AuthLite Administrator's Manual for software revision 2.0

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OTP Token Types

Yubikey:

AuthLite uses the Yubikey from Yubico Inc. as an inexpensive, robust one-time-code generating device. Yubikeys have no display or battery, no moving parts, and are waterproof and virtually indestructible even in rugged environments. They draw power from the USB port and are treated as an HID keyboard device so they work without special drivers on all platforms.

The yubikey platform also contains extra cryptographic security features that allows AuthLite to securely authenticate users to offline (disconnected) domain workstations.

AuthLite supports the YubiKey Standard, Edge, Nano, and NEO. AuthLite cannot use the blue “U2F Security Key”.

OATH Token:

AuthLite is also compatible with OATH Time-based One-time passcodes (TOTP) generated by smart-phone soft-token apps such as the free cross-platform Google Authenticator app. This is useful for cases where carrying a hardware token is undesirable or plugging in a USB device is impossible (such as authenticating to a 2-factor system from a smart phone).

These tokens emit short-code OTPs that must be authenticated in real-time by the domain, and cannot be used to logon at offline (disconnected) domain workstations.

Requirements and platforms

AuthLite is licensed on a per-user basis, so you don't have to worry about counting the number of servers or workstations. Here is some high level guidance on where software needs to be installed, and what is supported. For scenarios not covered here, please contact us for assistance.

Note: 32 and 64 bit platforms are supported.

Workstations:

AuthLite software should be be installed if AuthLite users will be logging on to the machine, or if the machine needs to support AuthLite users as an RDP server. Supported platforms:

- Windows Vista
- Windows 7
- Windows 8

Domain Controllers

For Active Directory deployments, AuthLite software must be installed on at least one Domain Controller in your organization. AuthLite uses an Application Partition to store and distribute its user data.

You should install the software on every DC that could be used to authenticate AuthLite users.[1] The data partition should be replicated as needed.

To use RADIUS with AuthLite, you need to install the Microsoft IAS/NPS service on one or more domain servers and activate the AuthLite IAS/NPS plug-in.

Supported platforms:

- Windows 2003
- Windows 2008
- Windows 2012 (R1/R2)

Read-only DCs

AuthLite can function on RODCs, but because it uses one-time-passcode technology, at each successful logon the RODC must update OTP counter attributes on a writeable DC. The necessary configuration and permissions to allow this RODC → WDC access are applied automatically.

"Core" (command-line mode) DCs

Please see this KB article.

Terminal servers

If you want AuthLite users to connect to RDG/TSG or standalone terminal servers, the AuthLite software should be installed on each server. This allows the Windows NTLM authentication to handle AuthLite OTP entries that will be sent in the "username" field of the remote desktop software. Supported platforms:

- Windows 2003
- Windows 2008
- Windows 2012 (R1/R2)

Exchange front end servers

If you use Outlook Anywhere, your Exchange front end servers that host IIS, RPC/HTTP, and the Exchange components will need the AuthLite software installed. This allows the Windows NTLM authentication to handle AuthLite OTP entries that will be sent in the "username" field of Outlook. Exchange 2013 works best, presently. The 2010 version can be made to work but requires extra configuration. Supported platforms:

- Windows 2003
- Windows 2008
- Windows 2012 (R1/R2)

[1] If you have multiple AD sites and your servers and clients have their site membership defined correctly, then you could use this mechanism to limit AuthLite installs to only one, or a subset of your sites. If you do not have sites defined, then any client could choose any DC for authentication, therefore you need AuthLite on every DC. Also, see security notes in Requiring Two-factor Authentication.

Other domain member machines

For other systems, AuthLite software may need to be installed if AuthLite users will be logging on interactively to the system, but generally not otherwise. For example you do *not* need to install software on your back-end Exchange servers, because the actual logon is performed elsewhere.

Standalone system with local users

At this time, AuthLite version 2 can only be used on Domain member machines. AuthLite v1.2 can be installed and used for standalone servers/workstations.

Installation

Prerequisites

- Microsoft .NET framework version 2 or later
- All installs require administrator permissions
- Domain Controller installs should be run as a user with permission to add/modify an Active Directory Application Partition and add properties to the AD Schema (i.e. a Schema Administrator).

Installers

The same installation software is used for both workstations and servers:

- AuthLite_installer_x86.msi for 32-bit platforms
- AuthLite_installer_x64.msi for 64-bit platforms

This installer is designed to be run through the user interface, but may also be installed unattended through group policy. Contact support for more information.

Post-install

A system reboot is required to load (or update, or unload) AuthLite infrastructure components. After the Finish screen, the installer will remind you a reboot is needed.

Before you can start using AuthLite, you need to enter a license number (either an evaluation key or a purchased license). The License Information screen of the AuthLite Configuration program is used to accomplish this process.

Upgrading

Most version updates can install "over" the old version correctly. If this is not possible then the installer will instruct you how to properly upgrade.

Uninstalling

Uninstalling AuthLite v2 software from all systems in your enterprise will effectively revert everyone to normal one-factor password-only logins. Please note that any offline AuthLite users will need to reconnect their workstations to the Domain LAN at least once in order to re-authenticate, because their cached credentials will be invalid after the AuthLite software is removed.

To prevent accidental data loss, the AuthLite uninstaller never removes the AD data partition. If you are certain you no longer need the partition, you can remove it manually using Microsoft's **ntdsutil** command.

Licensing AuthLite

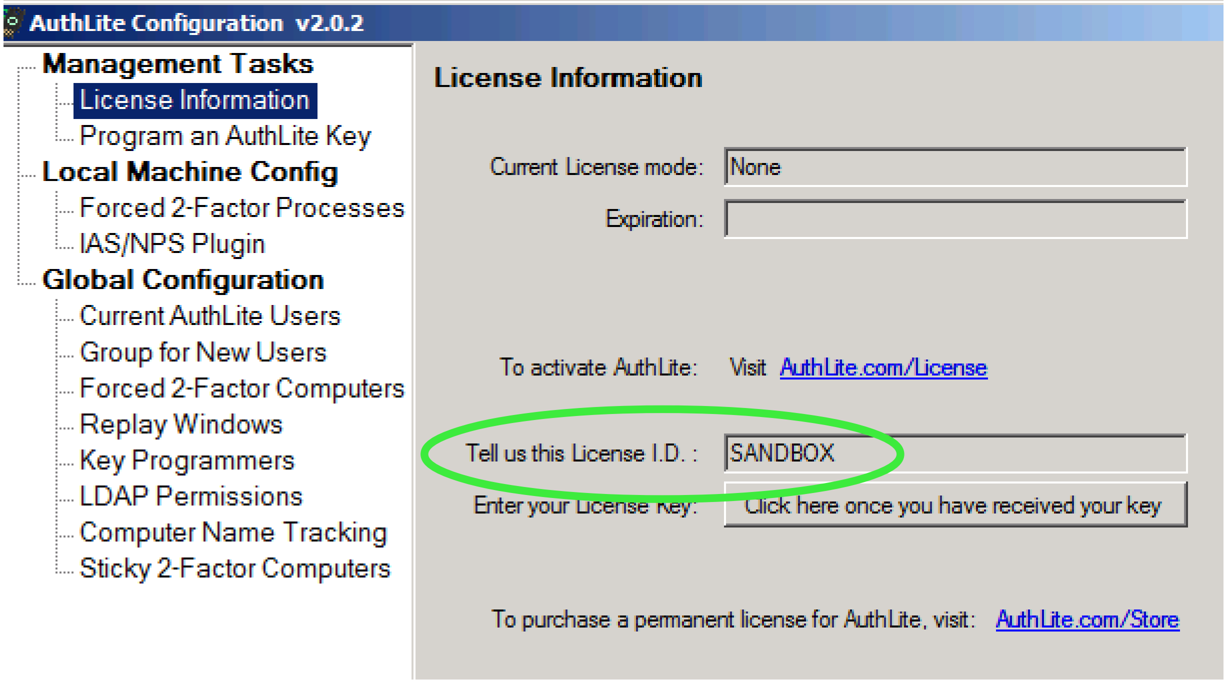
After installing AuthLite, be sure to reboot first before setting up the license.

Log in as a domain administrator to a DC that has AuthLite installed, and follow the license procedure below. **You only need to set up the license once**, and it will be automatically used by all servers and workstations in your domain. Due to AD replication settings the license value may not immediately propagate between all servers.

License procedure

We try to make this process as friendly as possible. Our support staff will respond to your request personally, and we will be available to assist you with any problems.

Find your I.D.



AuthLite Configuration v2.0.2

License Information

Current License mode: None

Expiration:

To activate AuthLite: Visit AuthLite.com/License

Tell us this License I.D. : SANDBOX

Enter your License Key:

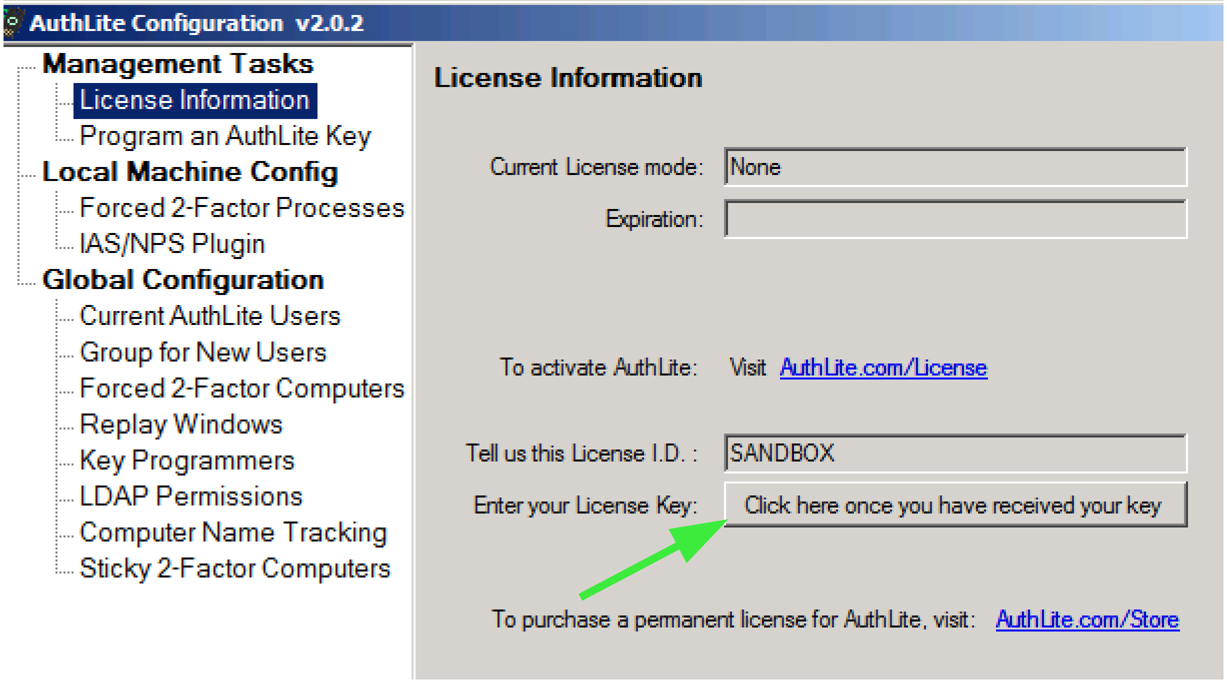
To purchase a permanent license for AuthLite, visit: AuthLite.com/Store

From the Start menu, launch the AuthLite Configuration application. The License I.D. is shown in the dialog. It is the NETBIOS name of your domain. You will need this value for the next step. You must tell us the exact name shown in the dialog, or the key we generate for you won't be recognized by the software.

Request a key

- Go to AuthLite.com/License and enter your I.D. found above.
- If you are **evaluating** you can enter "none" in the "Order number" field.
- Enter your contact information so our support staff can send your key.
- After you submit the form you should immediately receive an email confirming the request, and a URL that allows you to check the status of your ticket on the web.
- We will create and send your key as soon as possible.

Enter your key



License Information

Current License mode: None

Expiration:

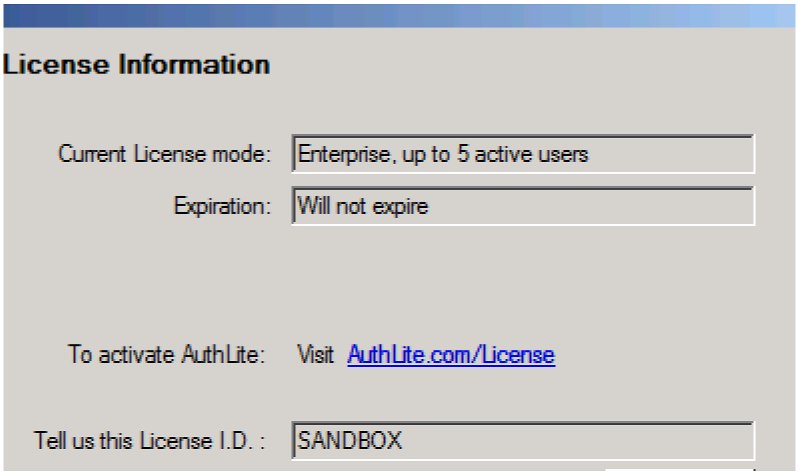
To activate AuthLite: Visit AuthLite.com/License

Tell us this License I.D. : SANDBOX

Enter your License Key: Click here once you have received your key

To purchase a permanent license for AuthLite, visit: AuthLite.com/Store

- You can only enter the license key on a Domain Controller. On other systems this field will display as read-only.
- Type or paste in the license key you receive into the configuration dialog and click "Apply"



License Information

Current License mode: Enterprise, up to 5 active users

Expiration: Will not expire

To activate AuthLite: Visit AuthLite.com/License

Tell us this License I.D. : SANDBOX

- The "License mode" and "expiration" fields should update to reflect the status of your license.

License Expiration

If your evaluation period expires, or the software is used for a higher number of users than it is licensed for, then certain functions will be disabled until a valid license is entered.

Disabled features:

- Importing or associating new AuthLite keys

Features that stay enabled even after the license is invalid/expired:

- Logging on with existing AuthLite keys

Identifying AuthLite Users

Tutorial Video!

AuthLite Groups and Policy

AuthLite User Group Pairs

Permission checking

AuthLite uses Active Directory group memberships to discern which users should be considered to be AuthLite users. These groups are used to decide which users should be required to provide 2-factor authentication when logging on at the computers and processes you have selected to Require Two-factor Authentication.

The AuthLite User Group Pairs dialog allows you to select the groups that will be used to perform this permission check. For example if you add a group called “AuthLite Domain Users” to this dialog, then any user who has membership in that group (directly or nested) will be considered an AuthLite user for the purpose of permission checks.

A user account NOT represented in any of these groups will never have any restrictions placed on it by AuthLite. Thus, it is very important to keep the list up to date and make sure your users are members of the correct groups.

Groups chosen should be:

- Global Groups, and
- Not referenced in the membership of any other AD group, except “Builtin” local groups

These limitations are imposed by the technical method AuthLite uses to do group checking. For more information on these limitations, please see this tutorial video series and if necessary contact customer service.

Two-factor Session tagging

This dialog also performs another very important function. Consider the following use case:

Normally, every kerberos ticket-granting ticket is essentially the same. Once a user authenticates, there is no way to tag that session's level of security. Consider a user who is permitted to authenticate with 1-factor from computer A, but you wish to protect resources on server B from 1-factor access by that user. Since the authentication already happened at logon time, and the user has a kerberos TGT, there is no additional way to check or protect the resources at B. Access will be granted regardless of your wishes. You'd either have to require 2-factor authentication for that user *everywhere*, or accept that it's possible to circumvent the protection of those resources.

To solve this problem, each line of the AuthLite Group dialog refers to a *pair* of AD groups:

1. The first group is called a “Default” group. This is just a normal AD global group that you will place your AuthLite users (or nested groups) into. Thus any time the users log on, their session token will by default carry the SID for this group. If they don't log on with 2-factors, this will remain the case. However:
2. The second group is called a “Two-Factor” group. Its membership in AD should be left **empty**; do not assign any users or nested groups to it. Any time a user logs on with two factors, AuthLite on the DC will edit the user's session token. Each instance of a “Default” group SID will be *replaced* with its corresponding “Two-Factor” group SID.

In other words, the user's effective group membership for this session will depend on how they authenticated. If it was a (permitted) one-factor password-only logon, then their session token will reflect the Default group(s). If it was a two-factor OTP and password logon, then their session token will reflect the Two-Factor groups instead.

With AuthLite authentication, the actual content of the session's group SIDs will now be different depending on the level of authentication that was used. You can now assign ACLs and permissions throughout your domain that are sensitive to the level of security the authentication used. If only the Two-Factor group is in server B's ACL, then users won't have permission to those resources unless they logged in with an OTP and password!

