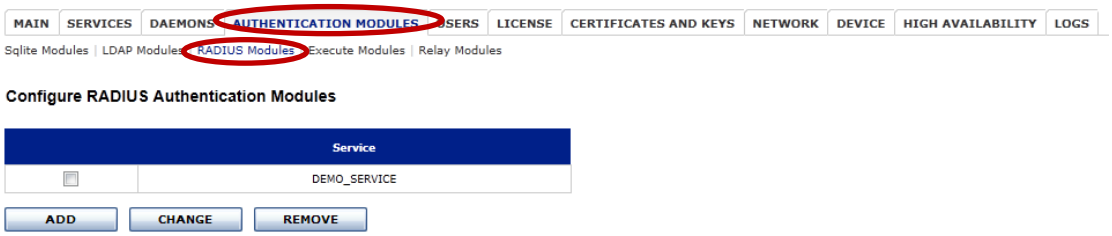


Figure 76: RADIUS Authentication Module

When a RADIUS server is used for authentication purposes, for example when using security tokens, this module can be used to bind the RADIUS based authentication to a KeyTalk service.

19.3.1. Adding a RADIUS Module

To add a RADIUS Module to a service, the service must exist and not be connected to another Authentication Module.

Select "ADD" and select the service you wish to connect:

Figure 77: Adding a RADIUS Authentication Module

19.3.2. Changing a RADIUS Module configuration

To change a RADIUS Module configuration of a service, select the appropriate service from the RADIUS Configuration Module list, and select "CHANGE":

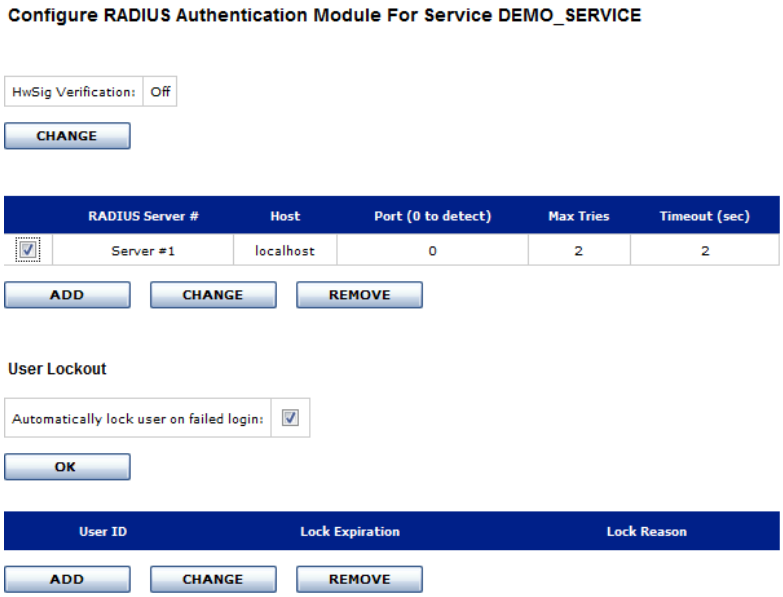


Figure 78: Configuring the RADIUS Authentication Module for a specified service

19.3.2.1. HwSig Verification settings

HwSig (see section 18.2 'Hardware Signature') verification settings allow for the optional configuration of HwSig verification for the specified service.

By default the HwSig verification is set to 'Off'.

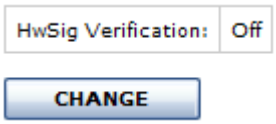


Figure 79: Hardware Signature verification setting

Select "CHANGE" to change the HwSig setting.

Two other options are available for the HwSig verification:

- DevId: Obtain the user's HwId from our DevId product solution.
- Exit: Obtain the user's HwId using the settings of the authentication module.

For the option 'Exit', in the case of Sqlite Module, the HwSig is obtained from the user's Hardware Signature field.

When the 'DevId' option has been chosen, make sure that the DevId Host & Port are properly set.

Figure 80: Editing Hardware signature settings for a specific service

19.3.2.2. RADIUS Server connectivity settings

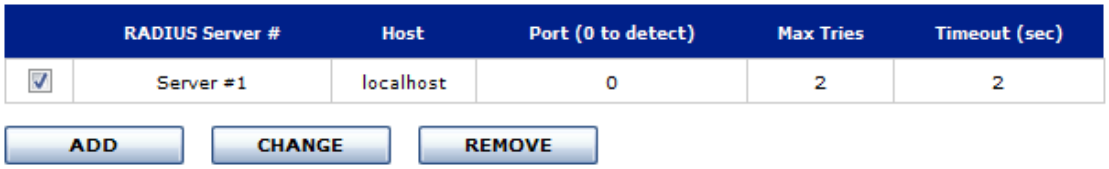


Figure 81: RADIUS server connectivity settings

Multiple RADIUS servers can be configured by selecting the server and clicking on "ADD". When Server #1 times out; the KeyTalk appliance will send its request to the next in line.

To change the RADIUS Server connectivity settings, select the server configuration you wish to change, and click on "CHANGE".

Fieldname	Description	Value
Host	The IP number of the Radius	Any valid IP number
Port (0 to detect)	The communication port number	Any valid port number. Use 0 to have the port number automatically detected
Secret	The Radius shared secret	Any valid Radius shared secret
Max Tries	Amount of connections attempts	Any valid positive amount up to 999999999
Timeout (sec)	Amount of time assumed for a timeout period before retrying	Any valid positive amount expressed in seconds up to 99999999

19.3.2.3. User LockOut

The User LockOut mechanism, allows for users to be locked-out from the system when they enter the wrong authentication credentials.

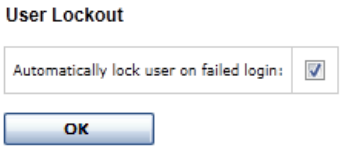


Figure 82: enable/disable user lockout

Automatic lockout can be selected or not. Click "OK" to save the settings.

When Automatic lockout is selected, the KeyTalk appliance will add, lock and release users automatically, based on an incremental time penalty.
The Admin can always manually release users before the time penalty expires, AND can manually add or remove users to the LockOut table.

When Automatic lockout is not selected, the system runs in a manual mode, allowing the Admin to add any usernames for a permanent lock, which can only be manually released.

Adding Users manually is done using a free text. No actual check is performed by the system to see if the User actually exists in the database used by the services' authentication module.

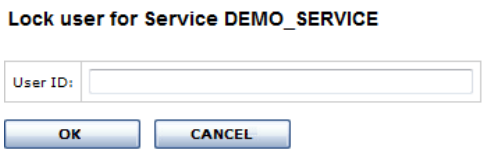


Figure 83: Manually adding a user to be locked out for a specific service

19.4. Execute Modules

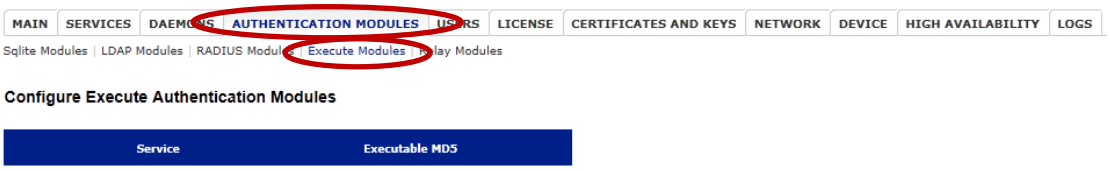


Figure 84: Executable Authentication Modules

Execute Modules are tailor made modules, officially released by KeyTalk BV as NON-STANDARD. These modules are not part of the formal firmware release.

