# sysPass Documentation

*Release 3.1.2*

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# Contents

sysPass is a password management system written in PHP that allows a centralized and collaborative passwords management.

# CHAPTER 1

# Features

- Encrypted passwords using AES-256 CTR
- Interface based on Material Design Lite with HTML5 and AJAX
- Multiuser with users, groups and profiles management
- Advanced profile management with 29 access levels
- MySQL/MariaDB, OpenLDAP and Active Directory authentication
- Activity notifications by email and in-app
- Public links to accounts without login
- Accounts changes history and restore points
- Accounts associated files management with images preview
- Multilanguage
- Portable backup format and export to encrypted XML
- Actions and events audit with the ability to send messages to a remote Syslog in CEF format
- API for integrating with other applications
- Import from KeePass and CSV
- One step installation

CHAPTER 2

# What sysPass does not do

- It does not store any **UNencrypted** keys in the server
- It does not send any data to an external service
- It does not encrypt the accounts' password individually, it uses a key protected by global master password for all instead
- It does not perform password changes on the servers
- It does not encrypt the accounts' data, only the password, custom fields' and plugins' data, because you wouldn't be able to perform searches
- It isn't like APT: doesn't have Super Cow Powers!!

## 2.1 Installation

### 2.1.1 Debian 9 Installation

#### Prerequisites

- Web server (Apache/Nginx/Lighttpd) with SSL enabled.
- MariaDB >= 10.1
- PHP >= 7.0
- **PHP modules**
  - mysql
  - curl
  - json
  - gd
  - xml

  - mbstring
  - intl
  - readline
  - ldap (optional)
  - mcrypt (optional for importing older XML export files)
- Package with latest sysPass version https://github.com/nuxsmin/sysPass/releases/latest
- Or clone sysPass repository from GitHub https://github.com/nuxsmin/sysPass.git

### Installation

Debian GNU/Linux package installation.

```
$ sudo apt install locales apache2 libapache2-mod-php7.0 php-pear php7.0 php7.0-cgi␣
↪php7.0-cli php7.0-common php7.0-fpm php7.0-gd php7.0-json php7.0-mysql php7.0-
↪readline php7.0 curl php7.0-intl php7.0-ldap php7.0-mcrypt php7.0-xml php7.0-
↪mbstring
$ sudo service apache2 restart
```

Optional for enabling SSL.

In order to increase your sysPass instance security, please consider to use SSL. See *Security* and the following resources for Debian:

- Sites only accessible from LAN: https://doc.debian.org/configuration/Self-Signed_Certificate
- Sites accessible from Internet, you could use Let's Encrypt, see https://certbot.eff.org/

### Directories and permissions

Create a directory for sysPass within the web server root.

```
$ sudo mkdir /var/www/html/syspass
```

If you go with the packaged version, download and unpack sysPass files.

```
$ cd /var/www/html/syspass
# Strip version directory and extract contents to current directory.
$ sudo tar xzf syspass.tar.gz --strip-components=1
# If using the vendors package
$ sudo tar xzf vendors.tar.gz
```

If you go with Git cloned version, clone sysPass GitHub repository.

```
$ sudo git clone https://github.com/nuxsmin/sysPass.git  /var/www/html/syspass
```

Setup directories permissions. The owner should match the web server running user.

```
$ sudo chown apache -R /var/www/html/syspass
$ sudo chmod 750 /var/www/html/syspass/app/config /var/www/html/syspass/app/backup
```

### Installing dependencies

PHP Composer is needed to keep up-to-date dependencies and an easy way to apply security or functional patches to them.

You can either download the dependencies using Composer itself or by getting the latest “vendor.tar.gz” package from the release page.

**Note:** If you don’t have any Internet access from the server, the vendor package will provide all the release dependencies and you don’t need to deal with composer commands.

### Using PHP Composer

From sysPass root directory, download and install Composer (https://getcomposer.org/doc/faqs/how-to-install-composer-programmatically.md)

Create a bash script called “install_composer.sh” and paste this code in it:

```
#!/bin/sh
EXPECTED_SIGNATURE="$(wget -q -O - https://composer.github.io/installer.sig)"
php -r "copy('https://getcomposer.org/installer', 'composer-setup.php');"
ACTUAL_SIGNATURE="$(php -r "echo hash_file('sha384', 'composer-setup.php');")"

if [ "$EXPECTED_SIGNATURE" != "$ACTUAL_SIGNATURE" ]
then
    >&2 echo 'ERROR: Invalid installer signature'
    rm composer-setup.php
    exit 1
fi

php composer-setup.php --quiet
RESULT=$?
rm composer-setup.php
exit $RESULT
```

```
$ chmod +x install_composer.sh
$ ./install_composer.sh
```

Then install sysPass dependencies

```
$ php composer.phar install --no-dev
```

### Environment configuration

Please, point your web browser to the following URL and follow the installer steps

https://IP_OR_SERVER_ADDRESS/syspass/index.php

**Note:** More information about how sysPass works on *Application*

**Warning:** It's very advisable to take a look to security advices on *Security*

### 2.1.2 CentOS 7.x Installation

#### Prerequisites

- Web server (Apache/Nginx/Lighttpd) with SSL enabled.
- MariaDB >= 10.1
- PHP >= 7.0 (7.1 or above recommended)
- **PHP modules**
  - mysqlnd
  - curl
  - json
  - gd
  - xml
  - mbstring
  - intl
  - readline
  - ldap (optional)
  - mcrypt (optional for importing older XML export files)
- Package with latest sysPass version https://github.com/nuxsmin/sysPass/releases/latest
- Or clone sysPass repository from GitHub https://github.com/nuxsmin/sysPass.git

#### Installation

CentOS 7 package installation (http://wiki.centos.org/SpecialInterestGroup/SCLo).

```
$ sudo yum -y install centos-release-scl.noarch
$ sudo yum -y install rh-php73 rh-php73-php rh-php73-php-fpm httpd rh-mariadb103 wget
$ sudo yum -y install rh-php73-php-gd rh-php73-php-intl rh-php73-php-json rh-php73-
↪php-ldap rh-php73-php-mbstring rh-php73-php-mysqlnd rh-php73-php-opcache rh-php73-
↪php-pdo rh-php73-php-xml rh-php73-php-zip
```

Automated start/stop Apache web server and MariaDB server.

```
$ sudo systemctl enable --now httpd24-httpd.service rh-mariadb103-mariadb.service
```

Setting up MariaDB.

```
$ sudo scl enable rh-mariadb103 mysql_secure_installation
```

Enabling firewall ports.

```
$ sudo firewall-cmd --zone=public --add-service=http --add-service=https
$ sudo firewall-cmd --runtime-to-permanent
```

Optional for enabling SSL.

In order to increase your sysPass instance security, please consider to use SSL. See *Security* and the following resources for Debian:

- Sites only accessible from LAN: https://doc.debian.org/configuration/Self-Signed_Certificate
- Sites accessible from Internet, you could use Let's Encrypt, see https://certbot.eff.org/

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Setup directories permissions. The owner should match the web server running user.

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$ sudo chown apache -R /var/www/html/syspass
$ sudo chmod 750 /var/www/html/syspass/app/config /var/www/html/syspass/app/backup
```

### SELinux

sysPass needs to be allowed to write its configuration and some other files (backup, cache, temp, etc). We have 2 choices:

**Note:** Please, run only one of the choices

- Change the SELinux context of files:

```
$ sudo setsebool -P httpd_can_connect_ldap 1
$ sudo semanage fcontext -a -t httpd_sys_rw_content_t "/var/www/html/syspass/app/
↪(config|backup|cache|temp)(/.*)?"
$ sudo restorecon -R -v /var/www/html/syspass
```

- Disable SELinux by editing the file "/etc/sysconfig/selinux" and setting "SELINUX" variable's value to "disabled". You need to restart the system. Until then you can use permissive mode which won't enforce the policies:

```
$ sudo setenforce 0
```

### Installing dependencies

PHP Composer is needed to keep up-to-date dependencies and an easy way to apply security or functional patches to them.

You can either download the dependencies using Composer itself or by getting the latest “vendor.tar.gz” package from the release page.

**Note:** If you don’t have any Internet access from the server, the vendor package will provide all the release dependencies and you don’t need to deal with composer commands.

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ACTUAL_SIGNATURE="$(php -r "echo hash_file('sha384', 'composer-setup.php');")"

if [ "$EXPECTED_SIGNATURE" != "$ACTUAL_SIGNATURE" ]
then
    >&2 echo 'ERROR: Invalid installer signature'
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    exit 1
fi

php composer-setup.php --quiet
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```
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```

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```
$ php composer.phar install --no-dev
```

### Environment configuration

Please, point your web browser to the following URL and follow the installer steps

https://IP_OR_SERVER_ADDRESS/syspass/index.php

**Note:** More information about how sysPass works on *Application*

**Warning:** It's very advisable to take a look to security advices on *Security*

### 2.1.3 Docker Installation

Docker based installations allow to run the application in an isolated environment besides try out multiple versions without installing any package on the host system.

sysPass can be ran in Docker containers which has been compiled on top of latest Debian stable version (Stretch) and avoiding any **package compilation**.

Docker images can be got from Docker Hub and they are complied automatically from Docker source files on https://github.com/nuxsmin/docker-syspass

There are two ways for installing:

- Using Docker Compose (recommended): deploys a fully working sysPass environment including application and database services.
- Using Docker: deploys each service (application and database) separately.

#### Docker Compose

In order to deploy using this method, you need to issue the following steps:

1. Install Docker engine from https://docs.docker.com/install/
2. Install Docker Compose from https://docs.docker.com/compose/install/
3. Download "docker-compose.yml" sysPass' file from https://raw.githubusercontent.com/nuxsmin/docker-syspass/master/docker-compose.yml or use the following one:

```
version: '2'
services:
  app:
    container_name: syspass-app
    image: syspass/syspass:3.1.0 # Set this version tag to desired one
    restart: always
    # Will listen on ports 80 and 443 of the host
    ports:
      - "80:80"
      - "443:443"
    depends_on:
      - db
    volumes:
      - syspass-config:/var/www/html/sysPass/app/config
      - syspass-backup:/var/www/html/sysPass/app/backup
    # Set USE_SSL=no if you're using a LB or reverse proxy for SSL offloading
    environment:
      - USE_SSL=yes
  db:
    container_name: syspass-db
    restart: always
    image: mariadb:10.2
    # Set a secure password for MariaDB root user
    environment:
      - MYSQL_ROOT_PASSWORD=syspass
```

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```
    # This ports will only be accesible internally
    expose:
      - "3306"
    volumes:
      - syspass-db:/var/lib/mysql

# Persistent volumes to be used across updates
volumes:
  syspass-config: {}
  syspass-backup: {}
  syspass-db: {}
```

4. Run “docker-compose” tool for setting up the environment:

```
docker-compose -p syspass -f docker-compose.yml up -d
```

This will download the latest sysPass stable image and the database (MariaDB) one.

5. Take a look to deployment’s logs:

```
docker-compose -p syspass -f docker-compose.yml logs -f
```

**Note:** Docker Compose will create an isolated network for all sysPass services making possible to use DNS resolution between containers. You can use “syspass-db” for setting up the database hostname in sysPass installation page.

It will create two fixed volumes for sysPass application, one for “. . . /app/config” directory and the other for “. . . /app/backup” directory. An additional fixed volume will be created for the database container’s data.

**Warning:** sysPass container will publish 80 and 443 host’s ports to the outside. You could change this behavior by tweaking the Docker Compose’s file.

**Tip:** You can disable HTTPS redirection by setting “USE_SSL=no” within “docker-compose.yml” file. This will offload the SSL encryption to a LB or reverse proxy.

### Docker

By this way all the services need to be deployed manually. The following steps are needed:

1. Install Docker engine from https://docs.docker.com/install/
2. Create network for sysPass services:

```
docker network create syspass-net
```

3. Create fixed volumes for sysPass services:

```
docker volume create syspass-app-config
docker volume create syspass-app-backup
docker volume create syspass-db-data
```

4. Setup sysPass database container:

```
docker run --name syspass-db \
--network syspass-net \
--restart unless-stopped \
--env MYSQL_ROOT_PASSWORD=syspass \
--volume syspass-db-data:/var/lib/mysql \
--detach mariadb:10.2
```

5. Setup sysPass application container:

```
docker run --name syspass-app \
--network syspass-net \
--publish 80:80 \
--restart unless-stopped \
--volume syspass-app-config:/var/www/html/sysPass/app/config \
--volume syspass-app-backup:/var/www/html/sysPass/app/backup \
--detach syspass/syspass:3.1.0
```

6. Connection data will be displayed in application container's console:

```
docker logs -f syspass-app
```

**Tip:** You can install sysPass extensions (plugins) by setting "COMPOSER_EXTENSIONS" environment variable when deploying the sysPass application container. Example: "–env COMPOSER_EXTENSIONS='syspass/plugin-authenticator'"

### Database Access

You can get access to the database using the following connection data:

- User: root
- Password: syspass

You may install other sysPass images from Docker Hub

**Note:** Please follow the installer steps in order to setup the sysPass application instance.

More information about how sysPass works on *Application*

**Warning:** It's very advisable to take a look to security advices on *Security*

## 2.1.4 Hosting Mode

The hosting mode is for those installations that are running on a external hosting, where is not possible to create neither database nor connection user for it.

Though hosting mode is about the database creation tasks, you would find useful to download the dependencies bundle when there isn't SSH access to the web server. The bundle will be attached to every release on GitHub as "vendor.tar.gz". It should be unpacked within sysPass directory.

**Note: It won't create neither database (except tables) nor connection user**

The steps to perform the installation are the following:

- Create an user/password for sysPass connection at the hosting panel
- Create the sysPass database (not tables) and give permissions to the previous user on it
- Start the sysPass installation and use the user/password that was previously created for sysPass (the two first fields in the installation page)
- Provide a MySQL/MariaDB user with administration rights (it could be the same as previous if it has enough permissions), in order to create sysPass database tables. This user is used only for the installation process and it often would be the user/password for the hosting management
- If database connection and permissions are right, the installation should finish successfully

**Note:** In case of errors, you could take a look to the web server error logs or "…/app/config/syspass.log".

## 2.2 Configuration

### 2.2.1 LDAP Configuration

#### Active Directory

#### Tips

- Checks if connection user is member of group "Account Operators"

#### OpenLDAP

In order to setup an OpenLDAP server correctly, you can follow the article at https://wiki.debian.org/LDAP/OpenLDAPSetup which describes the steps to configure a fully operational server under a Debian like distribution.

In OpenLDAP, to the use the group membership feature you need to add an 'overlay' called 'memberof'. It's a module that adds an internal attribute to those users which belongs to a group.

These are the steps to configure that module:

- Create the file 'ldap_memberof_add.ldif' with this content:

```
dn: cn=module,cn=config
objectClass: olcModuleList
cn: module
olcModulePath: /usr/lib/ldap
olcModuleLoad: memberof
```

- Create the file 'ldap_memberof_config.ldif' with this content:

```
dn: olcOverlay=memberof,olcDatabase={1}hdb,cn=config
objectClass: olcMemberOf
objectClass: olcOverlayConfig
```

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```
objectClass: olcConfig
objectClass: top
olcOverlay: memberof
olcMemberOfDangling: ignore
olcMemberOfRefInt: TRUE
olcMemberOfGroupOC: groupOfNames
olcMemberOfMemberAD: member
olcMemberOfMemberOfAD: memberOf
```

- Modify the LDAP configuration by running these commands:

```
ldapadd -D cn=admin,cn=config -w "password" -H ldapi:/// -f memberof_add.ldif
ldapadd -D cn=admin,cn=config -w "password" -H ldapi:/// -f memberof_config.ldif
```

### Tips

- Check whether the sysPass ‘admin’ user is the same in OpenLDAP, you need to add this user to the LDAP group that have access permissions to sysPass.
- The username and email ofthe LDAP users are populated from ‘displayname’,’fullname’ and ‘mail’ attributes.
- You could use ldaps by setting a connection URI like ‘ldaps:/ /my_ldap_server’.
- You could install phpLDAPadmin to create and manage the LDAP objects.

### Links

- LDAP Debian Wiki: https://wiki.debian.org/LDAP/OpenLDAPSetup
- ‘memberof’ overlay config: http://www.cbjck.de/2012/05/enabling-the-memberof-overlay-for-openldap/

## 2.2.2 Apache Configuration

If you are running an Apache httpd web server this configuration/s would be useful in order to configure and protect your sysPass application.

### Apache with HTTPS

This code will redirect any unencrypted request to an HTTPS enabled VirtualHost.

It requires the following modules enabled:

- ssl
- rewrite

Please make sure you replace the following placeholders:

- “/your/syspass/root/directory”: where sysPass is installed (eg. “”/var/www/sysPass”)
- “www.example.com”: your server DNS name

```
#
# File: syspass.conf
#

RedirectMatch "^/$" "/index.php"

<Directory "/your/syspass/root/directory">
    DirectoryIndex index.php
    Options -Indexes -FollowSymLinks -Includes -ExecCGI

    <RequireAny>
      Require expr "%{REQUEST_URI} =~ m#.*/index\.php(\?r=)?#"
      Require expr "%{REQUEST_URI} =~ m#.*/api\.php$#"
      Require expr "%{REQUEST_URI} =~ m#^/?$#"
    </RequireAny>
</Directory>

#<Directory ~ "/your/syspass/root/directory/.*/(css|js|images|fonts)">
#  Require all granted
#</Directory>

<FilesMatch ".(png|jpg|js|css|ttf|otf|eot|woff|woff2|ico)$">
    Require all granted
</FilesMatch>

<VirtualHost *:80>
  # the server uses to identify itself. This is used when creating
  # redirection URLs. In the context of virtual hosts, the ServerName
  # specifies what hostname must appear in the request's Host: header to
  # match this virtual host. For the default virtual host (this file) this
  # value is not decisive as it is used as a last resort host regardless.
  # However, you must set it for any further virtual host explicitly.
  ServerName www.example.com

  ServerAdmin webmaster@localhost
  DocumentRoot /your/syspass/root/directory

  # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
  # error, crit, alert, emerg.
  # It is also possible to configure the loglevel for particular
  # modules, e.g.
  #LogLevel info ssl:warn

  ErrorLog ${APACHE_LOG_DIR}/error.log
  CustomLog ${APACHE_LOG_DIR}/access.log combined

  <IfModule mod_ssl.c>
    RewriteEngine On
    RewriteCond %{HTTPS} !=on
    RewriteRule ^/?(.*) https://%{SERVER_NAME}/$1 [R,L]
  </IfModule>
</VirtualHost>

<IfModule mod_ssl.c>
  <VirtualHost _default_:443>
    ServerName www.example.com
    ServerAdmin webmaster@localhost
```

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```
    DocumentRoot /your/syspass/root/directory

    # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
    # error, crit, alert, emerg.
    # It is also possible to configure the loglevel for particular
    # modules, e.g.
    #LogLevel info ssl:warn

    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined

    # For most configuration files from conf-available/, which are
    # enabled or disabled at a global level, it is possible to
    # include a line for only one particular virtual host. For example the
    # following line enables the CGI configuration for this host only
    # after it has been globally disabled with "a2disconf".
    #Include conf-available/serve-cgi-bin.conf

    #   SSL Engine Switch:
    #   Enable/Disable SSL for this virtual host.
    SSLEngine on

    #   A self-signed (snakeoil) certificate can be created by installing
    #   the ssl-cert package. See
    #   /usr/share/doc/apache2/README.Debian.gz for more info.
    #   If both key and certificate are stored in the same file, only the
    #   SSLCertificateFile directive is needed.
    SSLCertificateFile        /etc/ssl/certs/ssl-cert-snakeoil.pem
    SSLCertificateKeyFile /etc/ssl/private/ssl-cert-snakeoil.key

    #   Server Certificate Chain:
    #   Point SSLCertificateChainFile at a file containing the
    #   concatenation of PEM encoded CA certificates which form the
    #   certificate chain for the server certificate. Alternatively
    #   the referenced file can be the same as SSLCertificateFile
    #   when the CA certificates are directly appended to the server
    #   certificate for convinience.
    #SSLCertificateChainFile /etc/apache2/ssl.crt/server-ca.crt

    #   Certificate Authority (CA):
    #   Set the CA certificate verification path where to find CA
    #   certificates for client authentication or alternatively one
    #   huge file containing all of them (file must be PEM encoded)
    #   Note: Inside SSLCACertificatePath you need hash symlinks
    #          to point to the certificate files. Use the provided
    #          Makefile to update the hash symlinks after changes.
    #SSLCACertificatePath /etc/ssl/certs/
    #SSLCACertificateFile /etc/apache2/ssl.crt/ca-bundle.crt

    #   Certificate Revocation Lists (CRL):
    #   Set the CA revocation path where to find CA CRLs for client
    #   authentication or alternatively one huge file containing all
    #   of them (file must be PEM encoded)
    #   Note: Inside SSLCARevocationPath you need hash symlinks
    #          to point to the certificate files. Use the provided
    #          Makefile to update the hash symlinks after changes.
    #SSLCARevocationPath /etc/apache2/ssl.crl/
```

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```
#SSLCARevocationFile /etc/apache2/ssl.crl/ca-bundle.crl

#   Client Authentication (Type):
#   Client certificate verification type and depth.  Types are
#   none, optional, require and optional_no_ca.  Depth is a
#   number which specifies how deeply to verify the certificate
#   issuer chain before deciding the certificate is not valid.
#SSLVerifyClient require
#SSLVerifyDepth  10

#   SSL Engine Options:
#   Set various options for the SSL engine.
#   o FakeBasicAuth:
#  Translate the client X.509 into a Basic Authorisation.  This means that
#  the standard Auth/DBMAuth methods can be used for access control.  The
#  user name is the `one line' version of the client's X.509 certificate.
#  Note that no password is obtained from the user. Every entry in the user
#  file needs this password: `xxj31ZMTZzkVA'.
#   o ExportCertData:
#  This exports two additional environment variables: SSL_CLIENT_CERT and
#  SSL_SERVER_CERT. These contain the PEM-encoded certificates of the
#  server (always existing) and the client (only existing when client
#  authentication is used). This can be used to import the certificates
#  into CGI scripts.
#   o StdEnvVars:
#  This exports the standard SSL/TLS related `SSL_*' environment variables.
#  Per default this exportation is switched off for performance reasons,
#  because the extraction step is an expensive operation and is usually
#  useless for serving static content. So one usually enables the
#  exportation for CGI and SSI requests only.
#   o OptRenegotiate:
#  This enables optimized SSL connection renegotiation handling when SSL
#  directives are used in per-directory context.
#SSLOptions +FakeBasicAuth +ExportCertData +StrictRequire
<FilesMatch "\.(cgi|shtml|phtml|php)$">
          SSLOptions +StdEnvVars
</FilesMatch>
<Directory /usr/lib/cgi-bin>
          SSLOptions +StdEnvVars
</Directory>

#   SSL Protocol Adjustments:
#   The safe and default but still SSL/TLS standard compliant shutdown
#   approach is that mod_ssl sends the close notify alert but doesn't wait for
#   the close notify alert from client. When you need a different shutdown
#   approach you can use one of the following variables:
#   o ssl-unclean-shutdown:
#  This forces an unclean shutdown when the connection is closed, i.e. no
#  SSL close notify alert is send or allowed to received.  This violates
#  the SSL/TLS standard but is needed for some brain-dead browsers. Use
#  this when you receive I/O errors because of the standard approach where
#  mod_ssl sends the close notify alert.
#   o ssl-accurate-shutdown:
#  This forces an accurate shutdown when the connection is closed, i.e. a
#  SSL close notify alert is send and mod_ssl waits for the close notify
#  alert of the client. This is 100% SSL/TLS standard compliant, but in
#  practice often causes hanging connections with brain-dead browsers. Use
```