The system AuthLite uses is similar in spirit and purpose to the Authenticaton Mechanism Assurance implemented by Microsoft in order to discriminate between smart card and password-only logons. Our approach additionally allows even AuthLite-unaware systems to be ACL'd securely against 1-factor access (because all systems can read the AD groups of the session, regardless of whether AuthLite is installed).

The reason you can specify *more than one pair* of groups is that you may not want all users to be lumped together in the same 1-factor group. For example, you may want to allow access to a group containing 2-factor authenticated domain admins, but not 2-factor authenticated low-level users. Having multiple group pairs allows you to define your own granularity.

It should be noted that AuthLite never changes the number of groups in a token, it only searches and replaces between the Default and Two-Factor side of each pair. In other words, if a token does not start out containing a certain Default group, it will never contain the corresponding Two-Factor group either.

AuthLite's use of group pairs to do session tagging is extremely powerful, but a little subtle to consider initially. The bottom line is that the users' effective group membership will switch around deterministically depending on how they authenticated, and you can use this knowledge to restrict access to your AD systems and resources.

Please refer to this tutorial video series for an illustrated discussion of these important topics.

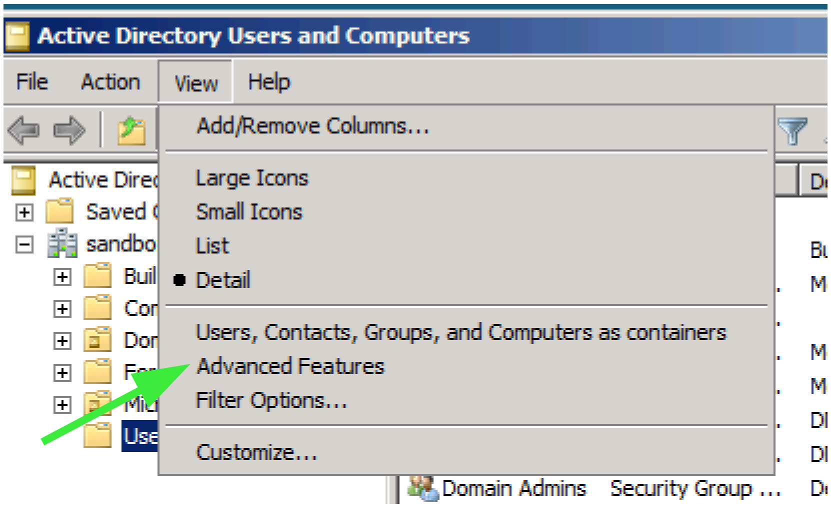
(Optional) “New Users” Group

Once you have set up various 2-factor computers and processes, the AuthLite User Group Pairs membership can present a timing problem:

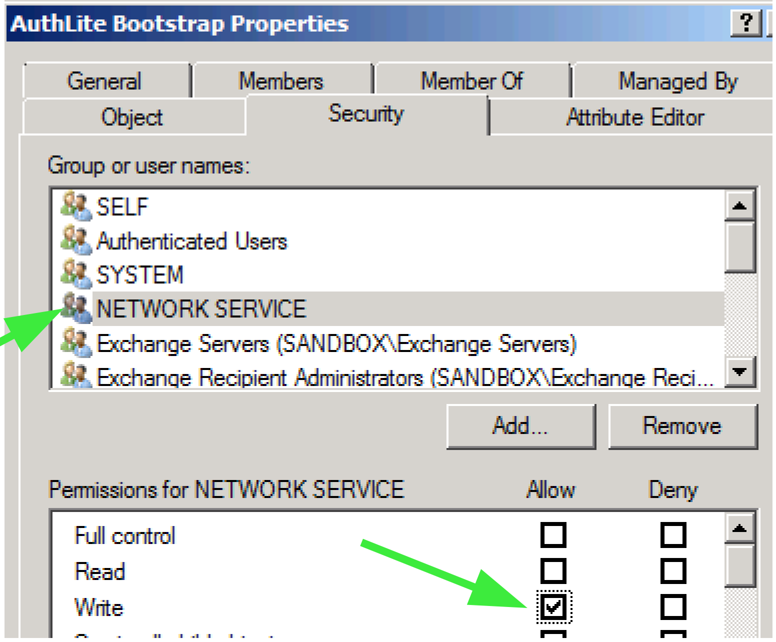
- If an account is placed into an AuthLite group before that user has a provisionined key in their hand, then they will be unable to log in to whatever computers and processes you have configured to require 2-factor authentication.
- But if the account is NOT in an AuthLite group, then 2-factor authentication will not be enforced on them.

Therefore you can create up an AD security group that will automatically be populated with user accounts as they become associated with yubikeys. You could then include this group in one of the AuthLite User Groups.

- Create a security group for new AuthLite users
- From AD Users and Computers, select View->Advanced Features:



- Give “Network Service” **Write** permission to this group:

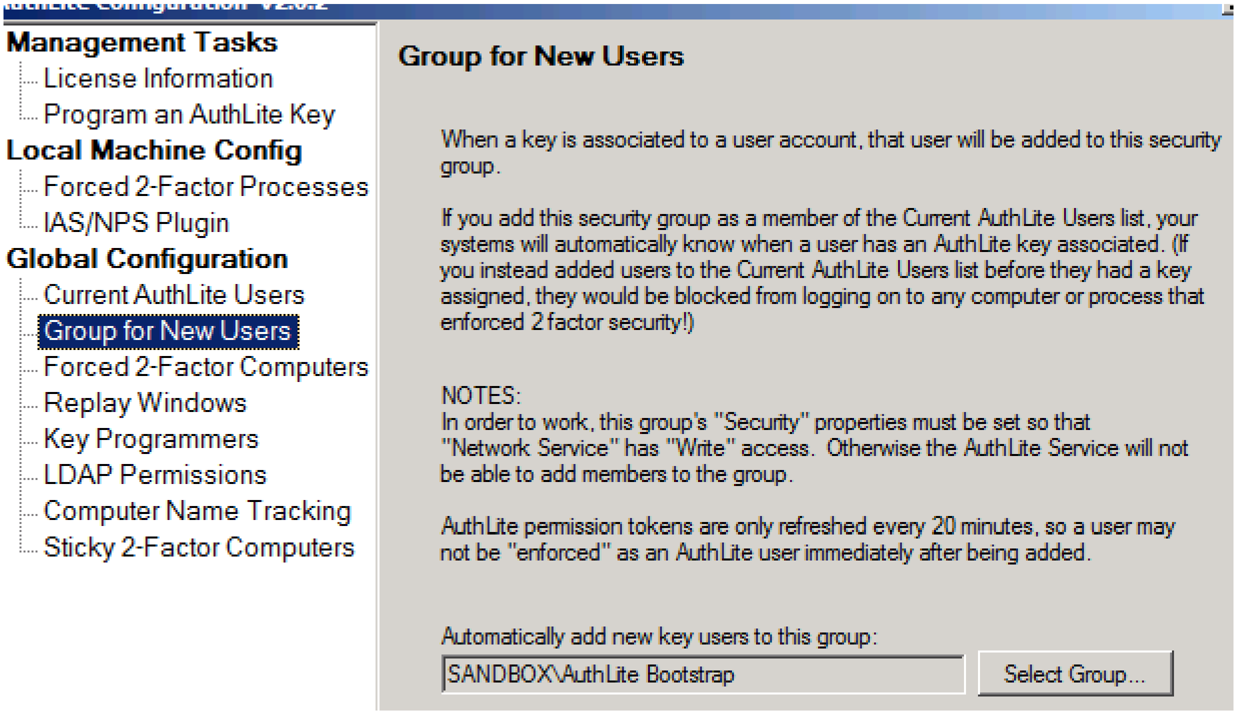


Group or user names:

SELF
Authenticated Users
SYSTEM
NETWORK SERVICE
Exchange Servers (SANDBOX\Exchange Servers)
Exchange Recipient Administrators (SANDBOX\Exchange Reci...

Permissions for NETWORK SERVICE	Allow	Deny
Full control	□	□
Read	□	□
Write	☑	□

- Finally, select this group in the AuthLite Configuration app's “Group for New Users” section, and apply:



Group for New Users

When a key is associated to a user account, that user will be added to this security group.

If you add this security group as a member of the Current AuthLite Users list, your systems will automatically know when a user has an AuthLite key associated. (If you instead added users to the Current AuthLite Users list before they had a key assigned, they would be blocked from logging on to any computer or process that enforced 2 factor security!)

NOTES:
In order to work, this group's "Security" properties must be set so that "Network Service" has "Write" access. Otherwise the AuthLite Service will not be able to add members to the group.

AuthLite permission tokens are only refreshed every 20 minutes, so a user may not be "enforced" as an AuthLite user immediately after being added.

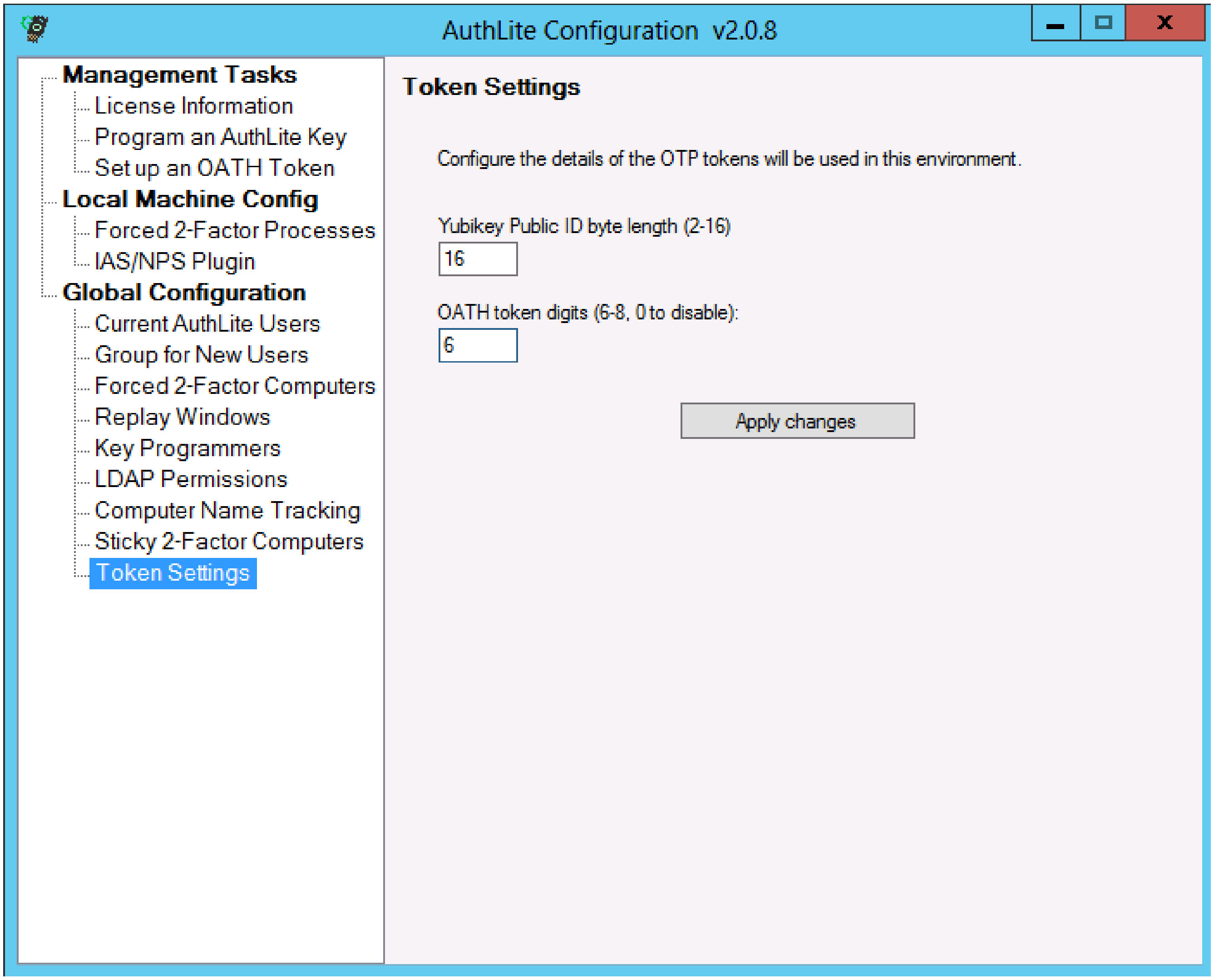
Automatically add new key users to this group: SANDBOX\AuthLite Bootstrap

Provisioning Yubikeys

Token Settings

Historically, AuthLite-programmed yubikeys have used the longest possible public ID (16 bytes), to eliminate the chance of an attacker guessing the ID and also because the key's record in the data store is encrypted by the hash of the public ID for greater protection.

As of AuthLite version 2, it is possible to specify that your domain will use shorter public IDs. Note that the number of possible yubikeys in your environment will be limited to 2 ^ (8 x byte length). So for example using a 2-byte public ID limits you to 2 ^ (8x2) = 65536 possible keys.



Token Settings

Configure the details of the OTP tokens will be used in this environment.

Yubikey Public ID byte length (2-16)
16

OATH token digits (6-8, 0 to disable):
6

One-off key provisioning from the console

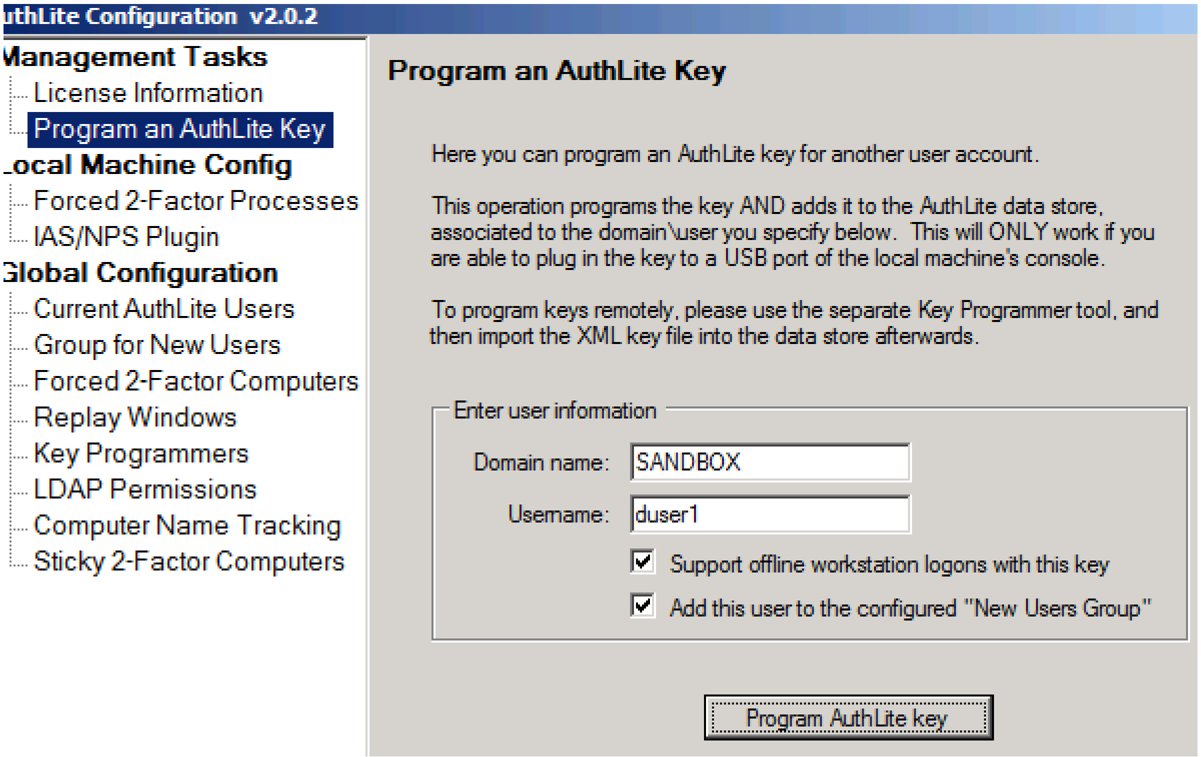
If you have physical console access (not a remote session or virtual console) to a domain member server or workstation with AuthLite software installed, then you can provision keys one at a time with this simple process.

Prerequisites

- AuthLite software installed on domain controllers and (if you are going to administer from a workstation) on that workstation machine.
- Valid license or evaluation key entered.
- A blank yubikey, or a formerly provisioned key that you want to **erase** and reprogram.

Procedure

- Insert the yubikey into a USB port on the server/workstation you are using.
- Launch AuthLite Configuration.
- Select the item “Program an AuthLite Key”:



Program an AuthLite Key

Here you can program an AuthLite key for another user account.

This operation programs the key AND adds it to the AuthLite data store, associated to the domain\user you specify below. This will ONLY work if you are able to plug in the key to a USB port of the local machine's console.

To program keys remotely, please use the separate Key Programmer tool, and then import the XML key file into the data store afterwards.

