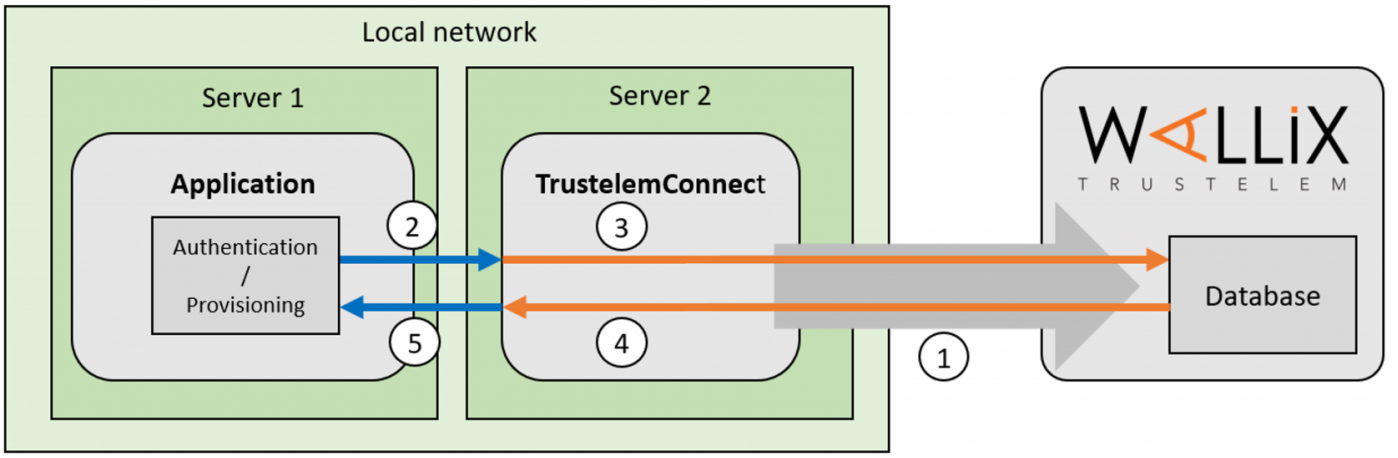
LDAP-Radius - Trustelem Connect

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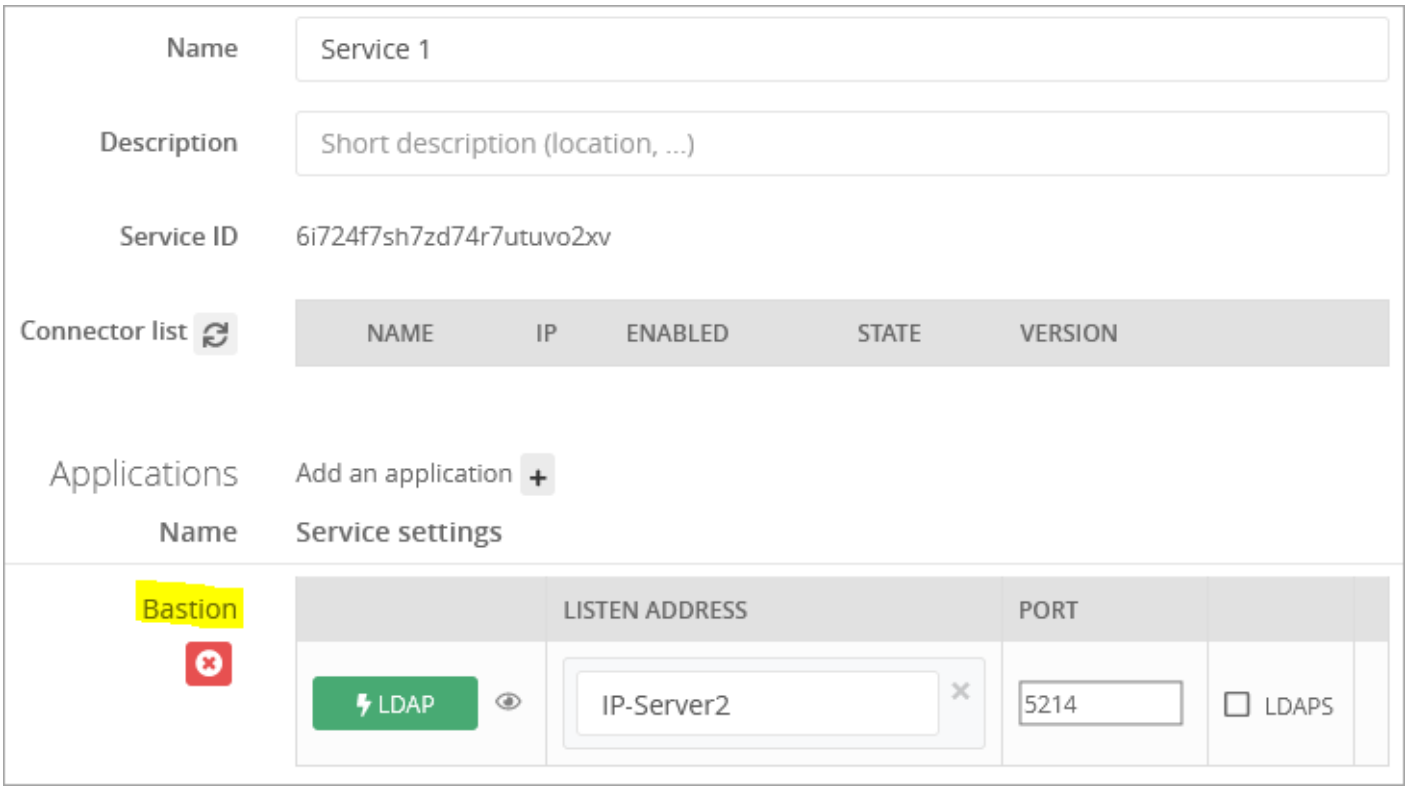
How does it work?