Though it is not the policy to release modules outside of the officially supported firmware releases, this feature allows for it to be made possible when executing beyond policy.

Licensing restrictions may apply. Consult your KeyTalk supplier or partner for more information.

19.5. Relay Modules (connecting other authentication solutions)

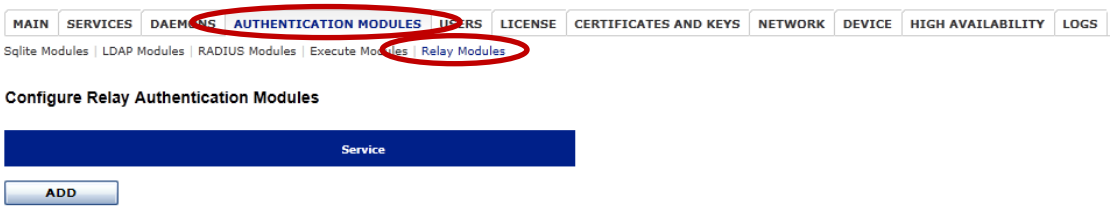


Figure 85: Relay Authentication Modules

Relay Modules, allow you to make use of the REMAP API, to connect to authentication solutions which are not by default supported by KeyTalk. REMAP: KeyTalk Exit Module Authentication Protocol.

Customers and partners of KeyTalk have made available some unsupported API implementations, which can be requested through your KeyTalk supplier or partner.

19.5.1. Adding a Relay Module

To add a Relay Module to a service, the service must already exist and not be connected to another Authentication Module.

Select "ADD" and select the service you wish to connect:

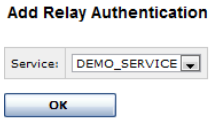


Figure 86: Adding a Relay Authentication Module

19.5.2. Changing the Relay Module service configuration

To change the configuration settings, select the Relay Module service for which you wish to change the configuration, and select "CHANGE".

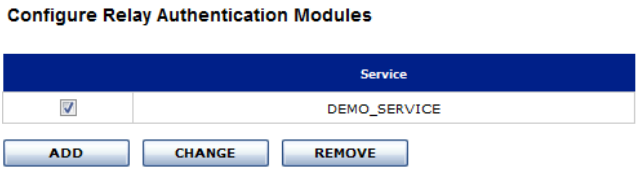


Figure 87: Configuring the Relay Authentication Module for a specified service

You will now see the current configuration, which can be changed by selecting "CHANGE".

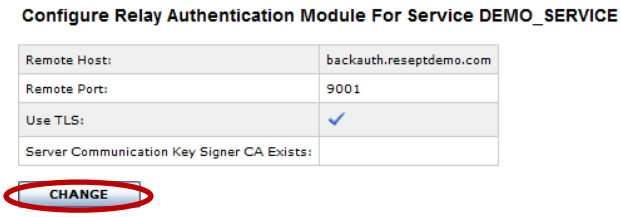


Figure 88: Current configuration

Figure 89: Editing the configuration

Since the Relay module effectively makes use of a host running remote, only a connection needs to be defined for the Remote Host.

Configure the Remote Host and corresponding Port and whether or not TLS should be used to secure the communication.

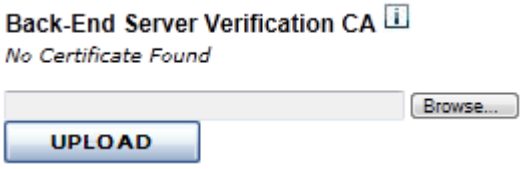


Figure 90: For TLS a server communication key signer CA certificate is needed

Additionally when using SSL/TLS you will need to upload the Server Communication Key Signer CA certificate in PEM format. This does NOT need to be a certificate created under your Certificate Authority tree, but can also be that of a 3rd party, such as VeriSign, or Microsoft.

19.5.3. Remote exit basics

When you wish to create your own authentication module (exit), you should always run it from a separate server.

The details of what needs to be configured are covered in a separate Remote Exit document which is available through your KeyTalk supplier or partner.

19.6. Synchronize User Lockout List

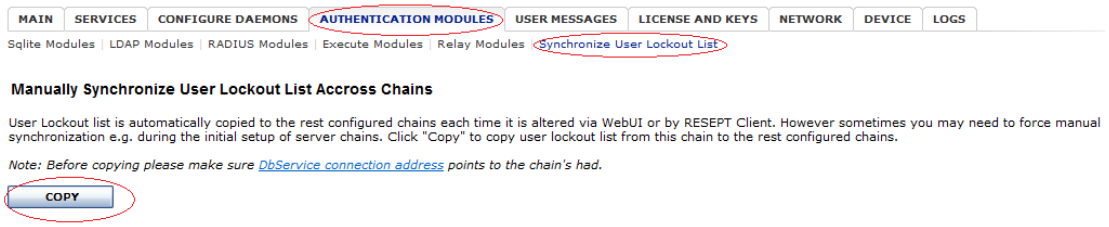


Figure 91: Synchronize user lockout list

This functionality is only applicable when running KeyTalk in a high availability configuration.

This feature allows you to manually initialize a synchronization of all your User Lockout Lists from all your Authentication Modules for all services on the KeyTalk appliance.

HA will automatically synchronize, but the manual feature is meant for synchronization after adding a new system to your High Availability setup.

20. User messages Logged-in users

20.1. User messages

User messages allow the Organization's administrator to send a custom message to the user when their KeyTalk client starts.

A common usage would be to inform users of network downtime announcements for example.

To create a user message, select "USERS" from the main menu and click on "ADD".

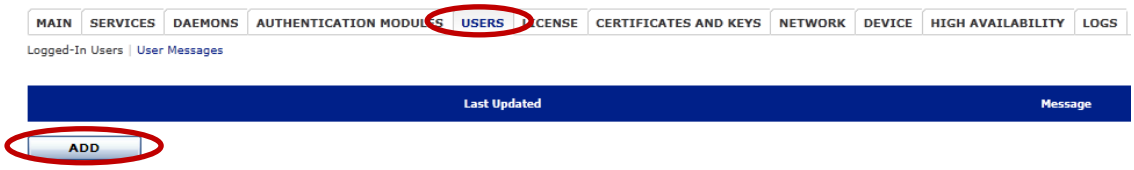


Figure 92: Adding a user message

Type the message that needs to be sent to all users with a KeyTalk Client and click "OK" to make the message available to your user community.

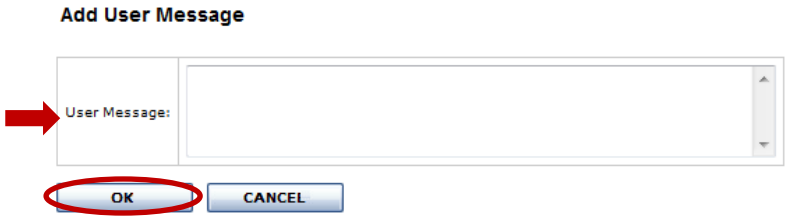


Figure 93: Adding user message and making it available to the KeyTalk Client users

An existing user message can be changed or removed by selecting the user message and clicking on "CHANGE" or "REMOVE".

