

# PAM Implementation guide

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# General instructions

## Introduction

The purpose of this document is to provide the instructions to implement PAM using the Soffid console. This is a step-by-step implementation guide.

Soffid is an information security product that provides a web console to **manage privileged accounts** in addition to, identity provisioning, identity governance, including risk management and Single sign on.

## Before starting

Before you start the PAM implementation it will be mandatory:

### 1. Install Soffid IAM Console

The first step will be to install Soffid. You could install Soffid console on-premise, or on the cloud; on your own servers, or using docker or Kubernetes.

For more information visit the [Soffid installation book](#).

### 2. Install Soffid PAM

The purpose of PAM is to manage accounts and to determinate what users will have access to critical resources. Soffid allows to you to install and configure PAM.

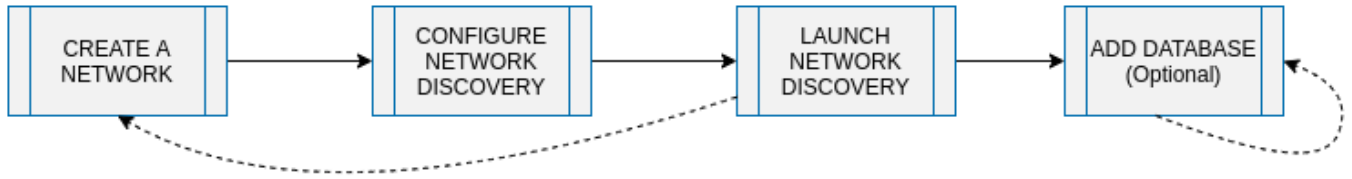
For more information visit the [PAM Install & config book](#).

### 3. Login into Soffid Console

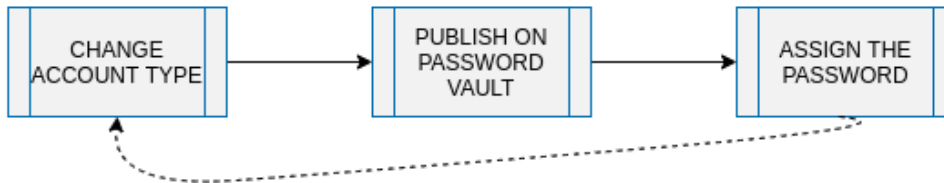
Your user need to be an administrator user or a user with the proper permission to perform the actions for the implementation procedure.

# Process definition

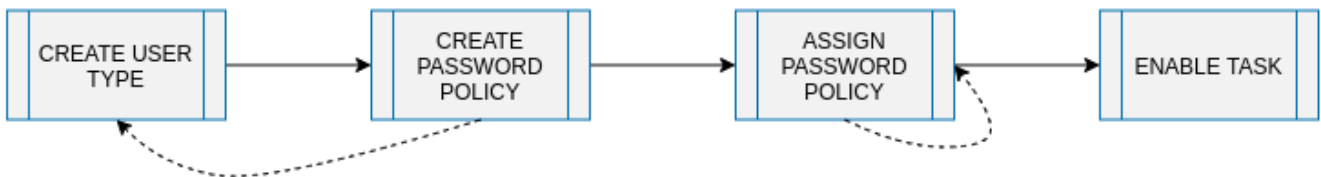
## NETWORK DISCOVERY PROCESS



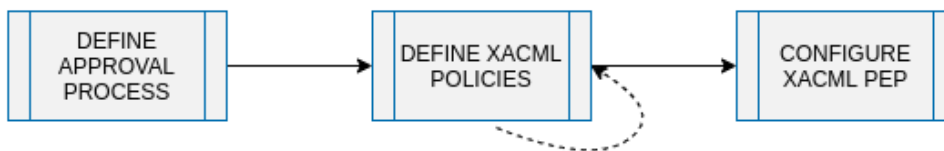
## ACCOUNT MANAGEMENT



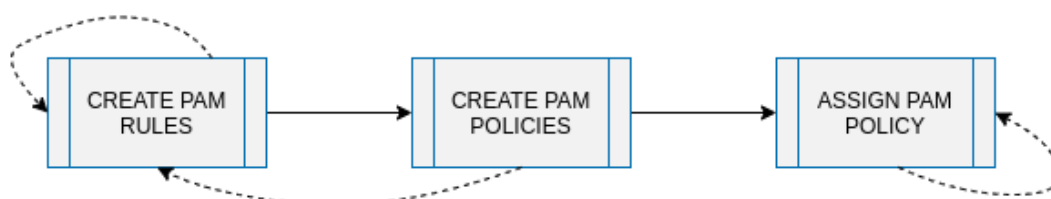
## PASSWORD ROTATION



## JUST IN TIME PRIVILEGES



## BEHAVIOR ANALYSIS





# Step 1. Create network

The first step of the PAM implementation will be to create the network we want to scan to discover the hosts

## Step-by-step

**1.** First of all, you must access the networks page, the path to access is the following:

Main Menu > Administration > Resources > Networks

**2.** Once you are located on the networks page, you must click the button with the add symbol (+) to add a new network. Then Soffid will display a new empty page to fill in the network data.

You must fill, at least the required fields (fields with an asterisk) to create a network.

- The **name** should be an identificative network name, that will be a unique network name (no spaces and no symbols).
- The **description** should be a brief description of the network.
- The **IP Address** should be the real network IP address you want to scan.
- The **IP Address mask** should specify the network's available hosts.

Other fields you could configure

- The **Internal network** allows you to indicate if this network is fully managed or not.
- The **Support DHCP** allows you to determine if the hosts that belong to this network will be automatically registered on Soffid.
- The **DHCP attributes** allow you to enter additional parameters that DHCP server will use to assemble DHCP response. Usually it will have a gw=0.1.2.34 like parameter. It is only needed when a DHCP connector is configured.

Auto calculated fields

- The **Used IPs** will be IP addresses used.

**3.** Once you have filled in all those fields, you must apply changes, by clicking on the "Apply changes" button to create the new network.

#### 4. When you apply changes:

**4.1.** If all the required information is correct, Soffid will save the new network, close the page and show the networks list with all the networks created on the system, including the last one created.

**4.2.** If the information filled in is not correct, Soffid will show an alert on the fields which have errors. You must correct the mistakes and save the network data again.

## Screen overview

### Basics Access Control

---

Name :	<input type="text" value="lab3"/> *
Description :	<input type="text" value="Laboratory network"/> *
IP Address :	<input type="text" value="10.129.122.0"/> *
IP Address mask :	<input type="text" value="255.255.255.0"/> *
Internal network :	<input checked="" type="radio"/> Yes <input type="radio"/> III
Supports DHCP :	<input type="radio"/> III <input checked="" type="radio"/> No
DHCP attributes :	<input type="text" value="DHCP attributes"/>
Used IPs :	<input type="text" value="5 / 256"/>



# Step 2. Configure network discovery

The second step will be to configure the network with the proper parameter to allow you to run the discovery process.