Enter user information

Domain name: SANDBOX

Username: duser1

☑ Support offline workstation logons with this key

☑ Add this user to the configured "New Users Group"

- In the “Domain Name” box, enter the NETBIOS domain of the user account you wish to associate with this yubikey.
- In the “Username” box, enter the username (SAM account name, NOT UPN) of the user account you wish to associate with this yubikey.
- If this user will use this key for logon to domain member workstations that can go offline from the domain (i.e. need to use cached logon credentials) then select the “Support offline workstation logons with this key” checkbox.[2]
- If you are using the (Optional) “New Users” Group feature, then you can select the corresponding checkbox and the user account will automatically be added to the “New Users” group.
- Click the “Program AuthLite key” button.

[2] This will program the second identity slot of the yubikey with a challenge/response token that will be used to provide strong 2-factor authentication when the key is plugged in to offline workstations. If you do not program this identity, then the key will NOT work for logon to offline workstations.

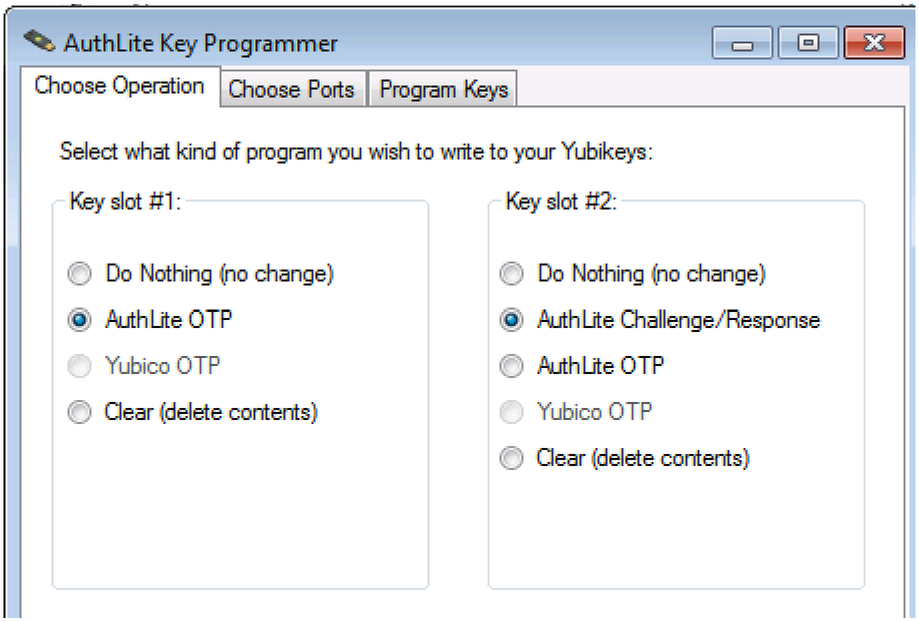
- If you are NOT using the "New Users" Group feature, then you must manually add this user into one of your AuthLite User Groups.
- This yubikey is now associated to the user account you specified.

Bulk programming from a standalone workstation

If you do not have direct physical console access to your domain, or if you want to program a large number of keys efficiently in one sitting, then you can use the following process.

Program Yubikeys

- Install the "AuthLite Key Programmer" standalone program on your workstation.
- Configure slot #1 for "AuthLite OTP" and slot #2 to "AuthLite Challenge/Response"[3]


AuthLite Key Programmer

Choose Operation | Choose Ports | Program Keys

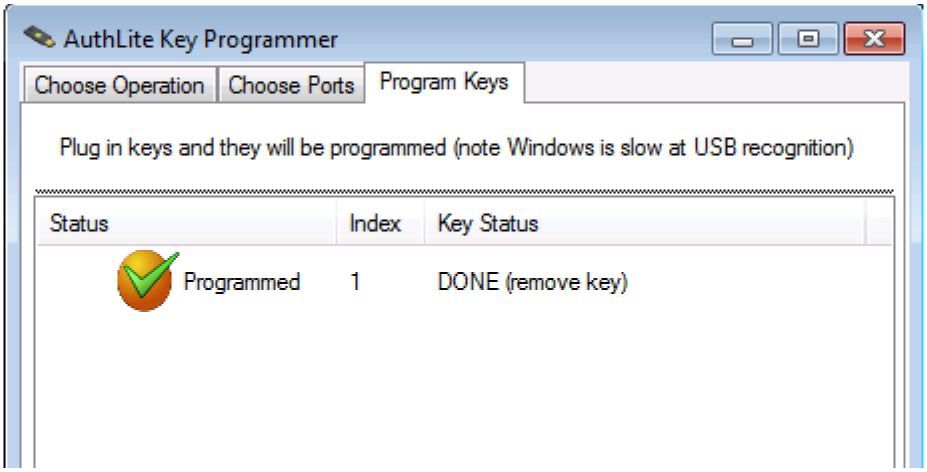
Select what kind of program you wish to write to your Yubikeys:

Key slot #1:
○ Do Nothing (no change)
● AuthLite OTP
○ Yubico OTP
○ Clear (delete contents)

Key slot #2:
○ Do Nothing (no change)
● AuthLite Challenge/Response
○ AuthLite OTP
○ Yubico OTP
○ Clear (delete contents)

- If you are using shorter public IDs than the default, specify the number of bytes on this page as well.
- The point of a random public ID is to use it as an encryption key to protect the key's record in the data store. If you are using very short IDs, you should NOT randomly-generate them because you will end up with collisions (more than one key programmed with the same ID, which will cause an import error).
- Go to the Choose Ports tab. Plug in one or more yubikeys to identify which USB ports will be used during this programming session. If you plug them in one-at-a-time and wait for each port to be recognized, you will know which port corresponds to which key. This will in turn make it easier to find which key to unplug/re-plug in the event of a programming error.
- When ready, click "Start Programming", and each time you plug in a yubikey to one of the ports, it will be programmed.

[3] This will program the second identity slot of the yubikey with a challenge/response token that will be used to provide strong 2-factor authentication when the key is plugged in to offline workstations. If you do not program this identity, then the key will NOT work for logon to offline workstations.



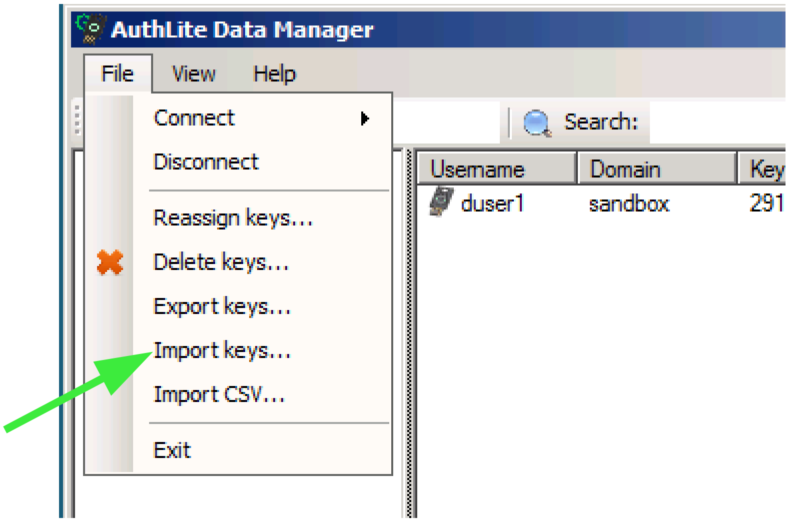
Plug in keys and they will be programmed (note Windows is slow at USB recognition)

Status	Index	Key Status
Programmed	1	DONE (remove key)

- Remove each key when the status reads “DONE (remove key)”.
- You can continue to plug in new keys and program them. When finished, click the “Finish” button.
- Save the resulting XML file. This file should be considered sensitive information, as it contains all the secret values programmed into the keys. Treat this with the same security measures you would use for a password list or other secure document.

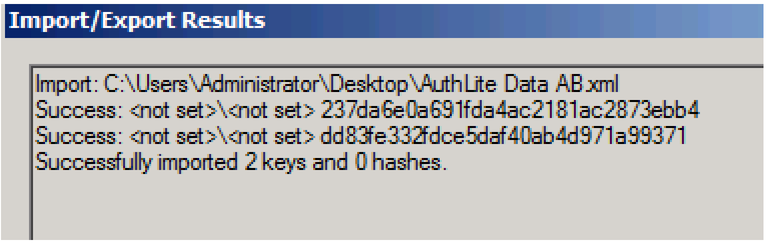
Import programmed keys

- On a domain controller, launch the AuthLite Data Manager and select Import Keys from the File menu:



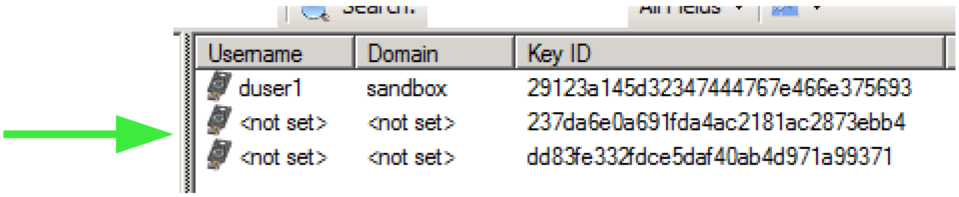
Username	Domain	Key
duser1	sandbox	291

- Select the XML file generated when you programmed your keys, and click “Open”.
- The key records will be imported:



```
Import: C:\Users\Administrator\Desktop\AuthLite Data AB.xml
Success: <not set>\<not set> 237da6e0a691fda4ac2181ac2873ebb4
Success: <not set>\<not set> dd83fe332fdce5daf40ab4d971a99371
Successfully imported 2 keys and 0 hashes.
```

- You should then see new unassociated key records in the list:

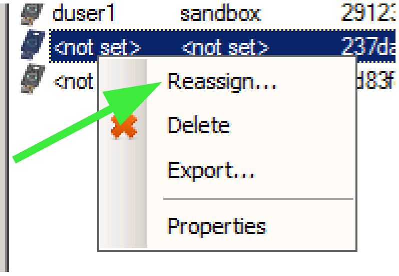


Username	Domain	Key ID
duser1	sandbox	29123a145d32347444767e466e375693
<not set>	<not set>	237da6e0a691fda4ac2181ac2873ebb4
<not set>	<not set>	dd83fe332fdce5daf40ab4d971a99371

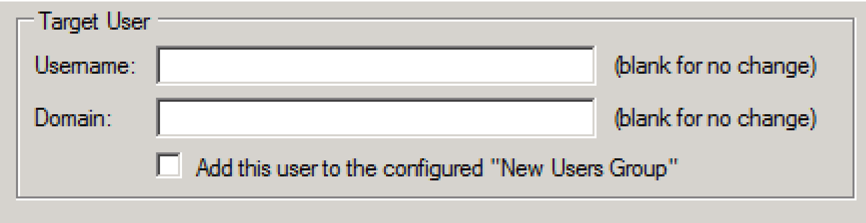
- Now that the file is imported, you should **DELETE the XML file** from your workstation and the DC. It is no longer needed once the keys are imported. This file should be considered sensitive information, as it contains all the secret values programmed into the keys.

Option 1: Associate each Yubikey to a User Account

- Right-click an unassociated key record and select “Reassign”:



- In the “Domain Name” box, enter the NETBIOS domain of the user account you wish to associate with this yubikey.
- In the “Username” box, enter the username (SAM account name, NOT UPN) of the user account you wish to associate with this yubikey.



Target User

Username: ______ (blank for no change)

Domain: ______ (blank for no change)

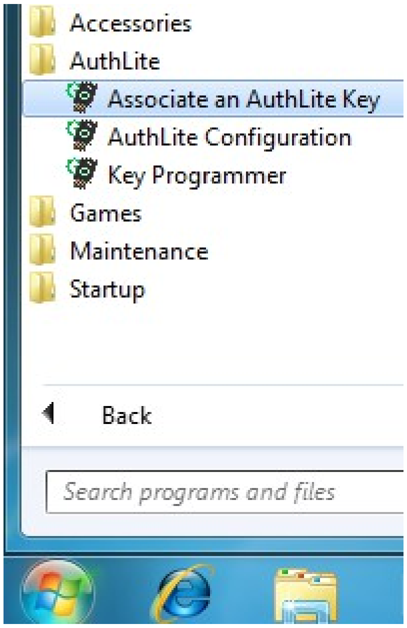
□ Add this user to the configured "New Users Group"

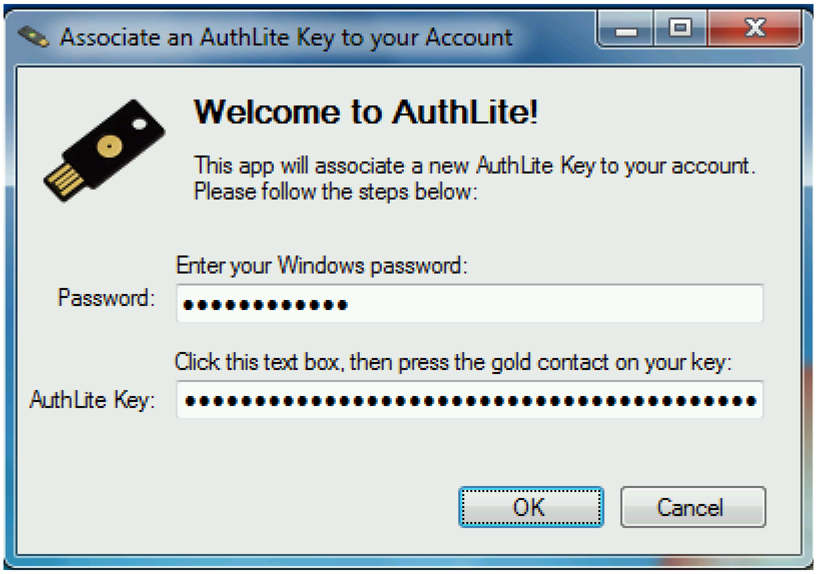
- If you are using the (Optional) “New Users” Group feature, then you can select the corresponding checkbox and the user account will automatically be added to the “New Users” group.
- Click the “Reassign” button.
- If you are NOT using the “New Users” Group feature, then you must manually add this user into one of your AuthLite User Groups.
- This yubikey is now associated to the user account you specified.

Option 2: Users can associate their own keys

If you have programmed and imported your keys but don't want the administrative overhead of associating each key to a specific user and then handing them out, you can let users associate their own keys.

- Distribute your programmed (but still unassociated) yubikeys out to the users you wish to use AuthLite.
- Each user should log on to a domain-connected system or virtual machine.





Welcome to AuthLite!

This app will associate a new AuthLite Key to your account.
Please follow the steps below:

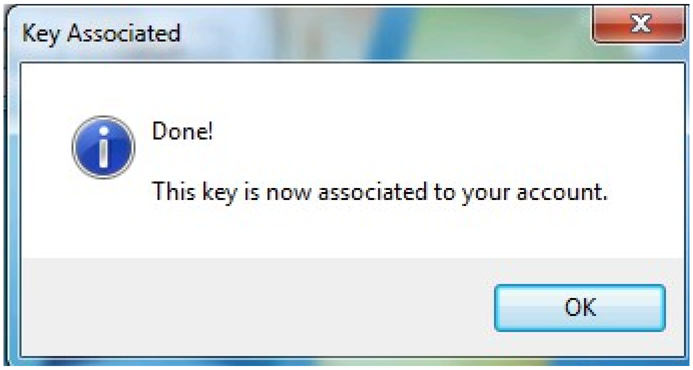
Enter your Windows password:

Password: ●●●●●●●●●●●●

Click this text box, then press the gold contact on your key:

AuthLite Key: ●●●

- Launch the program “Associate an AuthLite key”:
- Enter the password for the logged-in account.
- Highlight the AuthLite Key field and touch the yubikey button to enter an OTP from this key.
- Click “OK” and wait a moment. If successful the user will see the following dialog:



Done!