Figure 94: Changing or removing a user message

20.2. Logged-in Users

You can check if your license is still valid. Additionally, your license to serve a number of users can also be checked per service on the "MAIN" tab of KeyTalk.

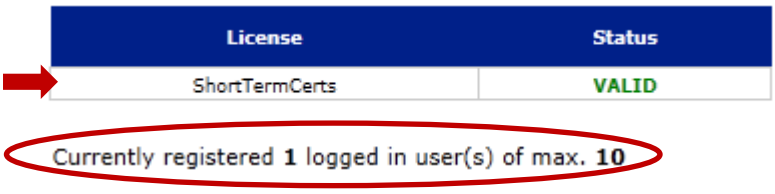


Figure 95: License validity and number of users logged in

It is possible that some users have left your company, but are still counted as 'logged in users'. To correct the user-counter field the "RESET" button on the "USERS" tab can be clicked, deleting the 10% of users that did not log in recently (oldest first).

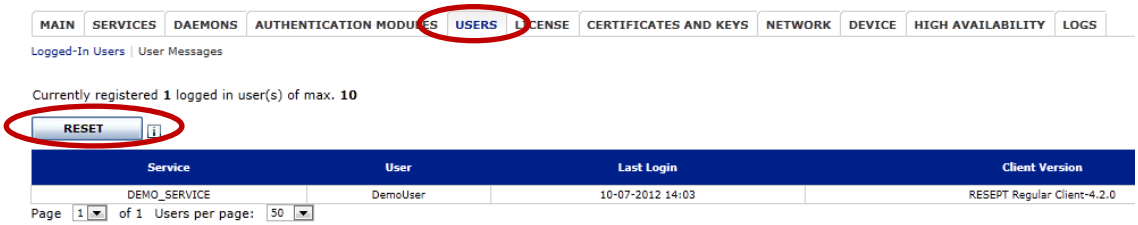


Figure 96: Resetting the oldest 10% of counted users

Deleting this 10% of oldest counted users can also be done via the LCD menu. See section 24 'LCD information display' for more information.

21. KeyTalk Appliance License

The KeyTalk Appliance License file contains the general terms & conditions text in a text file format. Your contract details override or amend these T&C. It is personalized to your company and contains all the information required to make the appliance work.

Your license details can be viewed under the "License" tab.

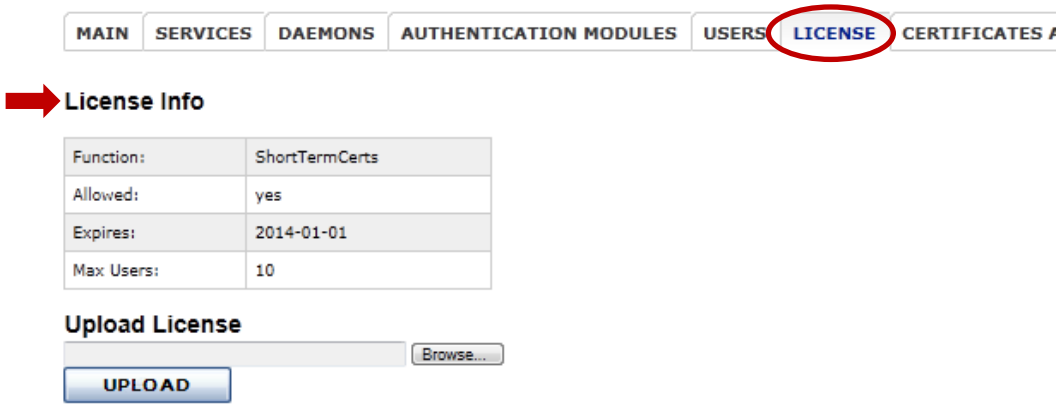


Figure 97: View license info or upload a new license

A new license can be uploaded by selecting the license via "Browse…" and clicking "UPLOAD".

The text file is signed by KeyTalk, ensuring that any tampered text files cannot be uploaded as a valid license. The maximum amount of users refers to the maximum amount of unique usernames used to obtain a certificate in a given timeframe.

22. Certificates and keys

On the "CERTIFICATE AND KEYS" tab the Certificate Authority Keys for the KeyTalk appliance can be managed.

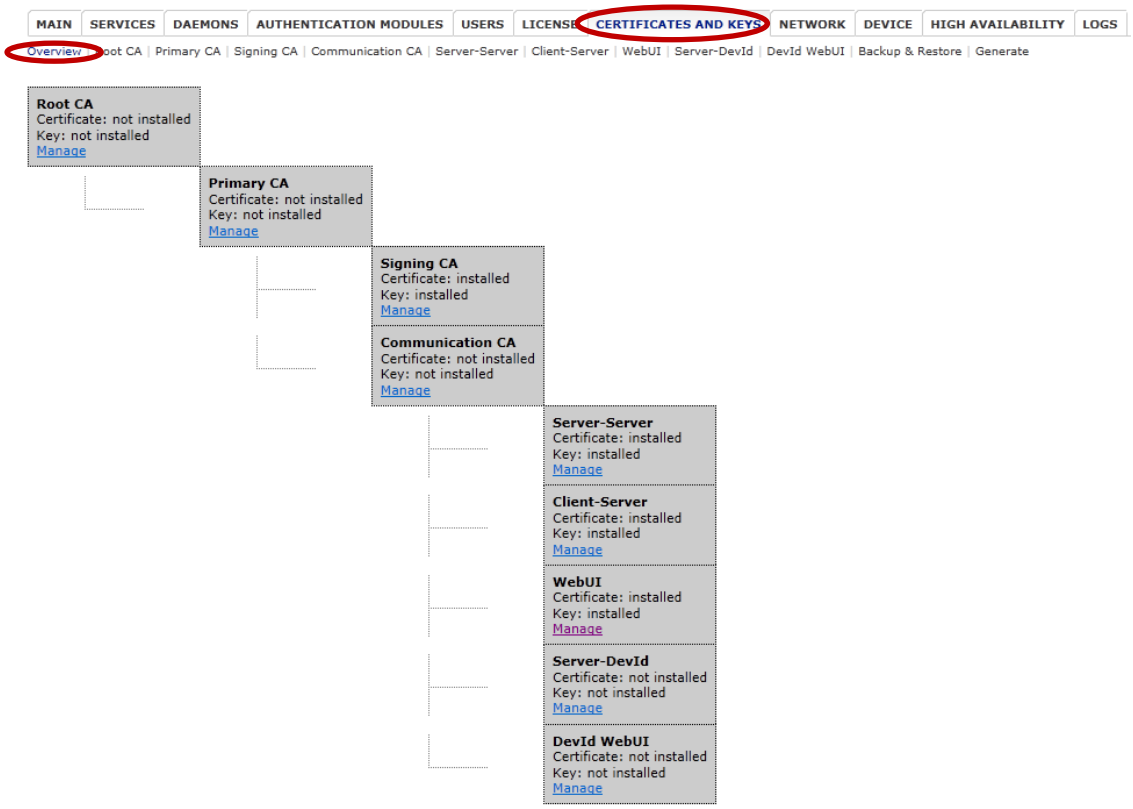


Figure 98: Overview of the KeyTalk Certificate Authority Keys

By default your KeyTalk appliance comes pre-configured with test key and certificate material. This material is NOT unique, but provided with every system. It is therefore necessary to be replaced by your own material when going into production.

