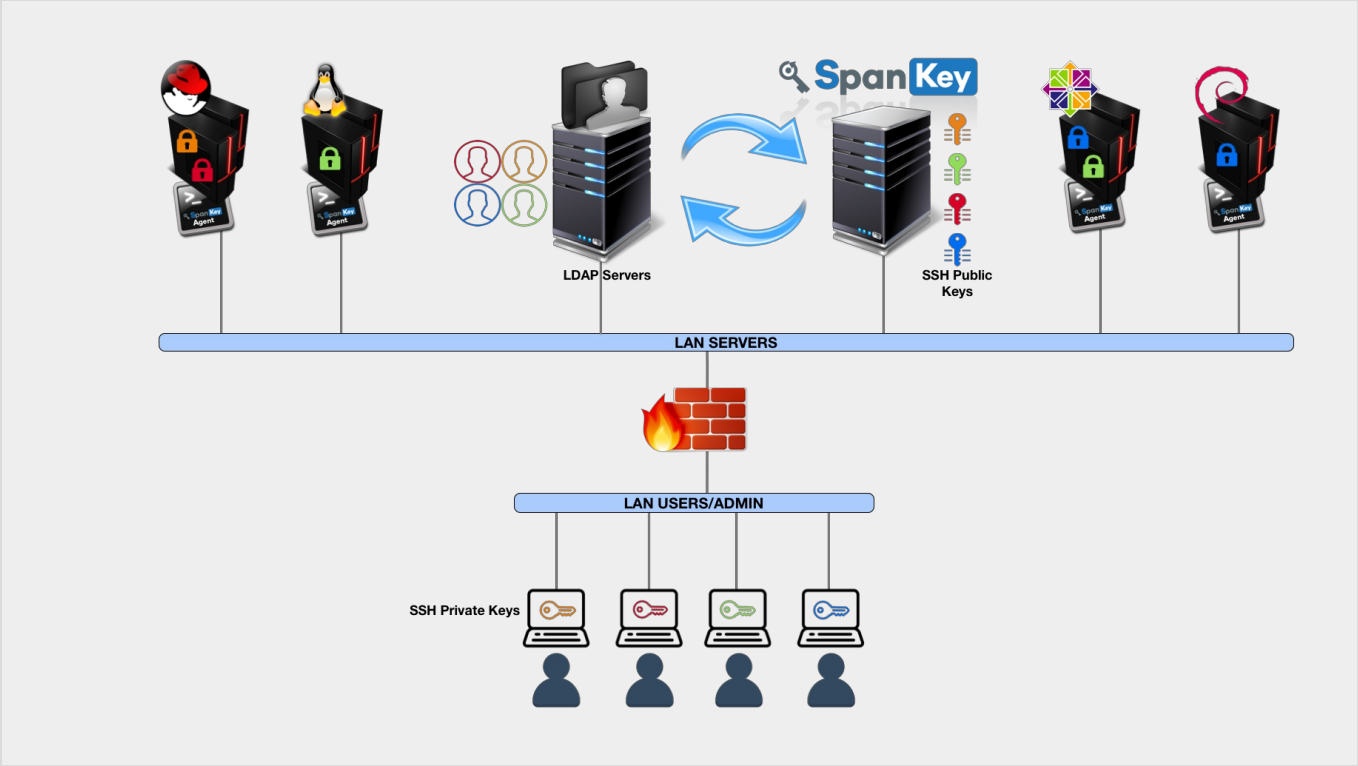
SPANKEY SSH KEY MANAGEMENT QUICK START

SpanKey SSH Key Management Quick Start

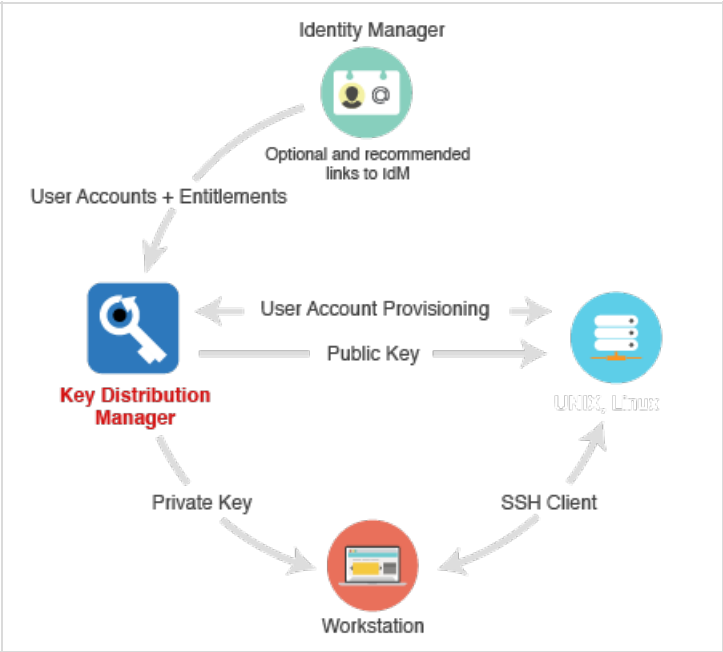
PAM OpenSSH NSS



1. Overview

SpanKey is a centralized SSH key server for OpenSSH, which stores and maintains SSH public keys in a centralized LDAP directory (i.e. Active Directory). With SpanKey there is no need to distribute, manually expire or maintain the public keys on the servers. Instead, the SpanKey agent is deployed on the servers and is responsible for providing the users' public keys on-demand. The SpanKey server provides per-host access control with "server tagging", LDAP access groups, centralized management from the RCDevs WebADM console, shared accounts, privileged users (master keys), recovery keys… It supports public key expiration with automated workflows for SSH key renewal (via Self-Services). For information on SpanKey, please visit RCDevs Website.

For this recipe, you will need to have WebADM installed and configured. Please, refer to WebADM Installation Guide and WebADM Manual before installing SpanKey server. SpanKey server should be installed on the WebADM server.



2. Packages Installation

2.1 RHEL & CentOS through RCDevs Repository

2.1.1 Add RCDevs Repository

On a RedHat, CentOS or Fedora system, you can use our repository, which simplifies updates. Add the repository:

```
yum install https://www.rcdevs.com/repos/redhat/rcdevs_release-1.0.0-0.noarch.rpm
```

Clean yum cache:

```
yum clean all
```

You are now able to install RCDevs packages on your system.

2.1.2 SpanKey Server Installation

```
yum install spankey
```

After the Spankey server installation, you need to restart WebADM services:

```
/opt/webadm/bin/webadm restart
```

To enable SpanKey web service, you need to login on the WebADM GUI. Under `Applications` tab, click `Authentication` in category box and you should find `SSH Public Key Server (SpanKey)`. Click on `REGISTER` button.

2.1.3 SpanKey Client and NSCD Installation

```
yum install spankey_client nscd
```

The SpanKey client requires nscd and OpenSSH. NSCD is the Linux name service caching daemon which is required for caching NSS information on the Linux client. Without NSCD, any user or group ID resolution will trigger SpanKey NSS requests. Caching on the client side will prevent your servers from being overloaded with NSS requests.

> **Note**
>
> Be aware that at leat OpenSSH 6.2 is needed. (Added a sshd_config option AuthorizedKeysCommand to support fetching authorized_keys from a command in addition to (or instead of) from the filesystem.)

2.2 Debian & Ubuntu through RCDevs Repository

2.2.1 Add RCDevs Repository

On a Debian system, you can use our repository, which simplifies updates. Add the repository:

```
wget https://www.rcdevs.com/repos/debian/rcdevs-release_1.0.0-0_all.deb
apt-get install ./rcdevs-release_1.0.0-0_all.deb
```

Clean apt cache:

```
apt-get update
```

You are now able to install RCDevs packages on your system with apt-get command.

2.2.2 SpanKey Server Installation

```
apt-get install spankey
```

After the Spankey server installation, you need to restart WebADM services:

```
/opt/webadm/bin/webadm restart
```

To enable SpanKey web service, you need to login on the WebADM GUI. Under `Applications` tab, click `Authentication` in category box and you should find `SSH Public Key Server (SpanKey)`. Click on `REGISTER` button.

2.2.3 SpanKey Client and NSCD Installation

```
apt-get install spankey-client nscd
```

The SpanKey client requires nscd and OpenSSH. NSCD is the Linux name service caching daemon which is required for caching NSS information on the Linux client. Without NSCD, any user or group ID resolution will trigger SpanKey NSS requests. Caching on the client side will prevent your servers from being overloaded with NSS requests.

> **Note**
>
> Be aware that at leat OpenSSH 6.2 is needed. (Added a sshd_config option AuthorizedKeysCommand to support fetching authorized_keys from a command in addition to (or instead of) from the filesystem.) With Ubuntu servers, depending on your OS setup, you may need to install libldap as well.

2.3 Installation Using the Self-Installer

You first need to download the Spankey software package. You can download the latest package on the RCDevs Website. Download and copy the SpanKey server self-installer package to your server. You can copy the package file to the server with WinSCP or SCP. Then connect via SSH to your server, uncompress and run the self-installer package with:

```
gunzip spankey-2.0.x-x.sh.gz
bash spankey-2.0.x-x.sh
```

Follow the installer.

For the SpanKey client:

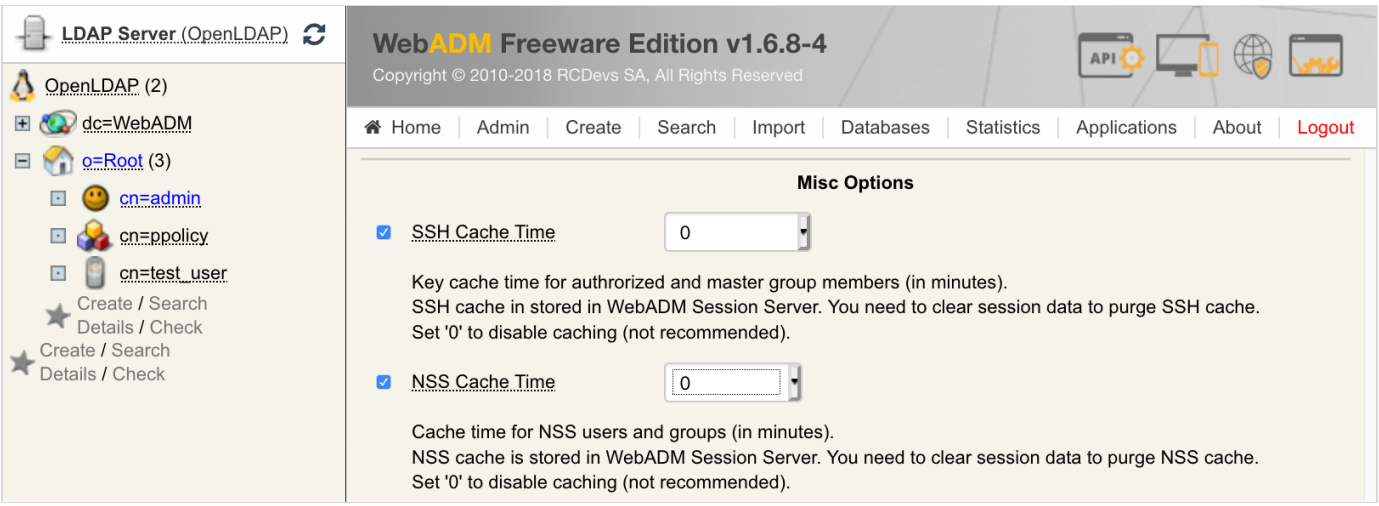
```
gunzip spankey_client-2.1.x.sh.gz
bash spankey_client-2.1.x.sh
```

Follow the installer and don't forget to install the NSCD package.

3. Configurations

3.1 SpanKey Server

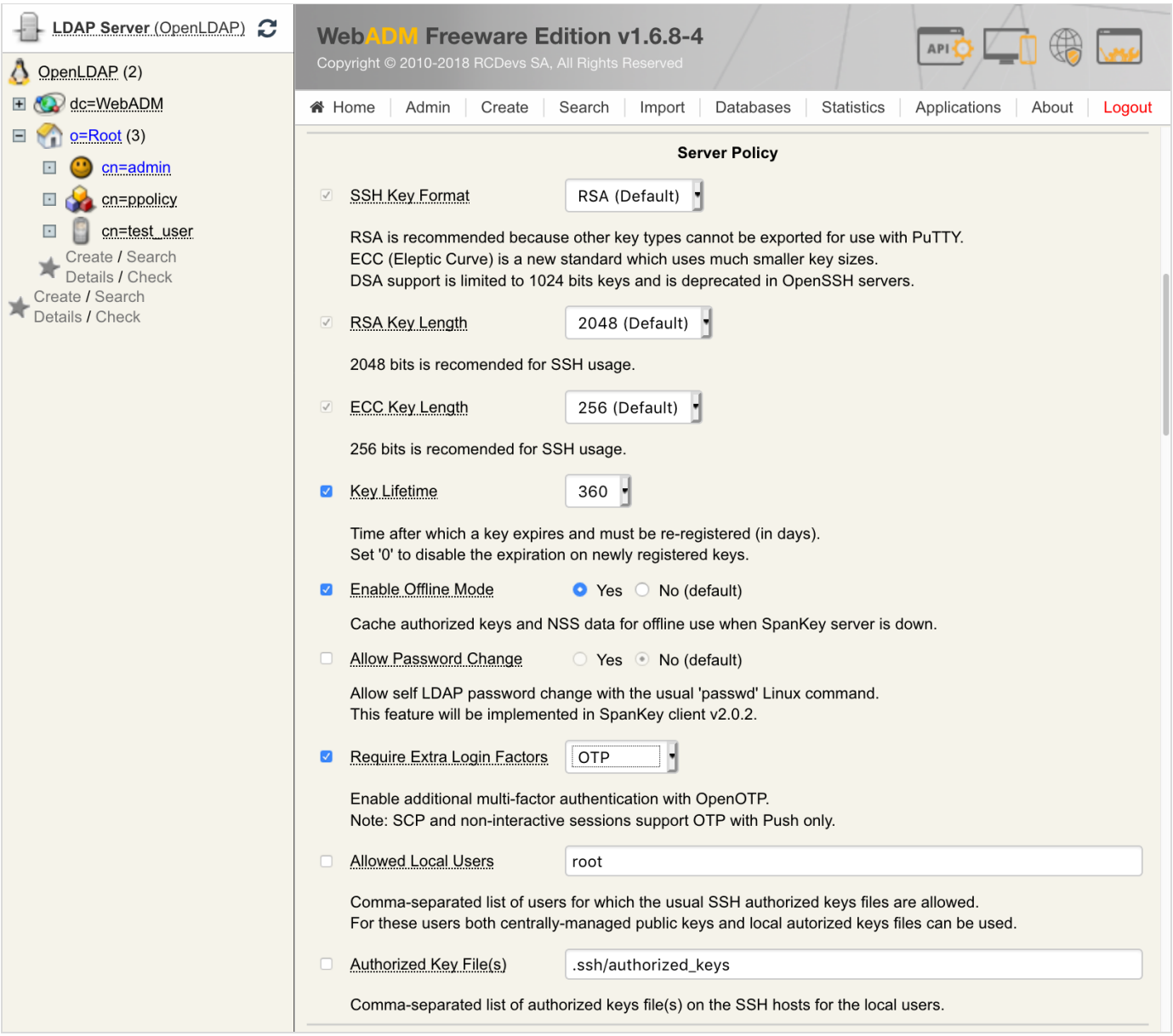
Once SpanKey server package is installed, you have to enable SpanKey service in WebADM. Go to the WebADM Administrator console, click on `Applications` tab > `Authentication` and click on `Register` button for `SSH Public Key Server`. The default configuration is ready and suited for most Linux environments, but for initial tests, it is recommended to click on `CONFIGURE` button and set the following options in SSH Public Key Server (SpanKey server):



This will disable server caching, generally helpful during configuration stage and tests.

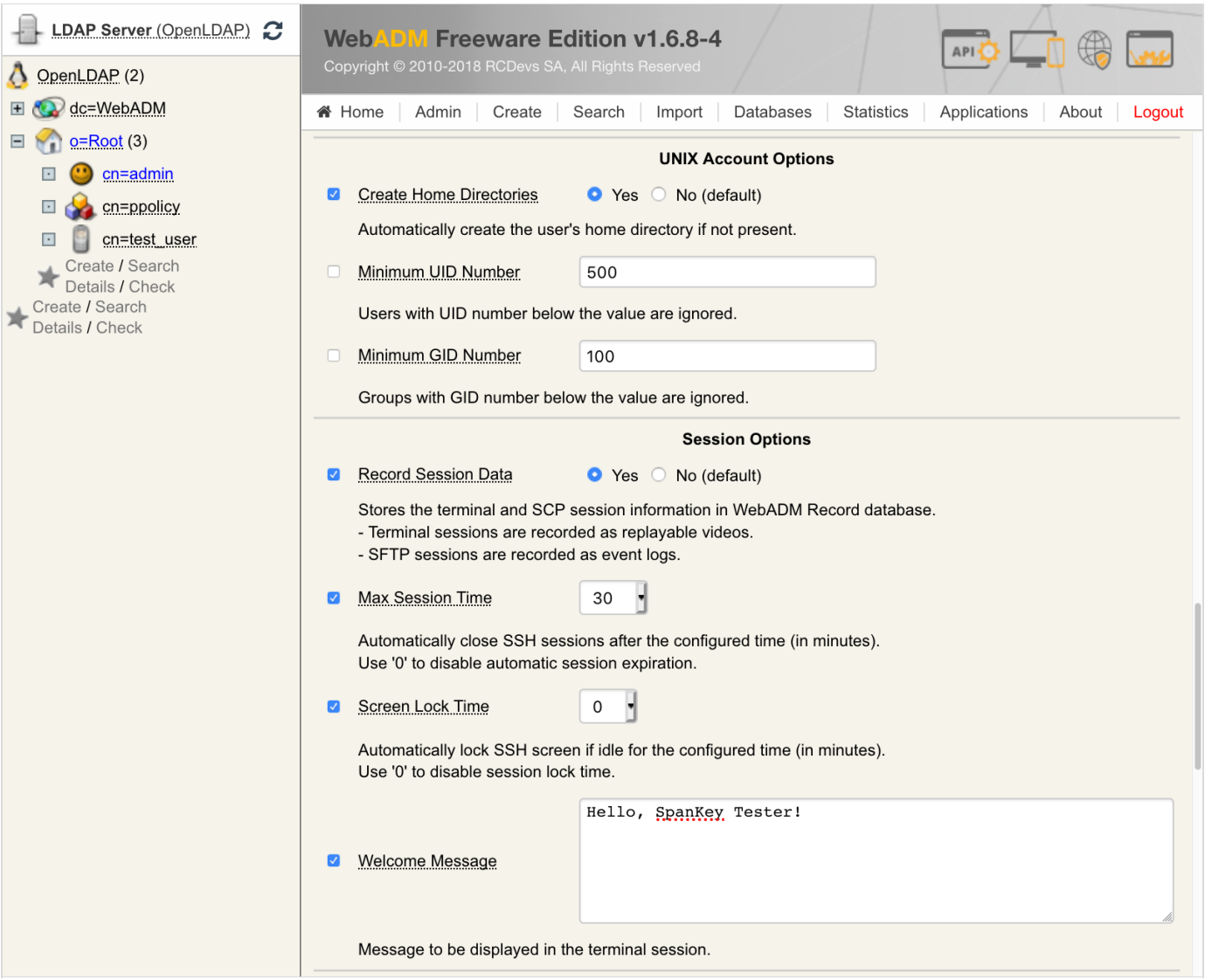
⚠ Important note

For production server caching is highly recommended.