The goal is to use Trustelem database to provision and or authenticate users on an application using LDAP or Radius.
To do so, a connector, **Trustelem Connect**, is installed on a local customer server and has the role of **LDAP server** / **Radius server**. When it receives a request (LDAP search, LDAP bind, Radius Access request, Radius Challenge request) then it sends the request to Trustelem.



1/ During the setup, **Trustelem Connect** opens a **websocket** to **Trustelem services** using **port 443**.
Note: with the websocket, information is encrypted by TLS protocol and with an additional symmetric encryption.

Trustelem Connect also opens on the local machine, TCP or UDP ports on a specified local IP, based on the Trustelem setup.
One opened port matches one protocol for one application on Trustelem
*For instance, I made the setup of Trustelem Connect, linked a Bastion application, and choose to use the port **5214** on the IP **IP-Server2** for the protocol **LDAP***



2/ The application makes a search/authenticate request and sends it to **Trustelem Connect** on the defined port using **LDAP or Radius**.
*With the previous example, the protocol is **LDAP**, the IP of the LDAP server is **IP-Server2**, the port is **5214***

3/ **Trustelem Connect** uses the **websocket** to send the request to **Trustelem services**:

4/ As said before, on Trustelem the port is associated to a specific protocol and application. Trustelem examines the **access rules** related to these protocol and application, and returns the answer to **Trustelem Connect** using the **websocket**.

With the previous example:

- *If Trustelem receives a **search request**, it returns **users who have an LDAP access-rule** for the application **Bastion**.*
- *If Trustelem receives an **authentication request**, it returns the **validation/invalidation** of the credentials based on the **Bastion LDAP access rule***

5/ **Trustelem Connect** forwards the answer to the application using **LDAP or Radius**.