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```
    #  this only for browsers where you know that their SSL implementation
    #  works correctly.
    #   Notice: Most problems of broken clients are also related to the HTTP
    #   keep-alive facility, so you usually additionally want to disable
    #   keep-alive for those clients, too. Use variable "nokeepalive" for this.
    #   Similarly, one has to force some clients to use HTTP/1.0 to workaround
    #   their broken HTTP/1.1 implementation. Use variables "downgrade-1.0" and
    #   "force-response-1.0" for this.
    BrowserMatch "MSIE [2-6]" \
      nokeepalive ssl-unclean-shutdown \
      downgrade-1.0 force-response-1.0
    # MSIE 7 and newer should be able to use keepalive
    BrowserMatch "MSIE [17-9]" ssl-unclean-shutdown
  </VirtualHost>
</IfModule>
```

The final step is placing this file in "/etc/apache2/sites-available" and run the following commands:

```
$ sudo a2ensite syspass.conf
$ sudo apache2 restart
```

**Warning:** Make sure you don't run overlapping configurations on Apache web server

## 2.3 Application

sysPass is an application that uses a MySQL/MariaDB database to store the data of all its components except for the configuration, which is stored in an XML file within 'app/config' directory.

**Warning:** It's important that '. . . /app/config' directory is not accessible from the web service, because it could reveal important information.

### 2.3.1 Encryption

**Warning:** If you already use a sysPass version **<= 2.0**, it's advisable to update to 2.1 version and then to 3.1, in order to use the new security improvements on the encryption mechanisms (CVE-2017-5999). Please see *Updating* for upgrading details.

sysPass encryption is based on AES-256 in CTR mode by using PHP's OpenSSL module. It uses the Defuse/php-encryption library for the encryption modules and functions management.

The encrypted data (up to 3.1 version) are:

- Accounts' passwords (always)
- Accounts' public links (always)
- Custom fields' data (if set)
- Plugins' data

- sysPass XML format export (if set)
- PHP's session data (if set)

In order to use the application, for every user first login, either a master password or a temporary master key (see *Temporary Master Key*) will be needed. That is so because the master password is not stored in the web server but a a generated Blowfish hash is saved in order to check if the user is using the correct master password.

After logging in with the master password, it's encrypted and stored within the user's data in the database. The encryption key is generated using a derived key from user's password and login, and a secure random salt generated by openssl_random_pseudo_bytes (stored in "…/app/config/config.xml" file).

On next user logins the master password is got from the user's data and decrypted by using the derived key. After this, the master password is encrypted again for storing it in the user's PHP session, so every time the master password is needed it must be decrypted using a session-based generated key. This key is regenerated every 120 seconds.

The master password will be prompted again if:

- The user changes either its login password or username. The previous password will be requested.
- It has been changed by the administrator.
- The configuration salt is changed.

**Note:** A temporary master key (see *Temporary Master Key*) could be used instead of the real master password

### Temporary Master Key

A temporary master key could be generated to be used by the application users, so it won't be needed to tell the real master password.

For the temporary master key generation the real master password is encrypted using a secure key generated by openssl_random_pseudo_bytes. Then a Blowfish generated hash of it is stored in the database ""Config" table." in order to check it when the temporary master key is provided on login.

**Note:** The real master password is never stored unencrypted. For checking the temporary master key, a Blowfish generated hash **is only used**

### PKI-RSA

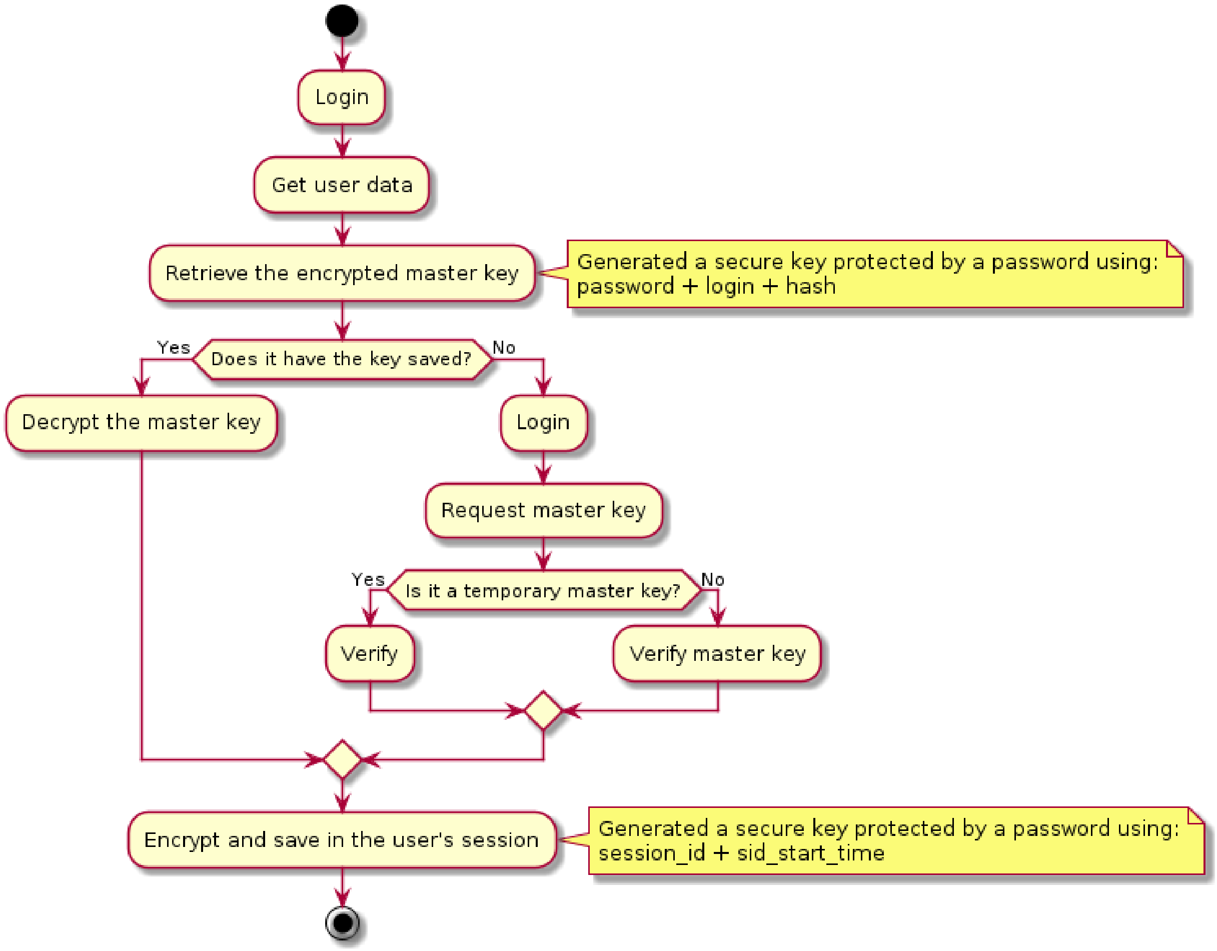
In order to improve the security of the sent data, RSA (PKI) is being used for encrypting the passwords that are being sent from the application forms. This prevents to send sensitive date through plain channels.

Public and private RSA keys are generated within the application "…/app/config" directory.

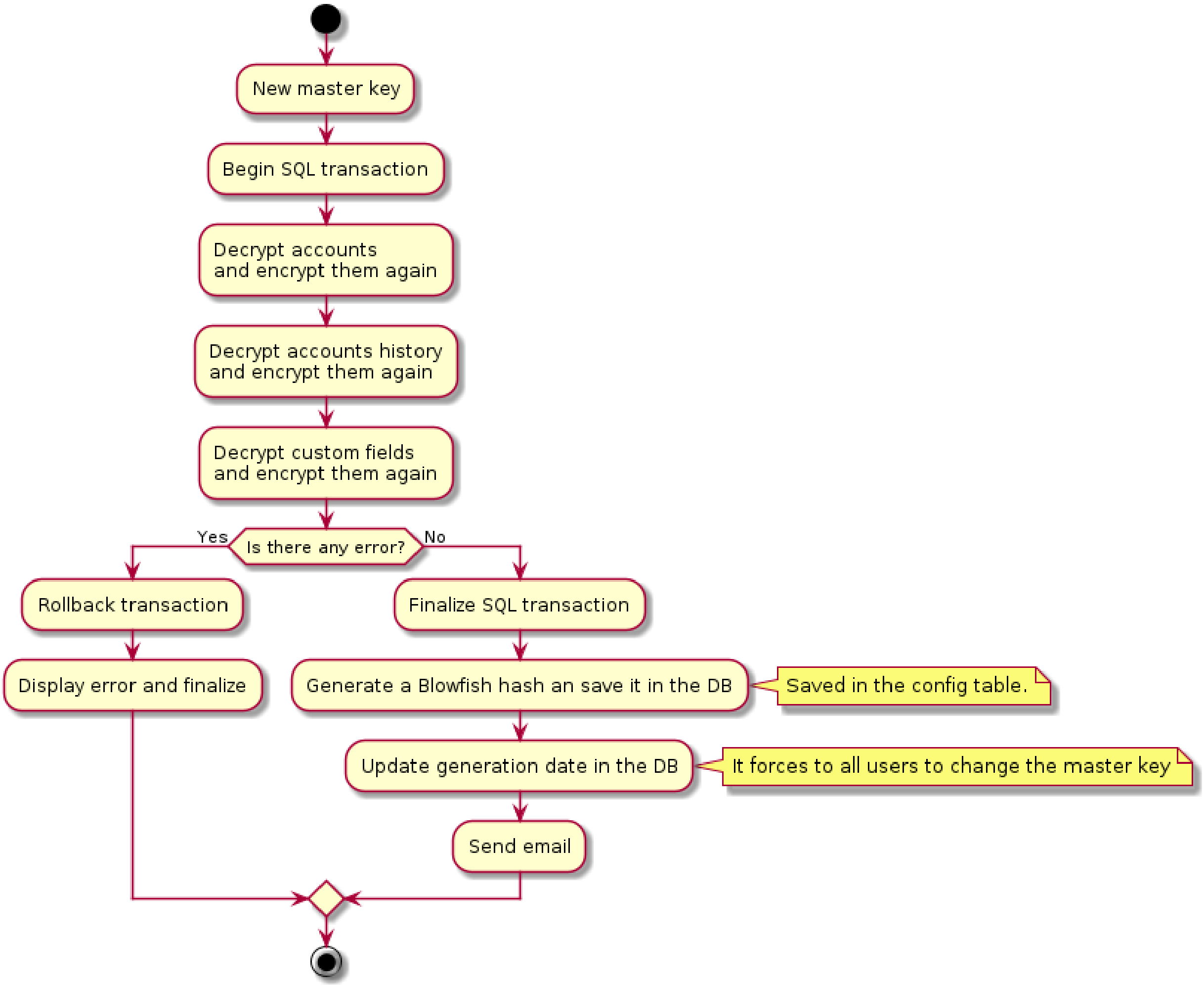
**Note:** Data flowing from server to client side is not encrypted unless you run over an HTTPS channel.

## 2.3.2 Diagrams

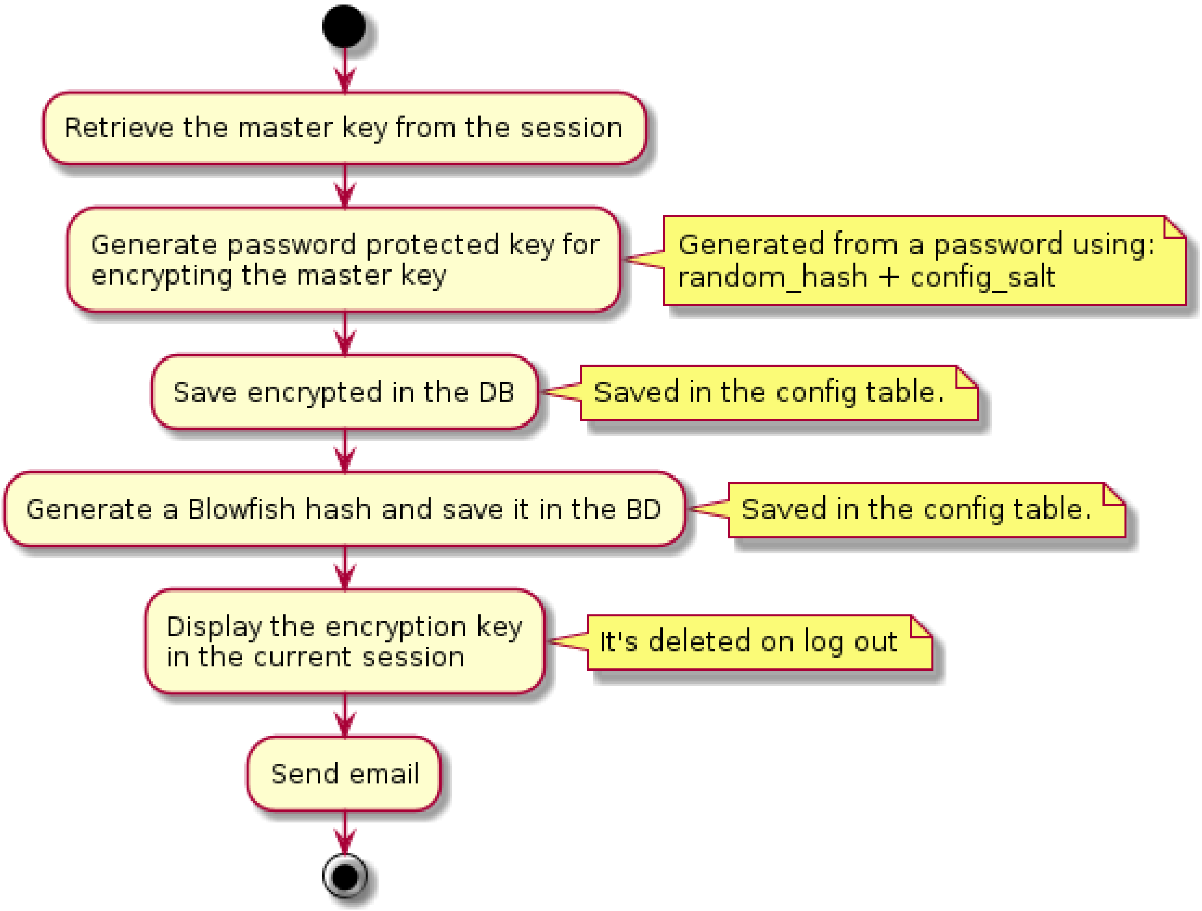
### Login Process


Login
Get user data
Retrieve the encrypted master key
Generated a secure key protected by a password using:
password + login + hash
Yes
Does it have the key saved?
No
Decrypt the master key
Login
Request master key
Yes
Is it a temporary master key?
No
Verify
Verify master key
Encrypt and save in the user's session
Generated a secure key protected by a password using:
session_id + sid_start_time

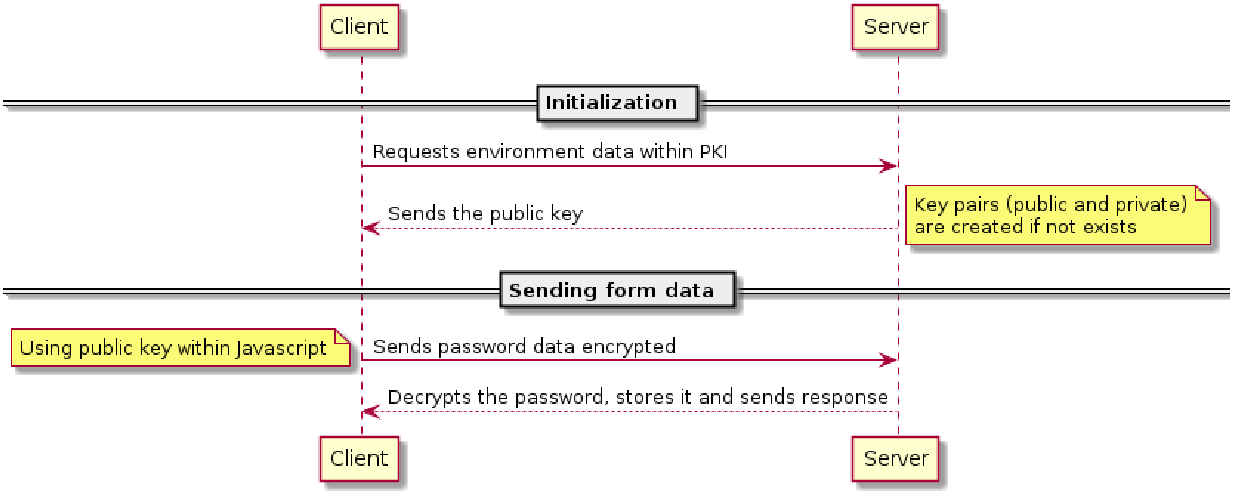
## Master Password Process


New master key
Begin SQL transaction
Decrypt accounts and encrypt them again
Decrypt accounts history and encrypt them again
Decrypt custom fields and encrypt them again
Is there any error?
Yes
No
Rollback transaction
Display error and finalize
Finalize SQL transaction
Generate a Blowfish hash an save it in the DB
Saved in the config table.
Update generation date in the DB
It forces to all users to change the master key
Send email

### Temporary Master Key Process


Retrieve the master key from the session
Generate password protected key for encrypting the master key
Generated from a password using: random_hash + config_salt
Save encrypted in the DB
Saved in the config table.
Generate a Blowfish hash and save it in the BD
Saved in the config table.
Display the encryption key in the current session
It's deleted on log out
Send email

### PKI Process


Client
Server
Initialization
Requests environment data within PKI
Sends the public key
Key pairs (public and private) are created if not exists
Sending form data
Using public key within Javascript
Sends password data encrypted
Decrypts the password, stores it and sends response
Client
Server

**Warning:** Be aware that the highest security risk is in the users themselves, because a compromised password could cause a security leak.

A sysPass compromised server could be dangerous if the database is placed alongside the web server, because the network data could be sniffed so the passwords would be revealed.

### 2.3.3 Security

sysPass has some security mechanisms to mitigate some kind of events and actions that could compromise the application security. Among them are:

- Security token generation for sending forms
- Removing of unwanted characters from received data
- Type casting of received data
- Hash generation for export and backup files name
- RSA (PKI) encryption is used for sending passwords within forms

Although these actions, some other task should be performed in order to secure the web server components and communications by:

- Using HTTPS
- Limiting access to ‘.../app/config’ and ‘.../app/backup’ directories
- Enforcing web server access policies

In order to limit the access to the directories through Apache, ‘.htaccess’ files could be used within the directories or by modifying the site configuration:

```
# Apache 2.4 (after 2.4.16)
<Directory "/var/www/html/sysPass">
  Options -Indexes -FollowSymLinks -Includes -ExecCGI
  <RequireAny>
      Require expr "%{REQUEST_URI} =~ m#.*/index\.php(\?r=)?#"
      Require expr "%{REQUEST_URI} =~ m#.*/api\.php$#"
      Require expr "%{REQUEST_URI} =~ m#^/?$#"
  </RequireAny>
</Directory>

<Directory "/var/www/html/sysPass/public">
  Require all granted
</Directory>

<FilesMatch "\.(png|jpg|js|css|ttf|otf|eot|woff|woff2|ico)$">
  Require all granted
</FilesMatch>
```

```
# Apache 2.4 (before 2.4.16)
<Directory "/var/www/html/sysPass">
  Options -Indexes -FollowSymLinks -Includes -ExecCGI
  <RequireAny>
      Require expr %{REQUEST_URI} =~ m#.*/index\.php(\?r=)?#
      Require expr %{REQUEST_URI} =~ m#.*/api\.php$#
      Require expr %{REQUEST_URI} =~ m#^/?$#
```

(continues on next page)

(continued from previous page)

```
  </RequireAny>
</Directory>

<Directory "/var/www/html/sysPass/public">
  Require all granted
</Directory>

<FilesMatch "\.(png|jpg|js|css|ttf|otf|eot|woff|woff2|ico)$">
  Require all granted
</FilesMatch>
```

**Danger:** '.../app/config' directory shouldn't be accessible through the web server, it could reveal private data.

### 2.3.4 Authentication

For sysPass authentication it could be possible to use several methods:

- MySQL/MariaDB database (by default)
- LDAP directory (OpenLDAP, eDirectory, Active Directory, freeIPA, etc)

**Note:** If LDAP option is enabled, the database authentication is used when the LDAP service is unavailable or the user doesn't exist.

For the database authentication, a generated Blowfish hash from user's password is checked, so the password is **never** stored.

If LDAP is enabled:

- The user's Blowfish generated hash is stored in order to check it, if the LDAP service is unavailable.
- Neither the user's login nor name nor email can be modified.

### 2.3.5 Authorization

For sysPass authorization it could be possible to use several methods:

- Auth Basic (by default)
- Two Factor 2FA (Authenticator Plugin)

The Auth Basic authorization could be enabled through the configuration module, so if the HTTP authorization header with the user's data is sent, it will be checked whether the sysPass user's login matches against the Auth Basic one.

The 2FA authorization, through the Authenticator Plugin, is done by generating an OTP token from Google Authenticator or similar applications. This authorization could be enabled from the user's preferences.

### 2.3.6 Permissions

sysPass permissions are set in users' profile. By default only accounts searching can be done.

There are 29 permission types:

- **Accounts**
  - Create - allows to create new accounts
  - View - allows to view the accounts' details[1]
  - View Password - allows to view the accounts' password[1]
  - Edit - allows to modify the accounts and its files[1]
  - Edit Password - allows to modify the accounts' password[1]
  - Delete - allows to delete accounts[1]
  - Files - allows to view account's files
  - Share Link - allows to create public links
  - Private - allows to create private accounts
  - Private for Group - allows to create private accounts only accessible by the account's main group
  - Permissions - allows to view and modify the accounts' permissions[1]
  - Global Search - allows to perform a searching in all the accounts except in the private ones[2]
- **Management**
  - Users - allows full access to the users management[3]
  - Groups - allows full access to the user groups management
  - Profiles - allows full access to the user profiles management
  - Categories - allows full access to categories management
  - Clients - allows full access to clients management
  - Custom Fields - allows full access to custom fields management
  - API Authorizations - allows full access to API authorizations management
  - Public Links - allows full access to the public links management
  - Accounts - allows full access to accounts management
  - Files- allows full access to files management
  - Tags - allows full access to the tags management
- **Configuration**
  - General - allows full access to the site, accounts, wiki, ldap and email configuration
  - Encryption - allows full access to the master password configuration
  - Backup - allows full access to perform backups[4]
  - Import - allows full access to import XML and CSV files
- **Others**
  - Event Log - allows full access to the event log

[1] Only the accounts that the user and its group are granted

[2] When the account access is not granted, he/she will only be able to perform a 'Request for Account Modification'

[3] 'Application Admin' users cannot be modified by other users

[4] Only 'Application Admin' users can download the backup or XML files

#### ACL

#### Users and Groups

- User profiles allow to set which actions could be done by the user
- An user can only display or modify accounts if:
  - Is the account's owner
  - Is member of account's primary group
  - Is member of account's secondary groups
  - Is listed as a secondary user of the account
  - His/Her main group is listed as a secondary group of the account
  - Is included through a group and the 'Secondary Groups Access' option is enabled
- Private accounts can only be accessed by the owner
- Private accounts for groups can only be accessed by the users of the main group
- Application Admin: allows full access to all the application modules and accounts, except private ones
- Accounts Admin: allows full access to all the accounts, except private ones

#### API

API's access permissions are complementary to the accounts access permissions, so users and groups ACLs will be applied when an account is either listed or accessed.

#### Notes

### 2.3.7 Accounts Searching

The accounts searching performs a query for the entered text within the fields 'name', 'login', 'url' and 'notes'.

Results filtering could be done by selecting category, client or tags.

The tag filtering is cumulative ('OR'), so it will be included all the accounts with selected tags.

There are special filters that could be entered in the text field. You could use either one or several special parameters separated by blank spaces:

| Filter | Description |
|---|---|
| user:"login" | Get the accounts in which the user with login 'login' has access |
| owner:"login" | Get the accounts in which the user with login 'login' is the owner |
| group:"group_name" | Search for accounts which 'group_name' has access rights |
| maingroup:"group_name" | Get the accounts which have the main group with name 'group_name' |
| file:"file_name" | Search for accounts which contain a file with the name 'file_name' |
| client:"client_name" | Search for accounts by client name |
| category:"category_name" | Search for accounts by category name |
| id:"account_id" | Returns the account for the given ID |
| name_regex:"regex" | Search for accounts name by regular expression |
| is\|not:expired | Search for accounts with expired password |
| is\|not:private | Get the private accounts for the current user |
| op:and\|or | Operator used by special parameters |

## 2.3.8 API

sysPass API relies on JSON-RPC v2 schema for client-server communication.

The API access URL is "https://server_name/api.php"

Example of JSON-RPC payload:

```
{
  "jsonrpc": "2.0",
  "method": "account/search",
  "params": {
    "authToken": "auth_token_for_api"
  },
  "id": 1
}
```

### Methods

### Accounts

### account/search

Search for accounts

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| text | string | no | Text to search for |
| count | int | no | Number of results to display |
| categoryId | int | no | Category's Id for filtering |
| clientId | int | no | Client's Id for filtering |
| tagsId | array | no | Tags' Id for filtering |
| op | string | no | Operator used for filtering. It can be either 'or' or 'and' |

### account/view

Get account's details

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| tokenPass | string | yes | API token's pass |
| id | int | yes | Account's Id |

### account/viewPass

Get account's password

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| tokenPass | string | yes | API token's pass |
| id | int | yes | Account's Id |
| details | int | no | Whether to return account's details within response |

### account/editPass

Edit account's password

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| tokenPass | string | yes | API token's pass |
| id | int | yes | Account's Id |
| pass | string | yes | Account's password |
| expireDate | int | no | Expire date in UNIX timestamp format |

### account/create

Create account

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| tokenPass | string | yes | API token's pass |
| name | string | yes | Account's name |
| categoryId | int | yes | Account's category Id |
| clientId | int | yes | Account's client Id |
| pass | string | yes | Account's password |
| tagsId | array | no | Account's tags Id |
| userGroupId | int | no | Account's user group Id |
| parentId | int | no | Account's parent Id |
| login | string | no | Account's login |
| url | string | no | Account's access URL or IP |
| notes | string | no | Account's notes |
| private | int | no | Set account as private. It can be either 0 or 1 |
| privateGroup | int | no | Set account as private for group. It can be either 0 or 1 |
| expireDate | int | no | Expire date in UNIX timestamp format |

### account/edit

Edit account

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| tokenPass | string | yes | API token's pass |
| id | int | yes | Account's Id |
| name | string | no | Account's name |
| categoryId | int | no | Account's category Id |
| clientId | int | no | Account's client Id |
| tagsId | array | no | Account's tags Id |
| userGroupId | int | no | Account's user group Id |
| parentId | int | no | Account's parent Id |
| login | string | no | Account's login |
| url | string | no | Account's access URL or IP |
| notes | string | no | Account's notes |
| private | int | no | Set account as private. It can be either 0 or 1 |
| privateGroup | int | no | Set account as private for group. It can be either 0 or 1 |
| expireDate | int | no | Expire date in UNIX timestamp format |

### account/delete

Delete an account

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| id | int | yes | Account's Id |

### Categories

### category/search

Search for categories

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User’s API token |
| text | string | no | Text to search for |
| count | int | no | Number of results to display |

### category/view

Get category’s details

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User’s API token |
| tokenPass | string | yes | API token’s pass |
| id | int | yes | Category’s Id |

### category/create

Create category

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User’s API token |
| name | string | yes | Category’s name |
| description | string | no | Category’s description |

### category/edit

Edit category

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User’s API token |
| id | int | yes | Category’s Id |
| name | string | yes | Category’s name |
| description | string | no | Category’s description |

### category/delete

Delete category

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User’s API token |
| id | int | yes | Category’s Id |

### Clients

#### client/search

Search for clients

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| text | string | no | Text to search for |
| count | int | no | Number of results to display |

#### client/view

Get client's details

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| tokenPass | string | yes | API token's pass |
| id | int | yes | Client's Id |

#### client/create

Create client

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| name | string | yes | Client's name |
| description | string | no | Client's description |
| global | int | no | Set client as global. It can be either 0 or 1 |

#### client/edit

Edit client

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| id | int | yes | Client's Id |
| name | string | yes | Client's name |
| description | string | no | Client's description |
| global | int | no | Set client as global. It can be either 0 or 1 |

#### client/delete

Delete client

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| id | int | yes | Client's Id |

## Tags

### tag/search

Search for tags

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| text | string | no | Text to search for |
| count | int | no | Number of results to display |

### tag/view

Get tag's details

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| tokenPass | string | yes | API token's pass |
| id | int | yes | Tag's Id |

### tag/create

Create tag

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| name | string | yes | Tag's name |

### tag/edit

Edit tag

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| id | int | yes | Tag's Id |
| name | string | yes | Tag's name |

### tag/delete

Delete tag

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| id | int | yes | Tag's Id |

### User Groups

#### userGroup/search

Search for user groups

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| text | string | no | Text to search for |
| count | int | no | Number of results to display |

#### userGroup/view

Get user group's details

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| tokenPass | string | yes | API token's pass |
| id | int | yes | User group's Id |

#### userGroup/create

Create user group

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| name | string | yes | User group's name |
| description | string | no | User group's description |
| usersId | array | no | User group's users Id |

#### userGroup/edit

Edit user group

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| id | int | yes | User group's Id |
| name | string | yes | User group's name |
| description | string | no | User group's description |
| usersId | array | no | User group's users Id |

### userGroup/delete

Delete user group

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| id | int | yes | User group's Id |

### Configuration

### config/backup

Perform an application and database backup

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| path | string | no | Server path to store the application and database backup |

### config/export

Export application data in XML format

| Parameter | Type | Required | Description |
|---|---|---|---|
| authToken | string | yes | User's API token |
| path | string | no | Server path to store the XML file |
| password | string | no | Password used to encrypt the exported data |

## 2.3.9 Features

sysPass implements the following features:

- **Security**
  - Database authentication
  - LDAP directory authentication
  - Auth Basic authorization
  - Two Factor authorization (using Authenticator Plugin)
- **Permissions**
  - Module access control by profiles
  - Application administrator users
  - Accounts administrator users
  - Accounts user access control (read or write)
  - Accounts group access control (read or write)
- **Items**

  - Encrypted and unencrypted custom fields for accounts, clients, categories and users
  - Accounts public links access without user/password
  - Accounts expiry date configuration
  - Accounts' files management
  - Accounts' tags management
  - Clients management
  - Categories management
  - Public links management
  - API's authorizations management
  - Accounts management
  - Accounts' history management
  - Plugins management
  - Users management
  - User groups management
  - User profiles management
  - In-App notifications management

- **Configuration**
  - Language configuration
  - Visual theme configuration
  - Logging and audit configuration
  - Proxy configuration
  - Accounts configuration
  - Public links configuration
  - Wiki links configuration
  - LDAP configuration
  - Import users and groups from LDAP
  - Email notifications configuration
  - Master password change
  - Temporary master key generation
  - Application and database backups
  - XML format exporting using encryption or not
  - Importing from sysPass or KeePass XML formats and CSV format

### 2.3.10 Plugins

sysPass allows to use plugins through an architecture that implements observer pattern which is characterized by emitting a message to all subscribed observers.

Plugins must be installed in ‘plugins’ directory within the target module and they contain the following base structure:

```
plugins/
└── PluginName (1)
    ├── base.php
    ├── CODE_OF_CONDUCT.md
    ├── composer.json
    ├── LICENSE
    ├── README.md
    ├── src
    │   ├── lib
    │   │   ├── Controllers
    │   │   ├── Models
    │   │   ├── Plugin.php
    │   │   ├── Services
    │   │   └── Util
    │   ├── locales
    │   │   ├── en_US
    │   │   │   └── LC_MESSAGES
    │   │   │       ├── PluginName.mo (2)
    │   │   │       └── PluginName.po (2)
    │   ├── public
    │   │   ├── css
    │   │   │   ├── plugin.css
    │   │   │   ├── plugin.css.map
    │   │   │   ├── plugin.min.css
    │   │   │   └── plugin.scss
    │   │   └── js
    │   │       ├── plugin.js
    │   │       └── plugin.min.js
    │   └── themes
    │       └── material-blue
    │           └── views (3)
    │               ├── login
    │               │   └── index.inc
    │               └── userpreferences
    │                   └── preferences-security.inc
    └── version.json (4)
```

Directory and file names need to be set in the following way:

1. Directory name within the plugin name: Example: **Authenticator**
2. Filename within the plugin name in lowercase: Example: **authenticator.po**
3. View’s name should match with the controller’s name in MVC pattern. It could be overridden by setting the name of the view in the controller’s code
4. ‘version.json’ file is used by JavaScript code for checking if the plugin is up-to-date.

*Plugin* (whithin ‘Plugin.php’ file) is the main class which will receive sysPass’ events through the observer pattern. It must extends the abstract class ‘SPPluginPluginBase’ which is responsible to make the plugin’s data available.

## Methods

The following methods must be implemented in ‘Plugin’ class

### init

Method that is called every time the plugin is executed. The dependency injection container will be passed.