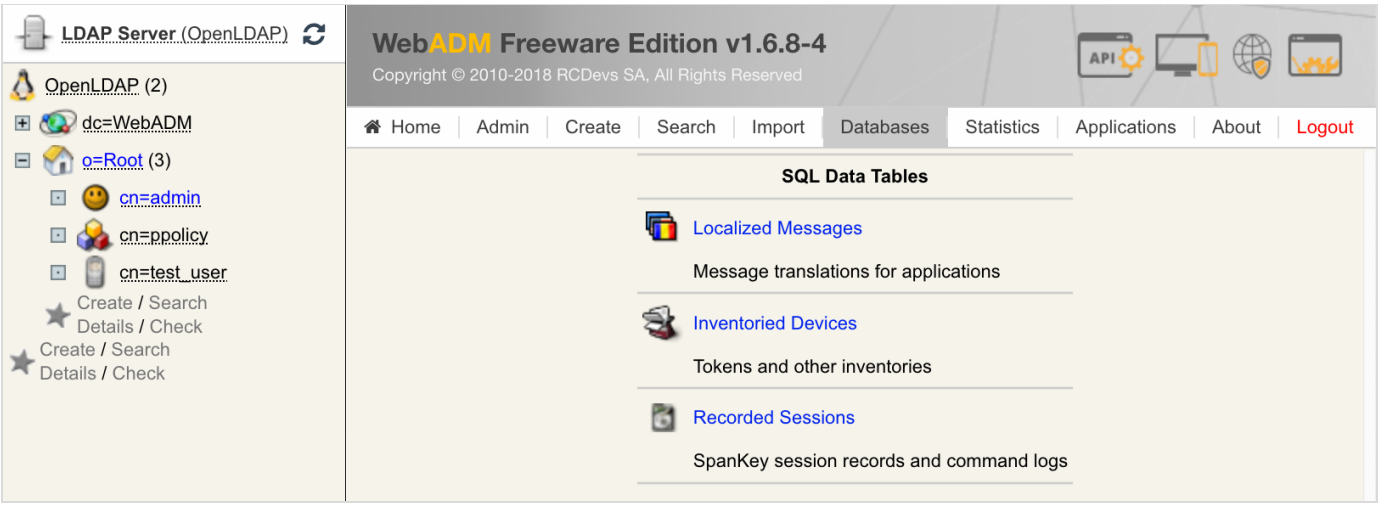


- The SSH Key format can be defined here.
- RSA Key Length can also be settled here.
- The SSH Key Lifetime can be adjusted too.
- Send Self-Registration: This option can be enabled if you want to have a new self-registration request when the SSH key has expired.
- Enable Offline Mode: Offline mode can be enabled in case of the SpanKey server is unavailable.
- Require Extra Login Factors: An OTP validation can be added during the authentication workflow.

Some other settings can be enabled on Spankey server:



- Create Home Directory: If enabled, the user home directory will be automatically created during the first login if not present.
- Record Session Data: This is a new feature of SpanKey! This setting allows you to record and store in SQL database, terminal sessions, SFTP sessions. Sessions are replayable video which can be found in `Databases` tab > `Recorded Sessions` under WebADM Admin Console.

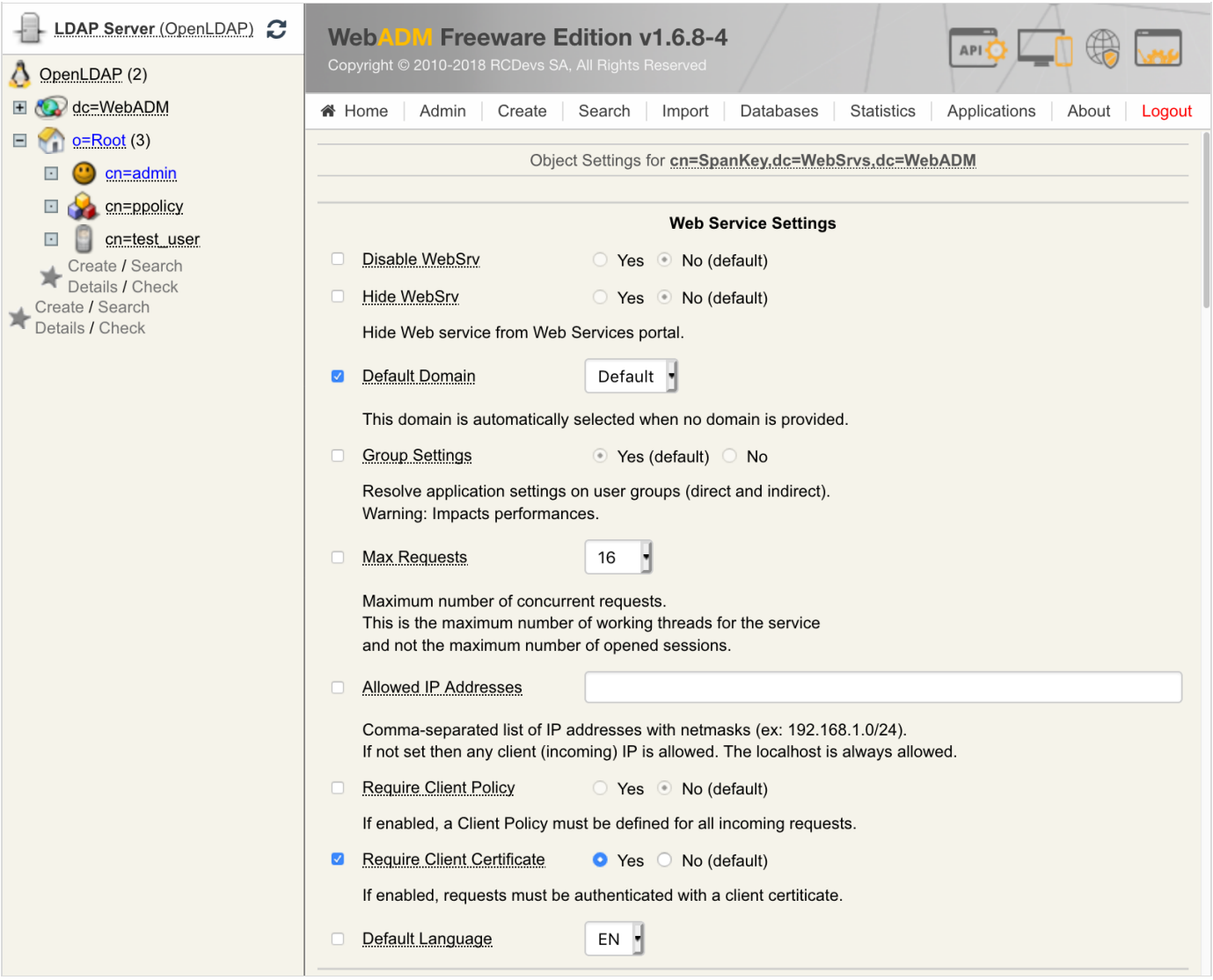


- Max Session Time: This setting can be settled if you want to define a maximum session time.

Under SSH Public Key Server configuration, you can find various configurations options to set access controls to your SSH key-based logins, such as Master Group, Backup Keys, Authorized Group, Tagging… Some of these settings are described in the chapter “Advanced Configuration”.

Important Note

Require client certificate for SpanKey client is highly recommended for production use!



Important Note

If you enable this option, every SpanKey client who actually works without a client certificate will stop working. To solve this, you can generate a client certificate through WebADM Admin GUI > Admin tab > Issue Server or Client SSL Certificate and import the generated certificate in /opt/spankey/conf/ folder of your SpanKey client.

LDAP Server (OpenLDAP)

- OpenLDAP (2)
  - dc=WebADM
  - o=Root (3)
    - cn=admin
    - cn=ppolicy
    - cn=test_user
    - Create / Search
    - Details / Check
  - Create / Search
  - Details / Check

WebADM Freeware Edition v1.6.8-4

Home | Admin | Create | Search | Import | Databases | Statistics | Applications | About | Logout

Create Third-party SSL Server Certificate

You can use this form to issue a X.509 SSL certificate and private key for a third-party server or component. The certificate is generated with the provided information and signed by WebADM certificate authority.

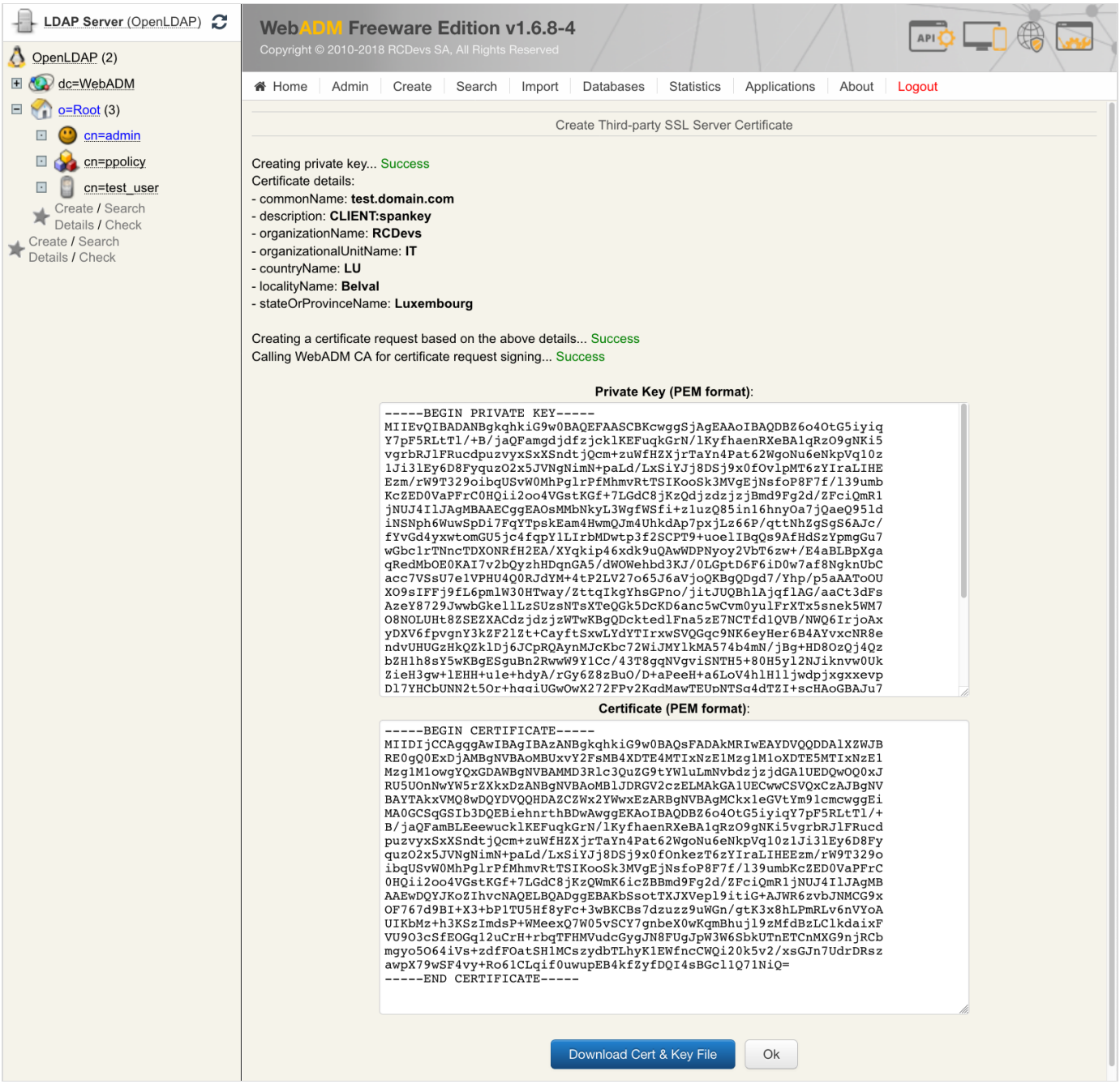
Main information

Client Name or Description:	test.domain.com
Certificate Type:	Client
Restricted Application:	SpanKey
Certificate validity (in days):	365
Private Key Password (optional):	

Additional information

Organization Name:	RCDevs
Organizational Unit:	IT
Country Name:	LU
Locality Name:	Belval
State or Province:	Luxembourg
Street Address:	
Email Address:	

Ok Cancel



3.2 SpanKey Client

The SpanKey client consists of two components activated at setup time.

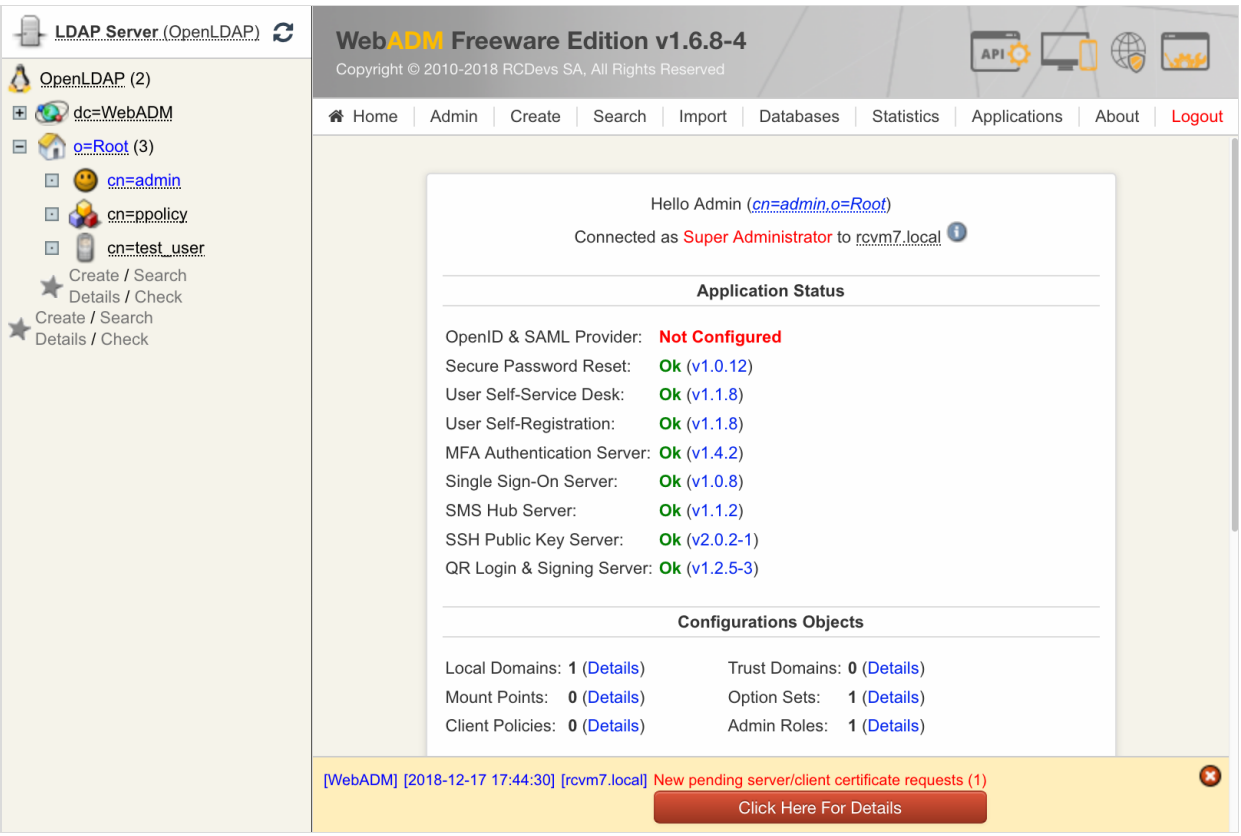
- SSH component - provides a user login with public keys stored within a directory server (Active Directory, OpenLDAP, Open Directory…).
- NSS component - provides a native mapping of your directory users and groups to those in Linux.

3.2.1 SpanKey Client Setup Script

At the end of the installation of the SpanKey package, run the following command to launch setup wizard: `/opt/spankey/bin/setup` The wizard will prompt you for the details similar to below:

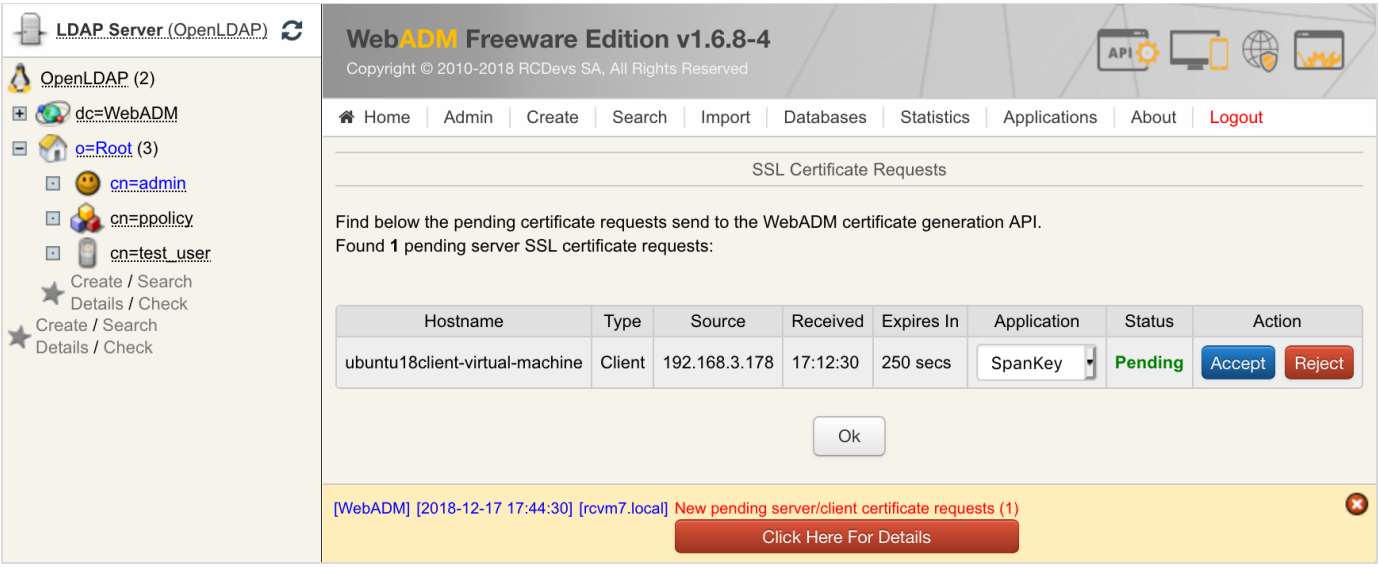
```
[root@spankey_client ~]# /opt/spankey/bin/setup
Setup has already been run for this installation. Overwrite (y/n)?: y
Overwriting...
Enter one of your running WebADM node IP or hostname []: 192.168.3.117
Do you want to enable SpanKey Client for OpenSSH server (y/n)? [N]: y
Do you want to enable SpanKey Client NSS plugin (y/n)? [Y]: y
Do you want to register SpanKey Client logrotate script (y/n)? [Y]: y
Do you want SpanKey Client to be automatically started at boot (y/n)? [Y]: y

    Primary OpenOTP service URL is: 'https://192.168.3.117:8443/spankey/'
    Enable SpanKey Client for OpenSSH server: 'YES'
    Enable SpanKey Client NSS plugin: 'YES'
    Register SpanKey Client logrotate script: 'YES'
    SpanKey Client must be automatically started at boot: 'YES'

Do you confirm (y/n)?: y

Applying SpanKey Client settings from default configuration files... Ok
Retrieving WebADM CA certificate from host '192.168.3.117'... Ok
The setup needs now to request a signed 'SpanKey' client certificate.
This request should show up as pending in your WebADM interface and an administrator
must accept it.
Waiting for approbation...
```

At this step, you have to log in on the WebADM Administration GUI to approve the SSL certificate request.