KeyTalk requires the certificates to be imported or generated in PEM file format and requires that they contain the .pem file extension.

Please note that the KeyTalk solution does not mandatorily require you to take into account any specific protocols and procedures as to the security level of key-creation, key management, etc. Instead it is your company who decides what is and what is not acceptable.

22.1. Root CA

The Root CA is an optional public certificate. It is only applicable when your company already has an existing certificate authority in place.

When installed it may serve as a root for the certificate tree generated on the appliance.

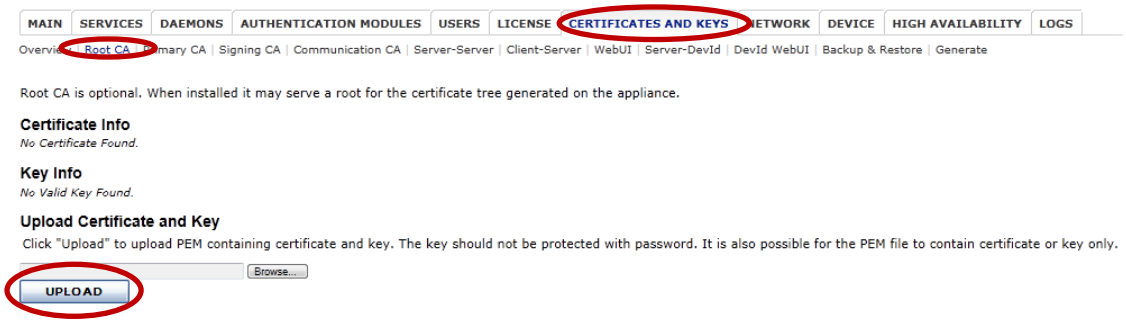


Figure 99: Root CA information and key upload functionality

A new certificate can be uploaded by selecting it via "Browse…" and clicking "UPLOAD".

After a successful UPLOAD the device management subsystem will automatically restart to effectuate the new certificate.

To make the changes permanent, please refer to section 8.2 'Saving changes & reboot'.

22.2. Primary CA

The Primary CA is a private key and is normally a root of the certificate tree unless the Root CA is installed and is an issuer for the Primary CA.

After generation this key is kept offline and is usually stored on a portable media in your safe. Depending on your security requirements it can be distributed in parts, for safe keeping, among several custodians.

This file also contains the Primary CA Certificate in PEM format.

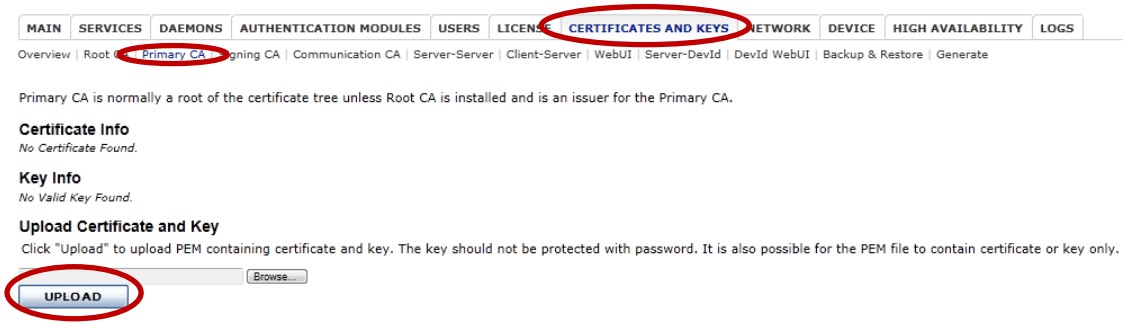


Figure 100: Primary CA information and key upload functionality

A new certificate can be uploaded by selecting it via "Browse…" and clicking "UPLOAD".

After a successful UPLOAD the device management subsystem will automatically restart to effectuate the new certificate.

To make the changes permanent, please refer to section 8.2 ‘Saving changes & reboot’.

22.3. Signing CA

This tab allows you to upload your own signing certificate and key, used to issue user certificates and keys. When you have a separate key and certificate you can upload these individually and KeyTalk will combine them for you.

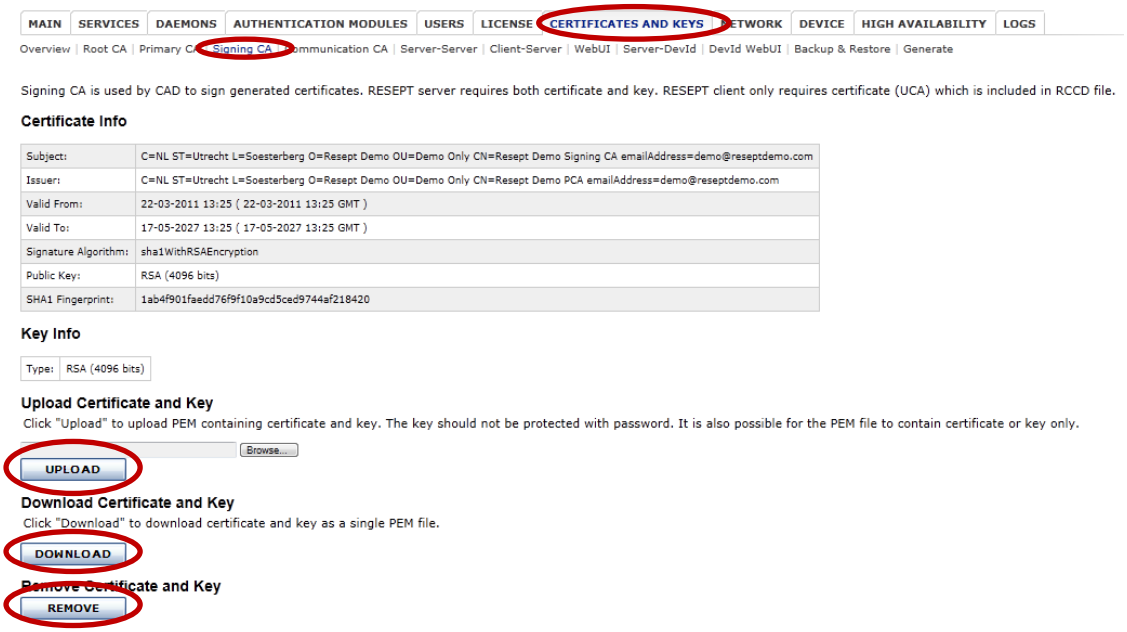


Figure 101: Signing CA information and key upload functionality

This screen allows you to download and remove the current certificate and key, and upload a new version.

A new certificate can be uploaded by selecting it via “Browse…” and clicking “UPLOAD”.

After a successful UPLOAD the device management subsystem will automatically restart to effectuate the new certificate.

To make the changes permanent, please refer to section 8.2 ‘Saving changes & reboot’.

22.4. Communication CA

This tab is used to secure communications between different parts of the system. The Communication CA corresponds to the SCA (Server CA) on the client-side.