## Step-by-step

1. First of all, you must access the network discovery page in the following path:

Main Menu > Administration > Configuration > Integration engine > Network discovery

2. Once you have accessed the network discovery page, Soffid will display all the networks created on Soffid using a list format.
3. You must select the network you want to scan to discover all its hosts.
4. Then, Soffid will display detailed information about the network. All that information will be read-only data.
5. You must click the "Enabled discovery" button to display new configuration fields, **server**, **accounts to probe**, **schedule**, and **current execution**.
6. The first of one, **Server** (from now on the **discovery proxy server**) the selected server will be used to try to connect the detected hosts using the accounts defined on the accounts to probe list. If no servers are selected, the server selected in the task definition will be used.
7. The second, **Accounts to probe** allows you to add accounts for trying to connect to the network hosts discovered.
  - 7.1. You must click the add button (+) to add a new account.
  - 7.2. You must select to create a new account or add an existing account.

**7.2.1.** To register a new account you must select the "Register a new account" option and fill in the login name and the password.

**7.2.2.** To use an existing account, you must select the "Use an existing account" option and select the chosen account. You have two options:

**7.2.2.1.** Writing the account name on the text field, Soffid helps you with predictive search. Then you must click the "Apply changes" to save the data and Soffid will add the account to the accounts to probe list.

**7.2.2.2.** Clicking the user icon, Soffid will show you the search account window. Once you search and find the proper account, you need to click on the account row. Then soffid will add the account to the accounts to probe list.

**8.** The third, **Schedule**: you can enable that option to schedule the execution of the task. If you enable that option, a task will be created and configured to be performed on the schedule defined.

**8.1.** You can update the schedule to be performed, the available fields are the following:

- **Month**: number of the month (1-12) when the task will be performed.
- **Day**: number of the day (1-31) when the task will be performed.
- **Hour**: hour (0-23) when the task will be performed.
- **Minute**: minute (0-59) when the task will be performed.
- **Day of week**: number of the day (0-7 where 0 means Sunday) of the week when the task will be performed.
- **Server**: (from now on **discovery manager**) primary sync server that will execute the Nmap process to discover hosts of the network. If no server is selected, Soffid will use one of the primary sync servers.

All those fields are mandatory to schedule the task.

For each value of month, day, hour, minute or day of the week:

- \* means any month, day, hour, minute or day of the week. e.g. \*/5 to schedule each five minutes.
- A single number specifies that unit value: 3
- Some comma separated numbers: 1,3,5,7
- A range of values: 1-5

**8.2.** If you update the schedule data, you will need to "Apply changes" to save the update. If there is any error, that will display and the data will not save; you must correct the data and apply changes again.

9. The fourth, the **Current execution** option allows you to fire the task execution at the current moment.
10. The **Last execution** section displays the information about the last execution of the discover network process, the start and end date and time, and the execution log.
11. The last one, **Previous executions**, will display a list with information about the previous executions. That option will be shown when the task executions were run and finished at least one time.

Soffid will display a list with information about the previous executions, the date and time when the task started, the status, and also will allow you to download the log file. To download the log file you must click on the proper "Execution log" cell, then a Txt file will be downloaded on your computer and you could check it.

# Screen overview

Name :

lab3

Description :

Laboratory network

IP Address :

10.129.122.0

IP Address mask :

255.255.255.0

Server :

Accounts to probe:

☒ Login name

☐ administrator

☐ soffid

Displayed rows: 2

Schedule

Enabled :

III

No

Task description :

Discover network Laboratory network

Month :

\*

Day :

\*

Hour :

0

Minute :

0

Day of Week :

6

Server :

iam-sync soffidnet

Current execution

Start now

Last execution

Start Date :

3/7/2023 09:25

End Date :

3/7/2023 10:20

Execution log:

Connecting to discovery server

Previous executions

Start Date	Status	Execution
4/25/2022 11:08	✓	T
4/25/2022 09:34	✓	T

Displayed rows: 2

Undo

Apply changes

# Step 3. Launch network discovery

# Step 3.1. Launch network discovery

Then, the third step will be to launch the network discovery process. That is the process in charge to scan the network, getting the hosts information, and connecting to the hosts as well.

## Step-by-step

1. The discovery network task can be executed manually or automatically:
  - 1.1. By clicking the "Start now" button, the process will be launched manually at the current moment.
  - 1.2. If the schedule option is enabled, the task will be launched at the schedule defined. You can configure it on the [Scheduled task page](#) as well.
2. Soffid will display the information about the result of the process when it has finished.
3. Also, Soffid will display in a tree structure the information recover about the host detected identifying indicating whether it was possible to connect, and in the affirmative case, the information about the agent and the entry point created, and the recovered accounts

The discovery process is multithread. To discover the host of the network, Soffid launch from 1 to 20 threads, with that configuration, Soffid gets to optimize the discovery process.

## Network discovery process

On the Network dicoverly page there are two different servers to configure, the first one, the **discovery proxy server** (located next to the network attributes), the second one, the **discovery manager** (located on the schedule section).

Communication between these servers is always encrypted with certificates on both sides.

The screenshot displays the Soffid configuration interface. At the top, there are input fields for 'Name' (lab3), 'Description' (Laboratory network), 'IP Address' (10.129.122.0), and 'IP Address mask' (255.255.255.0). Below these is a 'Server' dropdown menu set to 'Discovery proxy server'. The 'Accounts to probe' section shows a table with two rows: 'soffid' and 'Administrador', each with a checkbox. To the right of this table, it says 'Displayed rows: 2' and there is a blue circular button with a white plus sign. Below the accounts table, there are two sections: 'Schedule' and 'Current execution'. The 'Schedule' section has a toggle for 'Enabled' (set to 'No'), a 'Task description' field (Discover network Laboratory network), and fields for 'Month', 'Day', 'Hour', 'Minute', and 'Day of Week' (all set to '\*' or '0'). The 'Current execution' section has a 'Start now' button. At the bottom, there is a 'Server' dropdown menu set to 'Discovery manager'.

Name : lab3

Description : Laboratory network

IP Address : 10.129.122.0

IP Address mask : 255.255.255.0

Server : Discovery proxy server

Accounts to probe:

<input type="checkbox"/>	Login name
<input type="checkbox"/>	soffid
<input type="checkbox"/>	Administrador

Displayed rows: 2

**Schedule**

Enabled : No

Task description : Discover network Laboratory network

Month : \*

Day : \*

Hour : 0

Minute : 0

Day of Week : 6

Server : Discovery manager

**Current execution**

Start now

## The server to discover

That server is in charge to scan the network to discover the hosts of the network. For each host discovered, the Nmap utility gets the info about the ports and the protocols used. Also, that process gets the IP Address and the operating system. All the recover information will be saved on Soffid database.

If no **discovery manager** is selected, to execute that process, Soffil will use on of the principal sync servers installed and configured.

## The server to connect

The **discovery proxy server** works as a proxy to connect to the target systems.

When the **discovery manager** discovers a host, it gets the host information and then, through **discovery proxy server**, it attempts to connect to the host using the accounts defined on the accounts to probe list.

- If it can not connect to the host, it will attempt with the next host discovered.
- If it gets to connect to the host, then it will create automatically a Soffid agent with the proper attributes and connector parameters, also with the necessary account metadata.