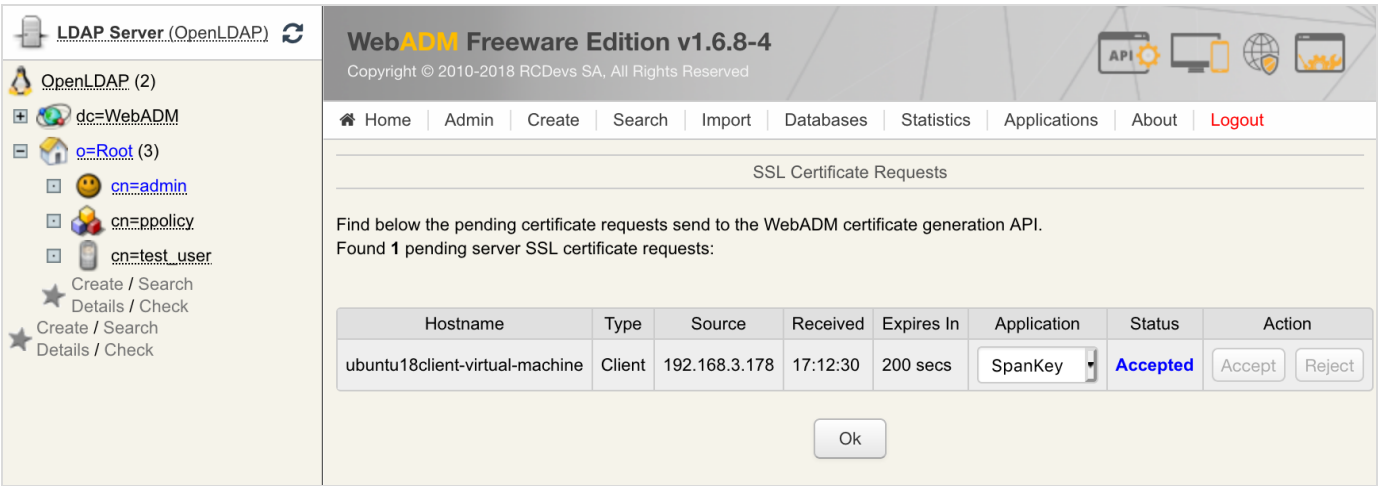


Click on the red button at the end of the home page.

On the next screen, you can show the SSL certificate request is pending:



Click on the Accept button and the Spankey-client setup will continue.




```
Waiting for approbation... Ok
Updating entry 'client_id' in file '/opt/spankey/conf/spankey.conf'... Ok
Updating file '/etc/ssh/sshd_config'... Ok
Updating file '/etc/nsswitch.conf'... Ok
Updating file '/etc/pam.d/password-auth'... Ok
Registering SpanKey Client service...
Registering SpanKey Client service... Ok
Adding logrotate script... Ok

SpanKey Client has successfully been setup.

IMPORTANT: Do not forget to perform the following actions before you exit this session:
 - Start SpanKey (/opt/spankey/bin/spankey start)
 - Restart 'sshd'
 - Restart 'nscd'
```

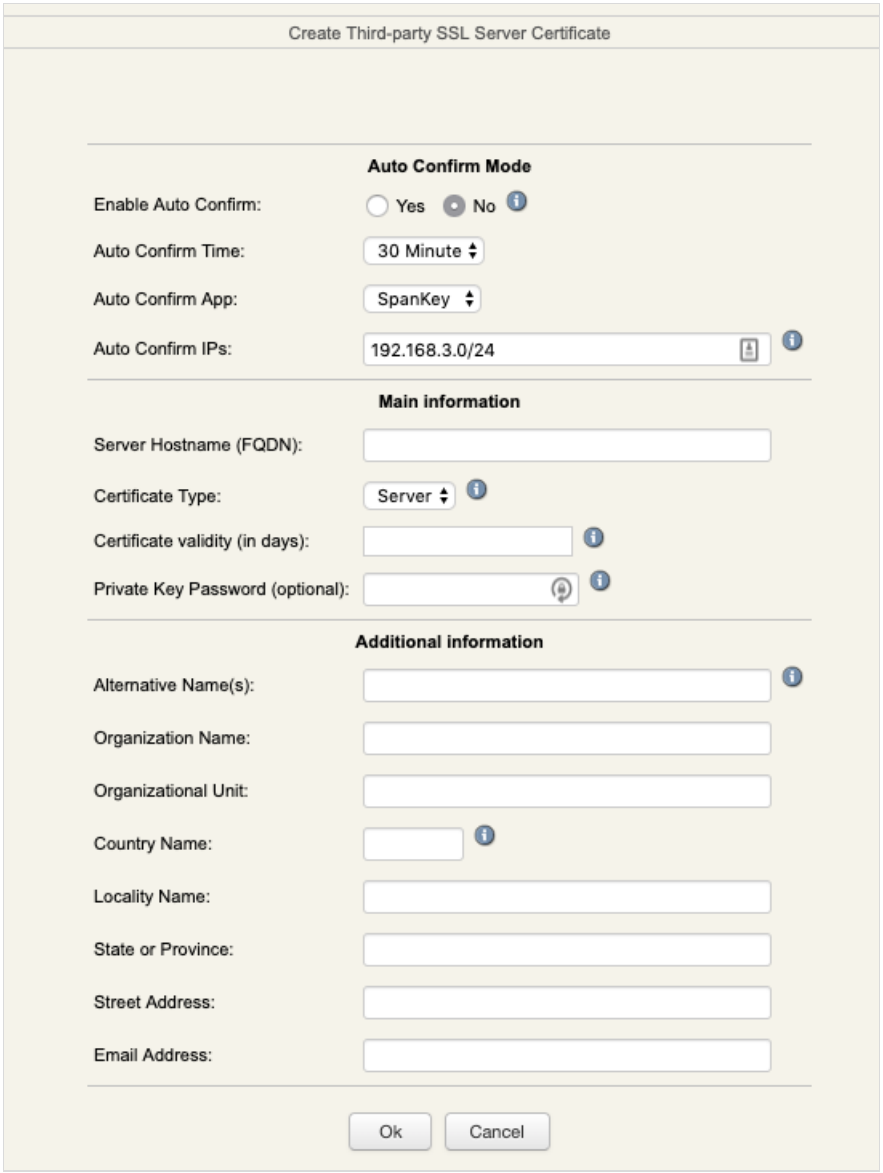
The configuration of the SpanKey client is done, you have to restart sshd, nscd and spankey-client:

```
[root@spankey_client ~]# systemctl restart sshd
[root@spankey_client ~]# systemctl restart nscd
[root@spankey_client ~]# systemctl start spankey
```

SpanKey client setup is done.

3.2.2 SpanKey Client silent installation

Since WebADM 1.7.1, a new feature is now available for the automatic certificate approval. This setting can be useful when you massively deploy SpanKey Client. To enable this feature, log in on the `WebADM Admin GUI` > `Admin` tab > `Runtime Actions` > `Issue Server or Client SSL Certificate` > `Auto Confirm Mode`.



In the Auto Confirm mode, you can specify the time, application and the clients IPs where auto confirms will works. On the previous screenshot, I have configured the auto confirm valid 30 minutes for every Spankey clients coming from the network 192.168.3.0/24. To enable the auto-confirm, switch the `Enable Auto Confirm` button to `Yes`. The auto confirm is now

enabled.

The SpanKey client can now be installed silently. Once the package is installed, run the following command to run the SpanKey Client setup with your parameters.

- `192.168.3.117` is my WebADM/SpanKey server IP,
- `my_client_id` is the client_id value configured in /otp/spankey/conf/spankey.conf
- `ENABLE_SSH__DEFAULT=Y` is to enable SpanKey_client for OpenSSH (by default, this setting is set to `No` for other scenarios)

```
[root@spankey_client ~]# ENABLE_SSH__DEFAULT=Y /opt/spankey/bin/setup silent
192.168.3.117 my_client_id
    Primary OpenOTP service URL is: 'https://192.168.3.117:8443/spankey/'
    Enable SpanKey Client for OpenSSH server: 'YES'
    Enable SpanKey Client NSS plugin: 'YES'
    Register SpanKey Client logrotate script: 'YES'
    SpanKey Client must be automatically started at boot: 'YES'

Applying SpanKey Client settings from default configuration files... Ok
Retrieving WebADM CA certificate from host '192.168.3.117'... Ok
The setup needs now to request a signed 'SpanKey' client certificate.
This request should show up as pending in your WebADM interface and an administrator
must accept it.
Waiting for approbation... Ok
Updating entry 'client_id' in file '/opt/spankey/conf/spankey.conf'... Ok
Updating file '/etc/nsswitch.conf'... Ok
Updating file '/etc/pam.d/password-auth'... Ok
Registering SpanKey Client service...
Registering SpanKey Client service... Ok
Adding logrotate script... Ok

SpanKey Client has successfully been setup.

IMPORTANT: Do not forget to perform the following actions before you exit this session:
 - Start SpanKey (/opt/spankey/bin/spankey start)
 - Restart 'sshd'
 - Restart 'nscd'
```

The configuration of the SpanKey client is done, you have to restart sshd, nscd and Spankey client:

```
[root@spankey_client ~]# systemctl restart sshd
[root@spankey_client ~]# systemctl restart nscd
[root@spankey_client ~]# systemctl start spankey
```

4. Advanced Configurations

4.1 SpanKey Client

4.1.1 Files and Folders

SpanKey client is installed under `/opt/spankey/` folder.

Find below the SpanKey client software installation file structure and important files.

- `/opt/spankey/bin/`: Location for SpanKey service binaries and startup scripts.
  - `spankey`: SpanKey executable control script for starting and stopping the service process. To start SpanKey from the command line, issue `./spankey start`. To stop SpanKey, issue `./spankey stop`.
  - `setup`: Initial SpanKey setup script run by the self-installer. The setup can be re-run manually at any time.
- `/opt/spankey/doc/`: Location for spankey documentation resources.
- `/opt/spankey/conf/`: Location for SpanKey configuration files.
  - `spankey.conf`: Main configuration file. Defines the basic SpanKey client parameters.

```
#-#-#-#
#
#  SpanKey's main configuration file.
#
 #-#-#-#
 #
 #  The entry below tells the daemon where the log file must be.
 #  At the very early stage (when the daemon started but did not read yet this
configuration file)
 #  logs are sent to the standard output. Anyway, since the launcher script use a
redirection, you won't even see them.
 #
  log_file             /opt/spankey/logs/spankeyd.log
 #
 #  When log level is set to 'Normal', all components will log both errors and warnings
only.
 #  'Verbose' will make all components just log everything.
 #
  log_level            Normal
 #
 #
 #-#-#-#


 #-#-#-#
 #
 #  Where to produce the daemon's pid file.
 #
  #pid file             /opt/spankey/temp/spankeyd.pid
```

```
 #pid_file              /opt/spankey/tmp/spankeyd.pid
 #
 #
 #-#-#-#


 #-#-#-#
 #
 #  The daemon needs this CA file to trust SpanKey servers it will talk to.
 #
  ca_file              /opt/spankey/conf/ca.crt
 #
 #
 #-#-#-#


 #-#-#-#
 #
 #  An optional client certificate and password spankeyd will use to communicate with
SpanKey servers.
 #
  client_cert_file     /opt/spankey/conf/spankey.pem
  #client_cert_password PaSsWoRd
 #
 #
 #-#-#-#


 #-#-#-#
 #
 #  The section below contains a list of backend servers the daemon should connect to.
 #  It must contains one or two target OTP server.
 #  Any additional server in the list will just be ignored.
 #
  server_urls {
   url1 https://192.168.3.117:8443/spankey/
   #url2 https://<server2>:8443/spankey/
  }
 #
 #
 #-#-#-#


 #-#-#-#
 #
 #  How spankeyd will relay request to the WebADM backend.
 #   - "balanced" means the request will be balanced between server 1 and server 2 in a
round-robin fashion.
 #   - "ordered" means server 2 is kept as a hot spare in case the primary server stops
answering requests properly.
 #
  #server_policy        BaLaNcEd
 #
```

```
 #
 #-#-#-#


 #-#-#-#
 #
 #  The default domain name to pass when the requester only provided a username.
 #  It typically overrides the default domain in the SpanKey server configuration.
 #
  #default_domain_name Default
 #
 #  To let backends know how to extract fields 'domain' and 'username' correctly from
the username string the client entered.
 #
  #domain_separator     \\
 #
 #
 #-#-#-#


 #-#-#-#
 #
 #  Requested Tags (user must present all the tags).
 #
  #requested_tags       TAG1,TAG2
 #
 #
 #-#-#-#


 #-#-#-#
 #
 #  User settings (better configure settings in client policies).
 #  Fixed list of SpanKey policy settings to be passed via the SpanKey API.
 #
  #user_settings        SpanKey.KeyExpire=10
 #
 #
 #-#-#-#


 #-#-#-#
 #
 #  The client identifier to be sent to OpenOTP servers along authentication requests.
 #  This allows to apply per client contextual policies on the WebADM server while
running an authentication workflow.
 #
  client_id            my_client_id
 #
 #
 #-#-#-#
```

```
 #-#-#-#
 #
 #  The SOAP request TCP timeout is by default 30.
 #  Just keep it as it unless you really understand all the possible consequences a
change could have.
 #
  #soap_timeout         30
 #
 #
 #-#-#-#
#
#
#-#-#-#
```

- `/opt/spankey/lib/` : Location for SpanKey system libraries.
- `/opt/spankey/libexec/` : Location for SpanKey system executables.
- `/opt/spankey/logs/` : Location for log files produced by SpanKey client.
- `/opt/spankey/temp/` : Location for SpanKey temporary data files. Under this directory, you will find service PID files.

4.1.2 SpanKey Client and Auditd

Since Spankey client v2.1.0 and SpanKey server v2.0.4-1, you can use Auditd with SpanKey. Auditd will allow you to record executed commands, SCP actions (copy, remote execution) in WebADM record database. To enable Auditd with SpanKey client and Auditd packages must be installed and running on the target machine. By default, Auditd for SpanKey client is disabled. To enable it, after the Spankey client installation and configuration, edit the following file:

```
/etc/audisp/plugins.d/spankey.conf
```

```
# This file controls the configuration of the SpanKey Client plugin.
# It simply takes events and forwards them to the SpanKey daemon.

active = no
direction = out
path = /opt/spankey/libexec/audisp_plugin
type = always
#args =
format = string
```

Change the `active` setting from `no` to `yes` :

```
# This file controls the configuration of the SpanKey Client plugin.
# It simply takes events and forwards them to the SpanKey daemon.

active = yes
direction = out
path = /opt/spankey/libexec/audisp_plugin
type = always
#args =
format = string
```

To changes takes effect, a restart of spankey client is required. Logs are now sent to auditd and auditd forwards logs to SpanKey client daemon. The daemon will forward logs to SpanKey server.

```
systemctl restart spankey
```

⚠ Important Note

Be aware, if you enable Auditd with SpanKey then all Auditd rules that have been set before on that machine will be erased. Therefore, if you are using your own Auditd rules for monitoring your machine then you can not use SpanKey with the `Record Audit Logs` feature.

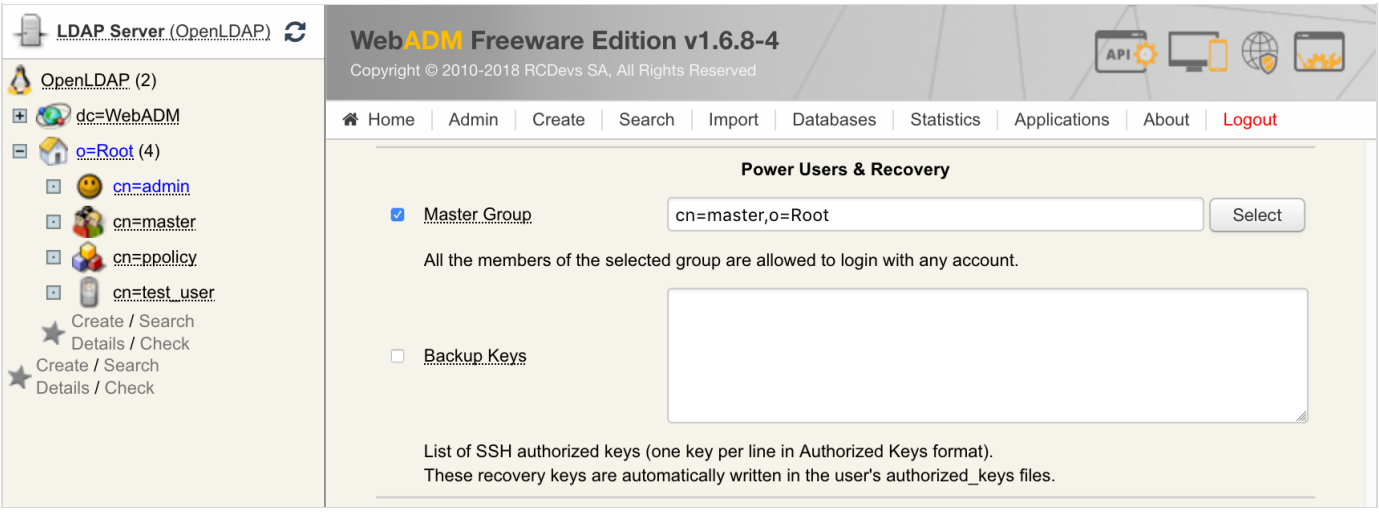
Please refer to step `4.2.7 Audit logs and SSH Sessions recording` of this documentation to enable auditd logs on the SpanKey server side and to know how to consult recorded logs.

4.2 SpanKey Server

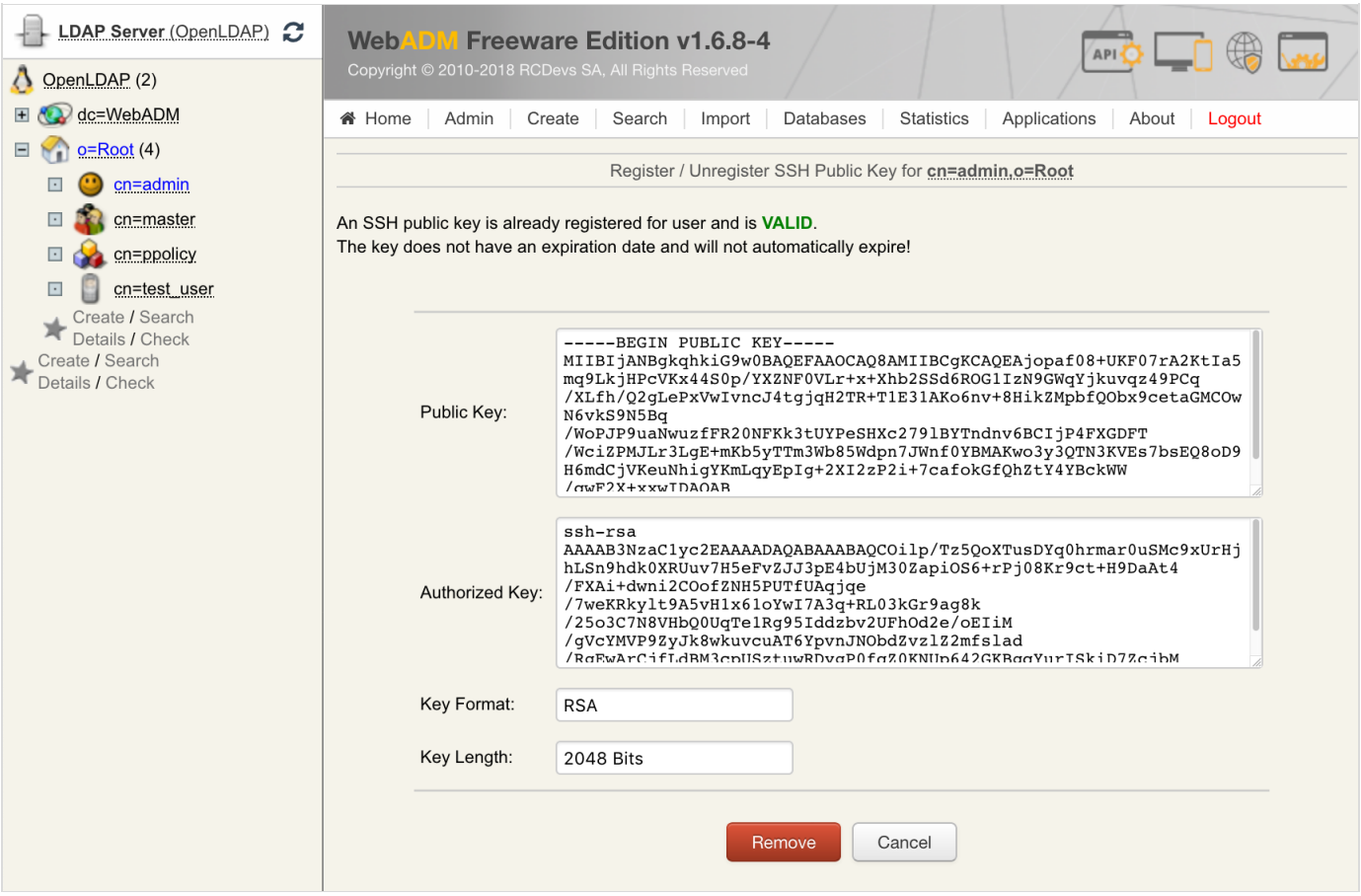
Below are described some of the most relevant SSH Public Key Server configuration options.