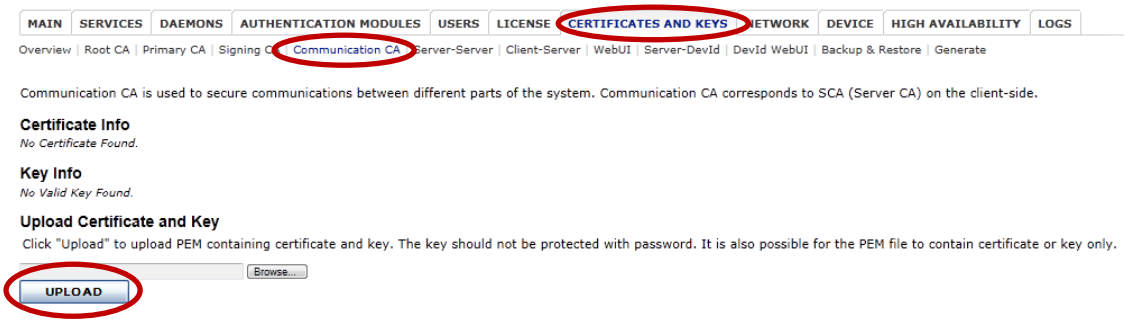


Figure 102: Communication CA information and key upload functionality

A new certificate can be uploaded by selecting it via "Browse…" and clicking "UPLOAD".

After a successful UPLOAD the device management subsystem will automatically restart to effectuate the new certificate.

To make the changes permanent, please refer to section 8.2 'Saving changes & reboot'.

22.5. Server-Server Communication Key

This tab allows you to view the information of the Server-Server Communication Key and certificate.

This certificate and key is required to encrypt the information exchange between KeyTalk servers in High Availability mode; and to encrypt the information exchange between KeyTalk and the DevID additional module.

You can upload the combined certificate and key as a single file or you can upload the key and the certificate as separate files in PEM format. There is no need to rename the files, as KeyTalk will do this for you.

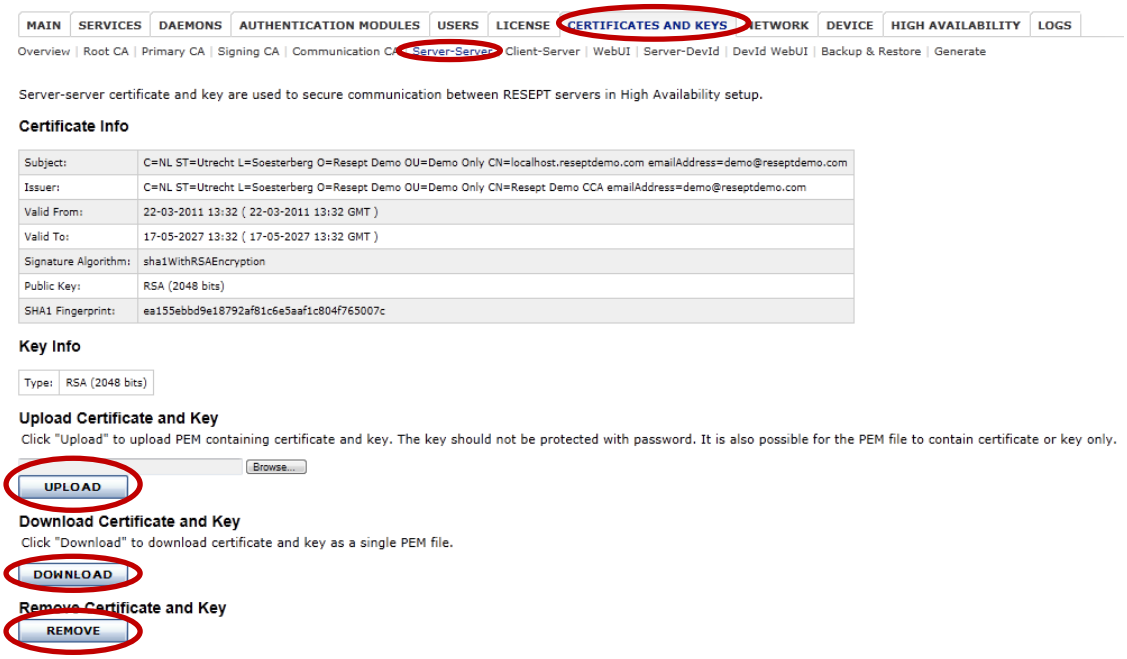


Figure 103: Server-server certificate information and key upload functionality

This screen allows you to download and remove the current certificate and key, and upload a new version.

A new certificate can be uploaded by selecting it via "Browse…" and clicking "UPLOAD".

After a successful UPLOAD the device management subsystem will automatically restart to effectuate the new certificate.

To make the changes permanent, please refer to section 8.2 'Saving changes & reboot'.

22.6. Client-Server Communication Key

This tab allows you to view the information of the KeyTalk Client-Server Key and certificate.

This certificate and key is required to establish a secure connection between the KeyTalk client and the KeyTalk server.

You can upload the combined certificate and key as a single file or you can upload the key and the certificate as separate files in PEM format. There is no need to rename the files, as KeyTalk will do this for you.

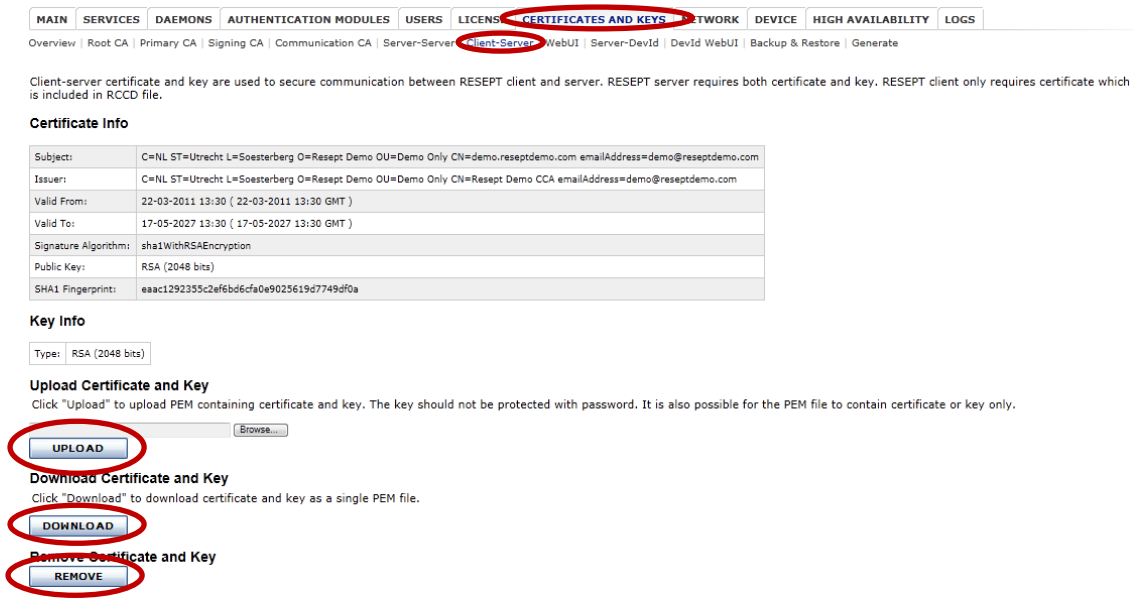


Figure 104: Client-server certificate information and key upload functionality

This screen allows you to download and remove the current certificate and key, and upload a new version.