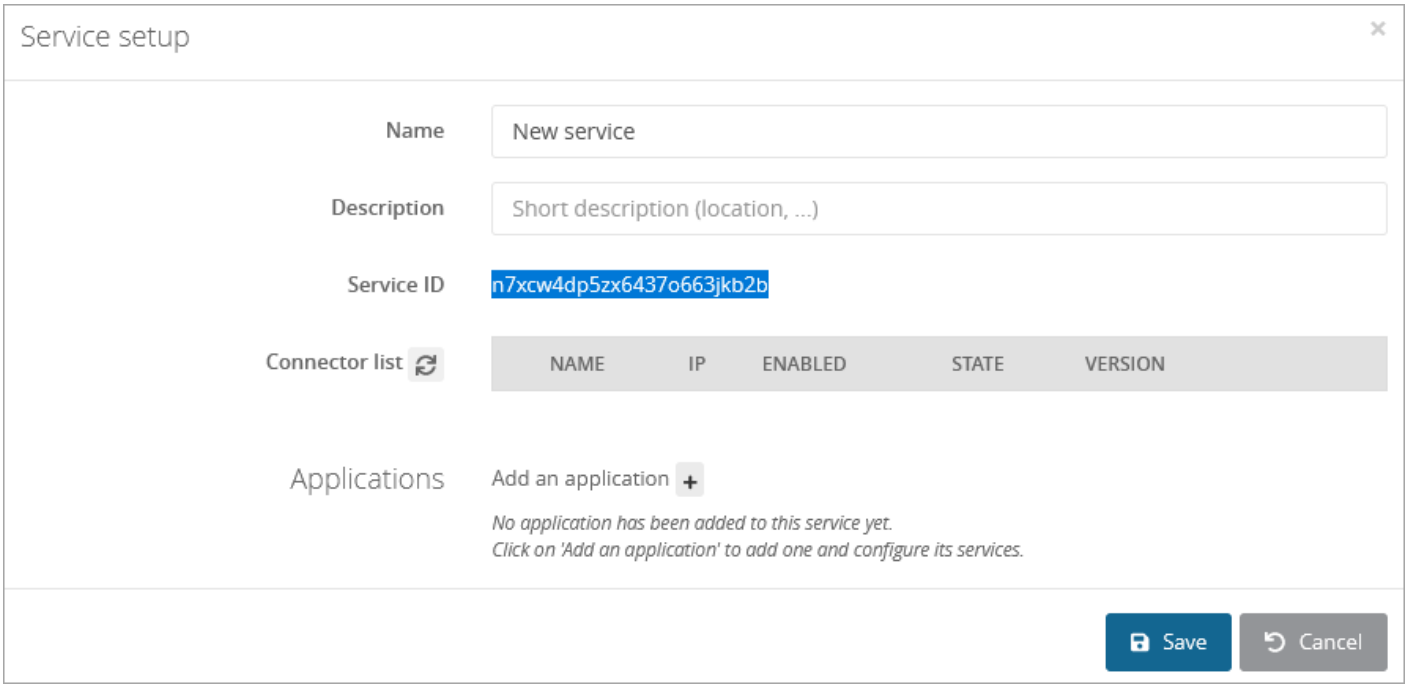
Prerequisites

- Prepare a VM, Windows Server or Linux, with minimal resources for the OS
  - If you already have a VM for Trustelem ADConnect, you can use the same
  - If you have only one VM which is down, the link to your application is down too..
  - The recommendation is 2 VM at least, to have a failover system
- Download Trustelem Connect on the VM (.exe or .tgz depending of the OS)
  - https://dl.trustelem.com/connect/
- The flow from the application to the VM should be opened for the IP/port/protocol defined in the Service setup
  - usually tcp port 2001 for LDAP, and udp port 1812 for Radius
- The flow from the VM to **https://admin.trustelem.com** should be opened (IP: 185.4.44.22)
  - tcp port 443
- (optional) A service account with "read only" rights should be created on your Active Directory

Setup TrustelemConnect on a Windows machine

In your Trustelem administration page:

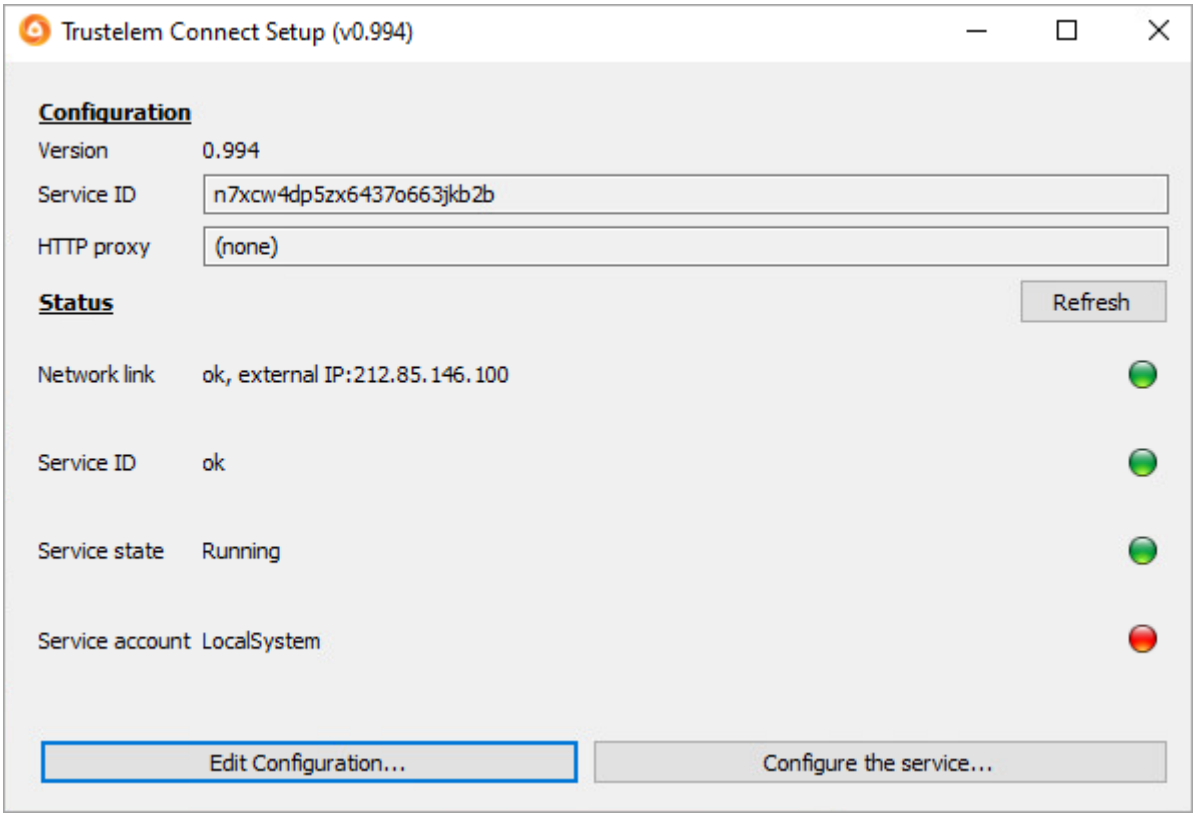
- Go to the **Services** tab.
- Click on the button **+ Create a service** and copy the **service ID**.