4.2.1 Master Group

In SpanKey you can define master groups where the members of the group are considered as super users and can use their SSH key to access any other SpanKey account. A master group can be configured in SpanKey global configuration or in a client policy. To configure a master group, go on SpanKey global configuration or client policy and configure your Master Group.



For example, my master group is `cn=master,o=Root` and the member of this group is my `cn=admin,o=Root` who has a public key enrolled on his account:



That means the admin's account is able to login on every account with his own private key. The public key of the admin account is added to every user account. If I call the authorized_key command for different users I should see the administrateur public key and the public key of the user:

```
[root@ubuntu18client-virtual-machine ~]# /opt/spankey/libexec/authorized_keys test_user
environment="ONE_TIME_AUTHENTICATION_TOKEN=C6578D1DCE1FFAA29F7C3F092957DF96",command="/op
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCJQuTFOMSmLUZ4iCpxBS/6D/nITkfkILuSO0cTC3BR3tC2lhqjvxZXW07OC
test_user@Default
environment="ONE_TIME_AUTHENTICATION_TOKEN=C6578D1DCE1FFAA29F7C3F092957DF96",command="/op
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCOilp/Tz5QoXTusDYq0hrmar0uSMc9xUrHjhLSn9hdk0XRUuv7H5eFvZJJ3
admin@Default
```

We can see 2 public keys for test_user account, his own public key and admin's public key.

```
[root@ubuntu18client-virtual-machine ~]# /opt/spankey/libexec/authorized_keys yoann
environment="ONE_TIME_AUTHENTICATION_TOKEN=010EF8A1110F7503DD4AC04F325E52F1",command="/op
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCTLE6WCDDi/gknvCpWKNXBgCZ8eZeFfYN/MJ7PBv90lWlk/puUEwC2lmWQv
yoann@Default
environment="ONE_TIME_AUTHENTICATION_TOKEN=010EF8A1110F7503DD4AC04F325E52F1",command="/op
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCOilp/Tz5QoXTusDYq0hrmar0uSMc9xUrHjhLSn9hdk0XRUuv7H5eFvZJJ3
admin@Default
```

It's the same for yoann's account…

Now, trying to log in with test_user and Yoann's account with the admin's private key:

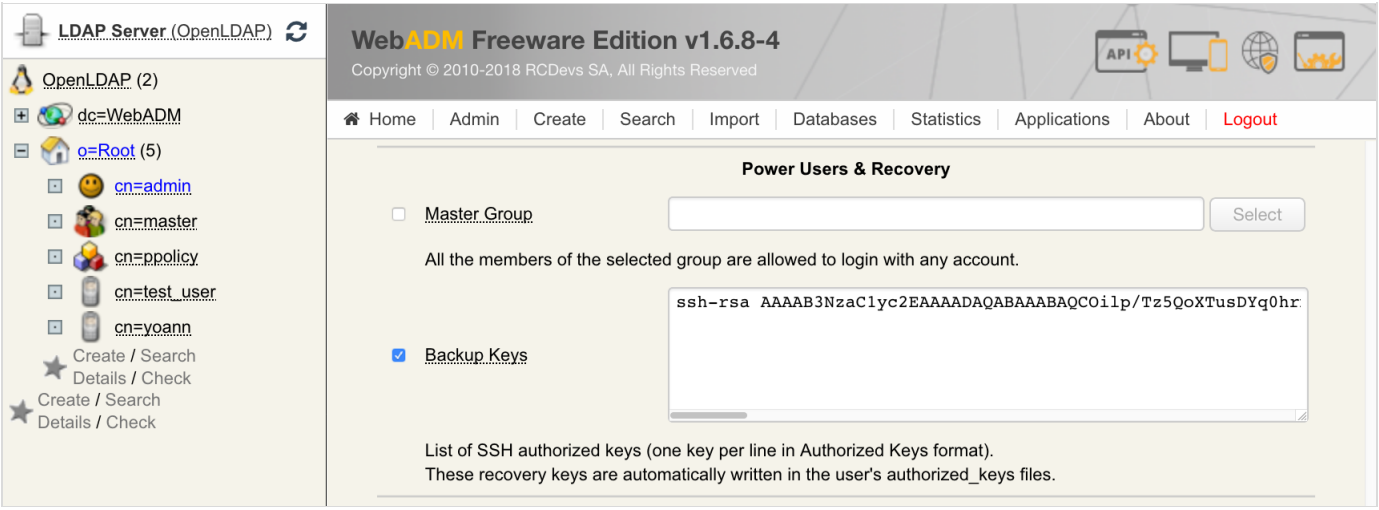
```
11:56 $ ssh -i admin.pem test_user@192.168.3.178

Hello, SpanKey Tester!

Session recording is enabled.
Session lock is disabled.
Session's max duration is 30 minutes.

test_user@ubuntu18client-virtual-machine:~$ whoami
test_user
test_user@ubuntu18client-virtual-machine:~$ pwd
/home/test_user
test_user@ubuntu18client-virtual-machine:~$ exit
exit

>>>> Session's duration was aprox 11 seconds <<<<

Connection to 192.168.3.178 closed.
```

```
11:56 $ ssh -i admin.pem yoann@192.168.3.178

Hello, SpanKey Tester!

Session recording is enabled.
Session lock is disabled.
Session's max duration is 30 minutes.

yoann@ubuntu18client-virtual-machine:~$ whoami
yoann
yoann@ubuntu18client-virtual-machine:~$ pwd
/home/yoann
yoann@ubuntu18client-virtual-machine:~$ exit
exit

>>>> Session's duration was aprox 6 seconds <<<<

Connection to 192.168.3.178 closed.
```

4.2.2 Backup/Recovery Keys

By default, the SpanKey agents will erase users' authorized_keys file at runtime to prevent users from adding rogue public keys. If recovery keys are configured, then these keys are automatically written to the user's authorized_keys file, for recovery purposes (to be used in the event where SpanKey client cannot communicate with the SpanKey server).

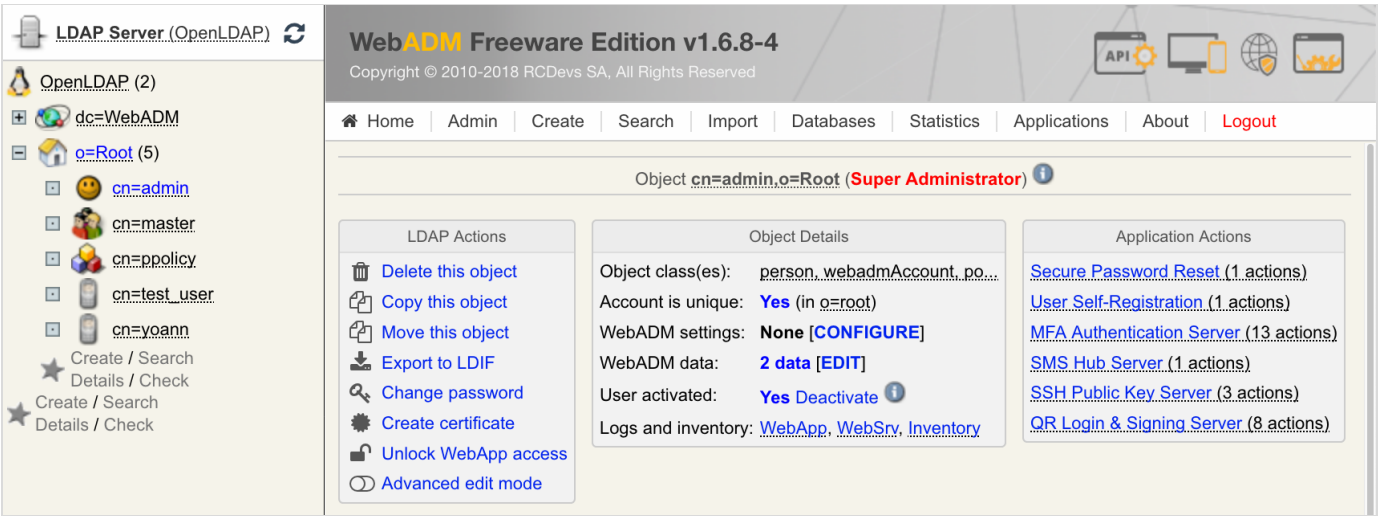
To configure a backup key, go on the WebADM Admin GUI, click on `Applications` tab, in `Authentication` category, you can find `SSH Public Key Server`, click on `CONFIGURE` button. You are now in SpanKey server configuration. Find the `Power Users & Recovery` section, check the box `Backup Keys` and put the public key to have an access on the target server even if SpanKey client or SpanKey server is down. Put the public key in the authorized key format here:

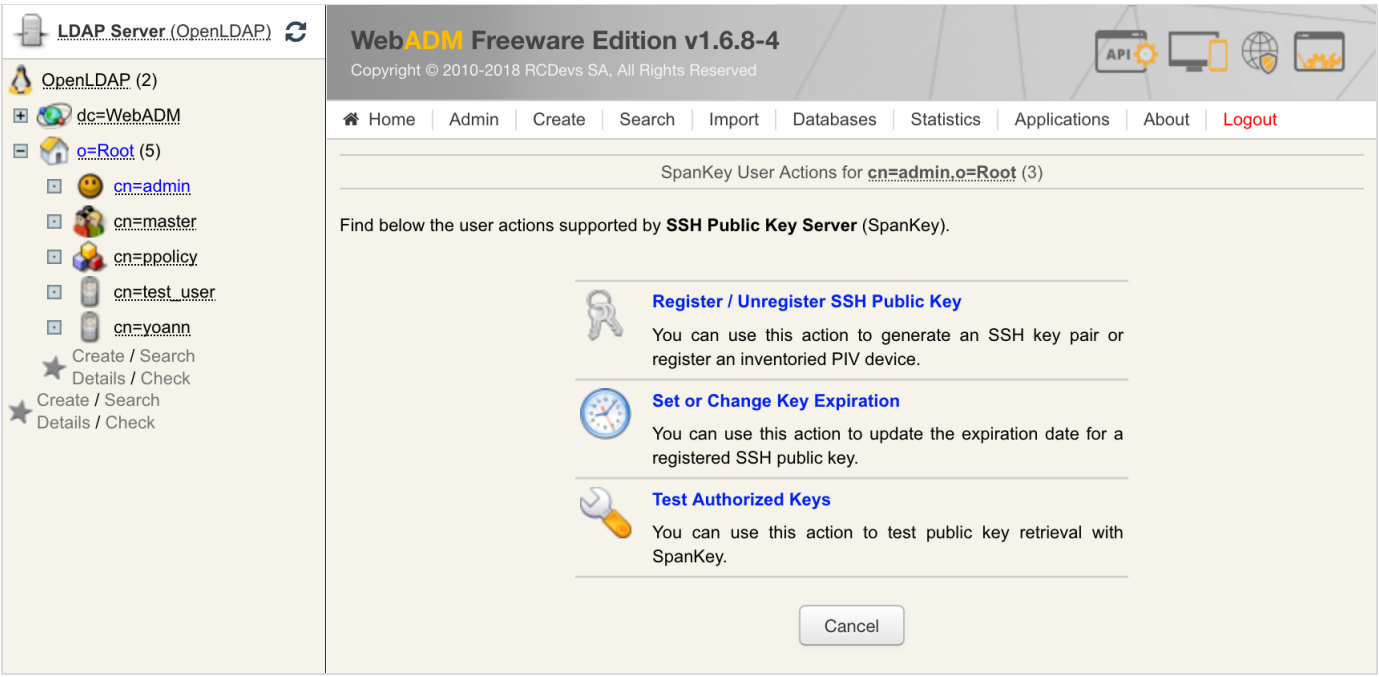


That means the private key associated with this public key will be able to log in on the target server even if SpanKey server or SpanKey client is down.

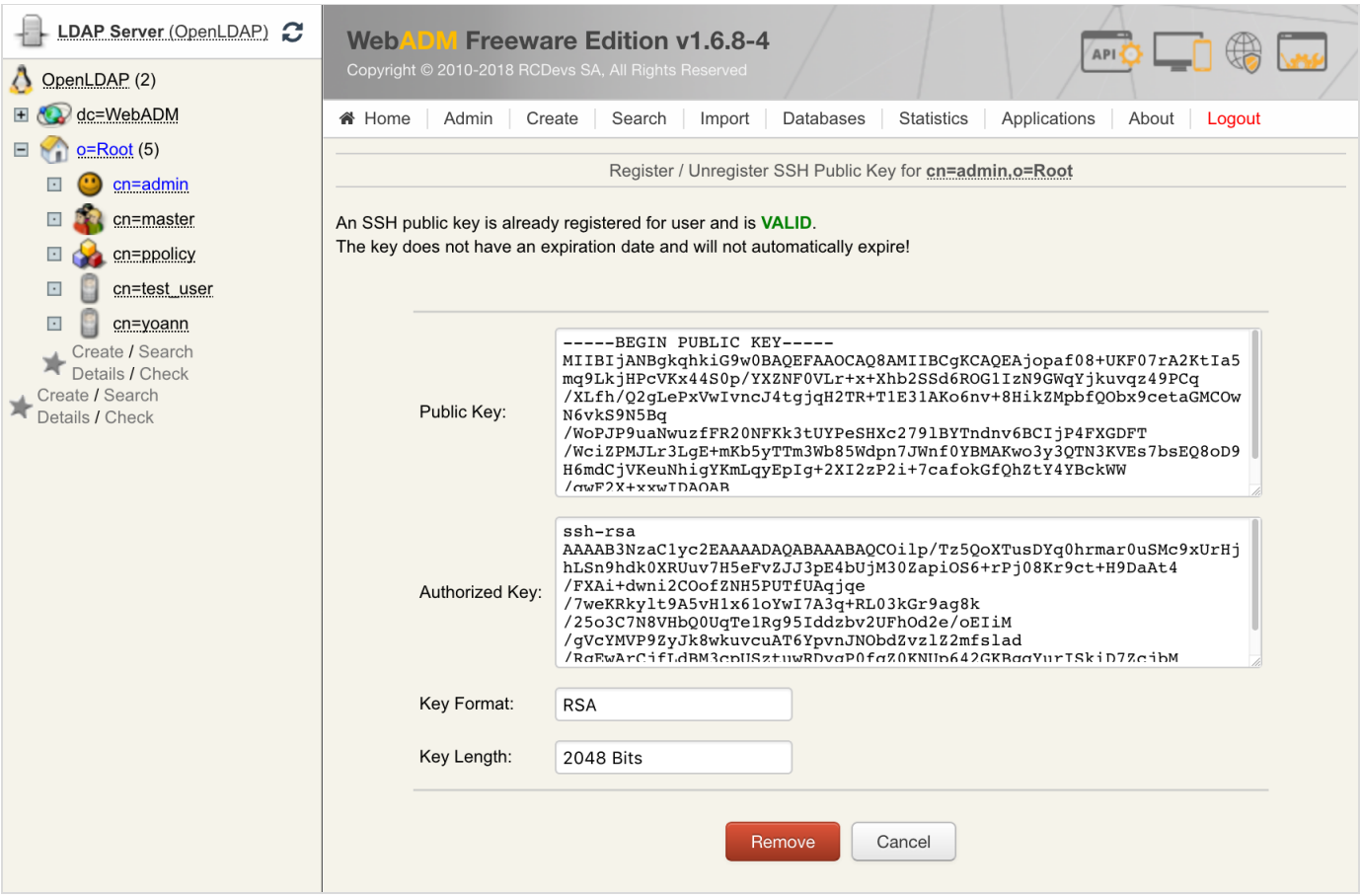
The public key can be found when you click on the user on the left tree, in `Application Actions` box, click on

`SSH Public Key Server` and `Register/Unregister SSH Public Key`.





I can see the public key enrolled for this user in SSH key format and in authorized key format.



Now, we will do a test to see if the backup key is returned by the authorized key command for the yoann user on a SpanKey client:

```
[root@ubuntu18client-virtual-machine ~]# /opt/spankey/libexec/authorized_keys yoann
environment="ONE_TIME_AUTHENTICATION_TOKEN=CF6CC2389B99374FBBD92E76D58EF891",command="/op
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCTLE6WCDDi/gknvCpWKNXBgCZ8eZeFfYN/MJ7PBv90lWlk/puUEwC2lmWQv
yoann@Default
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCOilp/Tz5QoXTusDYq0hrmar0uSMc9xUrHjhLSn9hdk0XRUuv7H5eFvZJJ3
```

As you can see, yoann user has his own public key returned by SpanKey server and the Admin recovery key previously configured.

```
12:59 $ ssh -i admin.pem yoann@192.168.3.178

Welcome to Ubuntu 18.04.1 LTS (GNU/Linux 4.15.0-42-generic x86_64)
Last login: Tue Dec 18 12:57:16 2018 from 192.168.3.233

yoann@ubuntu18client-virtual-machine:~$ exit
logout
Connection to 192.168.3.178 closed.
```