A new certificate can be uploaded by selecting it via "Browse…" and clicking "UPLOAD".

After a successful UPLOAD the device management subsystem will automatically restart to effectuate the new certificate.

To make the changes permanent, please refer to section 8.2 'Saving changes & reboot'.

22.7. WebUI Certificate & Key

This tab allows you to view the information of the KeyTalk Admin Graphical User Interface.

It is used to secure the communication between the KeyTalk appliance and the computer of the organization's administrator (single SSL). You should choose to purchase this certificate ad key from a 3rd party certificate provider. For more information please refer to section 8.1 'Replacing Admin GUI SSL-certificate'.

A separate WebUI key and certificate are required for each KeyTalk and DevID appliance, since each appliance will run under its own unique FQDN in the network.

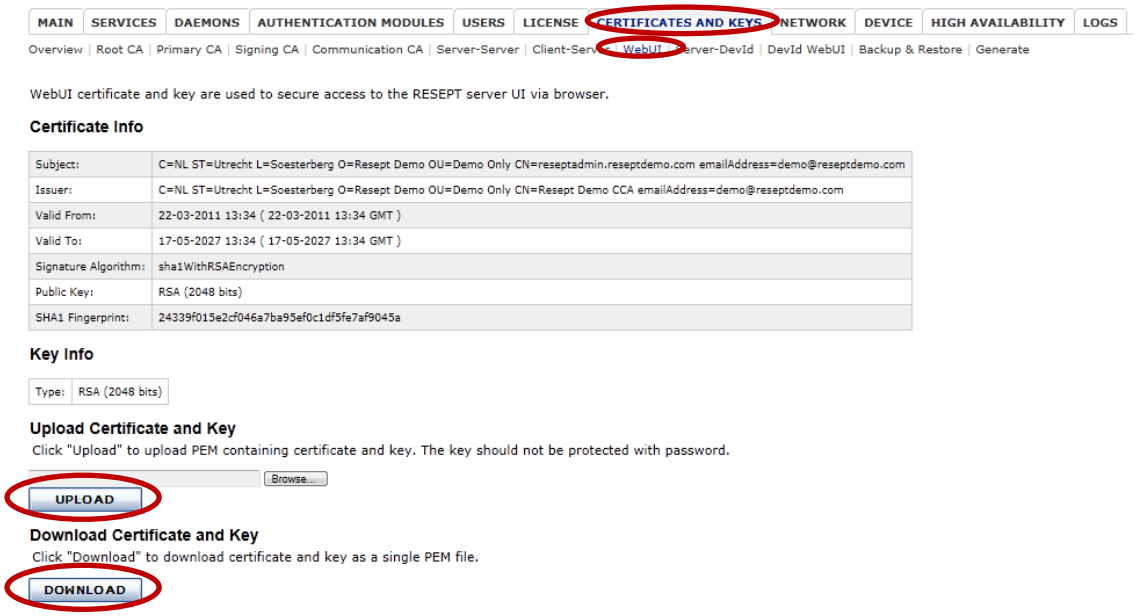


Figure 105: WebUI certificate information and key upload functionality

This screen allows you to download the current certificate and key, and upload a new version.

A new certificate can be uploaded by selecting it via "Browse…" and clicking "UPLOAD".

After a successful UPLOAD the device management subsystem will automatically restart to effectuate the new certificate.

To make the changes permanent, please refer to section 8.2 'Saving changes & reboot'.

22.8. Server-DevID Certificate & Key

The Server-DevID certificate and key is used to secure communication between the KeyTalk Server and the DevID appliance.

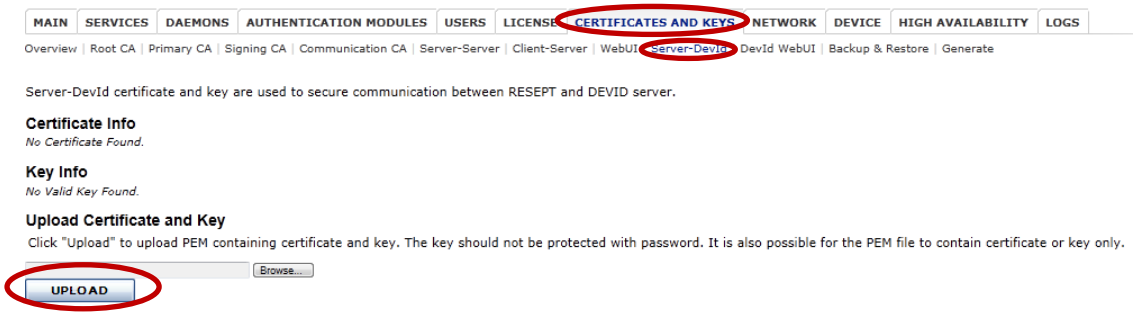


Figure 106: Server-DevID certificate information and key upload functionality

A new certificate can be uploaded by selecting it via "Browse…" and clicking "UPLOAD".

After a successful UPLOAD the device management subsystem will automatically restart to effectuate the new certificate.

To make the changes permanent, please refer to section 8.2 'Saving changes & reboot'.

22.9. DevID WebUI Certificate & Key

The DevID WebUI certificate and key are used to secure access to the DevID server UI via a browser.

A separate DevID WebUI key and certificate are required for each DevID appliance, since each one will run under its own unique FQDN in the network.

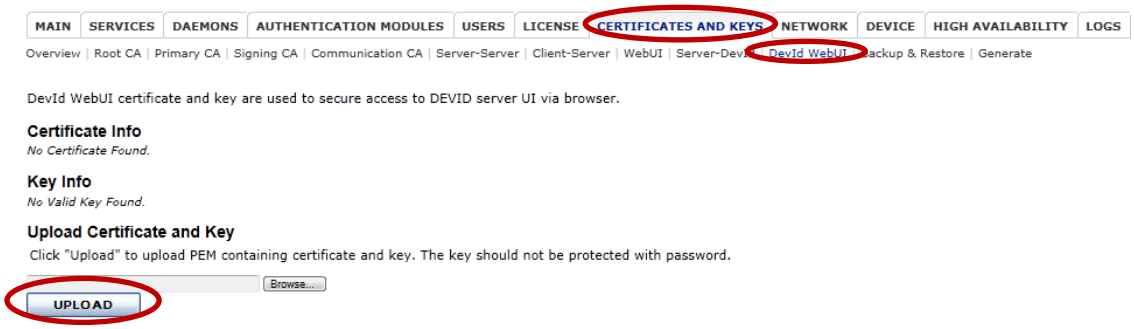


Figure 107: DevID WebUI certificate information and key upload functionality

A new certificate can be uploaded by selecting it via "Browse…" and clicking "UPLOAD".

After a successful UPLOAD the device management subsystem will automatically restart to effectuate the new certificate.

To make the changes permanent, please refer to section 8.2 'Saving changes & reboot'.

22.10. Backup & Restore

This tab allows you to make a full backup of your current certificates and keys, as well as granting the ability to restore your backup, if required.