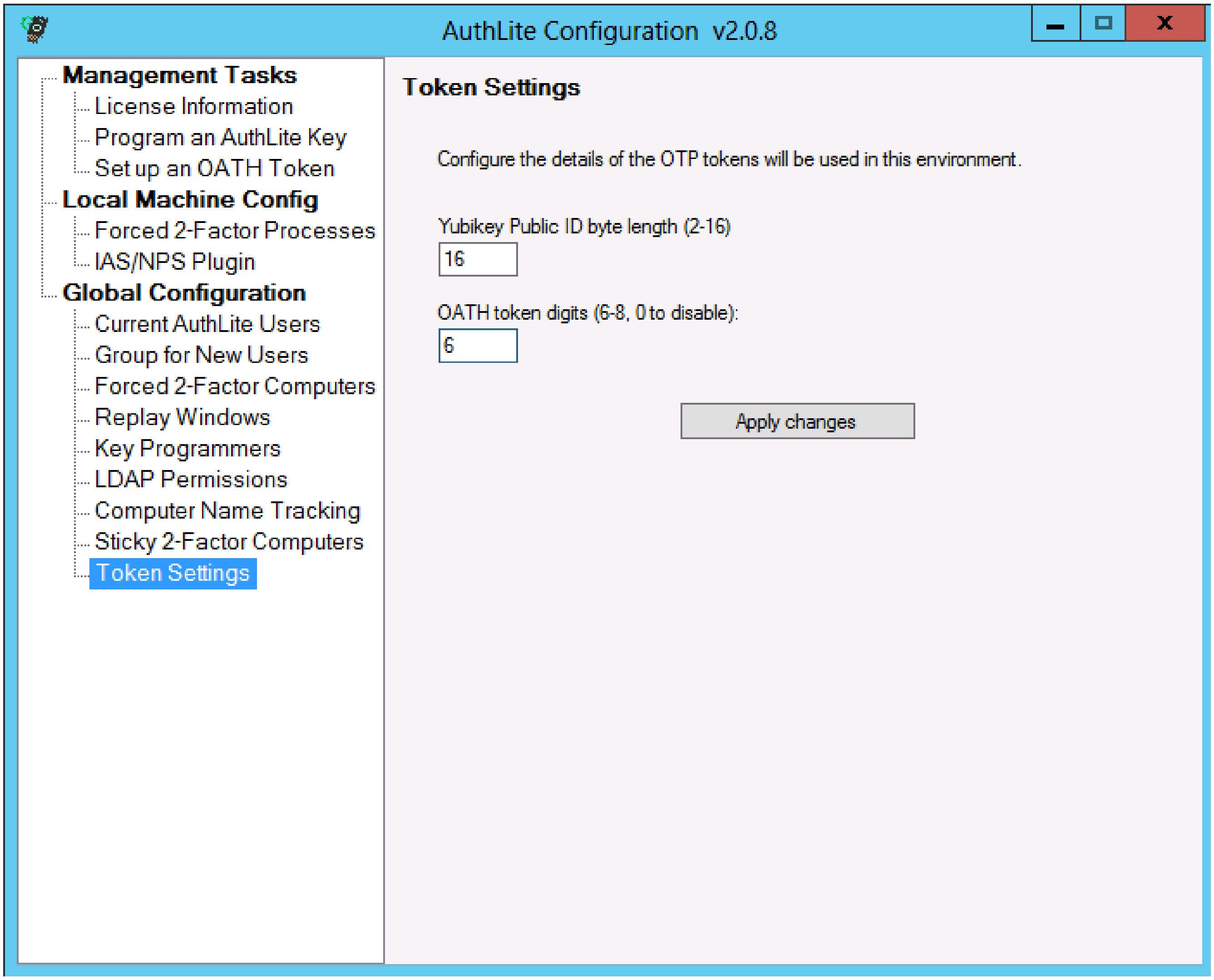
This key is now associated to your account.

- This yubikey is now associated to the user's account.
- If you have the “New Users Group” feature configured, this user will be automatically added into the group by this operation.

Provisioning OATH Tokens

Token Settings

By default, OATH token support is turned off. To enable it, set the number of digits in the Token Settings dialog:



Token Settings

Configure the details of the OTP tokens will be used in this environment.

Yubikey Public ID byte length (2-16): 16

OATH token digits (6-8, 0 to disable): 6

Google Authenticator uses 6 digits. If you are using some other token app/scheme, you may need to use 8 digits instead.

One-off key provisioning from the console

AuthLite can easily create a record for an OATH token, associate it to a user, and issue a QR-code to program the Google Authenticator app.

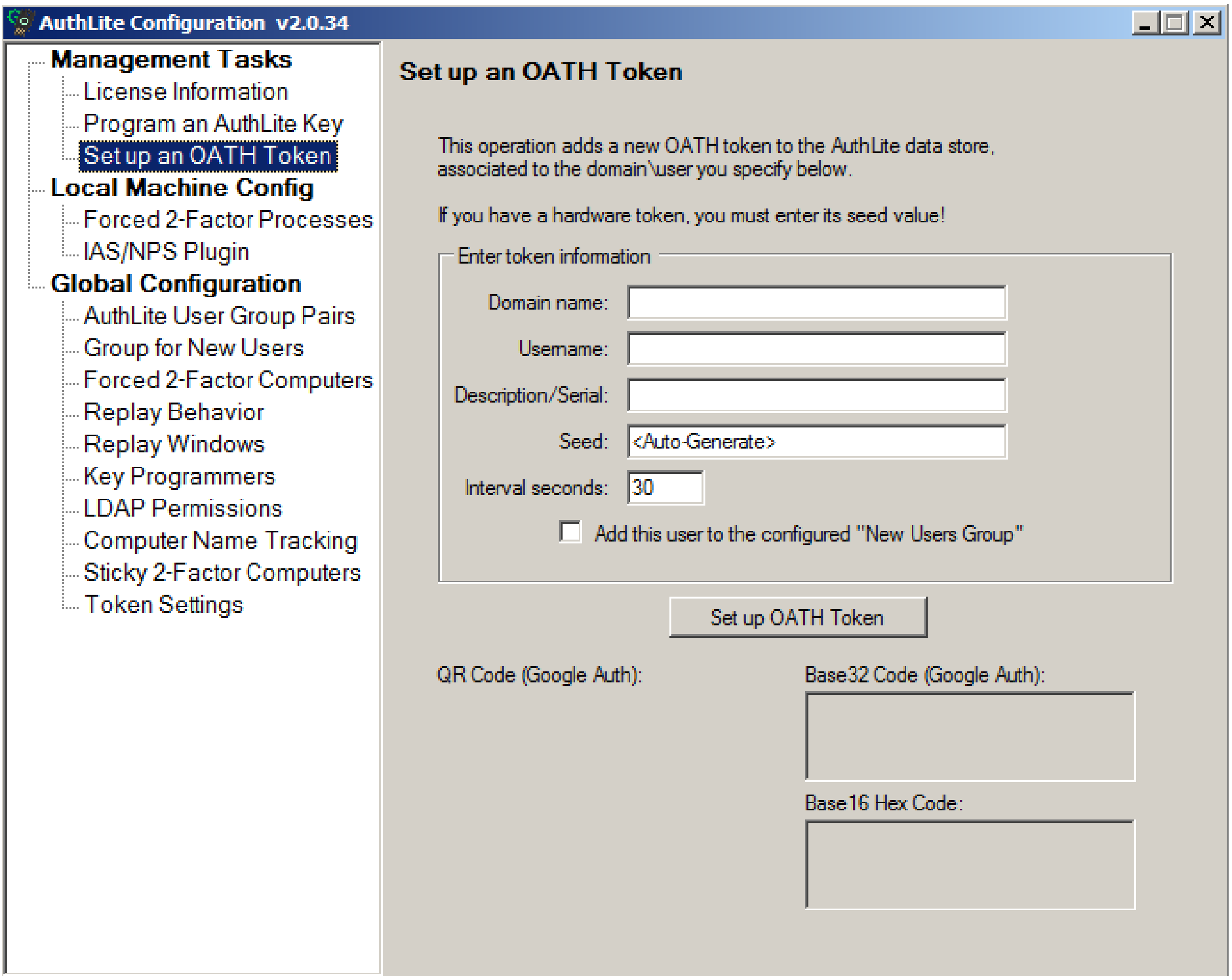
Prerequisites

- AuthLite software installed on domain controllers and (if you are going to administer from a workstation) on that workstation machine.

- Valid license or evaluation key entered.
- Smart phone with Google Authenticator app or other compatible OATH TOTP app that can recognize QR-codes for token programming.

Procedure

- Launch AuthLite Configuration.
- Select the item "Set up an OATH Token":



Set up an OATH Token

This operation adds a new OATH token to the AuthLite data store, associated to the domain\user you specify below.

If you have a hardware token, you must enter its seed value!

Enter token information

Domain name:

Username:

Description/Serial:

Seed: <Auto-Generate>

Interval seconds: 30

☐ Add this user to the configured "New Users Group"

QR Code (Google Auth):

Base32 Code (Google Auth):

Base16 Hex Code:

- In the "Domain Name" box, enter the NETBIOS domain of the user account you wish to associate with this token.
- In the "Username" box, enter the username (SAM account name, NOT UPN) of the user account you wish to associate with this token.
- In Description/Serial, enter a unique ID for this key to distinguish it in data store. It will also be encoded into the QR code for use in the Google Authenticator app.
- If you are importing a hardware token, you must enter the seed from your OTP token's manufacturer. You can enter it in Hex, Base32, or Base64 format.
- For Google Authenticator, you MUST leave the interval at 30 seconds. Specify an interval of 60 for Feitian/FTSafe tokens (c200). Some hardware tokens only change once per minute, instead of the normal interval of 30 seconds. If you do not set this value correctly, your token will not work.

- If you are using the (Optional) “New Users” Group feature, then you can select the corresponding checkbox and the user account will automatically be added to the “New Users” group.
- Click the “Set up OATH Token” button.
- If you are NOT using the “New Users” Group feature, then you must manually add this user into one of your AuthLite User Groups.

A QR-code and encoded secret values will now be shown. Now:

- Scan the QR with Google Authenticator on the user's mobile device to set up a token within the app that can be used with AuthLite. Or,
- Send the Base32 code via SMS to your user's phone, and they can enter it manually into Google Authenticator.
- If you are using a hardware token, make sure the proper user gets the token.

NOTE: The QR-code and other code readouts should be considered sensitive information, as they contain the shared secret used between the OATH token and AuthLite!

Bulk importing OATH tokens

You can import multiple hardware tokens, if you possess a properly formatted XML file. To construct the proper format:

- Import one token through the UI as described above
- *Before using the token*, export that key from the AuthLite Data manager.
- Look at the exported XML file to see the proper format and values.
- You can omit Username and Domain if you don't want to import keys already associated to specific users.
- Public ID can be any 32-character hex string. It must be unique for each key in your domain.
- You may wish to store the token's serial number in the DescriptiveID tag. There is a nil tag called SerialNumber, but it cannot be used for this since it is an integer only suitable for Yubikey-sized values.
- Note carefully that the OathDrift tag is set to 2147483647. This special value indicates that the token is new and has not yet been clocked to track its drift. AuthLite will update this value in the data store once the token has been characterized.
- Once you complete an XML file, you can import it from the Data Manager to bring in your tokens in bulk.

Requiring Two-factor Authentication

By default, installing AuthLite will not add any authentication requirements to users or computers in your domain. This is by design. You must tell AuthLite which users, computers, and processes should be required to use two-factor authentication.

- You must tell the domain which accounts are AuthLite users by properly configuring the AuthLite User Group Pairs.

Using the Domain's Own Access Control Lists

Tutorial Video!

AuthLite Groups and Policy

The most powerful, flexible, and foolproof way to enforce 2-factor authentication at any point in the domain is to use Windows' built-in security controls. Our User Group Pairs feature means that you can set up ACLs to only allow sessions that have been tagged by AuthLite as 2-factor logons.

For example you can use Group Policy to restrict which security groups are allowed to authenticate to certain machines.

Forced 2-Factor Processes

Explanation

For some servers it is not appropriate to require two-factor for every authentication by AuthLite users. For example, consider an Exchange server which must support OWA and ActiveSync. In this case, you will (ideally) be using client certificates on each ActiveSync device to increase security, and the user will authenticate with username+password only.

Even AuthLite users will authenticate this way, since it is not feasible to use yubikeys on most mobile devices[4]. You cannot put the Exchange server in the Forced 2-Factor Computers list, since that would break ActiveSync authentications for AuthLite users. But you may have other services on the same Exchange server such as Outlook Web Access, that you wish to require two-factor authentication for AuthLite users.

Even though the domain controllers are not enforcing two-factor authentication on the Exchange server, the AuthLite code running on the server itself can voluntarily enforce two-factor depending on the name or command-line of the process that is performing the authentication. This is accomplished by configuring the “Forced 2-Factor Processes” list on the server. Each string you place in this list will be matched against the “Logon process ID”, the file name, and the command-line of the calling process. If there is a match, then two-factor authentication will be enforced for AuthLite users for that process.

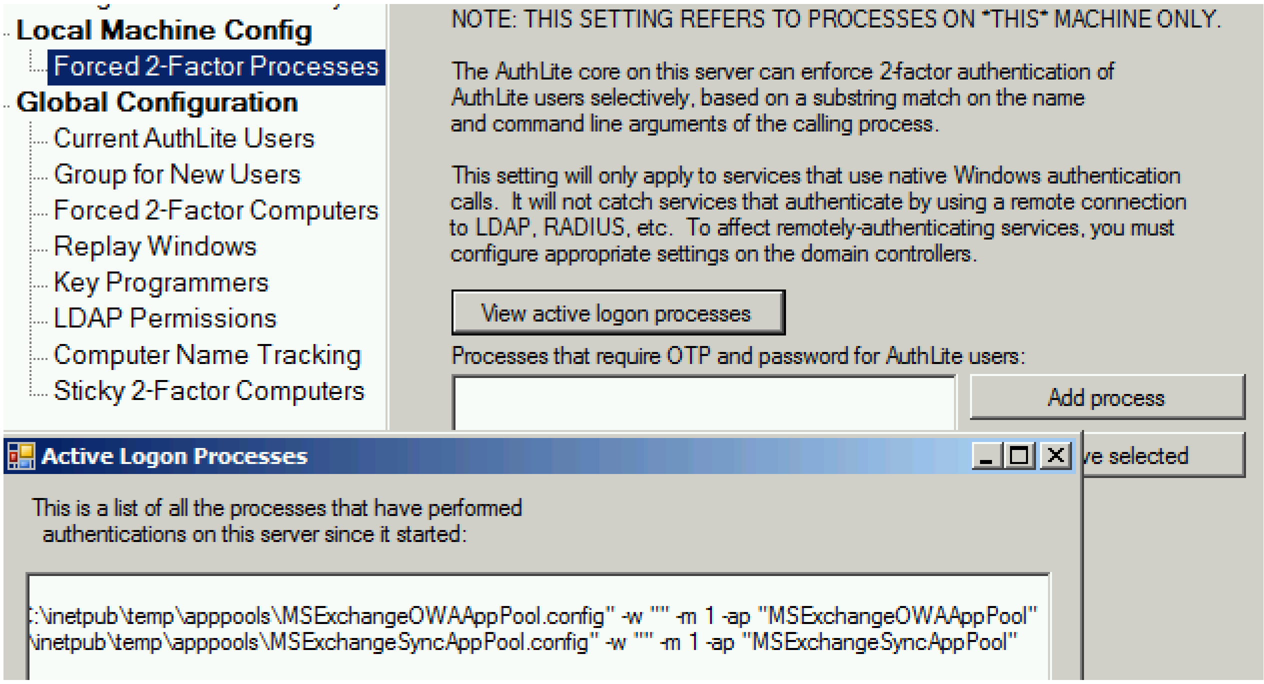
NOTES:

- You must configure this list on each member server separately.
- It is not necessary to set up this list for any machine that is represented in the Forced 2-Factor Computers list.

[4] Although you could use an OATH token app. But for the purpose of this example assume not.

Example Configuration

For a concrete example, we'll consider OWA. On an Exchange server both ActiveSync and OWA run under the same process name (w3wp.exe), but they have different command-lines. You can see what processes have performed authentications so far since the last restart by clicking the “View active logon processes” button:



NOTE: THIS SETTING REFERS TO PROCESSES ON *THIS* MACHINE ONLY.

The AuthLite core on this server can enforce 2-factor authentication of AuthLite users selectively, based on a substring match on the name and command line arguments of the calling process.

This setting will only apply to services that use native Windows authentication calls. It will not catch services that authenticate by using a remote connection to LDAP, RADIUS, etc. To affect remotely-authenticating services, you must configure appropriate settings on the domain controllers.

Processes that require OTP and password for AuthLite users:

This is a list of all the processes that have performed authentications on this server since it started:

```
:\inetpub\temp\apppools\MSExchangeOWAAppPool.config" -w "" -m 1 -ap "MSExchangeOWAAppPool"
\inetpub\temp\apppools\MSExchangeSyncAppPool.config" -w "" -m 1 -ap "MSExchangeSyncAppPool"
```

Note the different command-line options passed to the IIS app pools. Since we want to enforce two-factor authentication for OWA we can add the value “MSExchangeOWAAppPool” to the forced 2-factor processes list, and then OWA logons to this server by AuthLite users will require OTP and password. Other logons will be allowed with password only.

NOTE: IIS/Exchange caches logons for a period of time. Also, AuthLite only updates its knowledge of groups and settings every 20 minutes. So after you enable two-factor enforcement on OWA, you may still be able to log on with one-factor until these caches expire.