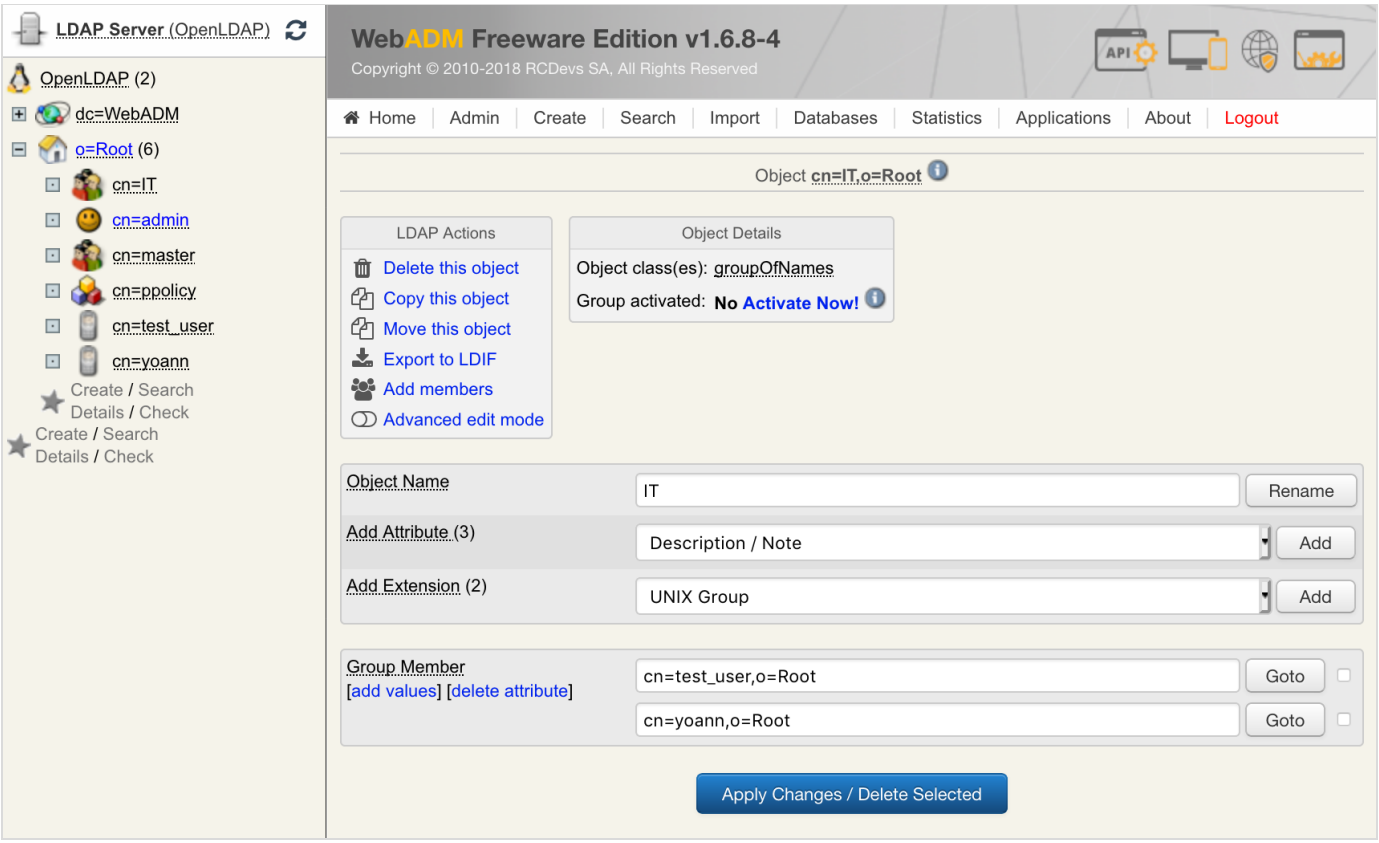
Below are the logs from the SpanKey server side for the authorized key request:

```
[2018-12-18 12:59:01] [192.168.3.178] [SpanKey:MN3K614Y] New spankeyAutorizedKeys SOAP
request
[2018-12-18 12:59:01] [192.168.3.178] [SpanKey:MN3K614Y] > Username: yoann
[2018-12-18 12:59:01] [192.168.3.178] [SpanKey:MN3K614Y] > Client ID: SpanKey
[2018-12-18 12:59:01] [192.168.3.178] [SpanKey:MN3K614Y] Registered
spankeyAutorizedKeys request
[2018-12-18 12:59:01] [192.168.3.178] [SpanKey:MN3K614Y] Resolved LDAP user:
cn=yoann,o=Root (cached)
[2018-12-18 12:59:01] [192.168.3.178] [SpanKey:MN3K614Y] Found user fullname: yoann
[2018-12-18 12:59:01] [192.168.3.178] [SpanKey:MN3K614Y] Found 23 user settings:
EnableLogin=Yes,X11Forwarding=Yes,PortForwarding=Yes,AgentForwarding=Yes,PTYAllocation=Ye
[1
Items],AllowKeyFiles=No,KeyFiles=.ssh/authorized_keys,MinUID=500,MinGID=100,MailSubject=S
Access Notification
[2018-12-18 12:59:01] [192.168.3.178] [SpanKey:MN3K614Y] Found 1 user data: PublicKey
[2018-12-18 12:59:01] [192.168.3.178] [SpanKey:MN3K614Y] Found 2048 bits RSA public key
[2018-12-18 12:59:01] [192.168.3.178] [SpanKey:MN3K614Y] Returning 1 authorized public
key
[2018-12-18 12:59:01] [192.168.3.178] [SpanKey:MN3K614Y] Returning 1 backup public key
[2018-12-18 12:59:01] [192.168.3.178] [SpanKey:MN3K614Y] Sent success response
```

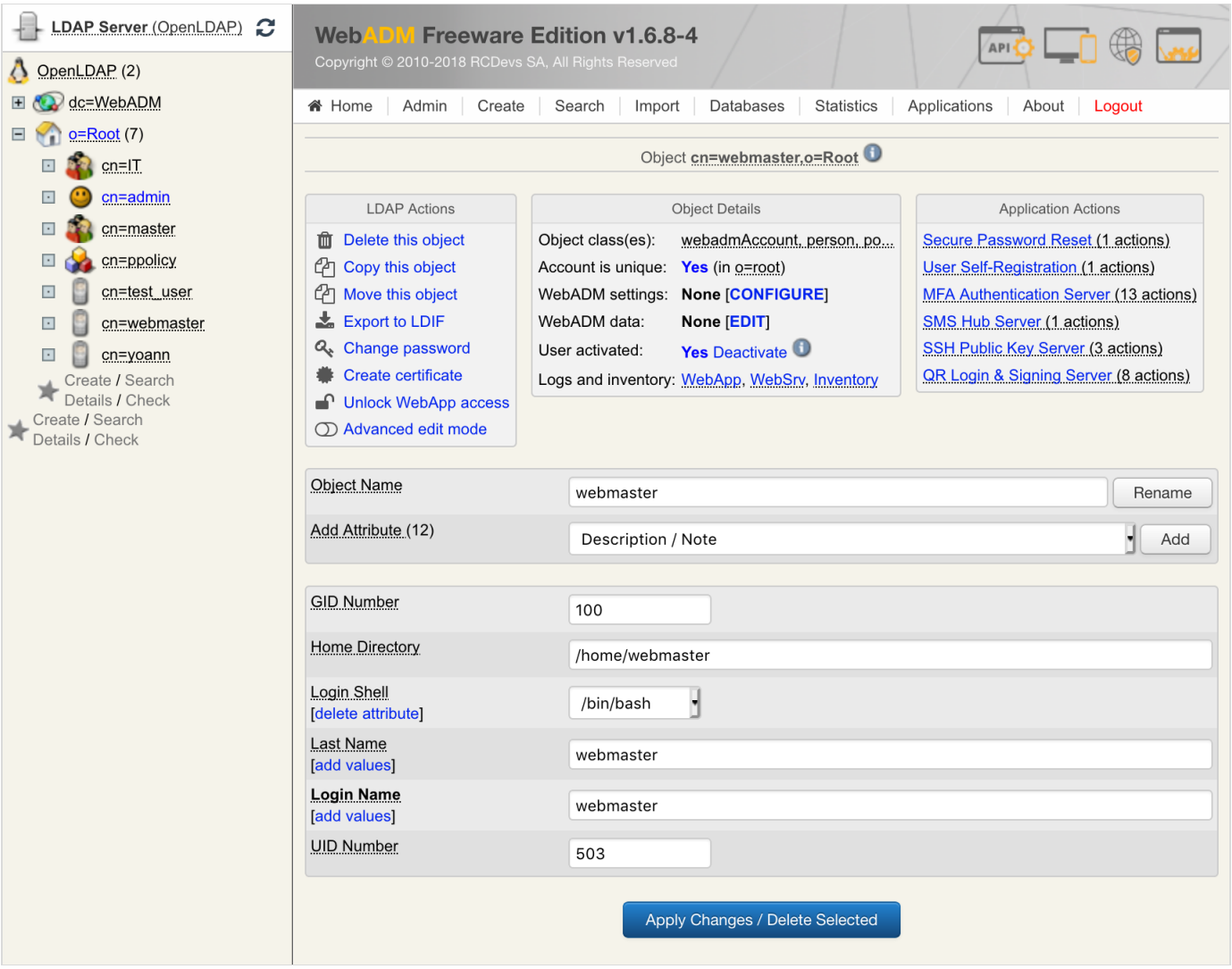
4.2.3 Shared Account/Authorized Group

Authorized Groups operate on the principle of a shared account. Shared accounts are a common practice in Enterprise use of SSH. A shared account (i.e. 'webmaster' user) is a system account which is used concurrently by several administrators. In SpanKey you can transform any generic LDAP user into a shared SSH account simply by linking this account to a 'shared access LDAP group'. Then all the members of that group can gain access to the shared account with their own SSH key. For example, my shared account is `webmaster` and I want to allow access to `webmaster` account by `IT` group members.

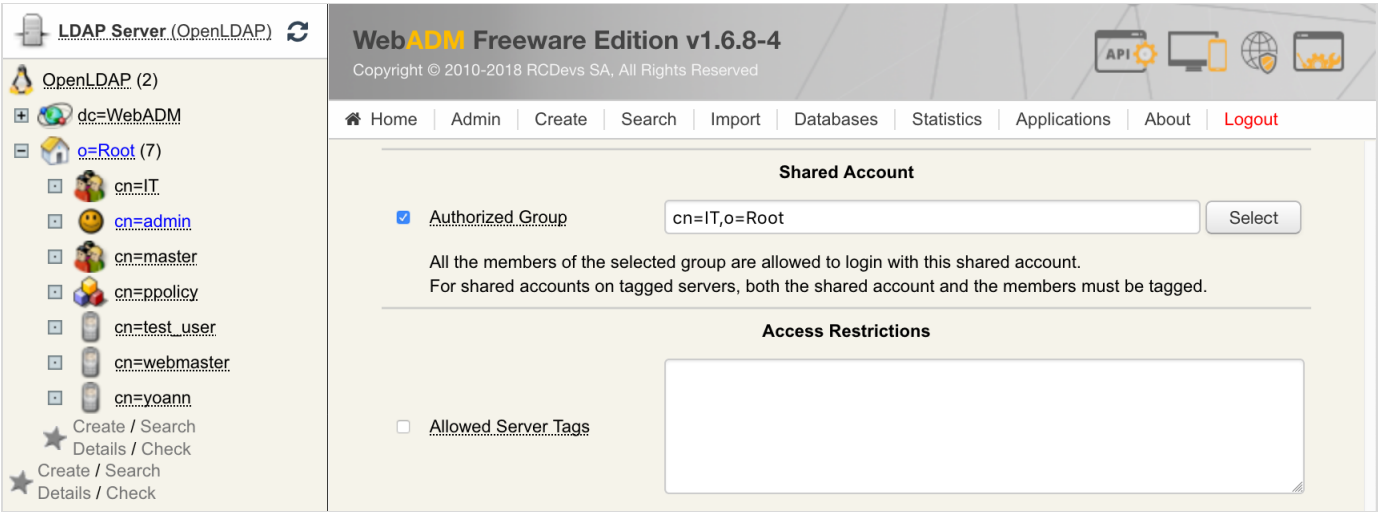
Member of this group are test_user and yoann accounts:



After that, I click on my `webmaster` account on the left tree. In `Object Details` box, I click on `CONFIGURE` button.



Choose SpanKey application and in `Shared Account` section, I configure my `IT` group like below:



Now, I'm able to log into my SpanKey_client with Yoann private key on the shared account `webmaster`:

```
16:43 $ ssh -i yoann.pem webmaster@192.168.3.178

Hello, SpanKey Tester!

Session recording is enabled.
Session lock is disabled.
Session's max duration is 30 minutes.

webmaster@ubuntu18client-virtual-machine:~$ whoami
webmaster
webmaster@ubuntu18client-virtual-machine:~$ pwd
/home/webmaster
webmaster@ubuntu18client-virtual-machine:~$ exit
exit

>>>> Session's duration was aprox 8 seconds <<<<

Connection to 192.168.3.178 closed.
```

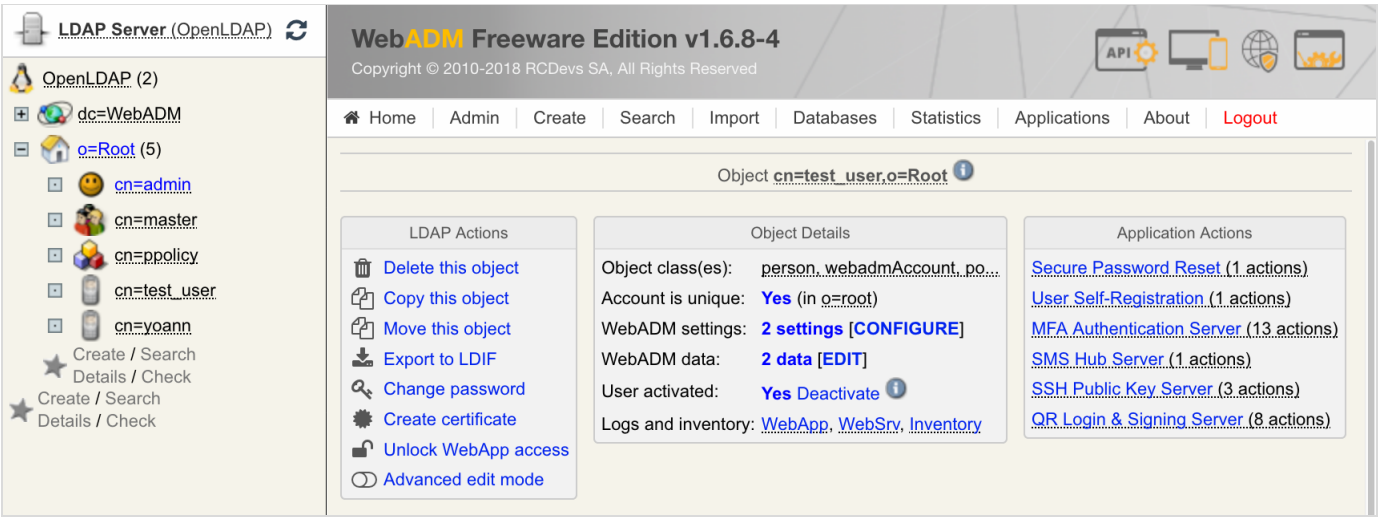
Logs on the SpanKey server side:

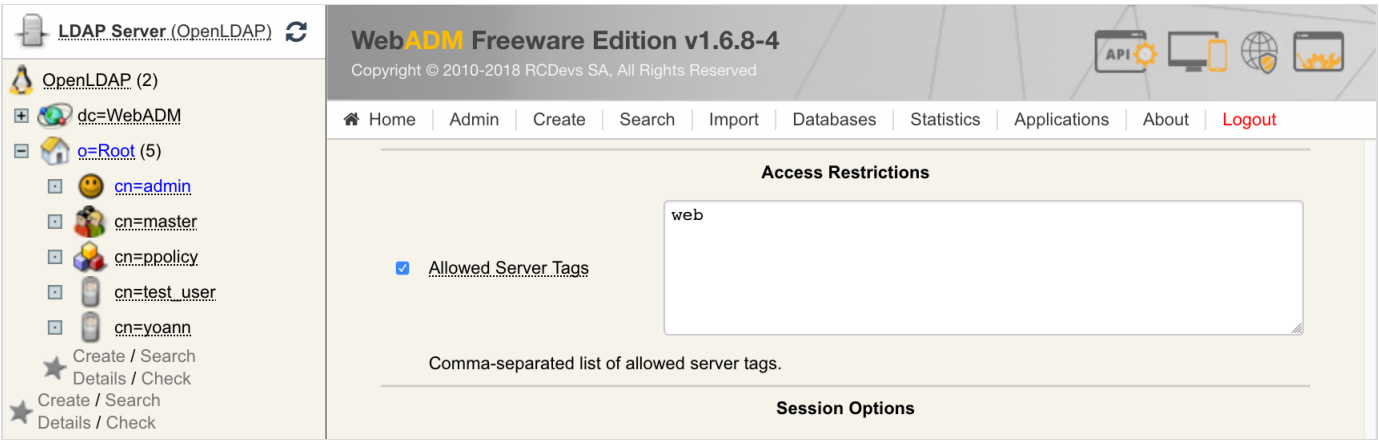
```
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:K6I3YWBV] New spankeyAutorizedKeys SOAP
request
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:K6I3YWBV] > Username: webmaster
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:K6I3YWBV] > Client ID: SpanKey
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:K6I3YWBV] Registered
spankeyAutorizedKeys request
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:K6I3YWBV] Resolved LDAP user:
cn=webmaster,o=Root (cached)
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:K6I3YWBV] Found user fullname: webmaster
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:K6I3YWBV] Found 23 user settings:
EnableLogin=Yes,X11Forwarding=Yes,PortForwarding=Yes,AgentForwarding=Yes,PTYAllocation=Ye
[1
Items],AllowKeyFiles=No,KeyFiles=.ssh/authorized_keys,MinUID=500,MinGID=100,MailSubject=S
Access Notification
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:K6I3YWBV] Allowed group 'IT' with 2
member public keys
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:K6I3YWBV] Returning 2 authorized public
keys
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:K6I3YWBV] Sent success response
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] New spankeySessionStart SOAP
request
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] > Username: webmaster
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] > Identity: yoann
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] > Command: /bin/bash
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] > Terminal: Yes
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] > Client ID: SpanKey
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] > Source IP: 192.168.3.233
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] Registered spankeySessionStart
request
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] Resolved LDAP user:
cn=yoann,o=Root (cached)
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] Resolved LDAP groups: it
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] Found user fullname: yoann
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] Found 16 user settings:
WelcomeText=Hello, SpanKey
Tester!,MaxSessionTime=30,LockSessionTime=0,RecordSessions=Yes,CreateHomedir=Yes,MailSubj
Access Notification,OfflineMode=Yes,EnableLogin=Yes
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] Started interactive terminal
session of ID cmIRB5Es0dfsx4rC valid for 600 seconds
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] Sent success response
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:G2MDIYQF] New spankeySessionUpdate SOAP
request
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:G2MDIYQF] > Session: cmIRB5Es0dfsx4rC
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] Found terminal session started
2018-12-18 14:41:04
[2018-12-18 14:41:04] [192.168.3.178] [SpanKey:HLTYITW4] Sent success response
```

4.2.4 TAGs

All hosts managed by SpanKey Server can be tagged in the SpanKey client configuration. For example, all web servers could be tagged with the acronym «WEB» in the configuration file of SpanKey client. Then you can add this Tag for all Webmaster accounts to ensure SSH access to every web server. To configure a Tag, click on a user account and in the section `Object Details` there is WebADM Settings. Click on the `CONFIGURE` button. Go on the SpanKey application and there are the options Allowed Server Tags.

TAGs can be configured on an LDAP account or an LDAP group. To set a tag on an account or a group, go on the WebADM Admin GUI, click on your account/group, in the `Object Details` box, you can find WebADM settings, click on `CONFIGURE`. In applications box on the left, select SpanKey. You are now in SpanKey configuration for your user or your group. In `Access Restriction` category, check the box `Allowed Server Tags` and configure your TAGs. On my side, I configured `web` TAG for my test_user.