```
/**
 * Plugin initialization
 *
 * @param ContainerInterface $dic
 */
public function init(ContainerInterface $dic)
{
    $this->base = dirname(__DIR__);
    $this->themeDir = $this->base . DIRECTORY_SEPARATOR . 'themes' . DIRECTORY_
↪SEPARATOR . $dic->get(ThemeInterface::class)->getThemeName();

    $this->setLocales();

    $this->dic = $dic;

    $this->session = $this->dic->get(ContextInterface::class);
}
```

### updateEvent

Method that is called when an event is emitted

```
/**
 * Update event
 *
 * @param string $event Event's name
 * @param mixed  $object
 */
public function updateEvent($event, $object) {}
```

### getEvents

Method that returns an array of strings with the events that the plugin will be subscribed to

```
/**
 * Returns the events implemented by the observer
 *
 * @return array
 */
public function getEvents()
{
    return ['show.userSettings', 'login.finish'];
}
```

### getJsResources

Method that returns an array of strings with the Javascript resources required by the plugin

```
/**
 * Returns JS resources required by the plugin
 *
 * @return array
 */
public function getJsResources()
{
    return ['plugin.min.js'];
}
```

### getAuthor

Method that returns the plugin's author

```
/**
 * Returns the plugin's author
 *
 * @return string
 */
public function getAuthor()
{
    return 'Rubén D.';
}
```

### getVersion

Method that returns an array of integers with the plugin's version

```
/**
 * Returns the plugin's version
 *
 * @return array
 */
public function getVersion()
{
    return [1, 0];
}
```

### getCompatibleVersion

Method that returns an array of integers with the minimum sysPass compatible version

```
/**
 * Returns the minimum sysPass compatible version
 *
 * @return array
 */
public function getCompatibleVersion()
```

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```
{
    return [2, 0];
}
```

### getCssResources

Method that returns an array of strings with the CSS resources required by the plugin

```
/**
 * Returns the CSS resources required by the plugin
 *
 * @return array
 */
public function getCssResources()
{
    return [];
}
```

### getName

Method that returns the plugin's name

```
/**
 * Returns the plugin's name
 *
 * @return string
 */
public function getName()
{
    return self::PLUGIN_NAME;
}
```

### getData

Method that returns the plugin's data

```
/**
 * @return AuthenticatorData
 */
public function getData()
{
    if ($this->data === null
        && $this->session->isLoggedIn()
        && $this->pluginOperation !== null
    ) {
        $this->loadData();
    }

    return parent::getData();
}
```

### onLoad

Method that will be called when the plugin is initialized

```
/**
 * onLoad
 */
public function onLoad()
{
    $this->loadData();
}
```

### upgrade

Method that receives the current sysPass version and would run a task if it needs to upgrade. This method will be called whenever a new sysPass version is detected.

```
/**
 * @param string          $version
 * @param PluginOperation $pluginOperation
 * @param mixed           $extra
 *
 * @throws Services\AuthenticatorException
 */
public function upgrade(string $version, PluginOperation $pluginOperation, $extra =␣
↪null)
{
    switch ($version) {
        case '310.19012201':
            (new UpgradeService($pluginOperation))->upgrade_310_19012201($extra);
            break;
    }
}
```

### Example

```
namespace SP\Modules\Web\Plugins\Authenticator;

use Psr\Container\ContainerInterface;
use SP\Core\Context\ContextInterface;
use SP\Core\Context\SessionContext;
use SP\Core\Events\Event;
use SP\Core\UI\ThemeInterface;
use SP\Modules\Web\Plugins\Authenticator\Controllers\PreferencesController;
use SP\Modules\Web\Plugins\Authenticator\Models\AuthenticatorData;
use SP\Modules\Web\Plugins\Authenticator\Services\UpgradeService;
use SP\Modules\Web\Plugins\Authenticator\Util\PluginContext;
use SP\Mvc\Controller\ExtensibleTabControllerInterface;
use SP\Plugin\PluginBase;
use SP\Plugin\PluginOperation;
use SplSubject;

/**
 * Class Plugin
```

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```
 *
 * @package SP\Modules\Web\Plugins\Authenticator
 * @property AuthenticatorData $data
 */
class Plugin extends PluginBase
{
    const PLUGIN_NAME = 'Authenticator';
    const VERSION_URL = 'https://raw.githubusercontent.com/sysPass/plugin-
↪Authenticator/master/version.json';
    const RECOVERY_GRACE_TIME = 86400;
    /**
     * @var ContainerInterface
     */
    private $dic;
    /**
     * @var SessionContext
     */
    private $session;

    /**
     * Receive update from subject
     *
     * @link  http://php.net/manual/en/splobserver.update.php
     *
     * @param SplSubject $subject <p>
     *                            The <b>SplSubject</b> notifying the observer of an␣
↪update.
     *                            </p>
     *
     * @return void
     * @since 5.1.0
     */
    public function update(SplSubject $subject)
    {
    }

    /**
     * Plugin initialization
     *
     * @param ContainerInterface $dic
     */
    public function init(ContainerInterface $dic)
    {
        $this->base = dirname(__DIR__);
        $this->themeDir = $this->base . DIRECTORY_SEPARATOR . 'themes' . DIRECTORY_
↪SEPARATOR . $dic->get(ThemeInterface::class)->getThemeName();

        $this->setLocales();

        $this->dic = $dic;

        $this->session = $this->dic->get(ContextInterface::class);
    }

    /**
     * Updating event
     *
```

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```
     * @param string $eventType Nombre del evento
     * @param Event  $event     Objeto del evento
     *
     * @throws \SP\Core\Exceptions\InvalidClassException
     * @throws \Exception
     */
    public function updateEvent($eventType, Event $event)
    {
        switch ($eventType) {
            case 'show.userSettings':
                $this->loadData();
                (new PreferencesController(
                    $event->getSource(ExtensibleTabControllerInterface::class),
                    $this,
                    $this->dic)
                )->setUp();
                break;
            case 'login.finish':
                $this->loadData();
                $this->checkLogin($event);
                break;
        }
    }

    /**
     * Load plugin's data for current user
     */
    private function loadData()
    {
        try {
            $this->data = $this->pluginOperation->get(
                $this->session->getUserData()->getId(),
                AuthenticatorData::class
            );
        } catch (\Exception $e) {
            processException($e);
        }
    }

    /**
     * Check 2FA within log in
     *
     * @param Event $event
     *
     * @throws \SP\Core\Context\ContextException
     */
    private function checkLogin(Event $event)
    {
        $pluginContext = $this->dic->get(PluginContext::class);

        if ($this->data !== null
            && $this->data->isTwofaEnabled()
        ) {
            $pluginContext->setTwoFApass(false);
            $this->session->setAuthCompleted(false);

            $eventData = $event->getEventMessage()->getExtra();
```

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```
            if (isset($eventData['redirect'][0])
                && is_callable($eventData['redirect'][0])
            ) {
                $this->session->setTrasientKey('redirect', $eventData['redirect'][0](
↪'authenticatorLogin/index'));
            } else {
                $this->session->setTrasientKey('redirect', 'index.php?
↪r=authenticatorLogin/index');
            }
        } else {
            $pluginContext->setTwoFApass(true);
            $this->session->setAuthCompleted(true);
        }
    }

    /**
     * @return AuthenticatorData
     */
    public function getData()
    {
        if ($this->data === null
            && $this->session->isLoggedIn()
            && $this->pluginOperation !== null
        ) {
            $this->loadData();
        }

        return parent::getData();
    }

    /**
     * Returns the events implemented by the observer
     *
     * @return array
     */
    public function getEvents()
    {
        return ['show.userSettings', 'login.finish'];
    }

    /**
     * Returns the JS resources required by the plugin
     *
     * @return array
     */
    public function getJsResources()
    {
        return ['plugin.min.js'];
    }

    /**
     * Returns the plugin's author
     *
     * @return string
     */
    public function getAuthor()
```

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```
    {
        return 'Rubén D.';
    }

    /**
     * Returns the plugin's version
     *
     * @return array
     */
    public function getVersion()
    {
        return [2, 1, 0];
    }

    /**
     * Returns the sysPass compatible version
     *
     * @return array
     */
    public function getCompatibleVersion()
    {
        return [3, 1];
    }

    /**
     * Returns the CSS resources required by the plugin
     *
     * @return array
     */
    public function getCssResources()
    {
        return ['plugin.min.css'];
    }

    /**
     * Returns the plugin's name
     *
     * @return string
     */
    public function getName()
    {
        return self::PLUGIN_NAME;
    }

    /**
     * Removes the data for the given item's Id
     *
     * @param $id
     *
     * @throws \SP\Core\Exceptions\ConstraintException
     * @throws \SP\Core\Exceptions\QueryException
     * @throws \SP\Repositories\NoSuchItemException
     */
    public function deleteDataForId($id)
    {
        $this->pluginOperation->delete((int)$id);
    }
```

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```
    /**
     * onLoad
     */
    public function onLoad()
    {
        $this->loadData();
    }

    /**
     * @param string          $version
     * @param PluginOperation $pluginOperation
     * @param mixed           $extra
     *
     * @throws Services\AuthenticatorException
     */
    public function upgrade(string $version, PluginOperation $pluginOperation, $extra = null)
    {
        switch ($version) {
            case '310.19012201':
                (new UpgradeService($pluginOperation))->upgrade_310_19012201($extra);
                break;
        }
    }
}
```

### Events

When an event is emitted the generating class instance is included as an argument, so it could be possible to access to the class events.

Events may include ‘SPCoreEventsEventMessage’ class which may contain additional data to pass into the plugin.

Currently, the generated events are the following:

| Event | Class | Description |
|---|---|---|
| acl.deny | | |
| check.notification | | |
| check.tempMasterPassword | | |
| clear.eventlog | | |
| clear.track | | |
| copy.account.pass | | |
| create.account | | |
| create.authToken | | |
| create.category | | |
| create.client | | |
| create.customField | | |
| create.itemPreset | | |
| create.notification | | |
| create.plugin | | |
| create.publicLink | | |
| create.publicLink.account | | |

Continued on next page

Table 1 – continued from previous page

| Event | Class | Description |
|---|---|---|
| create.tag | | |
| create.tempMasterPassword | | |
| create.user | | |
| create.userGroup | | |
| create.userProfile | | |
| database.query | | |
| database.rollback | | |
| database.transaction.begin | | |
| database.transaction.end | | |
| database.transaction.rollback | | |
| delete.account | | |
| delete.account.selection | | |
| delete.accountFile | | |
| delete.accountFile.selection | | |
| delete.accountHistory | | |
| delete.accountHistory.selection | | |
| delete.authToken | | |
| delete.authToken.selection | | |
| delete.category | | |
| delete.client | | |
| delete.client.selection | | |
| delete.customField | | |
| delete.customField.selection | | |
| delete.itemPreset | | |
| delete.notification | | |
| delete.notification.selection | | |
| delete.plugin | | |
| delete.plugin.selection | | |
| delete.publicLink | | |
| delete.publicLink.selection | | |
| delete.tag | | |
| delete.tag.selection | | |
| delete.user | | |
| delete.user.selection | | |
| delete.userGroup | | |
| delete.userGroup.selection | | |
| delete.userProfile | | |
| delete.userProfile.selection | | |
| download.accountFile | | |
| download.backupAppFile | | |
| download.backupDbFile | | |
| download.configBackupFile | | |
| download.exportFile | | |
| download.logFile | | |
| edit.account | | |
| edit.account.bulk | | |
| edit.account.pass | | |
| edit.account.restore | | |
| edit.authToken | | |

Continued on next page

Table 1 – continued from previous page

| Event | Class | Description |
|---|---|---|
| edit.category | | |
| edit.client | | |
| edit.customField | | |
| edit.itemPreset | | |
| edit.notification | | |
| edit.plugin.available | | |
| edit.plugin.disable | | |
| edit.plugin.enable | | |
| edit.plugin.reset | | |
| edit.plugin.unavailable | | |
| edit.publicLink.refresh | | |
| edit.tag | | |
| edit.user | | |
| edit.user.pass | | |
| edit.user.password | | |
| edit.userGroup | | |
| edit.userProfile | | |
| expire.tempMasterPassword | | |
| import.ldap.end | | |
| import.ldap.groups | | |
| import.ldap.start | | |
| import.ldap.users | | |
| ldap.bind | | |
| ldap.check.connection | | |
| ldap.check.group | | |
| ldap.check.params | | |
| ldap.connect | | |
| ldap.connect.tls | | |
| ldap.getAttributes | | |
| ldap.search | | |
| ldap.search.group | | |
| ldap.unbind | | |
| list.accountFile | | |
| login.auth.browser | | |
| login.auth.database | | |
| login.auth.ldap | | |
| login.checkUser.changePass | | |
| login.checkUser.disabled | | |
| login.finish | | |
| login.info | | |
| login.masterPass | | |
| login.masterPass.temporary | | |
| login.preferences.load | | |
| login.session.load | | |
| plugin.load | | |
| plugin.load.error | | |
| refresh.authToken | | |
| refresh.masterPassword | | |
| refresh.masterPassword.hash | | |

Continued on next page

Table 1 – continued from previous page

| Event | Class | Description |
|---|---|---|
| request.account | | |
| request.user.passReset | | |
| reset.min.css | | |
| restore.accountHistory | | |
| run.backup.end | | |
| run.backup.process | | |
| run.backup.start | | |
| run.export.end | | |
| run.export.start | | |
| run.export.verify | | |
| run.import.csv | | |
| run.import.end | | |
| run.import.keepass | | |
| run.import.start | | |
| run.import.syspass | | |
| save.config.account | | |
| save.config.dokuwiki | | |
| save.config.general | | |
| save.config.ldap | | |
| save.config.mail | | |
| save.config.wiki | | |
| search.category | | |
| search.client | | |
| search.tag | | |
| search.userGroup | | |
| send.mail | | |
| send.mail.check | | |
| session.cookie_httponly | | |
| session.gc_maxlifetime | | |
| session.save_handler | | |
| session.timeout | | |
| show.account | | |
| show.account.bulkEdit | | |
| show.account.copy | | |
| show.account.create | | |
| show.account.delete | | |
| show.account.edit | | |
| show.account.editpass | | |
| show.account.history | | |
| show.account.link | | |
| show.account.pass | | |
| show.account.request | | |
| show.account.search | | |
| show.accountFile | | |
| show.authToken | | |
| show.authToken.create | | |
| show.authToken.edit | | |
| show.category | | |
| show.category.create | | |

Continued on next page

Table 1 – continued from previous page

| Event | Class | Description |
|---|---|---|
| show.category.edit | | |
| show.client | | |
| show.client.create | | |
| show.client.edit | | |
| show.config | | |
| show.customField | | |
| show.customField.create | | |
| show.customField.edit | | |
| show.itemPreset | | |
| show.itemPreset.create | | |
| show.itemPreset.edit | | |
| show.itemlist.accesses | | |
| show.itemlist.items | | |
| show.itemlist.security | | |
| show.notification | | |
| show.notification.create | | |
| show.notification.edit | | |
| show.plugin | | |
| show.publicLink | | |
| show.publicLink.create | | |
| show.publicLink.edit | | |
| show.tag | | |
| show.tag.create | | |
| show.tag.edit | | |
| show.user | | |
| show.user.create | | |
| show.user.edit | | |
| show.user.editPass | | |
| show.userGroup | | |
| show.userGroup.create | | |
| show.userGroup.edit | | |
| show.userProfile | | |
| show.userProfile.create | | |
| show.userProfile.edit | | |
| show.userSettings | | |
| track.add | | |
| track.delay | | |
| unlock.track | | |
| update.masterPassword.customFields | | |
| update.masterPassword.end | | |
| update.masterPassword.hash | | |
| update.masterPassword.start | | |
| upgrade.app.end | | |
| upgrade.app.start | | |
| upgrade.authToken.end | | |
| upgrade.authToken.process | | |
| upgrade.authToken.start | | |
| upgrade.config.end | | |
| upgrade.config.process | | |

Continued on next page

Table 1 – continued from previous page

| Event | Class | Description |
|---|---|---|
| upgrade.config.start | | |
| upgrade.customField.end | | |
| upgrade.customField.process | | |
| upgrade.customField.start | | |
| upgrade.db.end | | |
| upgrade.db.process | | |
| upgrade.db.start | | |
| upgrade.publicLink.end | | |
| upgrade.publicLink.process | | |
| upgrade.publicLink.start | | |
| upload.accountFile | | |
| wiki.aclCheck | | |
| wiki.getPage | | |
| wiki.getPageHTML | | |
| wiki.getPageInfo | | |

## 2.3.11 Backup Strategies

**Note:** Work in progress

### Docker

Please perform backups regularly by using in-app tools or external ones (recommended). You need to copy the following data:

- "syspass-app-config" volume
- "syspass-app-backup" volume
- sysPass database

Example:

```
docker run --rm \
--volumes-from syspass-app \
--volume $PWD:/backup \
alpine sh -c "exec tar czf /var/www/html/sysPass /backup/syspass-app-backup.tar.gz"

docker run --rm \
--network syspass-net \
--volume $PWD:/backup \
mariadb:10.2 sh -c 'exec mysqldump -h syspass-db -u root -p"syspass" syspass > /
↪backup/syspass-db-dump.sql'
```

These commands will create "syspass-app-backup.tar.gz" and "syspass-db-dump.sql" files within the current directory

## 2.4 Updating

### 2.4.1 Strategies

Though it has been discussed a few times, I should mention that **sysPass does not provide an automated upgrading method for code files**. This is so because it would imply installing some kind of software libraries like Git and develop an UI interface within sysPass that will try to resolve many situations when dealing with CVS repositories (merge, conflicts, etc.).

Another question is about those installations on Docker or Kubernetes, which don't rely (philosophically speaking) on such kind on rolling updates based on CVS, since it will break the philosophy of containers: immutable, reproducible, scalable and so on.

That being said, all-in-one apps are not a great deal for these days, so I think the best way to update is to be performed externally, that is either using Git or Docker tagged images (through Docker Compose or Helm).

#### Normal

As described on release upgrading notes

#### Git

Install Git, point your CLI on the webserver root and run the following command:

```
$ git clone https://github.com/nuxsmin/sysPass.git
```

In order to get the latest updates:

```
$ git pull
```

**Note:** The "master" branch on Github holds the most recent stable version

After it, if database changes are required, you'll need to follow the steps through the web UI

**Warning:** Perform a full database and application backup using external tools like "mysqldump" and "tar" before updating

#### Docker

The fine and easy way is installing *Docker Compose* and every new version is released out, you only need to change the image tag on composer's YAML.

```
version: '2'
services:
  app:
    container_name: syspass-app
    image: syspass/syspass:3.1.0 # Set this version tag to desired one
    restart: always
...
```

After changing the version tag, tun the following command:

```
docker-compose -p syspass -f docker-compose.yml up -d
```

It will update the current sysPass container with the new version. If database changes are required, you'll need to follow the steps through the web UI

**Warning:** Perform a full database and application backups before updating: *Backup Strategies*

### 2.4.2 2.1 Version

This version includes some improvements on the sysPass security by the following features:

- It uses Defuse/php-encryption library for the data encryption with OpenSSL by using AES-256 CTR (CVE-2017-5999)
- Improvements on the session keys security
- API authorizations password
- Improvements on the public links security
- Failed log in attempts detection. A delay is set after several attempts

This upgrade requires to re-encrypt all the accounts and encrypted data, so the master password and a valid user login (for registering changes) will be needed.

Though it's a safe process, it's advisable to make a full sysPass backup.

#### Important Changes

Because the encryption data changes, the following items need to be regenerated:

- Public links: the links are now an snapshot of the linked account, so if the account is updated, the link needs to be renewed.
- API authorizations: As of this version, a password is needed for those authorizations that require encrypted data.
- Temporary master password: it needs to be regenerated if it's being used.

#### Process

For the sysPass updating the following steps are needed:

1. Download the application from https://github.com/nuxsmin/sysPass/releases and uncompress the files
2. Set the sysPass directory owner and permissions
3. Copy the files ("config.xml", "key.pem" y "pubkey.pem") within the "config" directory from the current version to the new one
4. Open the application from a web browser

If the application requires a database upgrade:

1. **Perform a database backup**
2. Enter the updating code which could be found in the "config/config.xml" file within the tag "upgradeKey"

3. Please, enter the sysPass master password.
4. Please, enter a valid user login

**Note:** During the upgrade, it will display the encryption tasks processes.

**Note:** After the updating, it will show a message and you could take a look to the updating details in the event log

## 2.4.3 3.0 Version

This version only can be updated from v2.1

### Important Changes

- This version performs a fully database structure change, so **it's very important to make a full database backup using external tools like "mysqldump"**
- "config" directory is moved off to "/app/config"
- Composer PHP package manager is used to install and keep up-to-date sysPass dependencies

### Process

The following steps need to be performed in order to update sysPass:

1. Download or clone sysPass repository from either https://github.com/nuxsmin/sysPass/releases or https://github.com/nuxsmin/sysPass.git
2. Set user and group permissions on sysPass directory
3. Copy "config.xml", "key.pem" y "pubkey.pem" from the old ". . . /config" directory to ". . . /app/config" directory
4. From sysPass root directory, download and install Composer: https://getcomposer.org/download/
5. Install dependencies

```
$ php composer.phar install --no-dev
```

6. Set up the correct permissions on directories. Please note that "config" and "backup" directories are now within "/app"
7. Point your browser to sysPass web server URL
8. **Perform a full database backup using external tools like "mysqldump"**
9. Enter the upgrade key located in "app/config/config.xml" file within the "upgradeKey" tag

## 2.4.4 3.1 Version

It's highly recommended upgrade from v3.0

Please check out *3.0 Version* upgrade notes if you're upgrading from v2.1

### Important Changes

- This version performs some database changes that will impact on plugins installed, so **it's very important to make a full database backup using external tools like "mysqldump"**
- Composer PHP package manager is used to install and keep up-to-date sysPass dependencies

### Process

The following steps need to be performed in order to update sysPass:

1. Download or clone sysPass repository from either https://github.com/nuxsmin/sysPass/releases or https://github.com/nuxsmin/sysPass.git
2. Set user and group permissions on sysPass directory
3. Copy "config.xml", "key.pem" y "pubkey.pem" from the old ". . . /app/config" directory to the new one
4. From sysPass root directory, download and install Composer (if not installed yet): https://getcomposer.org/download/
5. Install dependencies