Then, the reconciliation process of the created agent, will be launched and it will try to recover the information about the accounts defined on the host. Also, it will try to recover the information about the account protected services. The recover information will be saved on Soffid database.

The next step will be to create, in the possible cases, a new entry point to the host with the basic attributes, and the proper executions to run it. That entry point will display on the Application access tree page.

If no **discovery proxy server** is selected, Soffid will use the same sync server used to the discover process.

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<https://en.wikipedia.org/wiki/Nmap>

# Step 3.2. Account repositories

Once the network discovery process is complete, Soffid will have detected the devices connected to that network and will create, where possible, a repository of accounts. Soffid will also attempt to obtain all accounts from this repository.

This is an automatic process, and as a result, you will be able to access the agent definition and the accounts created

[Main Menu](#) > [Administration](#) > [Configuration](#) > [Integration engine](#) > [Network discovery](#)

Name	IP Address	Operating system	Managed
Filter	Filter	Filter	Filter
⊕ loopback			
⊖ lab3			
⊕ 10.129.122.1	10.129.122.1	LIN	No
⊕ ADSERVER	10.129.122.2	NTS	No
⊖ 10.129.122.22	10.129.122.22	NTS	Yes: 10.129.122.22
⊖ Account protected services			
⊖ Account repositories			
10.129.122.22		Accounts	Agent definition
Add new			
⊕ Entry points			
⊕ 10.129.122.252	10.129.122.252	LIN	No
⊕ 10.129.122.253	10.129.122.253	LIN	No
⊕ lab2			

Total rows: 15

## Agent definition

On the agent page, you could find the agent definition.



BasicsAttribute mappingLoad triggersMassive actionsAccount metadata

Task engine mode:

Automatic (each change is automatically sent to target systems)

Name

10.129.122.22

Description

Discovered host 10.129.122.22

Type:

Simple SSH Agent

Class:com.soffid.iam.sync.agent.SimpleSSHAgent

Server

- disabled -

Shared Thread:

Yes

III

Dedicated threads: 1

Task timeout (ms)

Long task timeout (ms):

Trust passwords

III

No

Read only

III

No

Manual account creation

Yes

III

User domain

Default user domain

\*

Passwords domain

Default password domain

\*

# Accounts

On the accounts page, you could find all the accounts detected at this system.

Main Menu > Administration > Resources > Accounts

Name Any

Description Any

System Equals: "10.129.122.22"

Type Privileged, Shared, Unmanaged

Add criteria

QuickBasicAdvanced

	System	Name	Description	Type	Status	Owner users
<input type="checkbox"/>	10.129.122.22	root	root	Privileged	Enabled	
<input type="checkbox"/>	10.129.122.22	daemon	daemon	Unmanaged	Enabled	
<input type="checkbox"/>	10.129.122.22	bin	bin	Unmanaged	Enabled	
<input type="checkbox"/>	10.129.122.22	sys	sys	Unmanaged	Enabled	
<input type="checkbox"/>	10.129.122.22	sync	sync	Unmanaged	Enabled	
<input type="checkbox"/>	10.129.122.22	games	games	Unmanaged	Enabled	
<input type="checkbox"/>	10.129.122.22	man	man	Unmanaged	Enabled	
<input type="checkbox"/>	10.129.122.22	lp	lp	Unmanaged	Enabled	
<input type="checkbox"/>	10.129.122.22	mail	mail	Unmanaged	Enabled	
<input type="checkbox"/>	10.129.122.22	news	news	Unmanaged	Enabled	
<input type="checkbox"/>	10.129.122.22	uucp	uucp	Unmanaged	Enabled	
<input type="checkbox"/>	10.129.122.22	proxy	proxy	Unmanaged	Enabled	
<input type="checkbox"/>	10.129.122.22	www-data	www-data	Unmanaged	Enabled	

Displayed rows: 33

## Step 3.3. Entry point

Soffid allows you to manually create entry points to connect to information systems.

### Step-by-step

**1.** Once the device is detected in the network, you could add new Entry points to this device. To add a new device you must click the *Add new* button

[Main Menu](#) > [Administration](#) > [Configuration](#) > [Integration engine](#) > Network discovery

Name	IP Address	Operating system	Managed
Filter	Filter	Filter	Filter
⊕ loopback			
⊖ lab3			
⊕ 10.129.122.1	10.129.122.1	LIN	No
⊕ ADSERVER	10.129.122.2	NTS	No
⊖ 10.129.122.22	10.129.122.22	NTS	Yes: 10.129.122.22
⊕ Account protected services			
⊕ Account repositories			
⊖ Entry points			
Add new			
⊕ 10.129.122.252	10.129.122.252	LIN	No
⊕ 10.129.122.253	10.129.122.253	LIN	No
⊕ lab2			
⊕ lab1			

Total rows: 14

**2.** Then Soffid will display a new window to add the new Entry point. At this step, you need to select the Entry point type you are creating, and the menu to place the entry point.

- Secure shell (ssh)
- Secure web application (https)
- Web application (HTTP)

Entry point type :

- Select value -

Entry Point :

Select menu to place the entry point

+ Corporate applications

Total rows: 1

Back

Apply changes

3. Finally you must save by clicking the *Apply changes* button

4. You could check the new Entry point by visiting the Application access tree page

[Main Menu](#) > [Administration](#) > [Resources](#) > Application access tree



id eq 7137364



[Quick](#) [Basic](#) [Advanced](#)

Name
Corporate applications
Soffid Folder Test
Discovered host 10.129.122.22 (http)
Create new entry
Create new entry

Total rows: 3

## Entry point detail

[Main Menu](#) > [Administration](#) > [Resources](#) > [Application access tree](#) ◀ 3 / 3



**Basics** Authorizations Executions ESSO

Menu :	III No
Name :	Discovered host 10.129.122.22 (http)
Code :	Code
Information system :	Information system
System :	
Public access :	III No
Visible without permissions :	III No
Icon :	↕

Undo

Apply changes

## Step 4. Register additional resources (Optional)

## Step 4.1. Add database (Optional)

The fourth step, to add a database, is an **optional** step. You only need to configure when there is any database (SQL Server or Oracle) in some of the discovered hosts and you want to manage its accounts as privileged or shared accounts.

### Step-by-step

The network discovery process can discover and connect to the hosts. Then Soffid allows you to add databases as account repositories in the proper host.