Now, I just have to TAG my servers where SpanKey client is configured. TAG should be configured in `/opt/spankey/conf/spankeyd.conf`.

```
[root@ubuntu18client-virtual-machine ~]# vi /opt/spankey/conf/spankeyd.conf
#-#-#-#
#
#  spankeyd's main configuration file.
#

...

        #-#-#-#
        #
        #  Requested Tags (user must present all the tags).
        #
                requested_tags       web
        #
        #
        #-#-#-#

...

#
#
#-#-#-#
```

Please, restart SpanKey Client after editing the configuration file.

```
[root@ubuntu18client-virtual-machine ~]# /opt/spankey/bin/spankey restart
```

After tagging my server, I perform a login with an account which has the same TAG configured.

```
15:39 $ ssh -i test_user.pem test_user@192.168.3.178

Hello, SpanKey Tester!

Session recording is enabled.
Session lock is disabled.
Session's max duration is 30 minutes.

test_user@ubuntu18client-virtual-machine:~$ whoami
test_user
test_user@ubuntu18client-virtual-machine:~$ pwd
/home/test_user
test_user@ubuntu18client-virtual-machine:~$ exit
exit

>>>> Session's duration was aprox 7 seconds <<<<

Connection to 192.168.3.178 closed.
```

See below the result of the authentication:

```
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] New spankeyAutorizedKeys SOAP
request
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] > Username: test_user
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] > Tags: web
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] > Client ID: SpanKey
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] Registered
spankeyAutorizedKeys request
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] Resolved LDAP user:
cn=test_user,o=Root
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] Found user fullname: test_user
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] Found 23 user settings:
EnableLogin=Yes,X11Forwarding=Yes,PortForwarding=Yes,AgentForwarding=Yes,PTYAllocation=Ye
[1 Items],BackupKeys=[1
Items],AllowKeyFiles=No,KeyFiles=.ssh/authorized_keys,MinUID=500,MinGID=100,MailSubject=S
Access Notification
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] Found 2 user tags: WEB,SQL
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] Found 1 user data: PublicKey
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] Found 2048 bits RSA public key
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] Validated authorization for
server tag 'WEB'
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] Returning 1 authorized public
key
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] Returning 1 backup public key
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:CC7ZTR8Q] Sent success response
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:TM789F0W] New spankeySessionStart SOAP
request
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:TM789F0W] > Username: test_user
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:TM789F0W] > Identity: test_user
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:TM789F0W] > Command: /bin/bash
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:TM789F0W] > Terminal: Yes
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:TM789F0W] > Client ID: SpanKey
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:TM789F0W] > Source IP: 192.168.3.233
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:TM789F0W] Registered spankeySessionStart
request
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:TM789F0W] Resolved LDAP user:
cn=test_user,o=Root (cached)
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:TM789F0W] Found user fullname: test_user
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:TM789F0W] Found 13 user settings:
WelcomeText=Hello, SpanKey
Tester!,MaxSessionTime=30,LockSessionTime=0,RecordSessions=Yes,CreateHomedir=Yes,MailSubj
Access Notification,OfflineMode=Yes
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:TM789F0W] Started interactive terminal
session of ID Md618XfBrP1Mnkmq valid for 600 seconds
[2018-12-18 15:39:36] [192.168.3.178] [SpanKey:TM789F0W] Sent success response
```

It works well for the test_user, I will try now an authentication with the account Yoann which doesn't have the `web` TAG.

```
15:40 $ ssh -i yoann.pem yoann@192.168.3.178
```

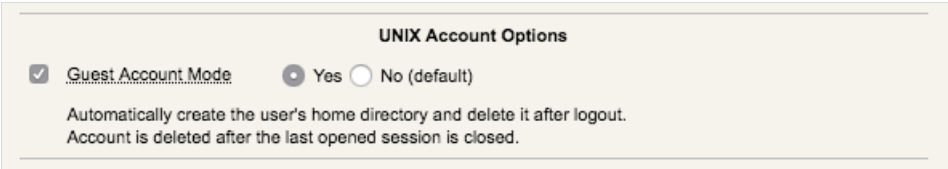
See below the result of the authentication:

```
[2018-12-18 15:40:18] [192.168.3.178] [SpanKey:8JSB1WKO] New spankeyAutorizedKeys SOAP
request
[2018-12-18 15:40:18] [192.168.3.178] [SpanKey:8JSB1WKO] > Username: yoann
[2018-12-18 15:40:18] [192.168.3.178] [SpanKey:8JSB1WKO] > Tags: web
[2018-12-18 15:40:18] [192.168.3.178] [SpanKey:8JSB1WKO] > Client ID: SpanKey
[2018-12-18 15:40:18] [192.168.3.178] [SpanKey:8JSB1WKO] Registered
spankeyAutorizedKeys request
[2018-12-18 15:40:18] [192.168.3.178] [SpanKey:8JSB1WKO] Resolved LDAP user:
cn=yoann,o=Root
[2018-12-18 15:40:18] [192.168.3.178] [SpanKey:8JSB1WKO] Found user fullname: yoann
[2018-12-18 15:40:18] [192.168.3.178] [SpanKey:8JSB1WKO] Found 23 user settings:
EnableLogin=Yes,X11Forwarding=Yes,PortForwarding=Yes,AgentForwarding=Yes,PTYAllocation=Ye
[1
Items],AllowKeyFiles=No,KeyFiles=.ssh/authorized_keys,MinUID=500,MinGID=100,MailSubject=S
Access Notification
[2018-12-18 15:40:18] [192.168.3.178] [SpanKey:8JSB1WKO] Found 1 user data: PublicKey
[2018-12-18 15:40:18] [192.168.3.178] [SpanKey:8JSB1WKO] Found 2048 bits RSA public key
[2018-12-18 15:40:18] [192.168.3.178] [SpanKey:8JSB1WKO] Account is missing
authorization for server tag 'WEB'
[2018-12-18 15:40:18] [192.168.3.178] [SpanKey:8JSB1WKO] No authorized public key found
[2018-12-18 15:40:19] [192.168.3.178] [SpanKey:8JSB1WKO] Sent failure response
```

As you can see, the authentication failed because the account is missing an authorization for server TAG `web`.

4.2.5 Guest Account

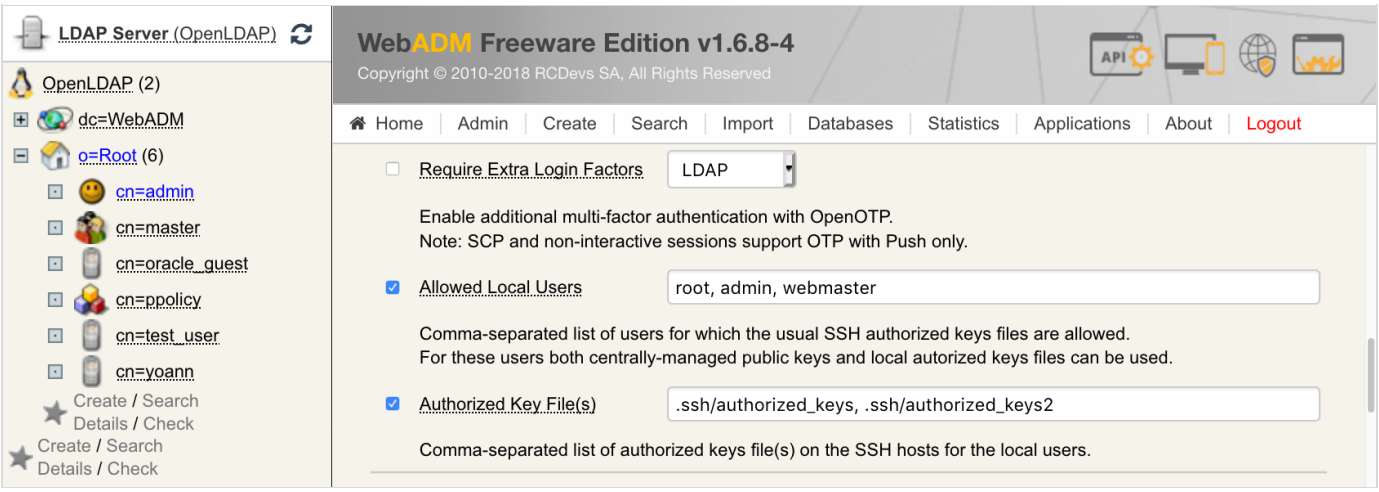
Another feature of SpanKey is the Guest Account. A Guest account can be used by a consultant for example. If enabled, the user's home directory will automatically be created and deleted after logout. The account is deleted after the last opened session is closed. In my example, I will configure an account named `Oracle_Guest`. To configure this account as a Guest Account, click on your user on the left tree, in `Object Details` box, you can find `WebADM Settings`, click on `CONFIGURE`. In applications box on the left, select `SpanKey`. You are now in SpanKey configuration for your users. In `UNIX Account Options` category, check the box `Guest Account Mode` and set this feature to `Yes`.



In that scenario, I can also configure a TAG for this Guest User, `SQL` TAG, for example, to allow the access to every `SQL` tagged servers by my Oracle consultant through the Guest account.

4.2.6 Allow local users and local Authorized Keys File(s) usage

The SpanKey server allows you to configure local users who will be able to use the local authorized keys file(s) configured. In the SpanKey server configuration, you will find the following setting under Server Policy:



Configure your users who are able to use the local authorized keys file(s) first and after that, configure the authorized keys file(s) that your users will be able to use for local login.

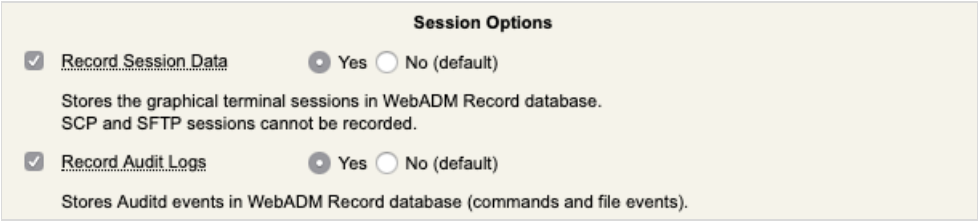
4.2.7 Audit logs and SSH Sessions recording

For security audit, Spankey provide 2 kinds of audit logs.

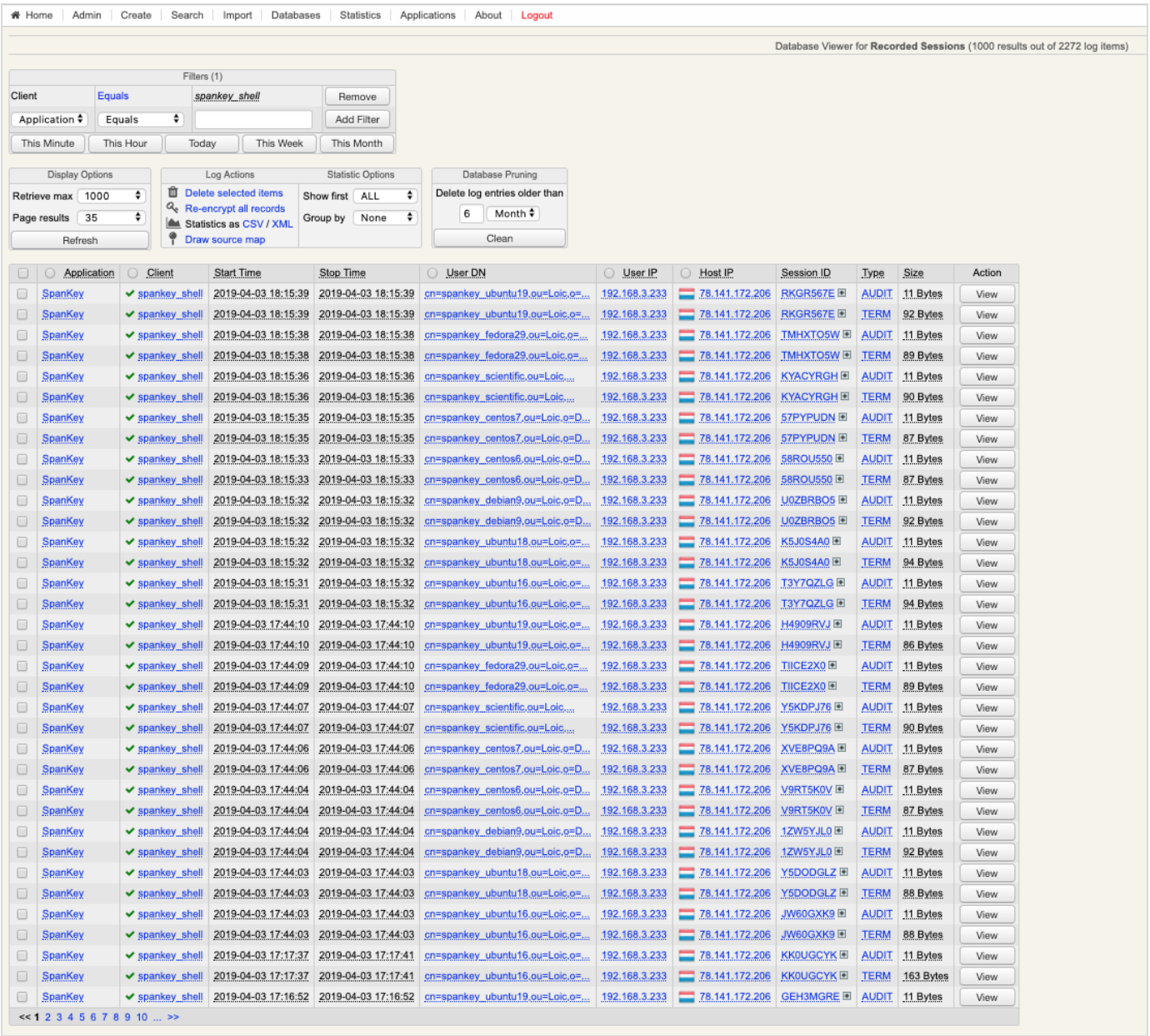
The first one is the graphical session recording. All SSH sessions can be recorded and that allow you to replay every SSH sessions at any moment through the WebADM Admin interface. The `Record Session Data` setting must be enabled for session recording.

Another kind of audit is the `Record Audit Logs`. The setting will allow you to store audit event (commands and file events) in the WebADM Record databases.

These 2 settings can be enabled under SpanKey Server configuration:



Recorded sessions and audit logs can be replayed under
`WebADM Admin GUI > Databases > Recorded Sessions`



Under the Recorded Sessions databases, 2 types of record are available:

- `TERM` : This is a graphical session record
- `AUDIT` : This is the command and file events record

Click on view button to see the recorded sessions/logs

Other informations like client, Session duration, User DN, User IP, Host IP and Session ID are also useful here.

This is an example of auditd logs available through WebADM Admin GUI under databases > Recorded Sessions. Click on `View` button on an `AUDIT` log type to consult auditd logs:

```
[2019-04-15 14:49:34] [1234] Executed command '/bin/bash' (pid 25851) in '/home/yoann' as
501:100
[2019-04-15 14:49:34] [1234] > Event 'execve' returned success with code 0
[2019-04-15 14:49:34] [1235] Executed command '/usr/bin/id -gn' (pid 25859) in
```

```
'/home/yoann' as 501:100
[2019-04-15 14:49:34] [1235] > Event 'execve' returned success with code 0
[2019-04-15 14:49:34] [1236] Executed command '/usr/bin/id -un' (pid 25861) in
'/home/yoann' as 501:100
[2019-04-15 14:49:34] [1236] > Event 'execve' returned success with code 0
[2019-04-15 14:49:34] [1238] Executed command 'ls /etc/bash_completion.d' (pid 25865) in
'/home/yoann' as 501:100
[2019-04-15 14:49:34] [1238] > Event 'execve' returned success with code 0
[2019-04-15 14:49:34] [1239] Executed command 'uname -o' (pid 25867) in '/home/yoann' as
501:100
[2019-04-15 14:49:34] [1239] > Event 'execve' returned success with code 0
[2019-04-15 14:49:34] [1240] Executed command 'pkg-config --variable=completionsdir bash-
completion' (pid 25869) in '/home/yoann' as 501:100
[2019-04-15 14:49:34] [1240] > Event 'execve' returned success with code 0
[2019-04-15 14:49:34] [1241] Executed command '/bin/sh /usr/libexec/grepconf.sh -c' (pid
25870) in '/home/yoann' as 501:100
[2019-04-15 14:49:34] [1241] > Event 'execve' returned success with code 0
[2019-04-15 14:49:34] [1242] Executed command 'grep -qsi ^COLOR.*none /etc/GREP_COLORS'
(pid 25871) in '/home/yoann' as 501:100
[2019-04-15 14:49:34] [1242] > Event 'execve' returned success with code 0
[2019-04-15 14:49:34] [1243] Executed command '/usr/bin/tty -s' (pid 25873) in
'/home/yoann' as 501:100
[2019-04-15 14:49:34] [1243] > Event 'execve' returned success with code 0
[2019-04-15 14:49:34] [1244] Executed command '/usr/bin/tput colors' (pid 25874) in
'/home/yoann' as 501:100
[2019-04-15 14:49:34] [1244] > Event 'execve' returned success with code 0
[2019-04-15 14:49:34] [1245] Executed command '/usr/bin/dircolors --sh
/etc/DIR_COLORS.256color' (pid 25876) in '/home/yoann' as 501:100
[2019-04-15 14:49:34] [1245] > Event 'execve' returned success with code 0
[2019-04-15 14:49:34] [1246] Executed command '/usr/bin/grep -qi ^COLOR.*none
/etc/DIR_COLORS.256color' (pid 25877) in '/home/yoann' as 501:100
[2019-04-15 14:49:34] [1246] > Event 'execve' returned success with code 0
[2019-04-15 14:49:34] [1247] Executed command '/usr/bin/id -u' (pid 25879) in
'/home/yoann' as 501:100
[2019-04-15 14:49:34] [1247] > Event 'execve' returned success with code 0
[2019-04-15 14:49:39] [1248] Executed command 'ps faux' (pid 25880) in '/home/yoann' as
501:100
[2019-04-15 14:49:39] [1248] > Event 'execve' returned success with code 0
[2019-04-15 14:49:41] [1249] Executed command 'sh /tmp/test.sh' (pid 25886) in
'/home/yoann' as 501:100
[2019-04-15 14:49:41] [1249] > Event 'execve' returned success with code 0
[2019-04-15 14:50:05] [1250] Executed command 'scp /tmp/test.sh
yoann@192.168.3.181:/Users/yoann/Desktop/' (pid 25907) in '/home/yoann' as 501:100
[2019-04-15 14:50:05] [1250] > Event 'execve' returned success with code 0
[2019-04-15 14:50:05] [1251] Executed command '/usr/bin/ssh -x -oForwardAgent=no -
oPermitLocalCommand=no -oClearAllForwardings=yes -l yoann -- 192.168.3.181 scp -t
/Users/yoann/Desktop/' (pid 25908) in '/home/yoann' as 501:100
[2019-04-15 14:50:05] [1251] > Event 'execve' returned success with code 0
```

4.2.8 Sudoers Policy Plugin

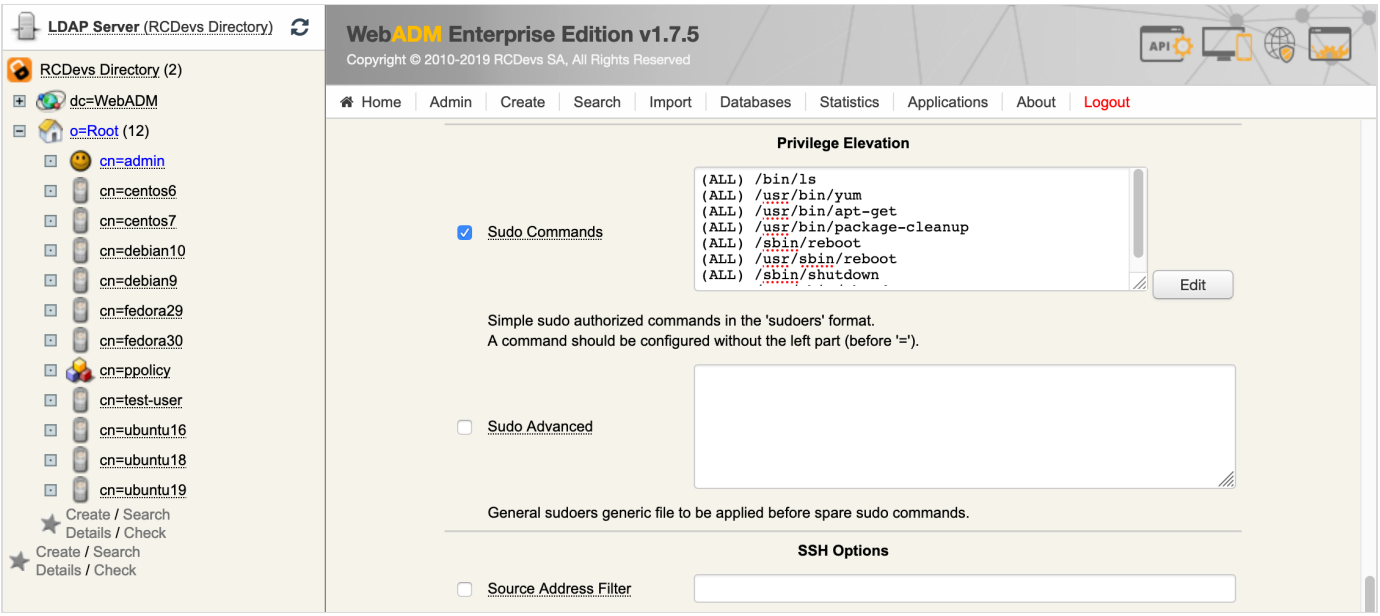
Since SpanKey Client for Linux v2.2.0 and SpanKey Server v2.0.5-1, you can use Sudo Commands with SpanKey. There is an advanced section that you may use in WebADM to apply the full syntax of the sudoers file (global options, global aliases and rules). Then, the rules coming from Spankey policies (global, user, and client policy) will be appended. So the priority order of the rules are:

1. Client policy
2. User policy
3. Global policy
4. Rules from the advanced section

Run the following command `sudo -V` to check if SpanKey sudoers policy plugin has been successfully loaded:

```
$ ssh -i centos7 centos7@192.168.3.120

Welcome to SpanKey SSH Server.
This is a demonstration by RCDEVS SA.

Session recording is enabled.
Audit logs recording is enabled.
Session lock idle time is 10 minutes.
Session's max duration is 30 minutes.

[centos7@centos7-client ~]$ sudo -V
Sudo version 1.8.23

SpanKey sudoers policy plugin version 2.3.0
Copyright 2010-2019 RCDevs SA, All rights reserved.

Sudoers file grammar version 46
Sudoers I/O plugin version 2.3.0
[centos7@centos7-client ~]$ exit
exit

>>>> Session's duration was aprox 6 seconds <<<<

Connection to 192.168.3.120 closed.
$
```

Authorized sudo commands can be set in `WebADM GUI` > `Applications` > `SSH Public Key Server (SpanKey) v2.0.5-1` > `Configure` > `Privilege Elevation`:



Run the following command `sudo -l` to check the rights and the set of rules:

```
$ ssh -i centos7 centos7@192.168.3.120

Welcome to SpanKey SSH Server.
This is a demonstration by RCDEVS SA.

Session recording is enabled.
Audit logs recording is enabled.
Session lock idle time is 10 minutes.
Session's max duration is 30 minutes.

[centos7@centos7-client ~]$ sudo -l
User centos7 may run the following commands on centos7-client:
    (ALL) /bin/ls
    (ALL) /usr/bin/yum
    (ALL) /usr/bin/apt-get
    (ALL) /usr/bin/package-cleanup
    (ALL) /sbin/reboot
    (ALL) /usr/sbin/reboot
    (ALL) /sbin/shutdown
    (ALL) /usr/sbin/shutdown
[centos7@centos7-client ~]$ exit
exit

>>>> Session's duration was aprox 4 seconds <<<<

Connection to 192.168.3.120 closed.
$
```

4.3 OpenSSH

The SpanKey client setup script asks us during the setup if we want to enable SpanKey for OpenSSH and we reply `Yes` to this question.