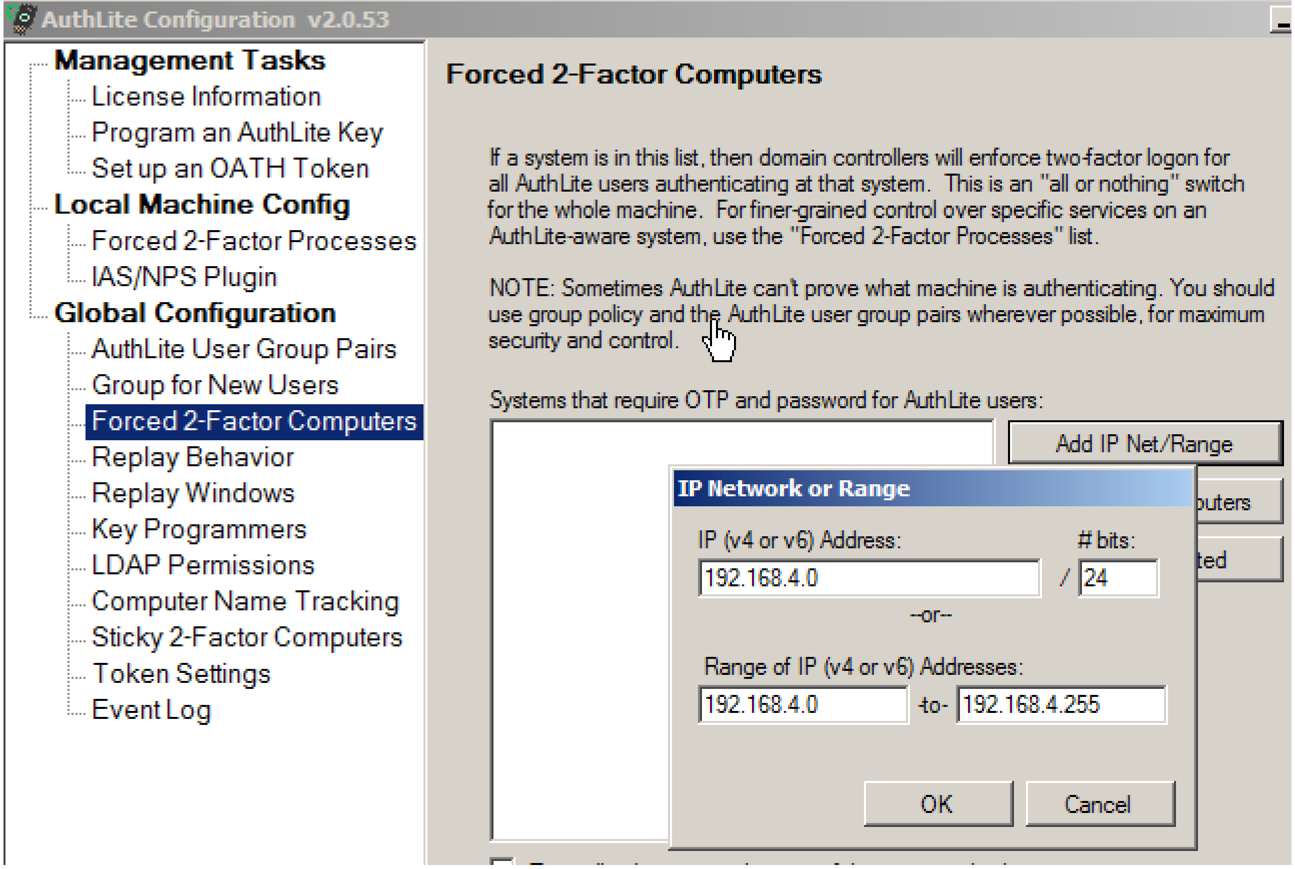
RDP Forcing

To enforce two-factor authentication for the server when Remote Desktop is used, select that checkbox. This appears as a separate option because both RDP and console logons use the same process (so there's no way to add RDP to the above list).

Forced 2-Factor Computers

You can tell domain controllers to reject one-factor authentication from AuthLite users if the requests originate from certain machines. This is not as robust or granular as Using the Domain's Access Control Lists, but may still be useful for some circumstances.

Select by IP Address / Range



Forced 2-Factor Computers

If a system is in this list, then domain controllers will enforce two-factor logon for all AuthLite users authenticating at that system. This is an "all or nothing" switch for the whole machine. For finer-grained control over specific services on an AuthLite-aware system, use the "Forced 2-Factor Processes" list.

NOTE: Sometimes AuthLite can't prove what machine is authenticating. You should use group policy and the AuthLite user group pairs wherever possible, for maximum security and control.

Systems that require OTP and password for AuthLite users:

IP Network or Range

IP (v4 or v6) Address: 192.168.4.0 / # bits: 24

--or--

Range of IP (v4 or v6) Addresses: 192.168.4.0 -to- 192.168.4.255

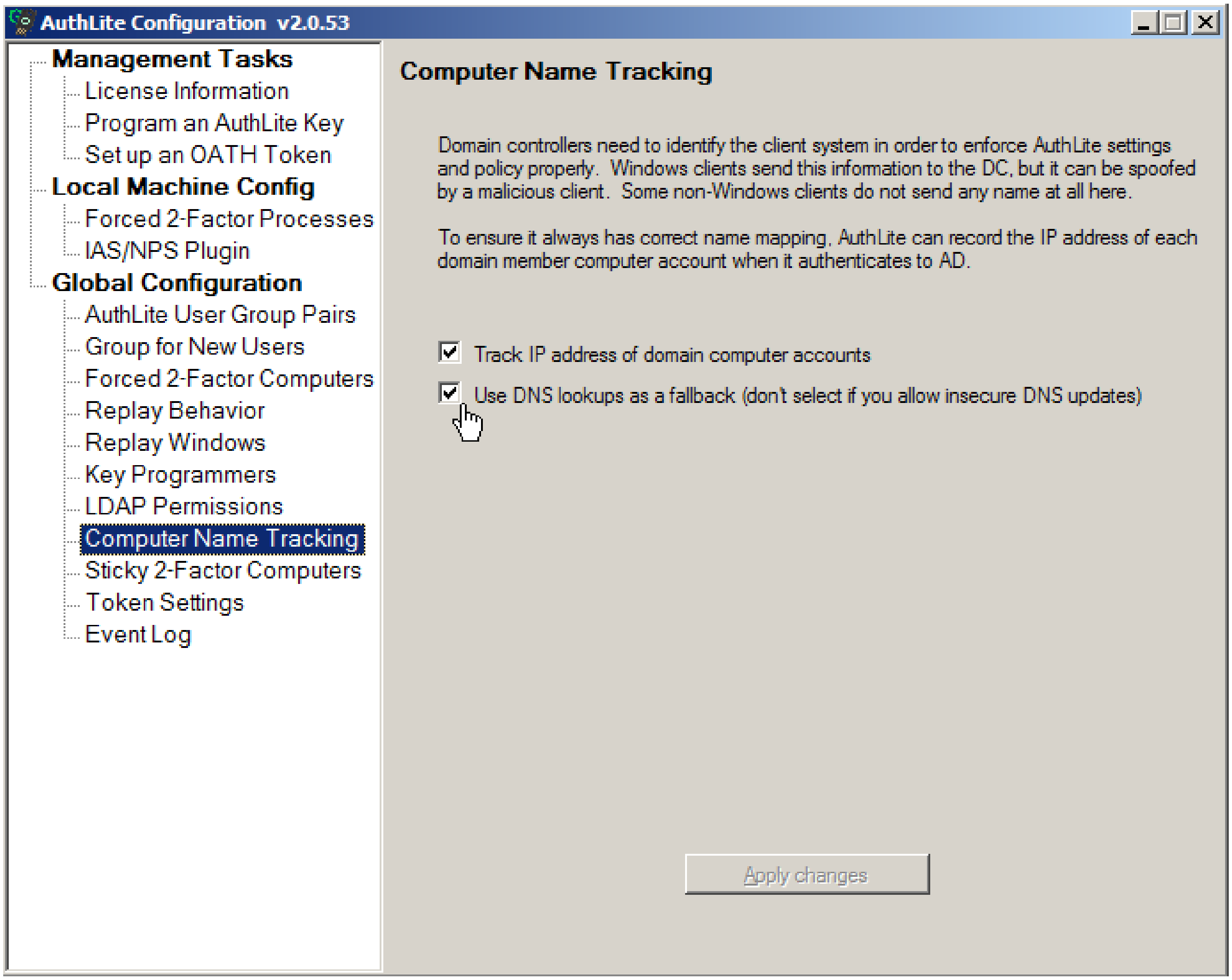
- Enter one or more IP ranges into the Forced 2-Factor Computers list.
- Any time an AuthLite user authenticates from a computer represented in this list, the domain controllers will require two-factor authentication before allowing the authentication.
- **Security Note:** If **any** of your domain controllers in the site are missing the AuthLite software, then they will not enforce or understand two-factor authentications.

Selecting by Name/Group

- It is possible but ***not recommended*** to select machines and groups of machines by name. AuthLite will try to decide what machine is connecting by keeping a map of IP addresses to computer names (see next section). It is not always possible to determine the computer name accurately, so you should use the IP Address selection instead whereever possible.

Computer Name Tracking

- If you are enforcing 2-factor computers based on computer names or groups, it is highly recommended to activate Computer Name Tracking. This will help AuthLite software on the DC's to associate incoming authentication attempts with the correct domain member machine, and prevent spoofing the identity of client systems for the purpose of bypassing two-factor restrictions:



Computer Name Tracking

Domain controllers need to identify the client system in order to enforce AuthLite settings and policy properly. Windows clients send this information to the DC, but it can be spoofed by a malicious client. Some non-Windows clients do not send any name at all here.

To ensure it always has correct name mapping, AuthLite can record the IP address of each domain member computer account when it authenticates to AD.

☑ Track IP address of domain computer accounts

☑ Use DNS lookups as a fallback (don't select if you allow insecure DNS updates)

Entering AuthLite Credentials

AuthLite supports several different ways to supply credentials. Which method you choose may be constrained by the application or logon protocol you are using. For example the application may not tolerate an OTP in the username field, or the authentication protocol could hash the password field contents, rendering useless any OTP entered into that field.

For Yubikeys:

- Enter a yubikey OTP in the username field (instead of the username), then enter password as normal. Or,
- Type username as normal, then enter (password followed by OTP) into the password field. O*r,*
- Type username as normal, then enter (OTP followed by password) into the password field.

For OATH OTPs:

- Enter your username followed by a dash "-" followed by the OTP code shown on your oath token. Then enter password as nomal. Or,
- Type username as normal, then enter (password followed by a dash "-" followed by the OTP code) into the password field. Or,
- Type username as normal, then enter (OTP followed by a dash "-" followed by your password) into the password field.

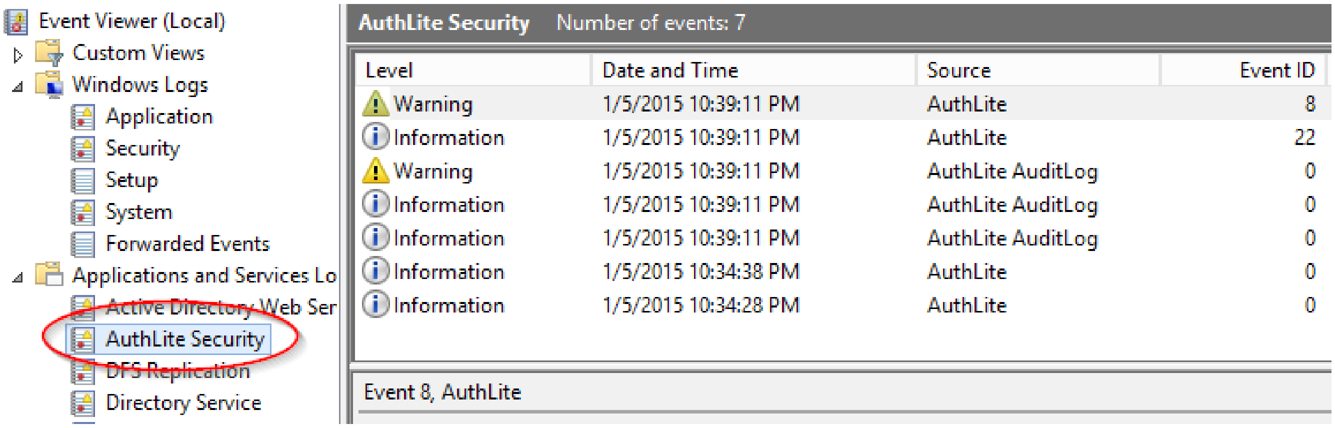
Event Logs and Troubleshooting

Because AuthLite uses your existing enterprise software and UIs, it is usually not possible to report meaningful error messages through the user interface when something goes wrong. You will usually just see a generic-looking logon error. In addition, if 2-factor enforcement isn't working the way you want, then there won't be any errors at all since the 1-factor authentication might be allowed when you expected it to be blocked. Because we can't show detailed errors to the user, event logs are used instead.

Event Log

AuthLite records events into the "AuthLite Security" Event Log any time a logon attempt occurs on the system. Also the service records events for the following actions:

- OTP authentication and replay events
- Key provisioning and other management events
- Computer name / IP lookup events



AuthLite Security Number of events: 7

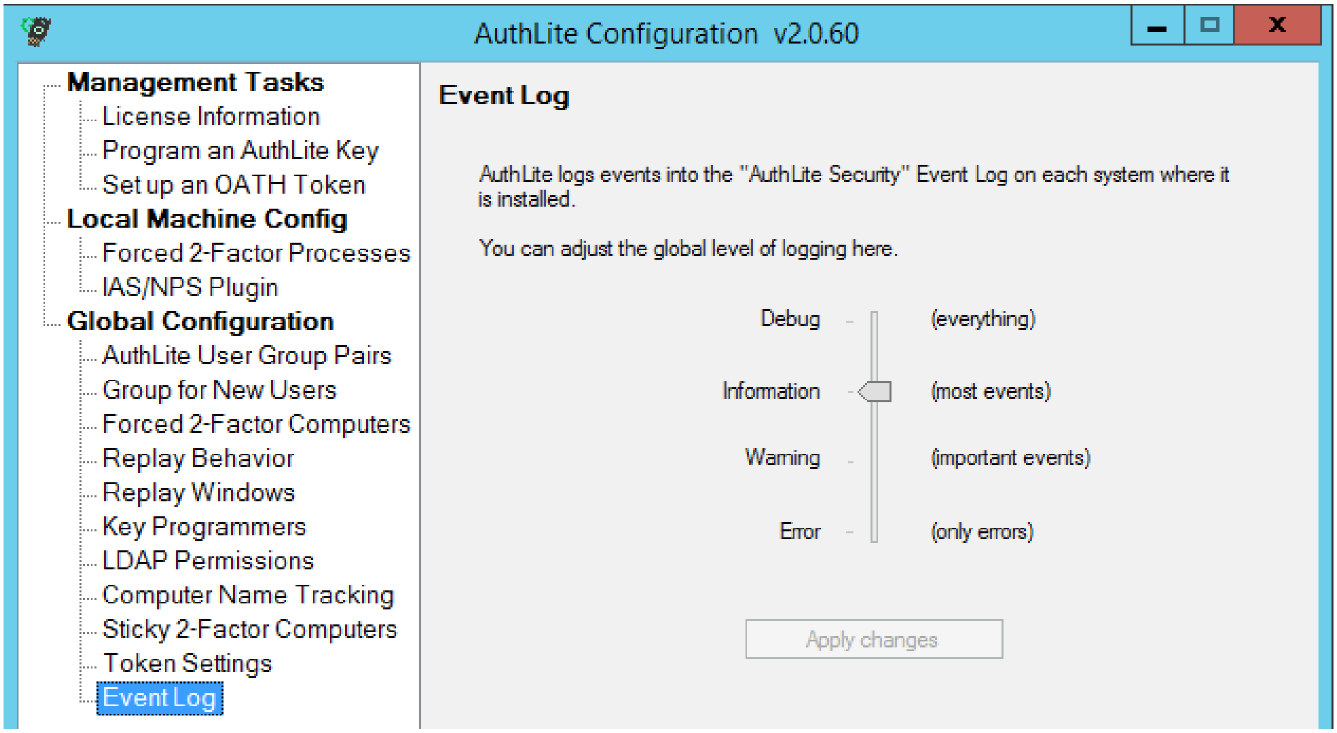
Level	Date and Time	Source	Event ID
Warning	1/5/2015 10:39:11 PM	AuthLite	8
Information	1/5/2015 10:39:11 PM	AuthLite	22
Warning	1/5/2015 10:39:11 PM	AuthLite AuditLog	0
Information	1/5/2015 10:39:11 PM	AuthLite AuditLog	0
Information	1/5/2015 10:39:11 PM	AuthLite AuditLog	0
Information	1/5/2015 10:34:38 PM	AuthLite	0
Information	1/5/2015 10:34:28 PM	AuthLite	0

Event 8, AuthLite

Note: Prior to version 2.0.60, most of these events went into the generic Windows Application log instead of the specialized "AuthLite Security" log.

There will often be *several events* corresponding to what you would consider a "single logon". And events may be spread across the workstation, member server, and one or more domain controllers that are all involved in a "single" logon. These events will only appear when the AuthLite software is installed. (All DCs that may handle authentications from AuthLite users **must** have AuthLite installed to function properly.)