**1.** First of all, the agent must be created on Soffid. That agent could be a SQL Server agent or an Oracle agent. To create an agent you can visit the next page [Step 4.2. Create an agent \(Optional\)](#)

**2.** Then, you must access the network discovery page in the following path:

Main Menu > Administration > Configuration > Integration engine > Network discovery

**3.** Once you have accessed the network discovery page, Soffid will display all the networks.

**3.1.** First, you must identify the network and click on the plus icon (+) to display all the hosts discovered.

Name	IP Address	Operating system	Managed
Filter	Filter	Filter	Filter
  loopback			
  lab100			
  lab200			
			Tota

**3.2.** Then, you must identify the host.

⚙ Name	▼ IP Address	⚙ Operating system	⚙ Managed
Filter	Filter	Filter	Filter
⊕ 🌐 loopback			
⊕ 🌐 lab100			
⊖ 🌐 lab200			
⊕ 🖨 soffid.pat.lab	192.168.122.1	ALT	No
⊕ 🖨 WIN-6O4SNJ52GPC	192.168.122.250	NTS	No
⊕ 🖨 192.168.122.69	192.168.122.69	LIN	No

Total

You can consult the information retrieved

Name : 192.168.122.69

IP Address : 192.168.122.69

Description : Discovered host 192.168.122.69

Operating system : Linux

⚙ Port	⚙ Description
Filter	Filter
22/tcp	OpenSSH 8.9p1 Ubuntu 3ubuntu0.3 (Ubuntu Linux; protocol 2.0)
3306/tcp	MariaDB (unauthorized)

Displayed

**3.3.** Finally, on the "Account repositories" you must click the "Add new" button.

⊖ 🌐 lab3
⊕ 🖨 10.129.122.1
⊕ 🖨 10.129.122.22
⊖ 🖨 10.129.122.25
⊕ Account protected services
⊖ Account repositories
10.129.122.25 Agent definition Accounts
Add new
⊕ Entry points
⊕ 🖨 10.129.122.252
⊕ 🖨 10.129.122.253

**4.** When you click "Add new" Soffid will display a wizard to add the database.

**soffid** New account repository

Main Menu > Admin

Select system type

Finish

Select system type :

- Select value -
- Select value -
- Linux local accounts
- MySQL or MariaDB database
- Other

Name	Filter
+ loopback	
+ lab100	
- lab200	
+ soffid.pat.lab	192.168.122.1 ALT No
+ WIN-6O4SNJ52GPC	192.168.122.250 NTS No
- 192.168.122.69	192.168.122.69 LIN No
- Account repositories	
Add new	
+ Entry points	

Total rows: 8

**5.** You must select the option "Other" on the "Select system type", and click the "Next" button.

**5.1.** If you click the "Next" button, the wizard will allow you to search the system using Quick, Basic, or Advanced search. When you run the search, Soffid will display all the systems that apply to the search criteria. Be in mind, the agent must have been previously created.

**5.2.** You must select the proper system from the result list and click the "Next" button. Then Soffid will add the agent to the "Account repositories" list and close the wizard.

Name

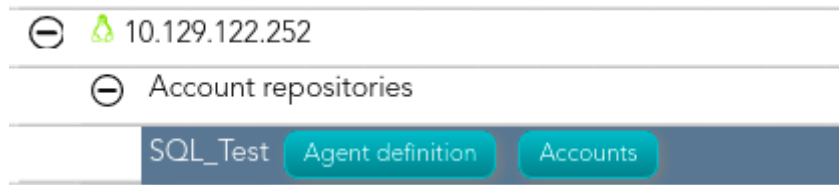
Filter

+ loopback
- lab3
+ 10.129.122.1
+ 10.129.122.22
- 10.129.122.252
- Account repositories
SQL_Test Agent definition Accounts
Add new
+ Entry points
+ 10.129.122.253
+ ADSERVER
+ test

\* When you are in the wizard and click the "Undo" button, the wizard will browse to the previous page of the wizard, or close and no operation will execute if it is the first page.

**6.** Once the database is added to the host, the next step will be to run the reconcile process to get all the accounts and permissions from the database to load into Soffid.

**6.1.** To access the agent definition, you must click the "Agent definition" button. The button is located close to the name of the agent, inside the "Account repositories" of a specific host, on the network discovery tree.



**6.2.** Once you click the button, Soffid will browse to the agent definition.

**6.3.** Then you must click the "Massive actions" tab.

**6.4.** At the "Massive actions" tab you must click the button "Reconcile (load target system objects)". That process is in charge to load into Soffid the accounts and permissions defined on the database.

**6.4.1.** If the process is successfully completed you could continue with the next step of the PAM implementation.

**6.4.2.** In another case, you must check the agent configuration and run again the process.

## Screen overview

<https://www.youtube.com/embed/HL4nsuEKSgo?rel=0>



# Step 4.2. Create an agent (Optional)

That step will be an **optional** step, and it will be mandatory only when the **SQL Server agent** or the **Oracle agent** was not created previously on Soffid Console and you need to add a database to manage its accounts.

## Step-by-step

**1.** First of all, to create an agent you must access the agent page in the following path:

Main Menu > Administration > Configure Soffid > Integration engine > Agents

**2.** Once you have accessed the agent page, Soffid will display all the active agents created on Soffid. You must click the button with the add symbol (+) to add a new agent. Then Soffid will display a new empty page to fill in the agent data.

**2.1.** You must fill, at least the required fields (fields with an asterisk) to create an agent.

- - The **Name** should be an identificative and unique agent name
  - The **Description** should be a brief description of the agent.
  - The **Type** allows you to select the connector type to use, the SQL Server connector or the Oracle connector. Be in mind that you need to load the connector on Soffid if you did not do it previously.
  - The **Server** allows you to select the synchronization server that will perform the agent tasks. It is allowed to select two servers in cases high disponibility will be necessary. If you choose two servers, when one fails, the other will be used.
    - If *"-disabled-"* is selected, the agent will be disabled-
  - The **User domain** allows you to select how to generate account names. If the account name is the same as the user name (as it is normally the case), the "Default user domain" should be used. The user domain values are defined on the Account naming rules page.

- The **Password domain** allows you to select the password policies that will be used. If the "Default password domain" is selected, Soffid passwords will be shared with the managed systems. The user domain values are defined on the [Password policies](#) page.

You can visit the [Plugins page](#) for more information about how to load a connector on Soffid Console.

**2.2.** You must fill in the optional parameters that you need to config the agent.

**2.3.** You must fill in the "Connector parameters". Those parameters depend on the agent.

**2.3.1.** SQL Server connector:

Below there are the specific parameters for this agent implementation:

Parameter	Description
User name	Database user name to authenticate
Password	The password of the database user
Driver	Identifies the driver of the relational database to use. Currently, these are the supported databases: MySQL (& MariaDB), PostgreSQL, Oracle, MS SQL Server, Informix, DB2/400, DB2 Universal, Sybase, ODBC

Parameter	Description
DB URL	<p>URL that identifies the connection properties. Please refer to the specific database vendor documentation to build this URL.</p> <pre>jdbc:mariadb://&lt;HOST&gt;/&lt;DATA_BASE&gt;</pre> <pre>jdbc:mysql://&lt;HOST&gt;/&lt;DATA_BASE&gt;</pre> <pre>jdbc:postgresql://&lt;HOST&gt;/&lt;DATA_BASE&gt;</pre> <pre>jdbc:oracle:&lt;drivertype&gt;:@&lt;database&gt;</pre> <pre>jdbc:sqlserver://&lt;HOST&gt;;databaseName=&lt;DATA_BASE&gt;</pre> <p>(*) <i>More documentation about the DB URL</i></p>
SQL Sentence to execute at startup	Each time the connection to the agent is established, this SQL statement will be executed.
Password hash algorithm	The algorithm is used to encrypt the password. For instance SHA1, SHA256, MD5, etc
Password hash prefix	<p>Prefix to add it to the password.</p> <pre>{SHA1}BzE/DjIPIsV6Nc/CIFCOs/9FfH4=</pre> <pre>{SHA256}AIEM+LINb8ucXeSE077EGHYgs+KHblmquQ2FL+Dxj7Y=</pre>
Enable debug	<p>Two options: <b>Yes</b>, and <b>No</b>.</p> <p>It enables or not more log traces in the Synchronization Server log</p>
Synchronization method	<ul style="list-style-type: none"> <li>• <b>Full synchronization:</b> persists the changes made in Soffid, regardless of the possible changes made in the final system.</li> <li>• <b>Incremental synchronization:</b> this type of synchronization is used to avoid losing changes that have been made to the target system. First, Soffid's changes will be propagated to the target system, and then the changes on the target system will be made in the Soffid system. If the changes are in the same attribute, the Soffid value is the one that will persist.</li> </ul> <p>(**)</p>