This action involves changing `/etc/ssh/sshd_config` configuration file. The script edit the following parameters:

```
AuthorizedKeysCommand /opt/spankey/libexec/authorized_keys
AuthorizedKeysCommandUser root
PermitUserEnvironment yes
UsePAM yes
```

Depending on the SSHd version, you might need to use `AuthorizedKeysCommandRunAs` instead of `AuthorizedKeysCommandUser`. Restart SSHd if you change the configuration.

```
service sshd restart
```

4.4 NSS Provider

4.4.1 RHEL & CentOS

The SpanKey client setup script asks us during the setup if we want to enable SpanKey for NSCD and we reply `Yes` to this question.

This action involves changing `/etc/nsswitch.conf` configuration file.

The script edit the following parameters:

```
passwd: files spankey sss
shadow: file sss
group: files spankey sss
```

Restart NSCD to apply the configuration:

```
service nscd restart
```

4.4.2 Debian & Ubuntu

The SpanKey client setup script asks us during the setup if we want to enable SpanKey for NSCD and we reply `Yes` to this question.

This action involves changing `/etc/nsswitch.conf` configuration file.

The script edits the following parameters:

```
passwd: compat spankey
shadow: compat
group:  compat spankey
```

4.4.3 getent passwd/group tests

To check if your LDAP users are well returned on your spankey_client, you can use the following command:

```
getent passwd
```

This command should return all LDAP accounts allowed for this host. An LDAP account can be returned only if the account is extended to UNIX. Please refer to step `5.0 Users/Groups Management` to know how to activate/extend an LDAP account for SpanKey usage).

```
[root@webadm temp]# getent passwd

#### The following accounts are local accounts

root:x:0:0:root:/root:/bin/bash
bin:x:1:1:bin:/bin:/sbin/nologin
daemon:x:2:2:daemon:/sbin:/sbin/nologin
adm:x:3:4:adm:/var/adm:/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
sync:x:5:0:sync:/sbin:/bin/sync
shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
halt:x:7:0:halt:/sbin:/sbin/halt
mail:x:8:12:mail:/var/spool/mail:/sbin/nologin
operator:x:11:0:operator:/root:/sbin/nologin
games:x:12:100:games:/usr/games:/sbin/nologin
ftp:x:14:50:FTP User:/var/ftp:/sbin/nologin
nobody:x:99:99:Nobody:/:/sbin/nologin
dbus:x:81:81:System message bus:/:/sbin/nologin
polkitd:x:999:998:User for polkitd:/:/sbin/nologin
avahi:x:70:70:Avahi mDNS/DNS-SD Stack:/var/run/avahi-daemon:/sbin/nologin
avahi-autoipd:x:170:170:Avahi IPv4LL Stack:/var/lib/avahi-autoipd:/sbin/nologin
postfix:x:89:89::/var/spool/postfix:/sbin/nologin
sshd:x:74:74:Privilege-separated SSH:/var/empty/sshd:/sbin/nologin
admin:x:1000:1000:admin:/home/admin:/bin/bash
nscd:x:28:28:NSCD Daemon:/:/sbin/nologin
systemd-bus-proxy:x:998:996:systemd Bus Proxy:/:/sbin/nologin
systemd-network:x:192:192:systemd Network Management:/:/sbin/nologin
tss:x:59:59:Account used by the trousers package to sandbox the tcsd
daemon:/dev/null:/sbin/nologin
webadm:x:997:995::/opt/webadm:/bin/bash
mysql:x:27:27:MariaDB Server:/var/lib/mysql:/sbin/nologin
ntp:x:38:38::/etc/ntp:/sbin/nologin
tcpdump:x:72:72::/:/sbin/nologin
radiusd:x:95:95:radiusd user:/var/lib/radiusd:/sbin/nologin
spankey:x:996:1001:SpanKey Client System User:/opt/spankey:/sbin/nologin

#### The following accounts are LDAP accounts

Administrateur:x:1111:111::/home/administrateur:/bin/bash
quick:x:500:100::/home/quick:/bin/bash
yoann:x:1010:100::/home/yoann:/bin/bash
test_user:x:500:100::/home/test_user:/bin/bash
```

Note

« getent passwd » command may take few seconds to yield results.

After the getent passwd command, you should have the following result in `/opt/webadm/logs/webadm.log` (server

side) if the command has worked successfully:

```
[2018-05-22 17:11:25] [192.168.3.178] [SpanKey:AFA5ES1I] New spankeyNSSList SOAP
request
[2018-05-22 17:11:25] [192.168.3.178] [SpanKey:AFA5ES1I] > Database: user
[2018-05-22 17:11:25] [192.168.3.178] [SpanKey:AFA5ES1I] > Client ID: my_client_id
[2018-05-22 17:11:25] [192.168.3.178] [SpanKey:AFA5ES1I] Registered spankeyNSSList
request
[2018-05-22 17:11:25] [192.168.3.178] [SpanKey:AFA5ES1I] Found 4 posix users
[2018-05-22 17:11:25] [192.168.3.178] [SpanKey:AFA5ES1I] Sent success response
```

To check if your LDAP groups are well returned on your spankey client machine, you can use the following command:

```
getent group
```

Note that only activated LDAP groups will be returned with this command. Please refer to step `5.0 Users/Groups Management` to know how to activate/extend an LDAP group for SpanKey usage).

```
[root@we2yo tmp]# getent group

#### The following groups are local groups

root:x:0:
bin:x:1:
daemon:x:2:
sys:x:3:
adm:x:4:
tty:x:5:
disk:x:6:
lp:x:7:
mem:x:8:
kmem:x:9:
wheel:x:10:
cdrom:x:11:
mail:x:12:postfix
man:x:15:
dialout:x:18:webadm
floppy:x:19:
games:x:20:
tape:x:30:
video:x:39:
ftp:x:50:
lock:x:54:
audio:x:63:
nobody:x:99:
users:x:100:
avahi-autoipd:x:170:
```

```
avahi-autoipd:x:170:
utmp:x:22:
utempter:x:35:
ssh_keys:x:999:
input:x:998:
systemd-journal:x:190:
systemd-bus-proxy:x:997:
systemd-network:x:996:
dbus:x:81:
polkitd:x:995:
dip:x:40:
tss:x:59:
postdrop:x:90:
postfix:x:89:
chrony:x:994:
sshd:x:74:
mysql:x:993:
webadm:x:1000:
ldap:x:55:
slocate:x:21:
nscd:x:28:
tcpdump:x:72:
cgred:x:992:
docker:x:991:
radiusd:x:990:
toto:x:1003:
apache:x:48:
stapusr:x:156:
stapsys:x:157:
stapdev:x:158:

#### The following groups are LDAP groups

Administrateurs de l’entreprise:x:100:Administrateur
Admins du domaine:x:101:Administrateur,yoann,vagrant
ITWeb:x:103:vagrant
Invités du domaine:x:110:
testgroup:x:100:testadfs,vagrant
webadm admins:x:102:yoann
yotesting:x:10000:
```

After the getent group command, you should have the following result in /opt/webadm/logs/webadm.log (server side) if the command has worked successfully:

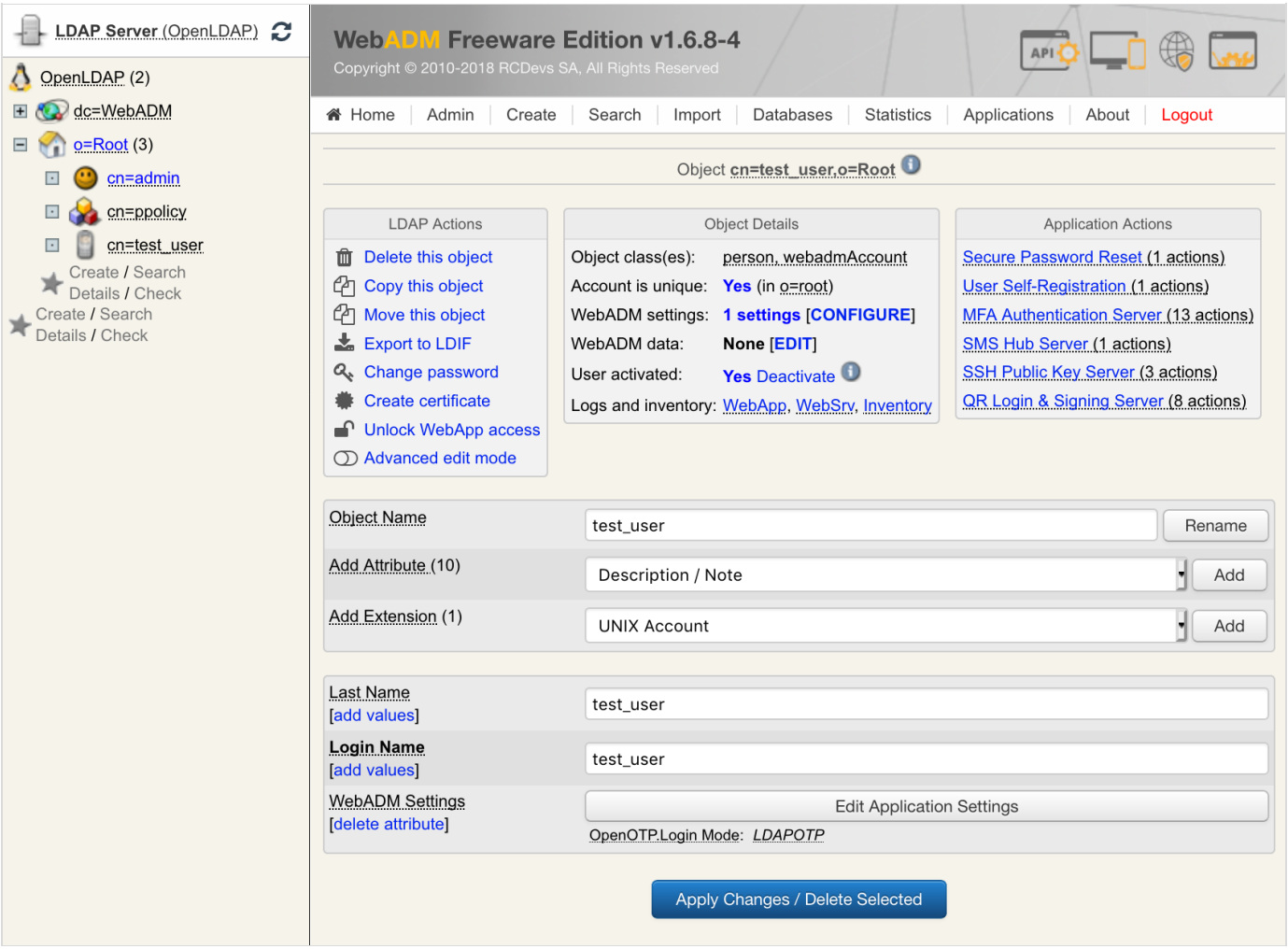
```
[2019-04-15 14:49:33] [192.168.3.178] [SpanKey:GMXOP188] New spankeyNSSList SOAP
request
[2019-04-15 14:49:33] [192.168.3.178] [SpanKey:GMXOP188] > Database: group
[2019-04-15 14:49:33] [192.168.3.178] [SpanKey:GMXOP188] > Client ID: my_client_id
[2019-04-15 14:49:33] [192.168.3.178] [SpanKey:GMXOP188] Registered spankeyNSSList
request
[2019-04-15 14:49:33] [192.168.3.178] [SpanKey:GMXOP188] Found 7 NSS groups
[2019-04-15 14:49:33] [192.168.3.178] [SpanKey:GMXOP188] Sent success response
```

5. Users/Groups Management

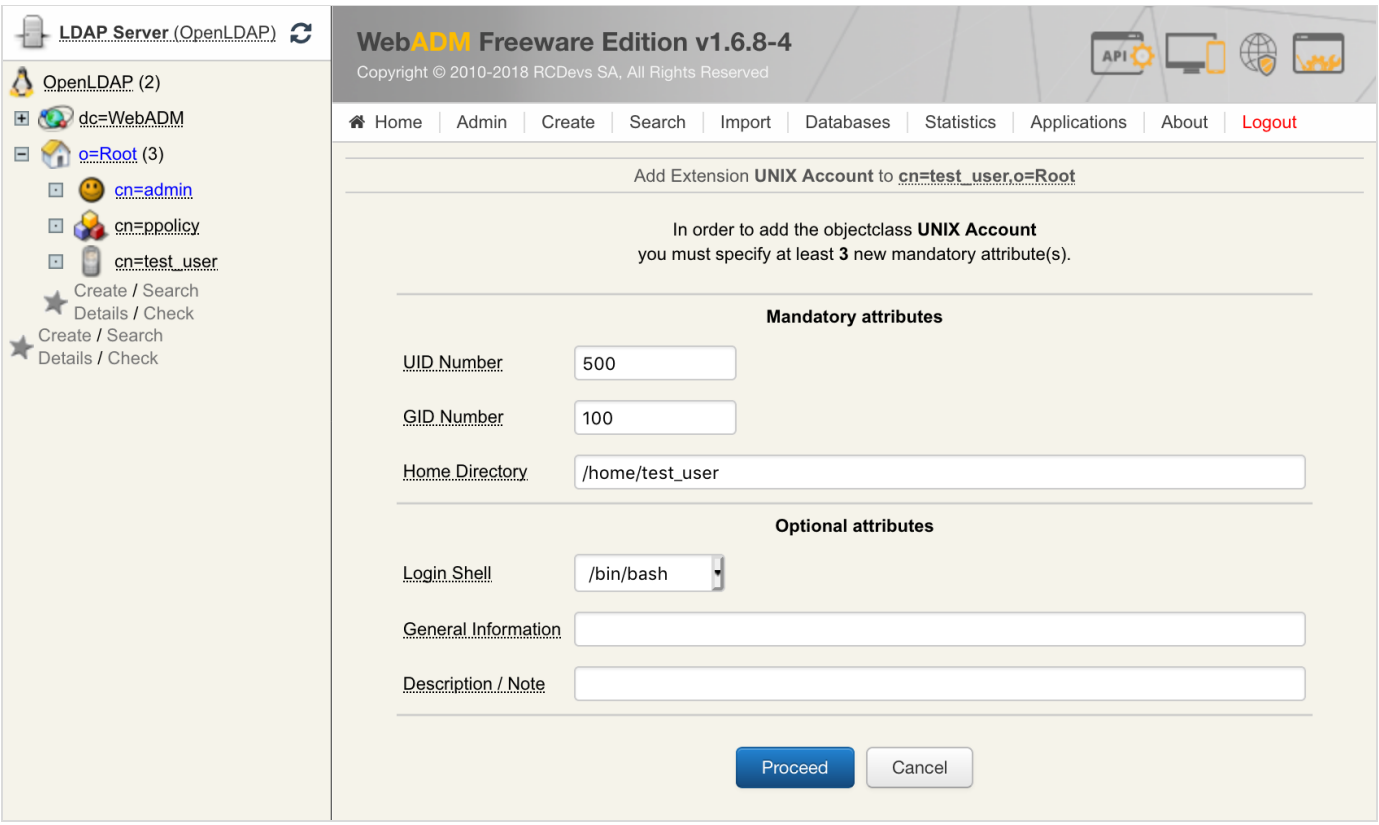
5.1 Users Management (Activation)

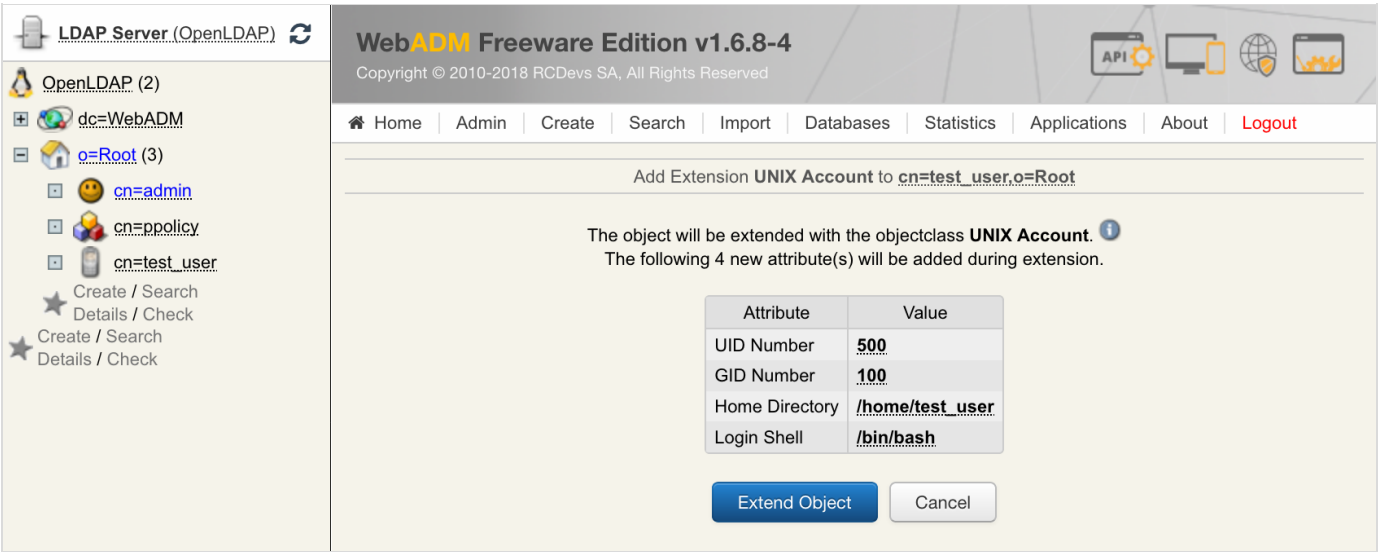
To enable your LDAP users to be propagated as Linux accounts, and to work with the SpanKey, they must be extended with “Unix Account” object class. This is done in the WebADM graphical interface (can be done as a batch jobs as well) as follows:

1. Choose LDAP account that you like to extend.
2. Make sure the account is a WebADM account. If not, you must first extend the account with WebADM object class.
3. Choose WebADM Account in Add Selector. Click `Add`.
4. Choose UNIX Account in the Add Extension selector. Click `Add`.