```
$ php composer.phar install --no-dev
```

6. Set up the correct permissions on directories
7. Point your browser to sysPass web server URL. The upgrade process will display the confirmation page
8. Though it's being said on the upgrade page, please **perform a full database backup using external tools like "mysqldump"**
9. Enter the upgrade key located in ". . . /app/config/config.xml" file within the "upgradeKey" tag
10. If the upgrading process fails, please check out ". . . /app/config/syspass.log" file for error messages
11. Once upgraded it will redirect to the sign in page

**Warning:** Please do not retry the upgrade process if database changes have been made. In that case, you will need to restore the database backup and restart the whole upgrade process.

### Changelog

### Fixed

- [FIX] Wrong URL when application URL setting is set. Thanks to @kalxasus for the notice. Closes #1395
- [FIX] LDAP group filter wasn't applied when importing. Thanks to @kalxasus for the notice. Closes #1390
- [FIX] Client custom fields were not created/saved. Thanks to @ZUNbado and @sf32738 for the notice. Closes #1375
- [FIX] Skip over initialization when upgrade is needed. Thanks to @Envikia and @alexseys for the notice. Closes #1355
- [FIX] Wrong URL handling when downloading files. Thanks to @fprina for the feedback and testing. Closes #1354
- [FIX] Wrong field definition on PluginData table. Thanks to @drewlsvern for the feedback. Closes #1326

- [FIX] Fix custom fields migration issue. Thanks to @VexedSyd for the feedback. Closes #1273
- [FIX] Wrong limit for maximum file size. Thanks to @javierlm for the feedback. Closes #1313
- [FIX] Wrong behavior when disabling remote syslog
- [FIX] Wrong behavior when saving LDAP server. Thanks to @lreiher for the feedback. Closes #1277
- [FIX] Wrong behavior when setting user's email from LDAP when several email addresses are set. Thanks to @cRaZy-bisCuiT for the feedback. Closes #1283
- [FIX] Wrong behavior when updating user's password. Thanks to @vrdominguez for the feedback. Closes #1293
- [FIX] Wrong behavior when no mail recipients are set
- [FIX] Wrong encoding in text area. Thanks to @pierrehenrymuller for the feedback. Closes #1296
- [FIX] Fixed wrong behavior when search operator was set
- [FIX] No debug messages when debug mode is activated
- [FIX] Fixed wrong behavior when setting password complexity length. Thanks to @andrucha97 for the feedback. Closes #1280
- [FIX] Fixed wrong behavior when searching for accounts on accounts manager. Thanks to @Weptun for the feedback. Closes #1271
- [FIX] Fixed Polski language option. Thanks to @pitrov24 for the notice. Closes 1288
- [FIX] Added missing Italian language option. Thanks to @Matwolf08 for the notice. Closes #1302
- [FIX] Wrong encoding when displaying account's password. Thanks to @DDH112 for the feedback. Closes #1257
- [FIX] Wrong behavior when copying account's tags. Thanks to @leBasti91 for the feedback. Closes #1256
- [FIX] Wrong behavior when selecting template's view

### Improved

- [MOD] Improved stacktrace by anonymizing function's arguments data. Thanks to @cRaZy-bisCuiT for the feedback. Closes #1339
- [MOD] Bump version & build
- [MOD] Improved behavior when searching for user permission on accounts. Thanks to @anth69 for the feedback. Closes #1338
- [MOD] Updated translations. Thanks to all contributors.
- [MOD] Update Authenticator version in composer.json
- [MOD] Minor code tweaks
- [MOD] Typo in translation. Related #1313
- [MOD] Increase account's name length up to 100 characters long. Related #1071
- [MOD] Unlocked PHP 7.3
- [MOD] Improved logging messages
- [MOD] Code cleanup
- [MOD] Minor CSS tweaks

- [MOD] Update translations
- [MOD] Avoid to import blank client or category name when importing CSV files.
- [MOD] Enforce password complexity checking. Thanks to @DDH112 for the feedback. Closes #1226
- [MOD] Improved plugins availability detection and skip weird event log entries

### Added

- [ADD] Added search for accounts name by regular expression. Closes #1311
- [ADD] Added missing tests
- [ADD] Added client IP address in syslog messages. Thanks to @sebagarayco for the feedback. Closes #1302
- [ADD] Allow to change the account's owner and main group when the user is the account's owner. Related #705
- [ADD] Allow to set account's owner when creating or copying the account. Related #1264
- [ADD] Application URL for handling requests through reverse proxy. Thanks to @rob42 for the feedback. Closes #1218
- [ADD] Allow to enable email notifications only for account access requests. Thanks to @jorgemfm for the feedback. Closes #1157
- [ADD] Improved plugins data handling by encrypting the plugin's data

### Thanks

Big thanks to all contributors for the feedback, pull requests, translations and donations.

- @kalxasus
- @ZUNbado
- @sf32738
- @Envikia
- @fprina
- @drewlsvern
- @VexedSyd
- @javierlm
- @lreiher
- @cRaZy-bisCuiT
- @vrdominguez
- @pierrehenrymuller
- @Weptun
- @pitrov24
- @Matwolf08
- @DDH112
- @leBasti91

- @anth69
- @sebagarayco
- @rob42
- @jorgemfm

## 2.5 HOWTOs

### 2.5.1 How to test a sysPass update

**Note:** This procedure tells the steps to follow to try out a sysPass update without modifying the current installation

1. Make a database backup. It could be made either through the sysPass utility, MySQL workbench or mysqldump tool
2. Create a new database (eg. syspass21)
3. Create an user (eg. sp_admin21) and set the permissions over the newly created database
4. Import the backup in the newly created database. You could use the above tools
5. Create a new directory and unpack the new sysPass version package[1]
6. Copy all files within the "config" directory to the new path and check out the permissions[1]
7. Modify the "config/config.xml" file to set the correct database connection parameters ("dbname", "dbuser" and "dbpass"). Please check out that "dbHost" is correct
8. Point the browser to the application URL and follow the steps for upgrading

#### Notes

### 2.5.2 How to restore sysPass

**Note:** This procedure requires to have a database and application backup

1. Restore the database backup. It could be made either through the sysPass utility, MySQL workbench or mysqldump tool
2. Create the connection user (see '. . . /app/config/config.xml' file for current connection settings) and set the correct permissions on the restored database
3. Restore the application backup
4. Point the browser to the application URL

[1] See *Installation* for more details

### 2.5.3 Azure MySQL

In order to install sysPass database on Azure MySQL you'll need to change the database engine used in DDL statements that create the database views. This will replace the "MyISAM" engine with "InnoDB", which does not take any effect in database views.

```
$ sed -i "s/MyISAM/InnoDB/g" /var/www/html/sysPass/schemas/dbstructure.sql
```

**Note:** Thanks to @shocker70 for this contribution

### 2.5.4 How to install and configure Nginx

Install required repositories and packages

```
$ sudo yum -y install epel-release.noarch centos-release-scl centos-release-scl-rh␣
↪scl-utils

$ sudo yum -y install nginx rh-php70 rh-php70-php rh-php70-php-fpm rh-php70-php-ldap␣
↪rh-php70-php-xml rh-php70-php-json rh-php70-php-gd rh-php70-php-pdo rh-php70-php-
↪mbstring rh-php70-php-cli rh-php70-php-mysqlnd mod_ssl
```

Configure Nginx "/etc/nginx/conf.d/syspass.conf" file

```
server {
  listen 80;

  #server_name: This is the domain you will be using for your site. Instead of␣
↪localhost, we will use the public facing domain and www version of the domain you␣
↪want to use.
  server_name syspass.foo.bar;

  location / {
    #root: This is the root directory for the site files.
    root /var/www/syspass;
    index index.html index.php;

    #try_files: What we are doing here is telling the server to display a 404 error␣
↪when a given file is not found.
    try_files $uri $uri/ =404;
  }

  error_page 500 502 503 504 /50x.html;

  location = /50x.html {
    root html;
  }

  location ~ .php$ {
    #root: This is the root directory for the site files.
    root /var/www/syspass;
    fastcgi_pass 127.0.0.1:9000;
    fastcgi_index index.php;
    include fastcgi_params;
    fastcgi_param SCRIPT_NAME $fastcgi_script_name;
```

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```
    fastcgi_param SCRIPT_FILENAME $document_root$fastcgi_script_name;
  }
}
```

Configure PHP

```
$ sudo sed -i 's/user = apache/user = nginx/g; s/group = apache/group = nginx/g;' /
↪etc/opt/rh/rh-php70/php-fpm.d/www.conf
$ sudo usermod -aG nginx apache
```

Enable and start services

```
$ sudo systemctl enable rh-php70-php-fpm
$ sudo service rh-php70-php-fpm start
$ sudo systemctl enable nginx
$ sudo service nginx start
```

**Note:** Thanks to @M1k13 for this contribution

### 2.5.5 LDAP Troubleshooting

PHP 7.2 now includes openssl directly compiled in.

You may just check that with:

```
$ /bin/php -r 'phpinfo();' | grep ssl
```

or if you’re like me using CentOS 7 and php via SCL:

```
$ /opt/rh/rh-php72/root/bin/php -r 'phpinfo();' | grep ssl
```

You may then also check if your linux box connects to your ldaps server with:

```
$ openssl s_client -connect yourldapsserver.domain.local:636
```

or ldap server using TLS

```
$ openssl s_client -connect yourldapsserver.domain.loca:389 -tls1_2
```

If those work, you may use ldapsearch to manually bind to your LDAP server and see what the problem might be. On CentOS, install it via:

```
$ sudo yum install openldap-clients
```

Simple LDAP Query

```
$ ldapseach -h yourldapserver.domain.local -p 389 -b \"dc=domain,dc=local\" -D \
↪"CN=YourBindAccount,DC=domain,DC=local\" -W
```

Add -Z to the ldapsearch line to switch to TLS.

If you get

```
ldap_start_tls: Connect error (-11)
additional info: error:14090086:SSL routines:ssl3_get_server_certificate:certificate␣
↪verify failed (unable to get local issuer certificate)
ldap_result: Can't contact LDAP server (-1)
```

Your certificate might be bad. You can override certificate checking in "/etc/openldap/ldap.conf" by adding line:

```
TLS_REQCERT     allow
```

Don't forget to restart php-fpm (or apache if using mod_php) for those settings to take effect.

**Note:** Thanks to @deajan for this contribution

## 2.6 Frequently Asked Questions

### 2.6.1 What is sysPass?

sysPass is a password manager that allows to save passwords using bidirectional encryption with a master password to a database. Passwords are associated to accounts, and these have detailed information about it like: customer, category, notes, files, etc.

The initial idea was to make servers and services passwords accesible in a multiuser environment with security applied and make a portable bundle to store on a flash drive.

### 2.6.2 Where can I install sysPass?

The application can be installed on any system that has Apache, PHP and MySQL installed.

### 2.6.3 How do I install sysPass

You can download the application from https://github.com/nuxsmin/sysPass/releases/latest and follow steps on *Installation*

### 2.6.4 Which authentication methods are used?

sysPass uses MySQL/MariaDB or LDAP as authentication backends.

If LDAP is used and it is for some reason not possible to connect to the configured LDAP server, it will use MySQL as backend. In this case, user login data will be the last used on user login by LDAP.

More information on: *Authentication*

### 2.6.5 What is the encryption for?

The database passwords encryption allows that in case of anyone get access to the database or a data exporting is performed, it won't be readable without the master key.

This solution is very convenient when you run the application from a flash drive, because if you lose it, the information is secured.

The encryption schema used is rijndael-256 in CBC mode.

More information on: *Encryption*

### 2.6.6 What is portable?

It means that you can run the application without really installing it.

This application can be portable by installing Apache, PHP and MySQL on a flash drive. You can use any available LAMP bundles like WAMP, XAMPP, etc.

The backup tool allows you to make a backup of whole the environment (application and database) for example to store it on a flash drive or put it somewhere safe as a backup.

### 2.6.7 Is there a master password for each account/user?

The master password is global for all accounts and users.

Each time a user is added, his personal password is changed or the master password is reset, the user needs to enter the master password on the next session login.

Each time the master password is changed, the users that are logged in, will only be able to view accounts details, until the new password is entered.

More information on: *Encryption*

### 2.6.8 What are Wiki links?

It allows you to link the accounts with a name pattern to an external Wiki that allow to pass the account name as a parameter in the URL.

There are two types of links, the one that links to a Wiki search page (and in which the account name is passed as a parameter), and the other that links to the account page in the Wiki.

### 2.6.9 What are categories?

Its goal is to classify the accounts to make more precise searches.

### 2.6.10 What are user groups?

These groups are used to give users access to accounts that have a certain group set as primary or secondary group

### 2.6.11 What is customer field?

Like categories, it is possible to do searches based on the customer. This field can be treated generically as department, company, division, etc..

En futuras versiones se podrán asociar usuarios a clientes.

### 2.6.12 Is there an account history?

Yes, each time an account is modified or deleted, the application saves a copy of the last state.

You can switch to a history point at account details page. If the master password that was used to save account history point differs from current, the password won't be shown.

### 2.6.13 What are profiles?

Profiles are used to define actions that the users can do.

There are 16 access levels that can be activated and it allows to define which modules can be accessed by the users in which are defined.

### 2.6.14 What is maintenance mode?

This mode is used to disable the users to log in to the application while you are doing operations on database, updating, etc.

The user that enables the maintenance mode, will be the only one that can use the application until a session log out. After that it will be needed to disable it in the "config/config.xml" file within the tag "maintenance"

### 2.6.15 Can I change Master Password?

Yes, you need to know the current one. It's advisable to make a database backup before this process.

### 2.6.16 I don't remember Master Password, can I decrypt the passwords?

No, it's not possible view the passwords without the Master Password.

### 2.6.17 Does backup runs on Windows?

Yes, it uses the PHP PHAR library to get it working.

### 2.6.18 The language doesn't change

Please take a look to the locales installed on your system (server), because sysPass uses the GNU gettext system for internationalization.

The installed locales should be on the UTF-8 variant.

### 2.6.19 What are these strange characters in password fields?

Don't worry about them, your password is okay. It's a security mechanism by which the passwords entered in a form field are automatically encrypted using RSA encryption before sending over the HTTP channel. Then, on server side, they are decrypted and stored/used as they were entered.

Further info on: *Encryption*