### 2.3.1. Oracle connector:

Below there are the specific parameters for this agent implementation:

Parameter	Description
User	Sysdba user name to authenticate
Oracle password	Password of the user to authenticate
Connection string to database	Database URL. Use something like <u><a href="#">jdbc:oracle:thin:@host:port:sid</a></u>
Password to protect roles	Optional password to use on password protected roles
Default user profile	Optional profile to set limits on the database resources and the user password
Default tablespace	Optional tablespace for user creation
Temporary tablespace	Optional temporary tablespace for user creation
Enable debug	Two options: [ Yes / No ]. When it is enabled more log traces are printed in the Synchronization Server log

**3.** Then, you should click the "Apply changes" button to save the new agent. Then Soffid will close the form, and display the agent list including the new agent created.

If you click the "Undo" button, the form will be closed and updates will not be saved.

Once the agent is configured, it could be assigned to the host to continue with the PAM implementation process: [Step 4. Add database](#)

# Screen overview

## SQL Server agent

Name	SQL_Test *	
Description	SQL_Test	
Type:	SQLServer Agent	Class:com. soffid.iam.agent.sqlserver.SqlServerAgent
Server	Each main synchronization server	
Shared Thread:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No         Dedicated threads: 1	
Task timeout (ms)		Long task timeout (ms):
Trust passwords	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Read only	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Manual account creation	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
User domain	Default user domain	*
Passwords domain	Default password domain	*

**Connector parameters:**

User	
Oracle password	
Connection string to database	
Create agents for each database	Yes
Enable debug	No

## Oracle agent

Name	SQL_Test *	
Description	SQL_Test	
Type:	OracleAgent	Class:com. soffid.iam.agent.oracle.OracleAgent
Server	Each main synchronization server	
Shared Thread:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No         Dedicated threads: 1	
Task timeout (ms)		Long task timeout (ms):
Trust passwords	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Read only	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Manual account creation	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
User domain	Default user domain	*
Passwords domain	Default password domain	*

**Connector parameters:**

User	
Oracle password	
Connection string to database	
Password to protect roles	
Default user profile	
Default tablespace	
Temporary tablespace	
Enable debug	No

# Step 4.3. Reconcile (Optional)

To request the accounts you must launch the reconciliation process. The main purpose of reconciling process is to provide a mechanism to ensure that all users are aligned on the specific roles and responsibilities.

## Step-by-step

**1.** First of all, you need to edit the agent must access the agent page in the following path:

Main Menu > Administration > Configure Soffid > Integration engine > Agents

**2.** Once you have accessed the agent page, Soffid will display all the active agents created on Soffid. You must click on the record of the agent you want to reconcile. Then Soffid will display a new window with the agent data.

**3.** Then, you must click on the "Massive actions" tab.

**4.** At the "Massive actions" tab, you must click on the "Reconcile (load target system objects)" button to launch the reconciliation process.

**5.** Once completion of the conciliation process, Soffid will show the result of the process execution. You could click on the alert to view the process result.

**5.1.** Green alert: the process finished ok.

**5.2.** Red alert: the process finished with an error.

## Screen overview

SSO - External SSO accounts

 Provision all users on to managed systems.

 Propagate groups to agent

Reconcile (load target system objects)

Generate target system potential impact

# Step 5. Account management

The account management step shows you how to manage the accounts to change the type, how to locate the accounts on the password vault and how to assign a password. To comply this step the discovery process must be completed.



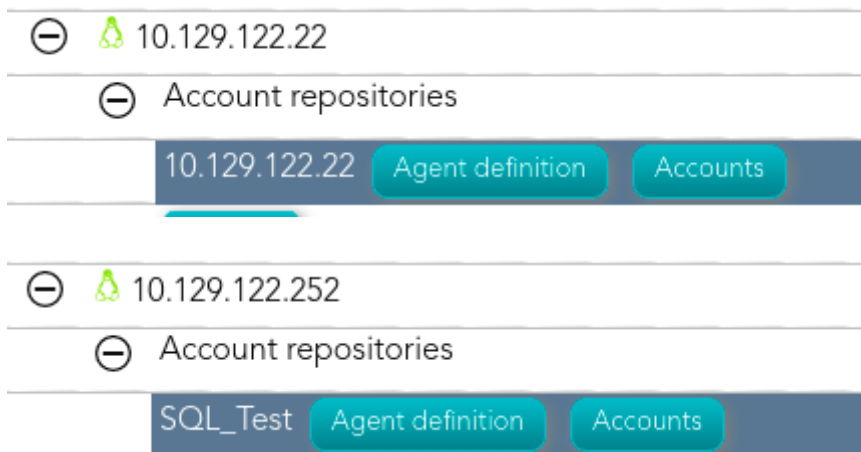
# Step 5.1. Account management

The account management step shows you how to manage the accounts to change the type, how to locate the accounts on the password vault, and how to assign a password. To comply with this step the discovery process must be completed.

## Step-by-step

**1.** To access the accounts of a specific host or database (SQL Server or Oracle), you must click the "Accounts" button. The button is located close to the name of the host or the agent, inside the "Account repositories" of a specific host, on the network discovery tree.

- Host



**2.** Once you click the button, Soffid will display the accounts list which belongs to the host or agent.

**3.** You must click on the account record to edit the detailed account info.

**4.** Then, you will be able to change the account type, place the account on the password vault, and assign a password for each account, one by one.

**a.** Step 5.2. Change account type

**b.** Step 5.3. Publish on Password Vault

**c.** Step 5.4. Assign the password

**5.** And finally, to save the updates you must click on the "Apply changes" button.

# Step 5.2. Change account type

The Change account type step shows how to change the type from *unmanaged* to **shared** or **privileged** depending on the case.

## Step-by-step

**1.** Once Soffid displays the account detail, you can change the Type (located on the Common attributes) to the proper type. You must click on the "Type" drop-down list and select the proper value for the account.

### Common attributes

System :	10.129.122.22 - Discovered host 10.129.122.22
Name :	root *
Description :	root *
Type :	Unmanaged ▼
Status :	Enabled ▼
Password policy :	SSO account ▼

**2.** Then, you can save the update by clicking on the disk icon (located at the top right), and continue with the next step.