On your server:

- Start the setup (Trustelem Connect.exe), and paste your **service ID**.

- If you have a proxy, complete the field **HTTP Proxy** with the value: https://username:password@proxy_IP:proxy_port
- Click on **Validate the Configuration**



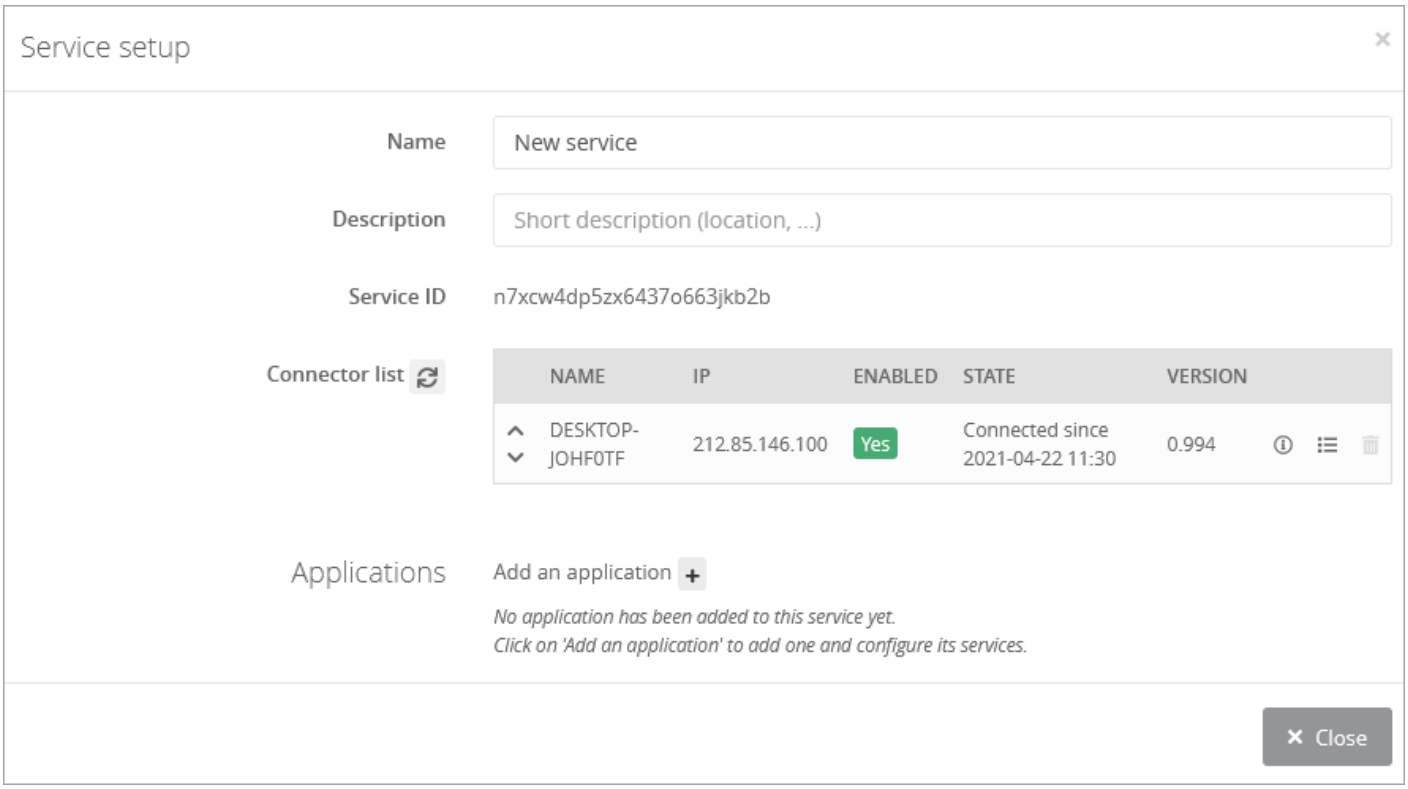
- Then if you want to use **LDAPs**, on the Trustelem Connect folder, add a **config.ini** file and provide the following information (adapted to your own repository and your own certifiates) :

```
tls_cert="C:\Program Files (x86)\Trustelem\cert.pem"
tls_cert_key="C:\Program Files (x86)\Trustelem\key.pem"
```

- Start the service.

In your Trustelem administration page

- Refresh your **Services** page.
- Turn on the service by clicking on **No**.