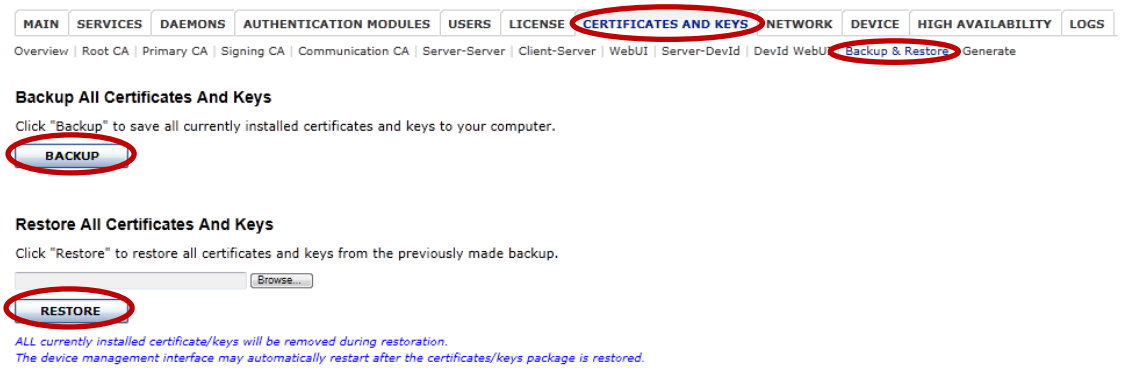


Figure 108: Backup and restore functionality

Click "Backup" to save all currently installed certificates and keys to your computer.

Click "Restore" to restore all certificates and keys from the previously made backup. The KeyTalk appliance will reboot afterwards, to effectuate the changes.

22.11. Generate

This tab allows you to edit specific criteria for the certificates that have been generated on the appliance.

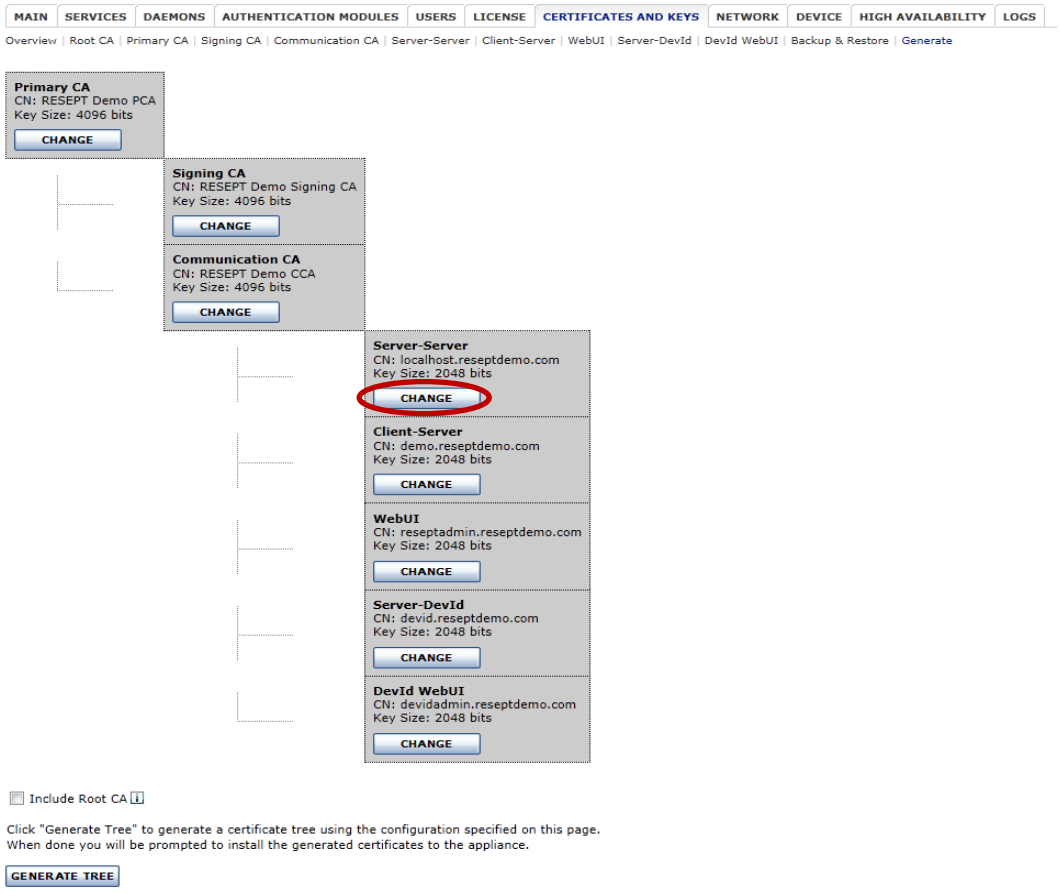


Figure 109: Edit specific criteria for all hosted certificates

Click on 'CHANGE' to edit a specific set of certificate fields. Click 'OK' to accept the alterations.

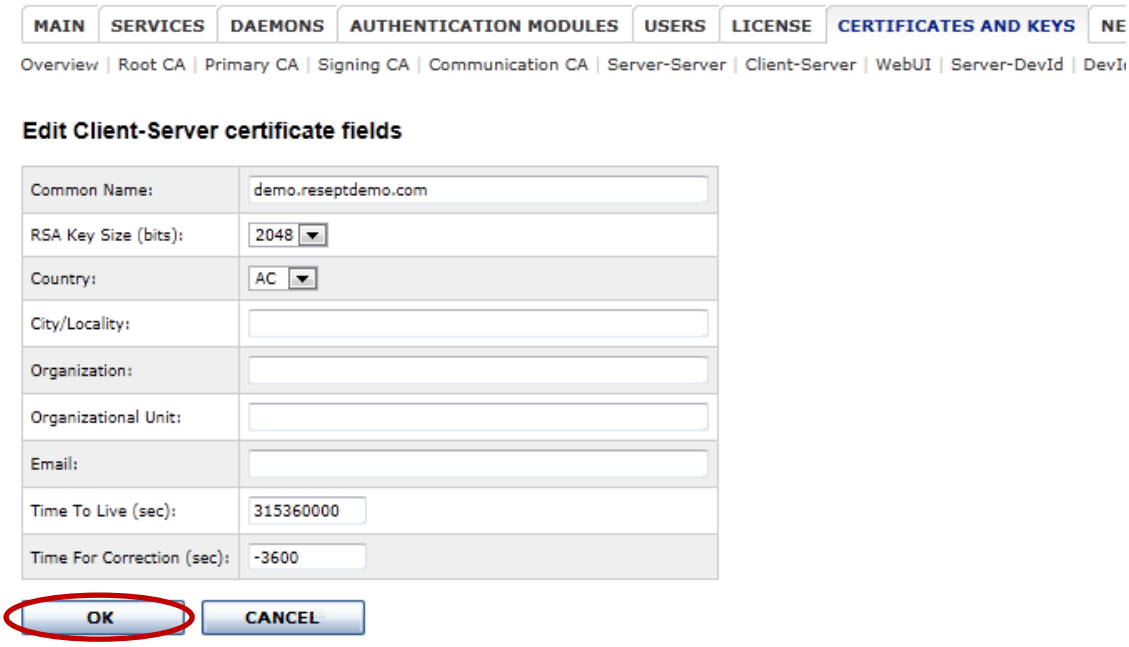


Figure 110: Edit specific Client-Server certificate fields

Once you have finished editing the necessary certificate fields; you are ready to generate the newly configured certificate tree.