# Step 5.3. Publish on Password vault

When **critical accounts** are detected, the best way to **keep them safe** is to place them on the Password vault. The password vault allows you to handle the access control list to these accounts, here you can define who are the owners, the managers, and the SSO users

## Step-by-step

**1.** Once Soffid displays the account detail, you can select the "Vault folder" on the "Password vault" section.

### Password vault

Vault folder :  

Inherit new permissions : ☒ ☐ No

**2.** There are two ways to assign the vault folder:

**2.1.** Writing on the predictive text field. In that case, Soffid will show the folders name that matches, and you could select the proper folder.

**2.1.** Click on the folder icon. Then you could search for the proper folder and select

Be in mind that the vault folders have to be created previously on the Password vault page.

**3.** Finally, you can save the update by clicking on the disk icon (located at the top right), and continue with the next step.

# Step 5.4. Assign the password

To be able to use an account, it is necessary to assign a password, this can be the current password or a new password. In the case of assigning a new password, it will be synchronized with the target system.

## Step-by-step

1. Once Soffid displays the account detail, you can change the password. You need to click on the hamburger icon and then on the "Set password" option.
2. Then, Soffid will show a new form to set the password.
3. You must select one of the available options:
  - 3.1. **Generated password:** If you select that option, Soffid will generate a random password and will display the password on the form.
  - 3.1. **Set password:** If you select that option, you must create a password and write it on the text field. That password should comply with the password policies defined on Soffid.
4. Finally, Soffid will send the new password to the target system.

# Step 6. Passwords rotation

The passwords rotation reduces the vulnerability to password-based attacks. Soffid allows you to limit the password lifespan and force you to change it.

# Step 6. Passwords rotation

## Introduction

The password rotation reduces the vulnerability to password-based attacks. Soffid allows you to limit the password lifespan and force you to change it.

Soffid defines a procedure for Password rotation to keep safe the critical accounts. It allows you to create password policies with the proper configuration to create strong passwords, the **password type should be "Automatically generated"**. Those policies must be assigned to critical accounts. Also, it allows to configure of an automatic task, **Expire untrusted passwords**, to check when a password has to be changed.

## Screen overview

### Password Policy

[Main Menu](#) > [Administration](#) > [Configuration](#) > [Security settings](#) > [Password policies](#) ◀ 4 / 4

Password domain

DEFAULT

User type

SSO account

Description

Default password policy

Password type

Automatically generated

Change allowed:

III

No

Query allowed:

Yes

III

### Scheduled task

[Main Menu](#) > [Administration](#) > [Monitoring and reporting](#) > [Scheduled tasks](#)

Enabled	Task description	Server	Start Date	End Date	S...
Filter	Expire untrusted passwords	Filter	Filter	Filter	Filter
Yes	Expire untrusted passwords	*			

Displayed rows: 1

You can find more information about how to configure a scheduled task on the [Scheduled task page](#).





# Step 6.1. Create User type

How to create a new User type. That will be mandatory to create a new Password policy.

## Step-by-step

1. First of all, you must access the User types page, the path to access is the following:

Main Menu > Administration > Configure Soffid > Global Settings > User types

2. Once you are located on the User types page, you must click the button with the add symbol (+) to add a new User type. Then Soffid will display a new empty page to fill in the data.

You must fill, at least the required fields (fields with an asterisk) to create a user type.

- The **short name** should be an identificative name, that will be a unique user type name (no spaces and no symbols).

Other fields you could configure

- The **Description** should be a brief description about the user type.
- If you check the **Unmanaged** field (Yes), the accounts that belong to this category will not be propagated to the target system.

3. Once you have filled in all those fields, you must apply changes, by clicking on the "Apply changes" button to create the new user type.

4. When you apply changes:

**4.1.** If all the required information is correct, Soffid will save the new user type, close the page and show the user types list with all the user types created on the system, including the last one created.

**4.2.** If the information filled in is not correct, Soffid will show an alert on the fields which have errors. You must correct the errors and save the user type again.

# Screen overview

Short name :

C

Description :

Critical accounts

Unmanaged :

III No

← Undo

Apply changes

# Step 6.2. Create Password policy

How to define a new password policy for the previous user type created.

## Step-by-step

**1.** First of all, you must access the Password policies page, the path to access is the following:

Main Menu > Administration > Configure Soffid > Security settings > Password policies

**2.** Once you are located on the Password policies page, you must click the "Add password policy", at the proper domain, to add a new Password policy type. Then Soffid will display a new empty page to fill in the data.

You must fill, at least the required fields (fields with an asterisk) to create a password policy.

- You must select the **User type** created in the previous step.
- The **Description** should be a brief description about the password policy.
- The **Password type** you must select the option **Automatically generated**.

Other fields you could configure

**3.** Once you have filled in all those fields, you must apply changes, by clicking on the "Apply changes" button to create the new user type.

**4.** When you apply changes:

**4.1.** If all the required information is correct, Soffid will save the new user type, close the page and show the user types list with all the user types created on the system, including the last one created.

**4.2.** If the information filled in is not correct, Soffid will show an alert on the fields which have errors. You must correct the mistakes and save the user type again.

# Screen overview

[Main Menu](#) > [Administration](#) > [Configuration](#) > [Security settings](#) > [Password policies](#) ◀ 5 / 6 ▶



Password domain	DEFAULT		
User type	<div>Secured accounts ▾</div>		
Description	<div>Critical Account password policy *</div>		
Password type	<div>Automatically generated ▾ *</div>		
Change allowed:	<div><div>III</div> <div>No</div></div>		
Query allowed:	<div><div>III</div> <div>No</div></div>		
Renewal Time	<div>30</div>		
Length	min:	<div>20</div>	max: <div></div>
Regular Expression	<div></div>		
Uppercase letters	min:	<div>1</div>	max: <div></div>
Lowercase letters	min:	<div>1</div>	max: <div></div>
Numbers	min:	<div>1</div>	max: <div></div>
Symbols	min:	<div>1</div>	max: <div></div>
Complexity	<div><div>III</div> <div>No</div></div>		
Passwords remembered	<div></div>		
Forbidden Words :	<div><div><input type="checkbox"/></div> <div>▼ Candidate words</div></div> <div><div><input type="checkbox"/></div> <div>2020</div></div> <div><div><input type="checkbox"/></div> <div>2021</div></div>		

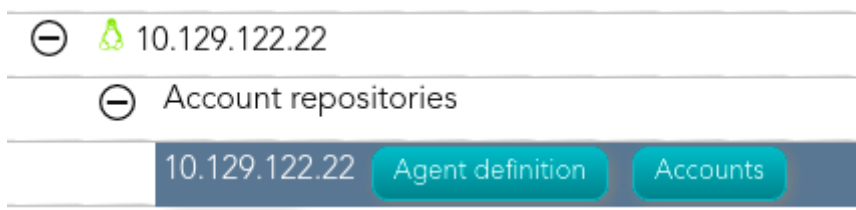
# Step 6.3. Assign password policy

You must assign a proper password policy to the critical accounts to keep them safe.