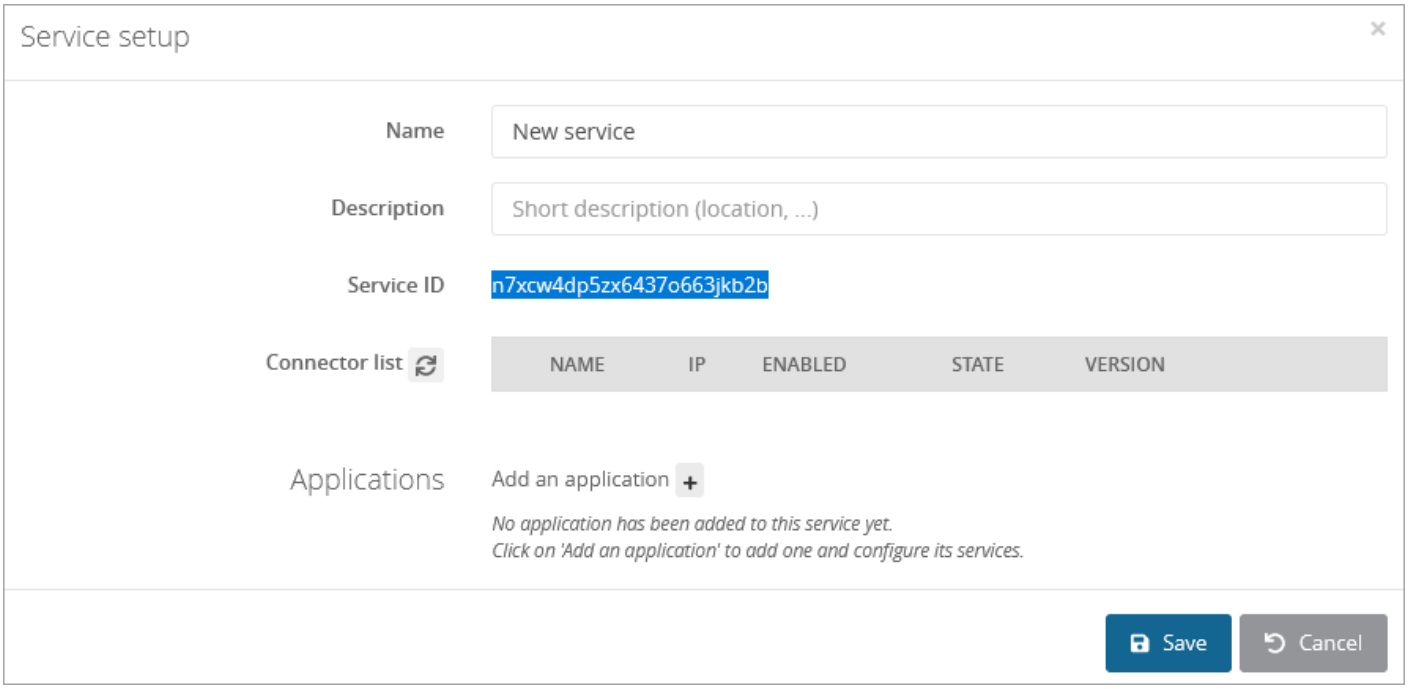


You now have a functional connector.

Setup Trustelem Connect on a Linux machine

In your Trustelem administration page:

- Go to the **Services** tab.
- Click on the button **+ Create a service** and copy the **service ID**.



On your server:

- Install the connector as a service with the **setup.sh** script launch with **root privilege**.
- To complete the configuration, edit /opt/wallix/trustelem-connect/config.ini file containing the synchronization id.
- A sample minimal config.ini would be:

```
service_id = 2jy34wpcohrhdytr6hutym6qfi2l7nnw
state_dir = run/
# if there is a proxy
proxy = https://username:password@proxy_IP:proxy_port
```