It is possible to turn up/down the level of events that the AuthLite service and infrastructure components emit:



Event Log

AuthLite logs events into the "AuthLite Security" Event Log on each system where it is installed.

You can adjust the global level of logging here.

Information (most events)

Make sure the log level is set to “Information” or higher during troubleshooting. When you are trying to determine why authentications are not working as you expect, your first action should be to note down what time you did the failing test, then find all corresponding events from the AuthLite Security event log on every implicated workstation, server, and all possible DCs, and read what they say. Events of interest will be clustered together around the time of your test. There may be many other unrelated events too, particularly on busy DCs.

If you open a support ticket, collecting events is among the first tasks we will need you to perform.

Windows "Security" event log

When a user completes a logon to Active Directory, you will still see the normal Windows Security log events as well. AuthLite does not remove or replace any of the default Microsoft authentication technology.

Windows Workstation (Endpoint) Protection

There are several important points to consider regarding workstations and the protection of logons/data on these endpoints.

Threat Modeling

Unlike remote network resources, workstations (especially mobile laptops) present a greater attack surface. In addition to subverting the OS logon itself, an attacker could choose to pull the hard drive and directly attempt to access the stored data. Therefore, solutions that only protect the OS logon itself may not be sufficient protection. Consideration should be given to the protection of stored data as well.

Full Drive Encryption

At this time AuthLite does not provide its own branded/integrated full disk encryption, although this may be added in a future release. We recommend using BitLocker with TPM if possible, since this integrates seamlessly into Windows and does not require the entry of any additional credentials.[5]

Untrusted workstations

With AuthLite version 2, the credential data processed by a workstation cannot be reused in the futer gain another kerberos session. By contrast, a malicious AuthLite v1 workstation could gather enough information to impersonate the user in the future. For more information see this KB article.

Per-account encrypted data on Windows

Overview

Windows encrypts several important secrets that are attached to your account, using its Data Protection API (DPAPI):

- Cached/saved logon credentials
- Certificate private keys
- EFS-encrypted files and folders
- Other (application-specific) secrets

In normal (non-AuthLite-aware) Windows, the encryption key for all these secrets is based on the static one-factor Windows password that you enter.

AuthLite enhanced security for workstation accounts

AuthLite-aware systems (machines that have the AuthLite software installed) add additional security to these secrets. In order to use this feature, a randomly-generated challenge/response secret is associated to each yubikey, and gets programmed into a

[5] This BitLocker+TPM authentication mode is quite secure for most threat models, however it is vulnerable to Cold Boot attacks. To protect against the threat model of an attacker chilling and removing a running workstation's DRAM, another approach should be considered.

yubikey's second identity slot (this option is called “support offline logins”, and is provided when you set up your yubikeys.)

The HMAC-SHA1 challenge/response scheme (in addition to your Windows password) is used to secure the encryption key for the user account's DPAPI secrets and cached credentials. For normal online logons, this challenge/response secret is retrieved from the domain controller and synchronized to the workstation. It is not necessary for the yubikey to be plugged in directly to the workstation (it can operate as a remote keyboard e.g. with RDP or virtual machines).

During “offline logons”, the AuthLite software communicates directly with the plugged-in yubikey to do the challenge/response procedure. Any (properly programmed) yubikey that has previously been used to log in online at this workstation will also be able to log in with offline mode.

Ramifications for yubikeys

Programming yubikeys to support AuthLite offline logons will “use up” both identity slots in the yubikey, and destroy any other (old) information that was previously loaded onto the key.

1. The first identity slot will contain the one-time passcode identity for entering OTPs as keystrokes. This identity is triggered each time the gold contact on the key is pressed. The OTPs generated can be used to log in to any AuthLite-aware system or network.[6]
2. The second identity slot will contain a challenge/response secret that gets automatically used by AuthLite when logging in to workstations that are offline from the domain.

Ramifications for OATH tokens

OATH tokens cannot be used to authenticate to offline workstations, because of the following limitations:

- It's not possible to authenticate the time-based OTP short code without having a connection to the DC.[7]
- There would be no additional security provided for the offline case. Without a strong challenge/response secret, the user's secret data would still only be protected by their static Windows password.

Zero-client two-factor workstation logons

It is possible to log in to workstations with 2-factor credentials even if the workstation has no AuthLite software installed. The DC's with AuthLite installed will still enforce Two-factor Authentication as expected.

Please note that security is VASTLY improved (see Per-account encrypted data on Windows) with the AuthLite software installed. You can push this software with Group Policy and it is recommended at the highest level to install the software if at all possible.

There are several important considerations for zero-client workstations:

[6] Provided the intermediate software supports long enough username/password values. AuthLite OTPs are normally 64 characters. They can be programmed shorter but will in all cases be at least 34 characters long (that shortest length would support a maximum of 255 keys in your whole domain.)

[7] Some other products address this by having the workstation cache a large number of potential OTP “answers” on the workstation's hard drive. This does not actually provide any security beyond the user's password.

- You must disable cached logons in Group policy. If you don't do this, then any attacker who knows the username and Windows password can log in simply by forcing the machine to go offline first. This is because without AuthLite software, Windows is unaware of the OTP security and continues to protect cached logons using only the Windows password.
- Windows will hash the password field, so you must enter the OTP in the username field in order for it to reach the DC. On AuthLite-aware systems, no such limitation exists, because the software can intercept and process the authentication request properly regardless of how credentials are entered.
- You should enforce the group policy to prevent the last username from being shown. This setting will ensure you always get a blank, type-able username field during logons and unlocks. If you don't do this, then the unlock screen will only show a password field. To unlock, you'd have to use the “Switch User” functionality and select “other user” so you'd get a new opportunity to enter an OTP into the username field.
- Parts of Windows will display the OTP you entered instead of showing the proper username. Although the correct username is returned in the session token, parts of the default Windows software will use the value that was typed in at logon time. This will result in generally cosmetic issues.

Known workstation limitations

- If a user's session lasts long enough for their Kerberos ticket-granting ticket to expire, the workstation will attempt to acquire a new ticket in the background using the previously entered credentials. For 2-factor users this operation will fail, because (by design) the workstation does not possess the user's full credentials. Therefore, logon sessions that endure past the expiration of the Kerberos TGT will become unable to access network resources. Upon trying to access a resource without a valid TGT, Windows will automatically show a message to the user instructing them to lock and unlock the workstation to provide domain credentials.

Workstation Safe mode operations

AuthLite can be used in *Safe Mode with Networking*. See the sections below for slightly different behavior in each operating system.

Windows XP/2003

If you start your machine in Safe Mode (with Networking), you can log in with AuthLite accounts as normal. This will only work in safe mode **with networking**, not the default safe mode or safe mode with command line. The AuthLite service communicates with the Windows infrastructure using a TCP socket, so the networking components must be loaded in order to perform any AuthLite actions.

Windows Vista/2008/Windows 7

If you start your machine in Safe Mode (with Networking), the AuthLite Credential tile extension will not be loaded. However, you can still log on with an AuthLite Integrated user as normal, even though the usual AuthLite popup balloon is not shown.

Note that you must use safe mode **with networking**, not the default safe mode or safe mode with command line. The AuthLite service communicates with the Windows infrastructure using a TCP socket, so the networking components must be loaded in order to perform any AuthLite actions.

Note: If your logon fails, it could be that the AuthLite service has not started yet. Normally when the AuthLite UI is loaded, an appropriate error message would be shown, but in safe mode the error you get will be generic and unhelpful. Wait a few minutes until all services have surely been loaded, and try again.

Password Operations

When an AuthLite user changes their password or has their password administratively reset, this will not affect their AuthLite keys. They will log in with their existing OTP token and the new password that has been set.

Reverting a user to normal Windows logon

To revert a user back to one-factor logon and remove them from all consideration of AuthLite permission checking, you must remove the account from all AuthLite User Groups. Also, uninstalling AuthLite everywhere will (trivially) have the effect of restoring all accounts to standard Windows functionality.

Overwriting (reprogramming) an existing Yubikey

There are several situations where the existing settings of a yubikey are no longer useful, and you want to reprogram it:

- The key was purchased from Yubico and is set up to use their online service, but you want to use it for AuthLite instead
- The key's former user is gone, or has changed their own account back to use a password-only logon

You can overwrite an already-programmed yubikey in any of the normal AuthLite programming operations. You will see an additional dialog warning you that the old information on the key will be destroyed[8].

[8] Except in the bulk Key Programmer, which overwrites key data without warning you every time.

Multiple OTP Tokens for the Same User

You can assign as many Yubikeys and OATH tokens as you want to each user account, and they will all operate interchangeably[9]. Each key will be programmed with its own distinct randomly-generated secret. So the loss or compromise of one key does not implicate any other keys the user still carries.

[9] Although OATH tokens cannot be used for offline workstation logons.

AuthLite Data Management

For maximum data safety, AuthLite stores key data forever by default, and does not run any logic to prune old users or keys out of its database. For example, when a user re-programs an existing key, the key's old data record is no longer used, but still remains in the data store. This does not present any security, performance, or functionality problems[10], but you may wish to remove old records to keep the database tidy.

The AuthLite Data Management program can be run from any AuthLite-aware domain controller. It allows you to display, sort, and search the data records for all the AuthLite keys that are currently provisioned in your domain.

Connecting to Active Directory

When you first start the AuthLite Data Manager, the application will automatically connect to the Active Directory instance on the local machine. The name of the domain controller to which the application is connected is shown in the status bar. To connect to a different domain controller, choose the **Conect to...** menu item from the **File** menu.

Refresh the Data

Choose **Refresh** from the **View** menu, click the **Refresh** button on the toolbar, or hit **F5**.

Find a Key

Click in the **Search** box in the tool bar, enter your search query, and hit the **Enter** key. Hit **ESC** to clear the search. The fields to search can be selected from the drop-down on the right.

Find by OTP

If you have an AuthLite OTP, and need to find the corresponding key entry, enter the OTP into the **Find OTP** box and hit the **Enter** key.

View a Key's Properties

To view the properties of a key, double-click on a key in either the tree-view or the list-view, or right-click on a key and choose **Properties** from the context menu.

Delete a Key

Select one or more keys in the list-view, choose the **Delete key(s)...** option from the **File** menu, or hit the **Delete** key, or press the **Delete** toolbar button, right-click and choose the **Delete** option from the context menu. **Be careful** because deleting key records is a permanent operation with no "Undo". If a record is in use, then deleting it will prevent that user from logging on to AuthLite-aware systems/services.

Reassign a Key to a New User

From the key properties dialog, click the **Reassign key** link. Or choose **Reassign key...** from the **File** menu. Or select one or more keys, right-click, and choose **Reassign** from the context menu.

VPN/RADIUS Authentication Overview

AuthLite has support for several arrangements of RADIUS authentication. Different situations

[10] Key data is only useful while it matches the AES key of a programmed AuthLite token, and correlates with a user. After a key is re-programmed, the old data no longer matches it and cannot be used either accidentally or by an attacker.

you may encounter are described below.

- Different RADIUS clients have different expectations about how the authentication will work
- Different VPN tunnel types treat the password field differently

RADIUS for Username and OTP authentication (no password)

Many vendors, such as Citrix and Juniper, allow you to configure 2-factor authentication by setting up two separate authentication mechanisms. The first mechanism (usually Windows native, or LDAP) is used for the "normal" authentication to Active Directory of the username and password. The second mechanism is set to RADIUS, and pointed at an AuthLite-aware RADIUS service.

The RADIUS server will only receive the username and the OTP. In this setup, the bulk of your AD infrastructure need not even be AuthLite-aware, since the only OTP authentication point is the RADIUS service, and the other DC's just get standard username/password requests.

You can set up this configuration with IAS/NPS as your RADIUS service. Select "one factor" in the AuthLite IAS/NPS PAP settings.

RADIUS for authentication of OTP and password together

Some systems such as the Cisco VPN do not split up their authentication into two steps as above. You can use one RADIUS target to authenticate both factors at once, in several different configurations.

How credentials are entered

- MS-CHAPv2 with OTP in the *username* field, and password in the *password* field. MS-CHAPv2 hashes the password field at the client, so the OTP must be sent in the *username* field. Supported by IAS/NPS. *PPTP NOT RECOMMENDED* [11]
- PAP with OTP in the *username* field, and password in the *password* field. Supported by IAS/NPS.
- PAP with the username in the *username* field, and the password and OTP **together** in the *password* field. Supported by IAS/NPS.

Constraints for different authentication scenarios

There are several considerations that will constrain which authentication strategy you can use:

- 802.1x authentication uses PEAP between the workstation and access point, and then RADIUS with MS-CHAPv2 between the access point and the authentication server. MS-CHAPv2 hashes the password field at the client, so the OTP must be sent in the *username* field. Consequently, your access point won't ever see the real user names, instead it will see the OTP strings. To support 802.1x authentication you need to use IAS/NPS. Security Note[12]

[11] As of 2012, PPTP tunnel security using the MS-CHAPv2 protocol has been completely broken. Consider immediately changing to some more secure technology.

[12] The security of industry standard 802.1x wireless authentication is not affected by the 2012 breaking of the MS-CHAPv2 protocol because the entire tunnel is independently encrypted by PEAP first.

- If you are using a PPTP VPN tunnel, you must use MS-CHAPv2 authentication. MS-CHAPv2 hashes the password field at the client, so the OTP must be sent in the *username* field. NOT RECOMMENDED[13]
- If the VPN (or front end) server needs to do its own policy checking or logging based on the entered username, then you won't be able to use MS-CHAPv2 because the real username is not ever sent to the VPN (or front end) server. You'll have to choose one of the PAP modes.

[13] As of 2012, PPTP tunnel security using the MS-CHAPv2 protocol has been completely broken. Consider immediately changing to some more secure technology.

Using IAS/NPS for RADIUS with AuthLite

Beginning with AuthLite version 1.2, a plug-in for Microsoft's IAS (also called NPS) RADIUS service is available. Activating this plug-in automatically makes IAS/NPS AuthLite-aware. Simply activate the plug-in and then use the IAS/NPS configuration panel to set up your connection policies.

Procedure

- Open the AuthLite Configuration application on the Domain Member Server you wish to set up as a RADIUS server. (Before version 2.0.62 it was a requirement to use a DC).
- Under Service Configuration, select the "IAS/NPS Plugin" item
- Select the "Enable IAS/NPS support on this server" checkbox
- To allow more flexibility of RADIUS clients, you can select the "Permit requests that don't send the domain name."
- Since Microsoft's IAS/NPS configuration dialogs are not AuthLite-aware, there is one additional setting you must select here. It controls how PAP requests will be processed.
    - One-factor (OTP in password field): In this mode, the server expects the username in the username field, and an OTP in the password field. This is the configuration you want to use if AuthLite is being used to validate **only** the OTP factor, and another process is being used to authenticate the user's name and password. For example, this is how Citrix and Juniper's two-factor authentication works.
    - Two-factor (OTP and Password both included): In this mode, the server expects to see both an OTP and a password included in the request. The OTP can be in the username field, or combined together with the plain text password in the password field[14]. This is the configuration you would use when you want IAS/NPS to authenticate both factors together.
- Apply changes
- **Restart the AuthLite service and also the IAS/NPS service**. Changes are only applied after the services restart.

Notes

- You must set up an appropriate policy in IAS/NPS to allow connections from the RADIUS client of the proper authentication type.
- You do not need to select between PAP and MS-CHAPv2 anywhere in the AuthLite interface, but the policy you configure on IAS/NPS will allow you to select between these settings.

[14] The reason for this flexibility is that some VPN servers need to see the username in order to enforce their own policy independently of the RADIUS server, or to do their own logging. But if your server does not need to know the username, then your users can enter OTP/password into the VPN client and save effort.

Microsoft VPN Client settings

AuthLite can work with the pre-installed VPN client that ships with Windows, and requires a minimum of configuration on the client side.

Username field retention

The Microsoft VPN client saves the last entered value from the username field by default. If you are using the Username field for OTP entry, then you may wish to change this behavior (so the user doesn't have to remember delete the string each time to enter a new OTP).