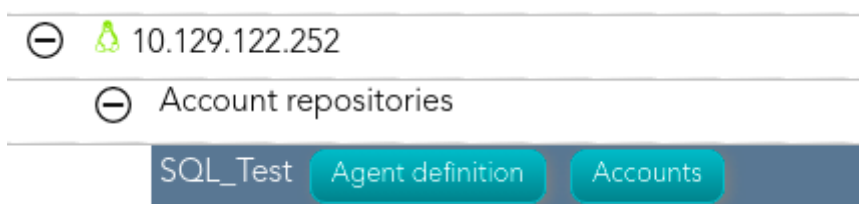
## Step-by-step

**1.** To access the accounts of a specific host or database (SQL Server or Oracle), you must click the "Accounts" button. The button is located close to the name of the host or the agent, inside the "Account repositories" of a specific host, on the network discovery tree.

- Host



- Database agent



**2.** Once you click the button, Soffid will display the accounts list which belongs to the host or agent.

**3.** You must click on the account record to edit the detailed account info.

**4.** Once Soffid displays the account detail, you can change the password policy (located on the Common attributes) to the proper type. You must click on the "Password Policy" drop-down list and

select the proper value for the account.

**5.** Then, you can save the update by clicking on the disk icon (located at the top right), and continue with the next account to change.

# Screen overview

## Common attributes

System :	SSO - External SSO accounts
Name :	4
Description :	accountX
Type :	Privileged ▾
Status :	Enabled ▾
Password policy :	SSO account ▾

# Step 6.4. Enable Task

To rotate the password it will be necessary to enable the task **Expire untrusted passwords**.

The **Expire untrusted passwords** task is in charge to create a new password for the accounts:

- Critical accounts with the password type "Automatically generated", in that case, the Renewal Time value will be in mind to determine when a password expires.
- Also, for accounts with the "Entered by the user" Password type that has expired. That case is out of the rotation passwords in the PAM implementation.

## Step-by-step

**1.** First of all, you must access the Scheduled tasks page, the path to access is the following:

Main Menu > Administration > Monitoring and reporting > Scheduled tasks

**2.** Second, you must search the task **Expire untrusted passwords** and click on the record to edit the task detail.

**3.** Once you have accessed the task detail, you must check the enable option. Also, you can update the schedule depending on your company policies.

**4.** Finally you must "Apply changes" to save the updates.

## Screen overview

Schedule

Enabled :

Yes

III

Task description :

Expire untrusted passwords

Month :

\*

\*

Day :

\*

\*

Hour :

0

\*

Minute :

5

\*

Day of Week :

\*

\*

Server :

iam-sync.soffidnet

▼

Current execution

▶ Start now



# Step 7. Just in time privileges

# Step 7. Just in time privileges

## Introduction

Once the discovery process has been run, the critical accounts have been detected and saved on the password vault, and the password rotation process has been defined, the next step would be to define the necessary approval process to manage the use of the critical accounts.

Using the approval process, Soffid allows you to define, step by step on the **BPM Editor**, the workflow for critical accounts use, and define who has to be the manager or authorized user who will approve or deny to use of those critical accounts. To define and configure the workflow you must know some information like:

- Who or whom can start the process of making a request.
- Who or whom must approve or deny the request.
- If the approved email will be available.
- Which fields must see or fill in the users whom requests.
- Which fields must see or fill in the users whom approve or deny.
- How many approval levels the workflow will need.
- And other requirements.

Then, Soffid can be able to add more complex and restricted rules to the authorizations using **XACML**. With the XACML tool, you will be able to define policy sets and policies to describe general access control requirements. Also, you will be able to define some obligations as actions that have to be returned with response XACML. To define the policy sets and policies, you need to know some relevant information like:

- On which resources, policy set, or policies should be applied
- On which users, a set of policies or policies should be implemented.
- The actions which will be executed
- In which environments the policy sets or policies will be implemented.
- The rules will be applied.
- And other.



# Step 7.1. Define an approval workflow

## Step-by-step

**1.** To define and configure an approval workflow, you can use the Soffid BPM editor. You must access the BPM editor page in the following path:

Main Menu > Administration > Configure Soffid > Workflow settings > BPM editor

**2.** To add a new workflow you must click the add button (+) and Soffid will display a new window.

**3.** Then, you must write a process name and select the process type "Account reservation" and Soffid will display the process editor to configure the new workflow.

**4.** At the "Process editor" form you could config the workflow steps.

You can visit the [BPM Editor book](#) to find more information and examples about the workflows.

**5.** Once you finish configuring the workflow, you must click the option "Save and Publish" to be able to use the workflow.

## Screen overview

Process editor

Process name:

Process type:

Description:

Initiators:

Managers:

Observers:

[Save](#) [Save and Publish](#) [Cancel](#)

Steps [Attributes](#)

Step	Step details
Start	Step name: : <input type="text" value="Start"/>
Approve	Step type : <input type="text" value="Start"/>
Apply changes	Description : <input type="text" value="Request new user management process"/>
End	

[+ New step](#)

[Task details](#) [Fields](#) [Triggers](#) [Incoming transitions](#) [Outgoing transitions](#)

# Step 7.2. Define XACML policy set to use a workflow

## Step-by-step

**1.** To define policies, you must access the XACML Policy Management page in the following path:

Main Menu > Administration > Configure Soffid > Security settings > XACML Policy Management

**2.** Once you have accessed the XACML Policy Management page, you can click the add button (+) to create a new policy set, or you can click on an existing policy set the record to add new policies.

**2.1.** Update a policy set: If you want to update an existing policy you must check if the proper PEP was configured with that policy set.

**2.2.** Create a new policy set: first of all you must click the add button (+). Then Soffid will display an empty window to fill in the required fields.

- - The **Identifier** should be an identificative and unique name. You will need the name to configure the PEP
  - The **Version** should be a number to identify the current policy version. You will need the version to configure the PEP.
  - The **Description** should be a brief description of the agent.
  - The **Policy Combining Algorithm** allows you to select the procedure for arriving at an authorization decision.

**2.3.** You need to click on the "Apply changes" button to save the new policy set or to update an existing policy set.

**3.** Once you have created or updated the policy set, you could add new policy sets, policies, policy references, and/or policy set references.

For more information, you can visit the [XACML Book](#) where you could find information about how to use XACML and some examples.