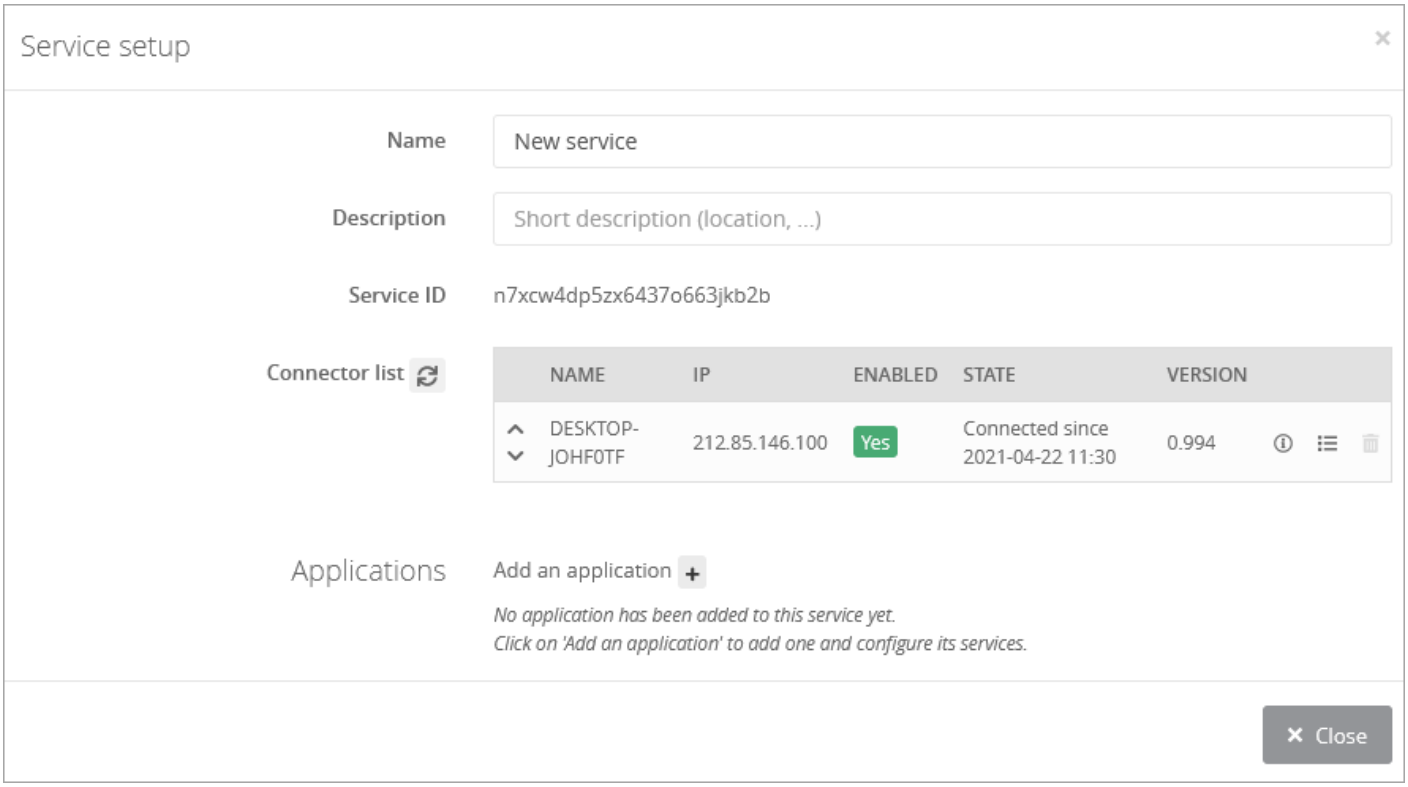
- The run folder must have read write rights for the trustelem user.
- You can add your own X509 certificate for ldaps and starttls. Accepted format is PEM.

```
tls_cert = run/connector.crt
tls_cert_key = run/connector.key
```

- After that, you can start the service with: **systemctl start trustelem-connect.service**
- The service will run with the user trustelem

In your Trustelem administration page

- Refresh your **Services** page.
- Turn on the service by clicking on **No**.



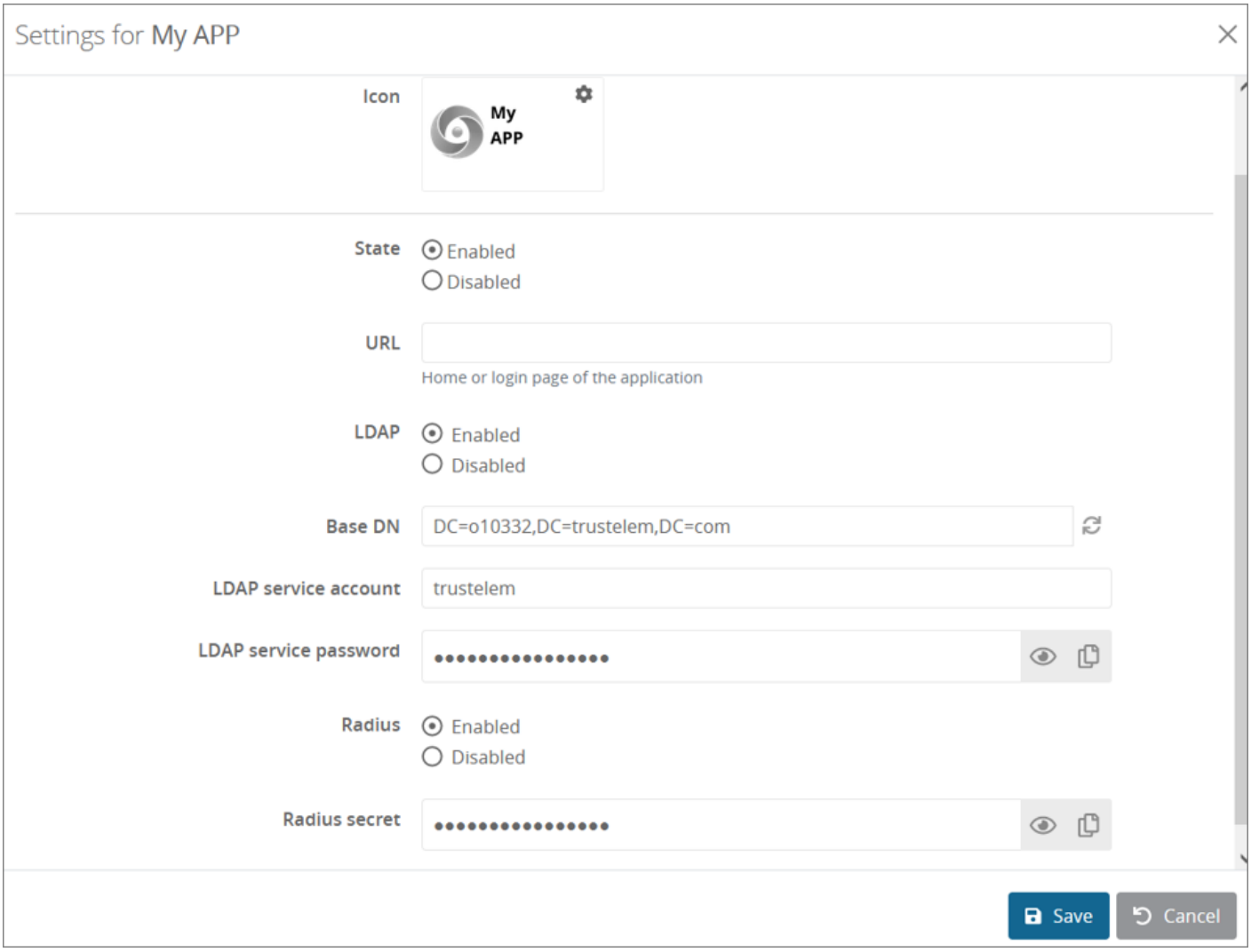
You now have a functional connector.