If you manage the workstations, you can set the following registry value:

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\RasMan\Parameters]
"DisableSavePassword"=dword:00000001
```

Although its primary use is to disable the option of saving VPN passwords, it also has the effect of clearing the username field.

Wireless 802.1x Authentication

AuthLite supports 802.1x authentication through its NPS RADIUS plug-in.

Prerequisites

- We do not provide extra client-end software to add 802.1x support to legacy workstations. It is assumed that your client machines are capable of performing wireless authentication, such as is possible with Windows 7. Alternately, you could use a third party solution such as NetMotion Mobility XE.
- It is assumed your Access Point is capable of supporting authentication with RADIUS with PEAP/MS-CHAPv2.[15] We use DD-WRT in our validation testing.
- Microsoft NPS as a RADIUS server. It should be installed on a Domain Controller.
- Windows 7 client machine whose Trusted Root certificate store trusts the certificate your NPS server is using.
- Users you wish to authenticate are Active Directory users. AuthLite will use AD for the password portion of the authentication.

Configuration

- Start **without** AuthLite. Get 802.1x wireless authentication working between your client workstations, the access point, and the NPS server. You should be able to type your username and password into the wireless authentication prompt on your workstation, and be authenticated and connected to the wireless network. Before you can add AuthLite, you need the basic setup to be working.
- Additional Windows 7 client settings to work with AuthLite:

[15] The security of industry standard 802.1x wireless authentication is not affected by the 2012 breaking of the MS-CHAPv2 protocol because the entire tunnel is independently encrypted by PEAP first.

        - In the Security tab of the network, deselect "Remember my credentials" (OTPs will only be valid one time!).
        - In PEAP settings, select EAP-MSCHAPv2 for the authentication method and configure it NOT to use the Windows credentials automatically (we want to enter OTPs).
        - In Security->Advanced, select "user" authentication.
    - AuthLite configuration settings:
        - Make sure you have your AuthLite users reflected in one of your AuthLite User Groups
        - Enable the IAS/NPS plug-in
        - Restart the AuthLite and NPS services

Testing

After users are in an AuthLite User Group and the NPS plugin is active, those users will no longer be allowed to authenticate with just username and password. *Instead of entering a username:*

- *For yubikey users,* tap the OTP into the username field of the wireless authentication pop-up.
- For OATH token users, type in your username followed by a dash “-” followed by the OTP from your OATH token app.

Then enter the password as normal, and you should get authenticated to the network.

DirectAccess and NetMotion Mobility XE

AuthLite is very simple to use with DirectAccess or NetMotion Mobility XE, no special configurations are needed. In a properly functioning DirectAccess/Mobility setup, the workstations operate as though they are always on the LAN.

Procedure

- Get your DirectAccess/Mobility infrastructure set up and working first **without** AuthLite being used at all.
- Install AuthLite on the domain controllers and workstations.
- License AuthLite
- Identify AuthLite Users and Provision their keys.
- For Mobility, be sure to configure machine authentication as well as Windows user authentication.
- For Mobility, AuthLite must be installed on the NetMotion Mobility server.
- At the time the user logs in, the workstation will already have the machine-level DirectAccess/Mobility tunnel up and running. AuthLite communicates with the DC over this channel automatically, and performs OTP validation exactly as if the machine was connected directly to the LAN.
- Be sure to use one of the methods for Requiring Two-factor Authentication. **Otherwise your setup may *support* 2FA but not *enforce* it.**

Notes

- DirectAccess is a complex thing to get set up from scratch, especially if you are trying to do it without the UAG wizard. You should definitely **not attempt to add AuthLite** into the mix until you are finished troubleshooting any DirectAccess issues. Otherwise you'll make it harder to figure out where the problems are.

File Servers

Prerequisites

The instructions below assume you have working shared folders already. Please verify the following points:

- Using a non-AuthLite user who has permissions to do this, verify you can connect and that your credentials give you access to the file server / shared folder.
- If you don't have this working as above, then adding AuthLite will only make things harder to troubleshoot. If you contact us for support the first thing we will do is try a connection with a non-AuthLite user to confirm your end-to-end setup is configured properly.

AuthLite setup for Shared folders

- Install AuthLite on the file server and domain controllers.
- Make sure all AuthLite users are represented in an AuthLite User Group.
- Set up one of the methods of Requiring Two-factor Authentication. The best way is to set Allow/Deny ACLs on the shared folders to take advantage of AuthLite Group Pairs.

Using Shared folders with AuthLite

To authenticate to a shared folder with an AuthLite user:

- Launch a shortcut to the shared resource or UNC path
- When the authentication prompt appears, tap your AuthLite key *into the Username field.* OATH token users should enter their username followed by a dash "-" followed by the OTP from their token.[16]
- Enter your password into the password field
- Click OK and the shared resource should open

[16] The password field is hashed by the NTLM protocol, so it cannot be used to enter OTPs.

Supporting Remote Desktop logons

This section assumes a direct RDP connection or publishing point. For Remote Desktop Gateway scenarios see the next section.

Prerequisites

The instructions below assume you have a working RDP configuration already. Please verify the following points:

- Using a non-AuthLite user who has permissions to do this, verify you can connect and that your credentials log you in to the Terminal server / remote desktop system seamlessly.
- If you don't have this working as above, then adding AuthLite will only make things harder to troubleshoot. If you contact us for support the first thing we will do is try a logon with a non-AuthLite user to confirm your end-to-end setup is configured properly.

AuthLite setup for RDP usage

- Install AuthLite on the Terminal Servers / Remote desktop systems, and domain controllers.
- Make sure all AuthLite users are represented in an AuthLite User Group.
- Use one of the methods of Requiring Two-factor Authentication. The best way is to assign Group Policy Allow/Deny permissions based on the AuthLite User Group Pairs feature. Or, add the Terminal Servers / Remote desktop systems (or groups containing them) into the Forced 2-Factor Computers list. Or, select “Remote Desktop Authentications” in the terminal server's Forced 2-Factor Processes section. This will make sure that AuthLite users can only connect if they enter a valid OTP and password.
  NOTE: Non-AuthLite users will **not** be blocked by this setting. To prevent certain non-AuthLite users from connecting, simply use group or local policy to restrict the users and groups allowed to log on.
- An RDP connection using Network Layer Authentication requires two sequential authentication events to establish your session. You need to set a Replay window value greater than zero so one entered OTP can be used for both of the authentications needed to establish your session.
- Also, if your client is on the LAN, its first authentication will go directly to the DC, so in addition to having the RDP server in the replay window, you should include all possible RDP client IP ranges in the window's “Initiators” list.

Using RDP with AuthLite

To log in to the remote desktop server:

- Launch the mstsc.exe client and specify the terminal server you are connecting to
- Tap your AuthLite key *into the Username field*. OATH token users should enter their

username followed by a dash “-” followed by the OTP from their token.[17]

- Enter your password into the password field
- Connect

[17] The password field is hashed by the NTLM protocol, so it cannot be used to enter OTPs.

Supporting Remote Desktop Gateway

If you publish a Remote Desktop Gateway to your extranet, you can configure the servers to support AuthLite users.

Prerequisites

The instructions below assume you have a working RDG/TSG configuration already. Please verify the following points:

- A Remote Desktop Gateway is set up and configured with appropriate policies
- One or more Terminal Servers or Remote Desktop services configured
- If possible, set the RDP proxy settings to use the same credentials for the RDG and the terminal server. This will enable you to enter one username and password and connect all the way through to the target system.
- Using a non-AuthLite user who has permissions to do this, verify you can connect from the Internet, through the RDG, and that your credentials log you in to the Terminal server / remote desktop system seamlessly.
- If you don't have this working as above, then adding AuthLite will only make things harder to troubleshoot. If you contact us for support the first thing we will do is try a logon with a non-AuthLite user to confirm your end-to-end setup is configured properly.

AuthLite setup for the RDG scenario

- Make sure all AuthLite users are represented in an AuthLite User Group.
- AuthLite should already be installed on domain controllers.
- Install AuthLite on the RDG system. The RDG server must be a domain member.
- Install AuthLite on the Terminal Servers / Remote desktop systems. These systems must be domain members.
- Configure some method for Requiring Two-factor Authentication. The best way is to use the AuthLite User Group Pairs feature. You can set up your gateway to only allow users who have a 2-factor tag group in their session.
- Alternately you could add the Terminal Servers / Remote desktop systems (or groups containing them) into the Forced 2-Factor Computers configuration list. Or, select “Remote Desktop Authentications” in the terminal server's Forced 2-Factor Processes section. This will make sure that AuthLite users can only connect if they enter a valid OTP and password.
  NOTE: Non-AuthLite users will **not** be blocked by this setting. To prevent certain non-AuthLite users from connecting, simply use group or local policy to restrict the users and groups allowed to log on.
- If possible, set the RDP proxy settings to use the same credentials for the RDG and the terminal server. This will enable you to enter one OTP and password and connect all the way through to the target system.
- An RDG connection requires several sequential authentication events to establish your

session. You need to set a Replay window value greater than zero so one entered OTP can be used for all the authentications needed to establish your session. We find about 10-20 seconds is usually sufficient in production. Slow/testing environments may require longer.

- Also, if your client is on the LAN, its first authentication will go directly from client to DC, so in addition to having the RDG and RDP servers in the replay window, you should include all possible RDP client IP ranges in the window's “Initiators” list.

Using RDG with AuthLite

To log in to the remote desktop server:

- Launch the mstsc.exe client
- In advanced settings, specify the external address of the RDG proxy server
- Select to use the same credentials for the proxy and the terminal server
- Specify the terminal server you are connecting to
- Tap your AuthLite key *into the Username field.* OATH token users should enter their username followed by a dash “-” followed by the OTP from their token.[18]
- Enter your password into the password field
- Connect

[18] The password field is hashed by the NTLM protocol, so it cannot be used to enter OTPs.

Supporting Outlook Anywhere

If you publish Outlook Anywhere to your extranet, you can configure the servers to support AuthLite users.

Prerequisites

The instructions below assume you have a working OA configuration already. Please verify the following points:

- A working Exchange organization
- IIS and Exchange front end server
- Outlook Anywhere configured on the server, set to use NTLM authentication (Note: this option also allows Kerberos Constrained Delegation, which is what we'll use for the case of publishing from ISA/TMG server)
- IIS on the Exchange front end server should have the RPC folder's authentication set to Integrated.
- RPC/HTTP configured and working.
- (Optional) OA published through a domain ISA/TMG server, listener pre-authenticating in HTTP/Basic mode, and rule delegating to the IIS server using Kerberos Constrained delegation.
  - If you are not pre-authenticating at an ISA/TMG publishing point, you can still use AuthLite with OA; just ignore the parts of the below setup that deal with ISA/TMG server, and set the Outlook proxy authentication to NTLM instead of Basic.
  - It is not possible to pre-authenticate an OA connection at an ISA/TMG server that is a workgroup machine, it *must* be a domain member.
- Set the Outlook proxy to the public interface of your publishing point, and select Basic authentication (if not using ISA/TMG, select NTLM authentication).
- Using a non-AuthLite user who has permissions to do this, verify you can connect from the Internet, through ISA/TMG server, through RPC/HTTP, and that your credentials log you in to Exchange seamlessly.
- Outlook Anywhere is hard to set up! If you don't have this working as above, then adding AuthLite will only make things harder to troubleshoot. If you contact us for support the first thing we will do is try a logon with a non-AuthLite user to confirm your end-to-end setup is configured properly. Here are some resources that we have found helpful in troubleshooting:
  - How to Install Exchange 2007 SP1 and SP2 Prerequisites on Windows Server 2008
  - How does Outlook Anywhere work (and not work)?
  - How to use the RPC Ping utility

AuthLite setup for the OA scenario

- Make sure all AuthLite users are represented in an AuthLite User Group.
- Install AuthLite on the DCs, and Exchange front end server containing IIS, RPC/HTTP, and the client access services.
- In the Forced 2-factor Processes list of the front end server, specify a string to match the Outlook Anywhere application pool. This is the setting that forces AuthLite users to submit 2-factor credentials. **Without this setting, Outlook could tolerate 2FA but it would not enforce it!**
- Set Replay Behavior to Retry, so that the Exchange back-end servers can use stale OTP credentials without balking.
- Outlook Anywhere 2010 will send your credentials repeatedly over the course of the session. You need to set a Replay window value for your front end server one entered OTP can be used for all the authentications needed to establish your session. After the window duration expires, Outlook will prompt for new logon credentials again.
- Outlook Anywhere 2013 seems to use the credentials just during session startup, so you could specify a short replay window as you would with RDP.

Using OA with AuthLite

To connect with Outlook Anywhere:

- Go into the advanced connection settings of your Outlook's email account
- Specify the external address of the OA proxy
- Select Basic authentication if using ISA/TMG to pre-authenticate. Select NTLM if authenticating directly to IIS.
- When prompted for credentials, tap your AuthLite key *into the username field.* OATH token users should enter their username followed by a dash "-" followed by the OTP from their token.[19]
- Enter your password into the password field
- Connect
- With Exchange/Outlook 2010, after the Replay window expires, you will be re-prompted for new credentials. Enter a new OTP and your password to continue.

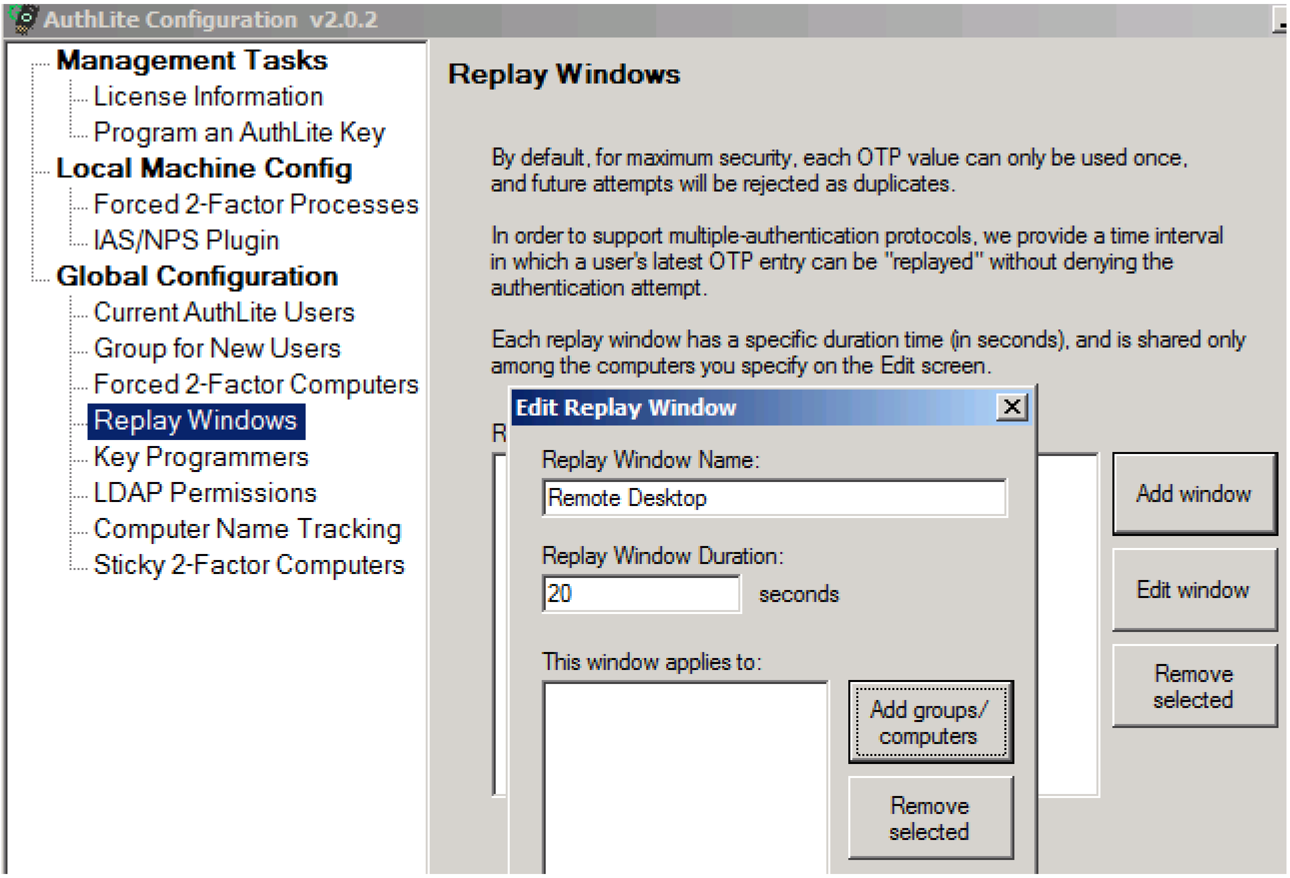
[19] The password field is hashed by the NTLM protocol, so it cannot be used to enter OTPs.

Replay windows to support re-authenticating protocols

When a user wants to connect to a service, they enter their credentials one time, and expect the software to use these values as many times as needed in order to log on and maintain their session. Some network protocols such as Outlook Anywhere and Terminal Services authenticate at each hop along the way from the client to the final destination server. Outlook opens and closes connections periodically, attempting to use the same credentials that the user entered to log in each time. HTTP "basic" authentication provides the same credentials for each connection.

Since AuthLite is a "one-time passcode" system, normally every attempt to use the same OTP again would result in the request being denied. In order to support multiple-authentication protocols, we provide a way to tell AuthLite to allow a user's latest OTP entry to be "replayed" for a certain amount of time without denying the authentication attempt.

This setting is controlled by the "Replay Windows" item of the AuthLite configuration tool.



Replay Windows

By default, for maximum security, each OTP value can only be used once, and future attempts will be rejected as duplicates.

In order to support multiple-authentication protocols, we provide a time interval in which a user's latest OTP entry can be "replayed" without denying the authentication attempt.

Each replay window has a specific duration time (in seconds), and is shared only among the computers you specify on the Edit screen.

Replay Window Name: Remote Desktop

Replay Window Duration: 20 seconds

This window applies to:

Each Replay Window you define will apply to a set of one or more computers or IP address/ranges on the network, and they are enforced by the domain controllers.

For a concrete example: In an RDG scenario you would specify each server that will participate in the authentications together: the RDG server and all its possible terminal servers should share *the same* Replay window. Also if clients are coming from the LAN, then you should also add the IP range of possible clients to the Initiator list. You can use groups and IP ranges rather than placing individual computer names into the list directly. You can specify servers and IPs in more than one replay window if needed.

NOTE: As with most AuthLite settings, Replay window configuration can take 20 minutes to propagate to all systems.

Security considerations

The window mechanism only allows a limited replay on a user's most recently entered OTP. So no matter what the size of your replay window you need not be concerned about previously-entered OTPs being used again maliciously. Only the freshest, most recently entered OTP is allowed to authenticate repeatedly during the window, and as soon as the user enters a new OTP any time remaining on the old window is canceled.

A short replay window such as 10-20 seconds does not notably diminish the security of an OTP system against most types of attacks. However if an adversary can launch immediate parallel sessions from your machine or in some automated, instantaneous fashion, then any replay window at all can allow impersonation. If you are not using any multiple-authentication protocols with AuthLite you can run without any replay windows configured, disabling this behavior completely.

A longer replay window such as is needed for Outlook Anywhere or HTTP Basic authentication decreases some of the benefits of a one-time passcode system. An attacker who is able to capture the user's OTP and password would have the ability to use these credentials *during the replay window*, and impersonate the user. A long window gives an adversary more leisure to perform an impersonation attack, and requires less sophistication. The dual credentials are still far more secure than a plain one-factor password, and the vulnerability is still time limited, but this is not *as* secure as using a small (or no) replay window.

RDG/RDP settings

For an RDG scenario, a short window value of 20 seconds is probably long enough to allow all the authentications (RDG, RPC, Network Layer Authentication, remote desktop session) to complete. And after those initial connections, no more authentications need to be performed. If you are not able to connect, check your AuthLite Log for recent replay events, and increase the associated replay window as needed.

Also, if your client is on the LAN, its first authentication will go directly to the DC, so in addition to having the RDP server in the replay window, you should include all possible RDP client IP ranges in the window's “Initiators” list.

Outlook Anywhere settings

For Outlook Anywhere 2010, several connections will be opened and closed throughout the user's session, and Outlook will keep using whatever credentials the user most recently entered. After the OTP replay window expires, Outlook's new connections will fail, and the user will see a pop-up dialog requesting new credentials.

So the length of your OTP replay window will effectively determine how long a user can use OA before needing to enter a new OTP and their password into the authentication pop-up.

Set the window long enough so as not to be overly annoying, but short enough to mitigate the threat of an attacker recording and re-using the credentials later. For example 30 minutes (set as 1800 seconds) is a reasonable session length, but 8 hours would probably be irresponsibly long.

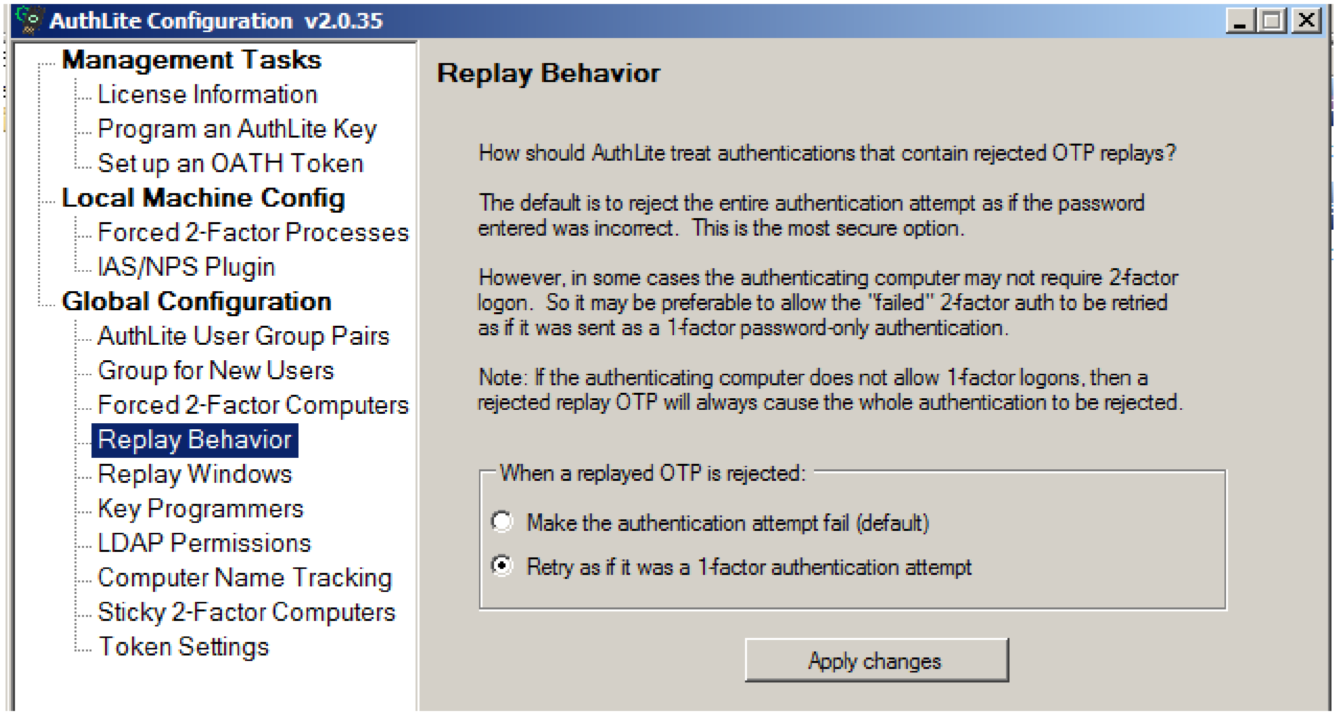
Outlook 2013 seems to do a better job keeping existing connections alive. Best practice is to only force 2-factor authentication on the front end RPC/HTTP server, and configure Replay Behavior to allow 1-factor retry of stale 2-factor credentials, so the back end servers can re-use the entered credentials.

Replay Behavior setting

One thing we have not yet considered is what behavior should occur when a two-factor authentication attempt is a non-allowed replay. By default AuthLite will force the authentication to fail, and return an error message. This behavior is the default for historical reasons, however it is unlikely to be the way you want to keep it.

There are many situations where credentials are stored and sent repeatedly by well-meaning client software. Each time you authenticate to a new NTLM resource, the credentials you entered at login-time are being sent AGAIN to the server. For one-factor passwords this is a detail you never need to think about, but with one-time credentials it can be a problem. If several stale credential attempts are made in a short interval, the account could get locked out even though the user hasn't done anything wrong.

So here is where we come to the Replay Behavior configuration. You can tell AuthLite that when a two-factor authentication is rejected as a replay, to discard the OTP and try again as if it was a simple one-factor logon instead. This allows services that don't need 2-factor security to tolerate seeing stale 2-factor credentials, and treat them as if they were just normal one-factor password-only logons.



Replay Behavior

How should AuthLite treat authentications that contain rejected OTP replays?

The default is to reject the entire authentication attempt as if the password entered was incorrect. This is the most secure option.

However, in some cases the authenticating computer may not require 2-factor logon. So it may be preferable to allow the "failed" 2-factor auth to be retried as if it was sent as a 1-factor password-only authentication.

Note: If the authenticating computer does not allow 1-factor logons, then a rejected replay OTP will always cause the whole authentication to be rejected.

When a replayed OTP is rejected:

○ Make the authentication attempt fail (default)

● Retry as if it was a 1-factor authentication attempt

This setting does not decrease security, and all your two-factor policies and security settings will still apply the same way; it is simply a new feature designed to make life easier to authenticate to non-secure services, and prevent accidental lockouts.

Support for Other Configurations

A rich ecosystem of applications all rely on the built-in authentication mechanisms of Active Directory. With AuthLite we have tried to support the most common cases as transparently as possible. If you have difficulty using an application with AuthLite, there are a number of approaches we can take to support your needs, as appropriate:

- Troubleshooting-- If a configuration is supposed to work and does not seem to, the first thing we will do is turn on extra logging and determine where the failure occurs. For successful authentication, many components must work together seamlessly. Extra logging may show the problem and lead to an easy remedy.
- DLL and .NET API-- It is possible to provision and validate AuthLite users through a .NET interface, enabling custom administrative tools to be used.
- Windows / Application API hooking-- We can help you to determine what method or API your application is using to authenticate to AD, and possibly create a hook to modify this behavior to be AuthLite compatible.

Please open a support request, or contact your representative to get started.

Appendix A: Account Recovery Considerations

Active Directory Accounts

In an Active Directory domain, AuthLite user accounts can be administratively reset through the normal AD Users and Computers console, without data loss. The directory has built-in technology to avoid the loss of EFS/Bitlocker and certificate access that will occur for standalone accounts. Therefore, there are no special precautions you need to take in an AD environment to protect your normal users from account and data loss.

It is definitely advisable to have at least one domain administrator account that is *not* an AuthLite user, in the event that you need to perform logons or operations where AuthLite software is not installed or is functioning improperly.

Special note: If you have restricted access to your domain controllers by policy to domain admins with a Two-Factor tag (via AuthLite User Group Pairs) then you should **also** explicitly allow logon from at least one non-AuthLite domain admin. Consider the case where AuthLite software gets uninstalled and the DC gets rebooted. No accounts will have the Two-Factor group tag, since AuthLite is no longer running. So it is crucial that you not accidentally lock yourself out of being able to log in to your own DC's. An emergency recovery domain administrator account is useful in this instance.

Be skeptical of the security of any logon product that offers a way to log on or change the account password without using all of the security factors! Any time there is a way to bypass the highest level of security, that means an attacker could use the lower security method to compromise your account more easily. This is a common security precept known as "low hanging fruit" or the "path of least resistance". Offering a lower security recovery option to the user means that the high security is effectively *optional*, and thus it will not provide any strength against a smart attacker.

Appendix B: Active Directory Deployment Notes

Licensing

Enter the license code on one Domain controller where AuthLite is installed, and it will propagate to other DC's via replication. Member servers and workstations will read the license value from the directory as well.

Due to replication delays, some servers may temporarily still believe they are unlicensed.

Software Installation

In order to authenticate AuthLite users, a Domain Controller must have the AuthLite infrastructure software installed. If a workstation (or member server) connects to a DC where AuthLite is *not* installed, all the AuthLite operations will fail on that machine, and AuthLite users will *not* be required to use two-factor authentication, since this enforcement is done at the domain controller.

Domain Controllers with AuthLite software installed will still function normally for all their normal roles, including authentication of non-AuthLite users. AuthLite does not replace or remove built-in Microsoft components or behaviors.

Application Partition (database)

AuthLite takes advantage of the robust, multi-master replication offered by Active Directory by using an Application Partition to store all its user data and domain-wide settings. This is the same method that Microsoft's own DNS server uses to manage its data.

The first installation of AuthLite on a Domain Controller in your enterprise will automatically create this partition, and the schema additions necessary to support it. Thus, the first DC you install AuthLite on will be a replication host for the partition, by default.

AuthLite does not add or change any schema properties on the "user" or other built-in objects in Active Directory. All AuthLite data is stored separately in the AuthLite Application Partition. Adding the AuthLite schema elements will have *no performance impact* on user object replication since we don't touch those objects at all.

Replication hosts

By design, AD Application Partitions do *not* automatically replicate to every DC in your enterprise, because it is assumed that the data they contain may only be needed by a subset of the enterprise. If a DC receives a directory query for a partition that's not stored locally, it will refer the request to a remote DC that stores the partition.

This referred connection can be slow if the remote DC is in another site. Since AuthLite requires access to its partition in order to operate, any AD site where AuthLite is used should have at least one DC that hosts a replica of the AuthLite data partition.

Also, to support redundancy if the first partition host goes offline, you may wish to host the partition on more than one Domain Controller in the same site. (Without access to the AuthLite partition, all AuthLite operations will not function.)

You can easily specify whether a DC should host a replica the AuthLite partition at install time, by enabling or disabling the installer feature “Create a Data Store Replica on this DC”.

This option in the AuthLite installer doesn't perform any proprietary operations when making a replica, it is just a convenience. You can also use the Microsoft command **ntdsutil** to control the replication hosts for Application Partitions. The partition's distinguished name will be