4. Finally, you must check and configure the XACML PEP configuration.

# Screen overview

## Policy set

Identifier :

Version :

Description :

Policy combination algorithm :

## Target

<input type="checkbox"/>	<input type="text" value="Subjects"/>	<input type="text" value="Operator"/>	<input type="text" value="Value:"/>	<input type="button" value="+"/>
Displayed rows: 0				
<input type="checkbox"/>	<input type="text" value="Actions"/>	<input type="text" value="Operator"/>	<input type="text" value="Value:"/>	<input type="button" value="+"/>
Displayed rows: 0				

<input type="checkbox"/>	<input type="text" value="Resources"/>	<input type="text" value="Operator"/>	<input type="text" value="Value:"/>	<input type="button" value="+"/>
Displayed rows: 0				
<input type="checkbox"/>	<input type="text" value="Environments"/>	<input type="text" value="Operator"/>	<input type="text" value="Value:"/>	<input type="button" value="+"/>
Displayed rows: 0				

## Obligations

<input type="checkbox"/>	<input type="text" value="Obligation"/>	<input type="text" value="Full fill on"/>	<input type="text" value="Attribute"/>	<input type="text" value="Value"/>	<input type="button" value="+"/>
Displayed rows: 0					

# Step 7.3. Configure XACML PEP

## Step-by-step

**1.** To configure the XACML PEP You must access the "XACML PEP configuration" page in the following path:

Main Menu > Administration > Configure Soffid > Security settings > XACML PEP configuration

**2.** At the "XACML PEP configuration page you must fill in the **Password vault Policy Enforcement Point** section.

**2.1.** The policy must be enabled, you must select Yes on the "Enable XACML Policy Enforcement Point".

**2.2.** Then you must fill in the **Policy set ID** and the **Policy set version** to use.

**2.3.** The trace request is an optional field used to debug.

**3.** Once you fill in the mandatory information, you must click the "Apply" button to save the updates.

**3.1.** If there is any error in the data, Soffid will display a message with the error data.

For detailed information about XACML, you can visit the [XACML book](#).

## Screen overview



**Password vault Policy Enforcement Point ( <https://iam-sync-lab.soffidnetlab:1760//XACML/vault> )**

Enable XACML Policy Enforcement Point : 

Yes

III

Policy Set Id : 

PolicySetPV

Policy Set Version : 

1

Trace requests : 

III

No

# Step 8. Behavior analysis

# Step 8. Behavior analysis

## Introduction

Using PAM you can configure **policies and rules** in the Soffid console to detect actions or behaviors that may put your organization at risk. With this information, you will be able to analyze the behavior of the critical accounts that you have defined in your systems and configure what actions you want to run in each case.

Once you create the PAM policy, you must assign it to the proper folder on the password vault.

# Step 8.1. PAM Rules

## Step-by-step

**1.** To create a new PAM Rule, you must access the PAM Rules page in the following path:

Main Menu > Administration > Configure Soffid > Security settings > PAM rules

**2.** To add a new PAM rule, you must click the add button (+) and Soffid will display a new window to fill in the data.

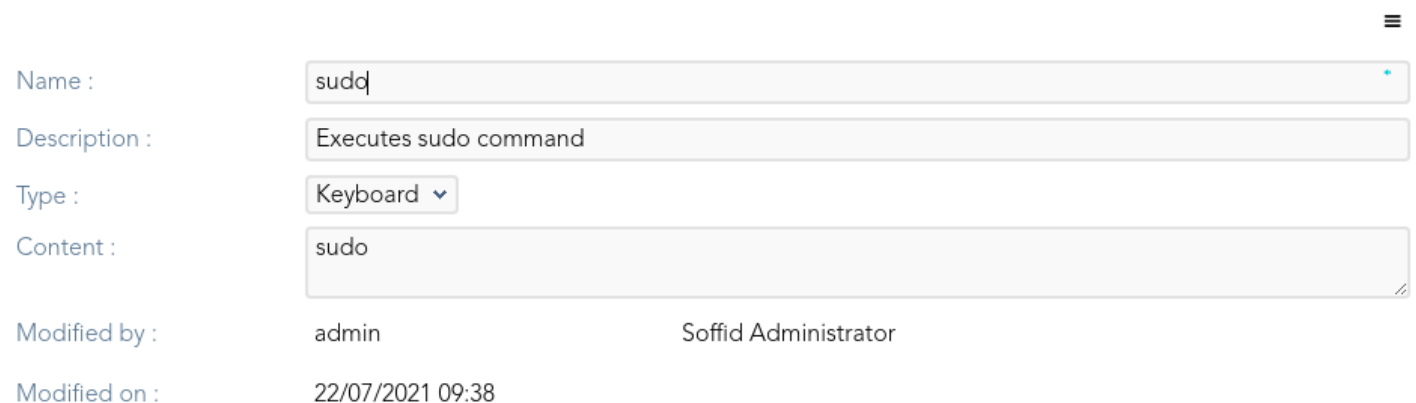
- The **Name** should be an identificative and unique rule name. That field will be mandatory.
- The **Description** should be a brief description of the rule.
- The **Type** allows you to select the rule will be a keyboard or a screen rule. That field will be mandatory.
- The **Content** should be what the rule will detect. For instance, a Linux command like *sudo* or *rm \*-r*. That field will be mandatory.

**3.** Then you need to click on the "Apply changes" button to save the new PAM rule.

**3.1.** If you click on the "Undo" button, no updates will be saved.

**4.** Finally you can create a PAM policy to apply the rules.

## Screen overview



The screenshot shows a web form for configuring a PAM rule. It includes fields for Name, Description, Type, and Content, along with metadata for Modified by and Modified on. A hamburger menu icon is visible in the top right corner.

Name :	<input type="text" value="sudd"/>	
Description :	<input type="text" value="Executes sudo command"/>	
Type :	<input type="text" value="Keyboard"/>	
Content :	<input type="text" value="sudo"/>	
Modified by :	admin	Soffid Administrator
Modified on :	22/07/2021 09:38	



# Step 8.2. PAM Policies

## Step-by-step

1. To create a new PAM Policy, you must access the PAM Rules page in the following path:

Main Menu > Administration > Configure Soffid > Security settings > PAM policies

2. To create a new PAM policy, you must click the add button (+) and Soffid will display a new window to fill in the data.

- The **Name** should be an identificative and unique policy name. That field will be mandatory.
- The **Description** should be a brief description of the rule.
- The **Rules list**: show a list of the PAM rules defined. You can check/uncheck the available options. You can choose zero, one, or several options:
  - **Close session**: if you select this option when the rule is met, Soffid will close the session opened.
  - **Lock account**: if you select this option when the rule is met, Soffid will lock the account.
  - **Open issue**: if you select this option when the rule is met, Soffid will open an issue in the ticketing system.
  - **Notify**: if you select this option when the rule is met, Soffid will send a notification about the action.

3. Then you need to click on the "Apply changes" button to save the new PAM policy.

**3.1.** If you click on the "Undo" button, no updates will be saved.

4. Finally you can assign the PAM policy to the proper Password vault folder.

## Screen overview

Name : default

Description : Default Policy

Modified by : pgarcia Patricia García

Modified on : 3/6/2023 12:04

• Rule	🔗 Close se...	🔗 Lock acc...	🔗 Open is...	🔗 Notify
cd .. (tenant)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Drop table	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ipconfig	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# Step 8.3. Assign PAM policy

## Assign PAM policy

**1.** To assign the PAM policy to a Password Vault folder, you must access the Password vault page in the following path:

Main Menu > Administration > Resources > Password vault

**2.** Then you must select the folder by clicking on the record. Soffid will display a window with the folder data.


**3.** You can select the password policy selecting it on the drop-down list.

**4.** Finally you need to click on the "Apply changes" button to save the password policy,

**4.1.** If you click on the "Undo" button, no updates will be saved.

## Screen overview

### Folder details

Name :	FolderXX *
Description :	Folder to save the privileged accounts 
PAM Policy :	defaultDemo ▼