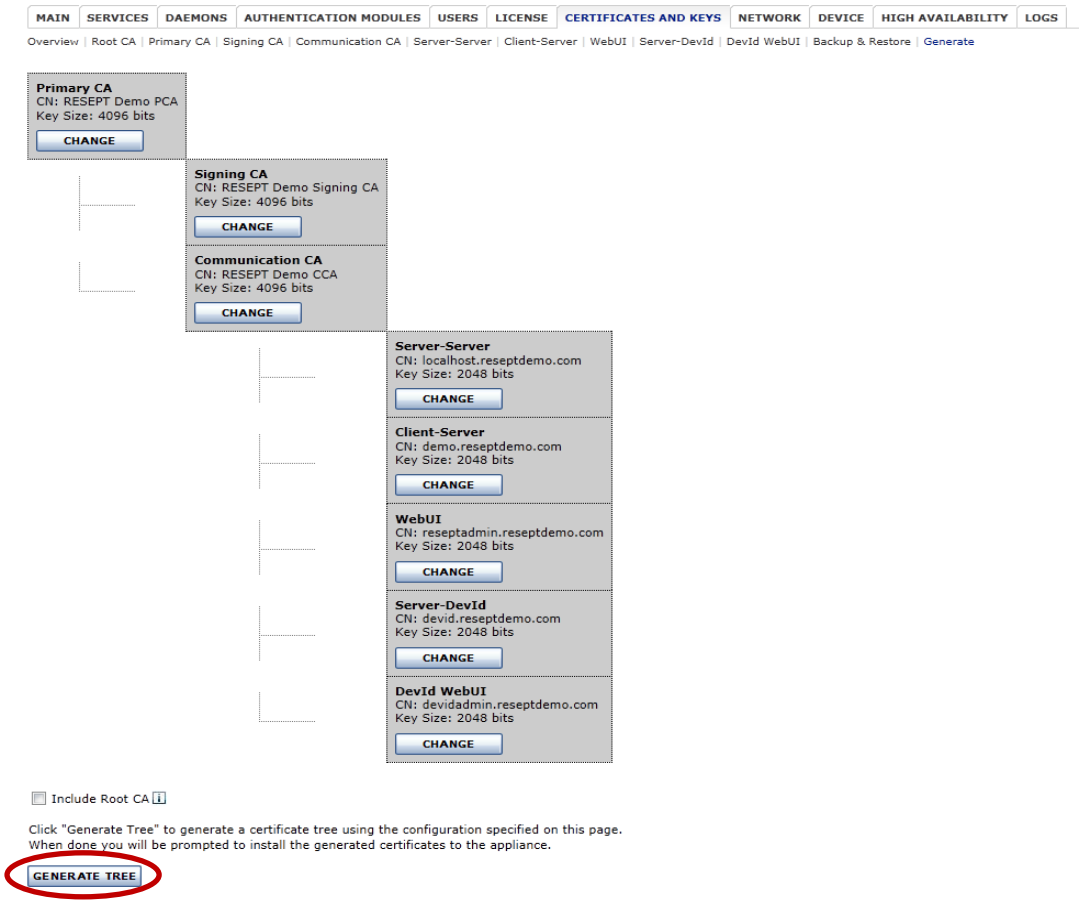


Figure 111: Generate the newly configured tree

Click "Generate Tree" to generate a certificate tree using the configuration specified on this page. When done you will be prompted to install the generated certificates to the appliance.

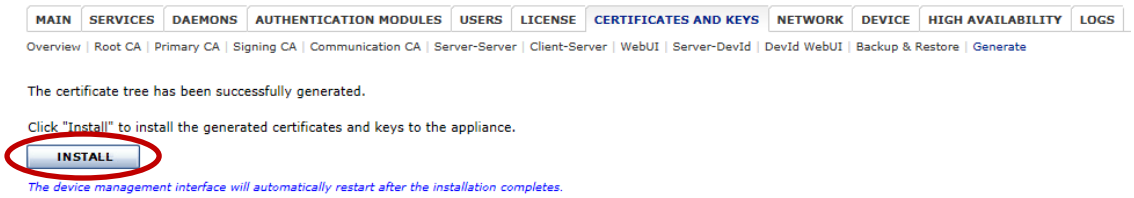


Figure 112: Install the generated certificate tree

After a successful UPLOAD the device management subsystem will automatically restart to effectuate the new certificate tree.

To make the changes permanent, please refer to section 8.2 ‘Saving changes & reboot’.

23. Errors and error-reporting

KeyTalk 4.x provides error messages.

These messages are:

- Resolved IP invalid
- Digest Invalid
- Time out of sync
- Server error

When an error cannot be resolved, the Admin should run “Report Problem” function.

Figure 113: Generate a problem activity report

Save the resulting file, and send it to your KeyTalk supplier or partner with a written description of the problem, preferably substantiated with screenshots, repro steps and log files.

24. LCD information display

Front Panel component 'J' provides information to those accessing the physical KeyTalk appliance.
Using buttons A, B, C and D, allows you to navigate the different information screens on the LED display.

Normal mode				
Button	A	B	C	D
Effect	Back	Up	Down	Confirm

Direct code mode				
Button	A	B	C	D
Effect	Position 1: 0-9	Position 2: 0-9	Position 3: 0-9	Confirm

To activate the LCD information display menu, touch any of the buttons A, B, C or D.
After it has been activated you can press 'D' to activate the Direct Code mode. Press buttons A-C to go to the Normal mode.
Select and confirm any of the three figure menu items will make the LCD go to its default display.

Menu item		**Direct code**	**Description**	**Effect**
0			Direct code	Activate direct code
1			Device	Go to device sub-menu
	11		Power	Go to the power sub-menu
		111	Reboot	Reboot the appliance. This will make the active configurations persistent.
	12		IP reset	Go to IP reset sub-menu
		121	External	Reset the external IP to default (perform 131 manually)
		122	Internal	Reset the internal IP to default (perform 131 manually)
		123	Management	Reset the management IP to default (perform 131 manually)
	13		Maintenance	Go to the KeyTalk maintenance sub-menu
		131	Reset users	Reset the oldest 10% of the user license count
		132	Save Settings	Save changed settings
		133	Reset Settings	Reset all appliance settings to factory default and reboot
		134	Upgrade	Activate the FWUPGRADE
2			Info	Go to the information sub-menu
	21		KeyTalk	Go to the KeyTalk information sub-menu
		211	Version	Display the current KeyTalk appliance firmware version
		212	Counted users	Display counted users for license purposes
	22		IP Address	Go to the IP information sub-menu
		221	External	Display the current external IP number
		222	Internal	Display the current internal IP number
		223	Management	Display the current management IP number

25. Release notes

25.1. KeyTalk Appliance firmware

Version	Release date	Description
4.0.0	June 1st 2011	Initial release
4.1	January 23rd 2012	Significant efficiency improvement, upgraded OS, upload firmware option, added DevID module support, updated HAD functionality, download & remove functions on daemon certificates & keys, total unique users per service reporting, LCD based oldest unique user cleaning (max 10%)
4.2	July 2012	Update documentation to KeyTalk 4.2. In 4.2 it is possible to generate the CA tree on the appliance.

26. Manufacturer information

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Index