```
DC=AuthLite,[your-domain's-dn]
```

Content

Although not necessary for normal operation, you can browse and change the partition content with the Microsoft MMC plugin **adsiedit**.

To browse the AuthLite key data, you can use the AuthLite Data Manager application installed on the domain controllers.

Deletion

Uninstalling AuthLite does not remove the data partition or affect which DC's host its replicas. This way, if AuthLite is reinstalled, all the existing data can be used again, and users can continue to authenticate. If removal of the partition is desired, this can be accomplished with the Microsoft **ntdsutil** command.

Appendix C: Kerberos Constrained Delegation Notes

Kerberos Constrained Delegation is a useful Microsoft extension that can allow IIS web servers to trust credentials provided by ISA/TMG server, even in scenarios when the user does not ever provide their password to log on to the Kerberos (AD) domain in the first place. AuthLite makes use of this technology in the following scenarios:

- Mobile devices that must log on to extranet services with only username and password.
- Extranet services that use only the username and OTP for logon. The password is never entered, so the users cannot be logged in to AD.

In these cases, ISA/TMG Server (with AuthLite installed) can verify the identity of the user, but there is not enough information provided to get an impersonation logon token from AD. The best ISA/TMG can do is get a Kerberos ticket via the "Service for User" (s4u) system. This kind of ticket provides a useful token that the local machine can use, but we still need a way to tell the remote IIS machine about the user.

This is where KCD comes in. ISA/TMG can take the s4u ticket and use it to get another ticket that will work on the remote service (for example the IIS server on your front end Exchange server). This will only work for the specific services that ISA/TMG's computer account is allowed to delegate to (this is why it's called "constrained"). The target service (for example an IIS Server hosting OWA) is trusting ISA/TMG to do a good job of authenticating the users.

KCD technology is built in to AD, ISA 2006/TMG and IIS. You can use it instead of other delegation options in ISA/TMG even when full credentials are available. In the above scenarios for AuthLite, however, there is no other choice than to use KCD, because full user credentials are never provided. You are choosing to say, in effect, even though we don't have complete information to do an authentication to Active Directory, the information we *do* have is sufficient to authenticate the user for the purposes of using these Extranet services. It is a matter of the security policy of your organization, the threat models you are addressing, and the usability of the Extranet services.

Several things must be configured correctly to use KCD. These requirements are based on the way Microsoft has implemented the technology, and don't have anything to do with AuthLite, per se. An excellent resource for KCD configuration between ISA and IIS (Exchange) is the article Kerberos Constrained Delegation in ISA Server 2006.

Appendix E: Using Group Policy to deploy software/settings

Administrative Template for settings

In a domain environment, most AuthLite settings are stored on domain controllers, in the data partition. These settings are automatically applied by all AuthLite-aware systems as needed. But certain settings are server-specific and stored in the registry.

In order to deploy a per-machine setting administratively to a group of systems, you can use a group policy Administrative Template. Save the following lines as a Unicode text file with an .adm extension:

```
CLASS MACHINE
CATEGORY "SOFTWARE\Policies\Collective Software\AuthLite\<etc>"
  POLICY <name>
  KEYNAME "SOFTWARE\Policies\Collective Software\AuthLite\<etc>\<name>"
    PART <settingname> EDITTEXT
    VALUENAME "<settingvalue>"
    END PART
  END POLICY
END CATEGORY
```

Where the <values in brackets> depend on what setting you are trying to control. You can then load this adm file into the group policy editor, in the "Administrative Templates" section of the Computer Configuration, and assign a value. This setting will then be applied along with the rest of the machine policy.

Note that the AuthLite Service only reads some settings on start up, so changing its values via policy will not have an immediate effect, even if you run "gpupdate" and apply the policy immediately. For other settings there is a 20 minute cache timeout.

Software deployment

See this KB article for information on deploying AuthLite software unattended, via Group policy.

Appendix H: Remote Data Store mode

There are some situations where you need the AuthLite core and service to behave as if it was installed on a domain controller, even though in reality it is not.

In Remote Data Store scenarios you still have to install AuthLite on at least one read/write Domain Controller, in order to create/replicate the data partition and make the configuration and data manager tools available. Install AuthLite normally on one or more DC's.

On the "remote" machine you must then launch the AuthLite core software installer from the command line, using the extra property switch REMOTEDATASTORE=1. For example:

```
AuthLite_installer_x86.msi REMOTEDATASTORE=1
```

or

```
AuthLite_installer_x64.msi REMOTEDATASTORE=1
```

and then configure extra settings in the Remote Data Store section of the AuthLite configuration tool.