1. Enter the following information and click `Proceed`. Click on `Extend Object`.





Now, the LDAP Account is extended for UNIX Authentication.

5.2 Groups Management (Activation)

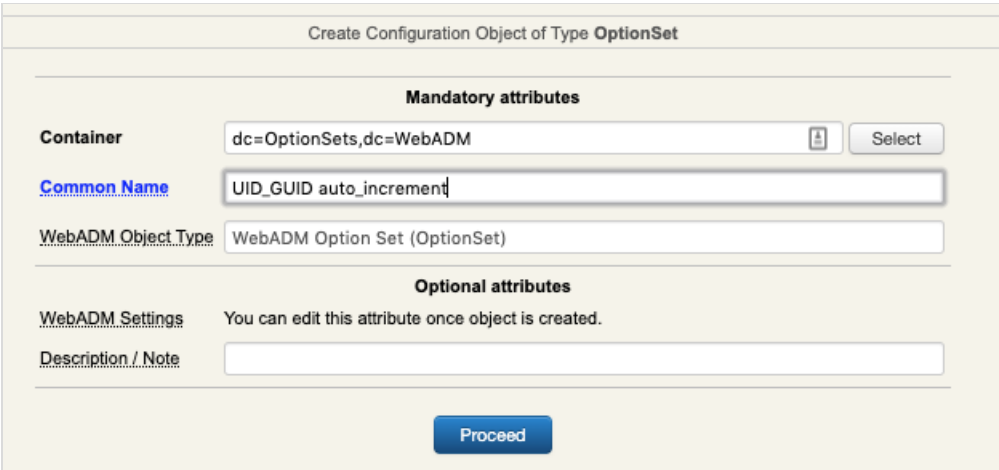
To enable your LDAP groups to be propagated as Linux groups, and to work with the SpanKey, it must be extended with “Unix Group” object class. This is done in the WebADM graphical interface (can be done as a batch jobs as well) as follows:

1. Choose LDAP group that you like to extend.
2. Choose UNIX Group in the Add Extension selector. Click `Add`.
3. Enter the required information and click `Proceed`. Click on `Extend Object`.

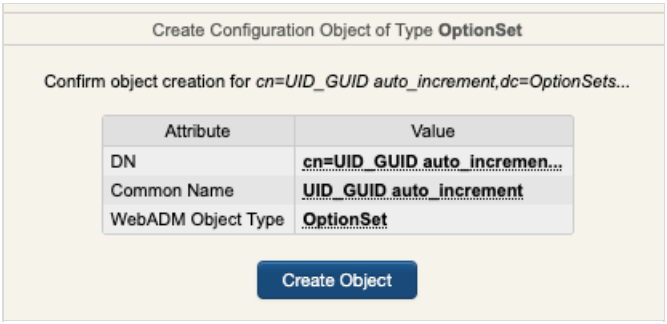
Now, the LDAP group is extended for UNIX usage.

5.3 Auto increment UIDnumber and GIDnumber during user/group activation

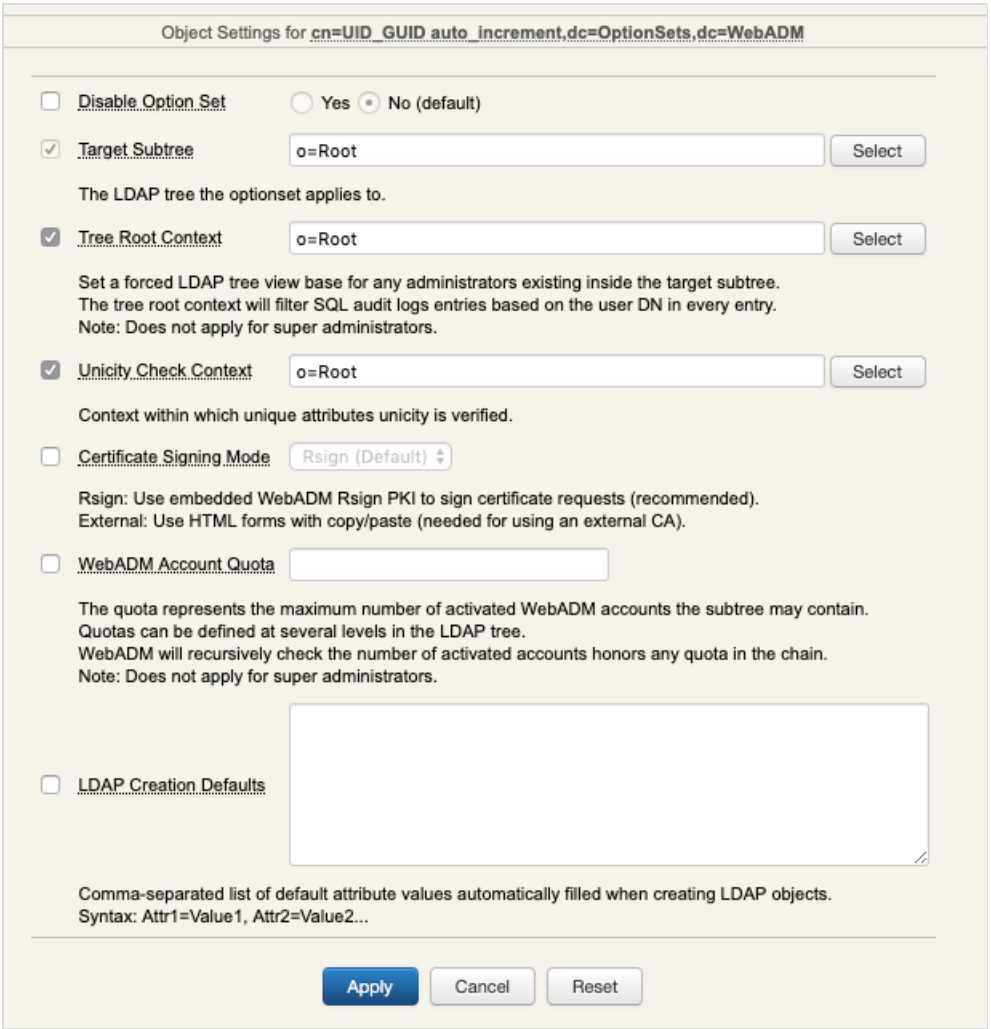
In order to auto increment UID and GUI numbers during user/group activation, you have to create an `LDAP Option Sets` object. Login on the `WebADM Admin GUI` > `Admin` tab > `LDAP Option Sets` > `Add OptionSet`. On the next screen, name your OptionSet :



Click `Proceed` button and on the next page click on `Create Object` :



You are now on the `Option Set` configuration page :



Configure the root LDAP treebase for the 3 first settings and click `Apply`. For Active Directory it should be something like dc=domain,dc=com according to your domain.

The OptionSet configuration is done and UIDnumber and GIDnumber will be automatically increased during user/group activation.

5.4 Active Directory Permissions

If you are working with Active Directory and during the UNIX extension you have a failure, it's probably due to rights permissions. That means your super_admin doesn't have enough rights to add the UNIX class to the user and/or to write values on UNIX attributes. To fix it, login on the Active Directory server and run the following command through Powershell:

```
dsacls "CN=Users,DC=test,DC=local" /I:T /G 'TEST\webadm_admins:WPRP;objectClass'
dsacls "cn=users,dc=test,dc=local" /I:T /G 'TEST\webadmadmin:WPRP;gidnumber'
dsacls "cn=users,dc=test,dc=local" /I:T /G 'TEST\webadmadmin:WPRP;uidnumber'
dsacls "cn=users,dc=test,dc=local" /I:T /G 'TEST\webadmadmin:WPRP;unixhomedirectory'
dsacls "cn=users,dc=test,dc=local" /I:T /G 'TEST\webadmadmin:WPRP;loginshell'
dsacls "cn=users,dc=test,dc=local" /I:T /G 'TEST\webadmadmin:WPRP;description'
dsacls "cn=users,dc=test,dc=local" /I:T /G 'TEST\webadmadmin:WPRP;gecos'
```

Note that `cn=users,dc=test,dc=local` is the user search base defined in WebADM Local Domain, `TEST` is my NetBIOS domain name and `webadmadmin` is my `super_admin` account.

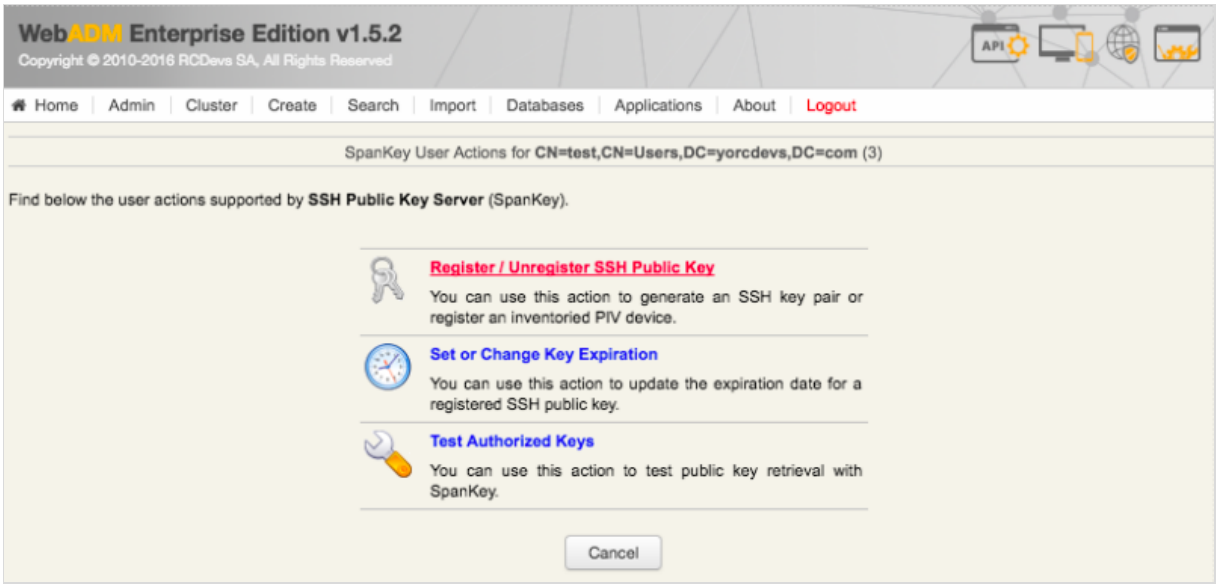
For writting on AD administrators, rights previously settled are not enough because AdminSDHolder overwrites these rights every hour. So we need also to apply these rules on AdminSDHolder object and wait one hour that it's applied on all admin users and groups of the domain:

```
dsacls "CN=AdminSDHolder,CN=System,DC=test,DC=local" /I:T /G
'TEST\webadm_admins:WPRP;objectClass'
dsacls "CN=AdminSDHolder,CN=System,DC=test,DC=local" /I:T /G
'TEST\webadmadmin:WPRP;gidnumber'
dsacls "CN=AdminSDHolder,CN=System,DC=test,DC=local" /I:T /G
'TEST\webadmadmin:WPRP;uidnumber'
dsacls "CN=AdminSDHolder,CN=System,DC=test,DC=local" /I:T /G
'TEST\webadmadmin:WPRP;unixhomedirectory'
dsacls "CN=AdminSDHolder,CN=System,DC=test,DC=local" /I:T /G
'TEST\webadmadmin:WPRP;loginshell'
dsacls "CN=AdminSDHolder,CN=System,DC=test,DC=local" /I:T /G
'TEST\webadmadmin:WPRP;description'
dsacls "CN=AdminSDHolder,CN=System,DC=test,DC=local" /I:T /G
'TEST\webadmadmin:WPRP;gecos'
```

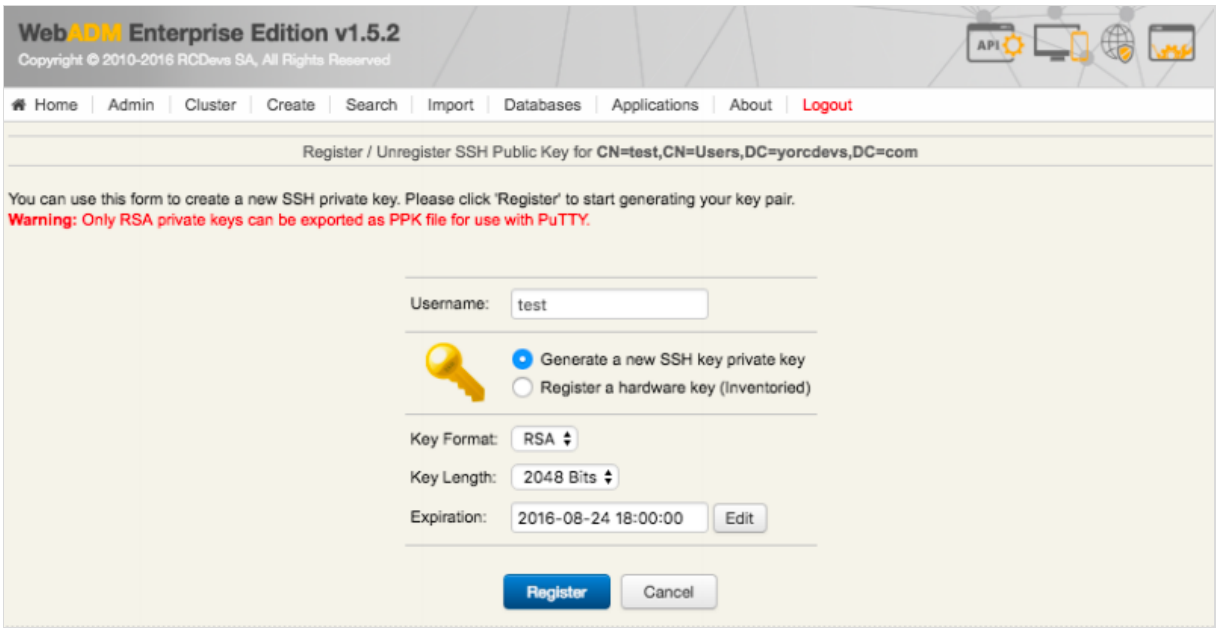
Now, you should be able to perform the UNIX extension through WebADM GUI.

Within the extended LDAP object, click on SSH Public Key Server (Actions box) to generate a SSH Private Key for the user:

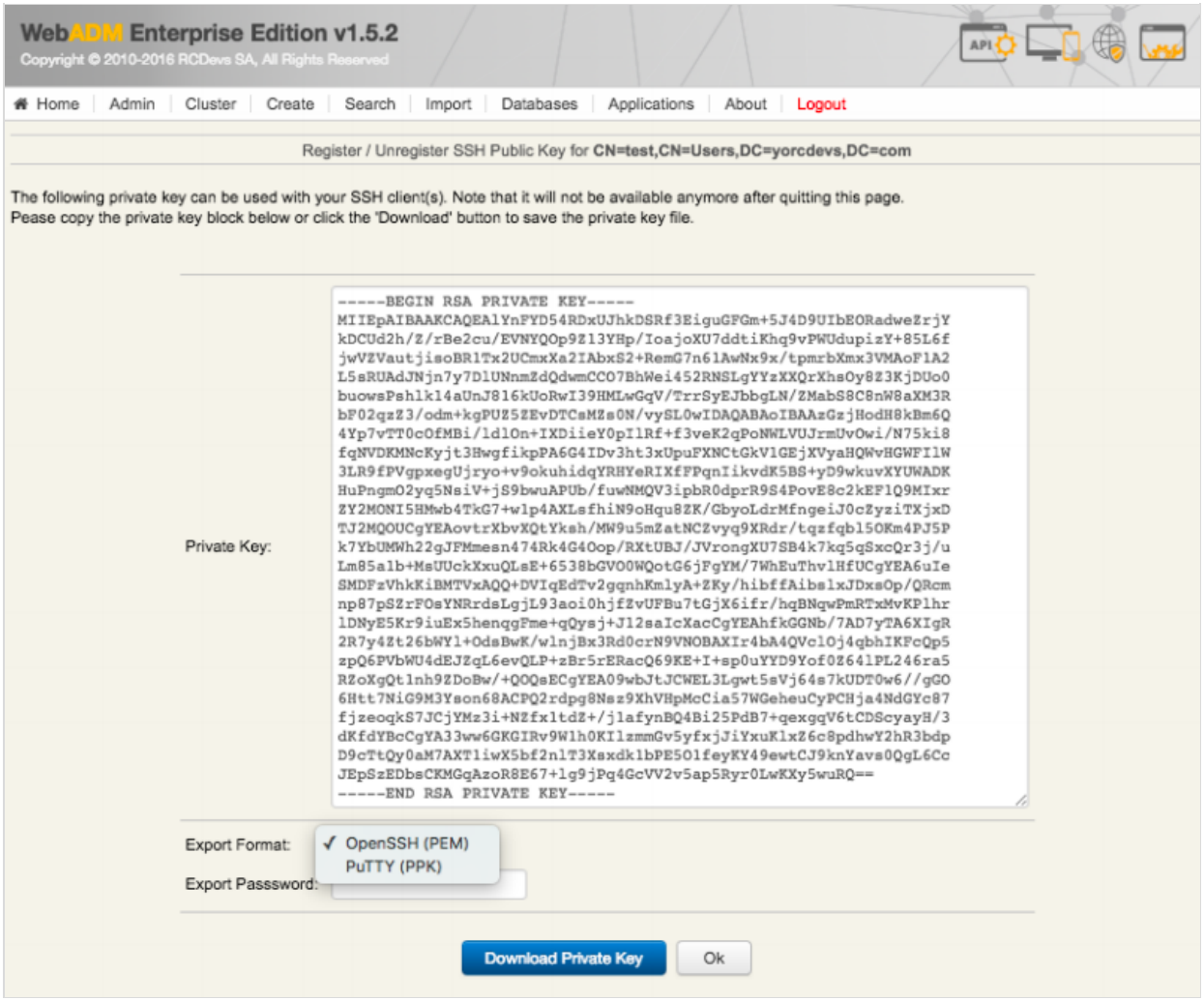
1. In Application Action box, click on `SSH Public Key Server (3 actions)`, and select the first item `Register / Unregister SSH Public Key`.



2. Configure your preferred Key Format and Key Length.
3. Configure key expiration (optional).
4. Click on `Register`.



Your Public and Private Key are now generated by SpanKey server. Choose the format of the Private Key (OpenSSH or Putty) and click on Download Private Key button.



Note

Register or Unregister of SSH Key can also be done through WebADM User Self-Services UI.

Now you can use the generated private key with your LDAP account, through SSH client or Putty and on any server where SpanKey Client is installed on. Without needing to deploy the user's public keys in authorized_keys files. To test, connect with your private key on a server managed by SpanKey client, like below:

```
ssh -i MyPrivateKey.pem test@192.168.3.178
[test@192.168.3.178 ~]#
```

6. Video Tutorial

Play Video on Youtube