Setup an application to use Trustelem Connect

Note: for WALLIX Bastion and WALLIX Access Manager, you should watch the dedicated documentation instead of this chapter.

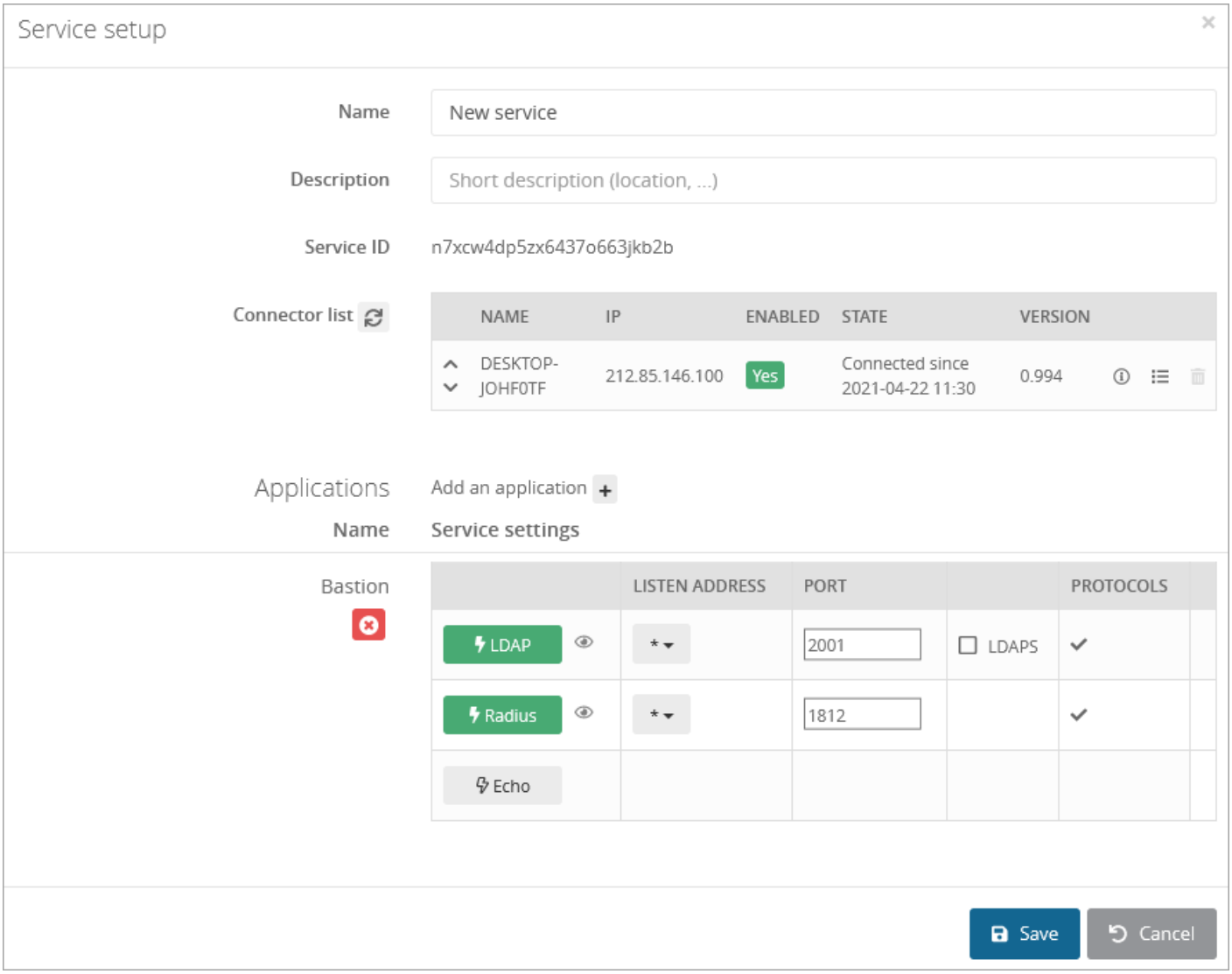
On your Trustelem administration page:

- Go to the **Apps** tab.
- Click on **+ Add an application**
- Choose either a pre-integrated application or a generic model depending on your need. *If you want to use only LDAP / Radius (no additional SAML/OpenID Connect) the generic **Basic no SSO** model should be used*.
- Turn on LDAP and/or Radius.



- Go back to the previously configured **service** and click on **Add an application +**
- Click on LDAP and/or Radius button(s) to enable the protocol, then enter the **listen address** and **port**

Notes:
  - the listen address can be **localhost**, all existing IP address on the machine = *, or a specific IP = **...**
  - this will open the defined udp (Radius) or tcp (LDAP) port on the machine running **Trustelem Connect** on the IP 127.0.0.1 (localhost) OR on all local IPs (*) OR on a specific local IP (...)
  - if you have a dedicated VM for the connector, choose *
- If you have setup **Trustelem Connect** to use LDAPS, then check **LDAPS**
- Click on **Save**



Trustelem is now ready to reply to applications sending requests to **TrustelemConnect** with the correct port and IP.

Of course, **you need to create the access rules** to defined which users can use the application

https://trustelem-doc.wallix.com/books/trustelem-administration/page/access-rules

On your your application setup:

Add a LDAP and/or Radius setup, based on the information provided by Trustelem:

- The **IP / FQDN of the LDAP or Radius server** is the IP / FQDN of the machine running **Trustelem Connect**
- The **port** is defined in the **Services** tab
- For a **LDAP server**
  - The **DN / user account / user account password** are provided on the setup of the Trustelem application. These values can be modified but except for specific situations, there is no reason to change them.
  - If you have to choose between an **Active Directory server** or a **LDAP server**, you should choose **Active Directory**. Trustelem tries to replicate how an Active Directory answers.
  - A user CN looks like that:

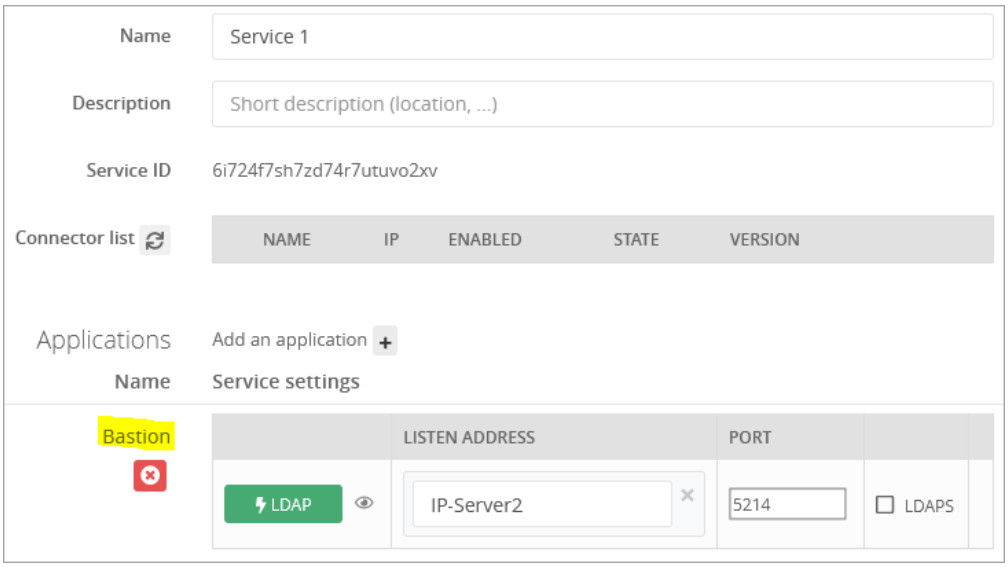
    ```
    CN=my_user,DC=my_trustelem_domain,DC=trustelem,DC=com
    ```

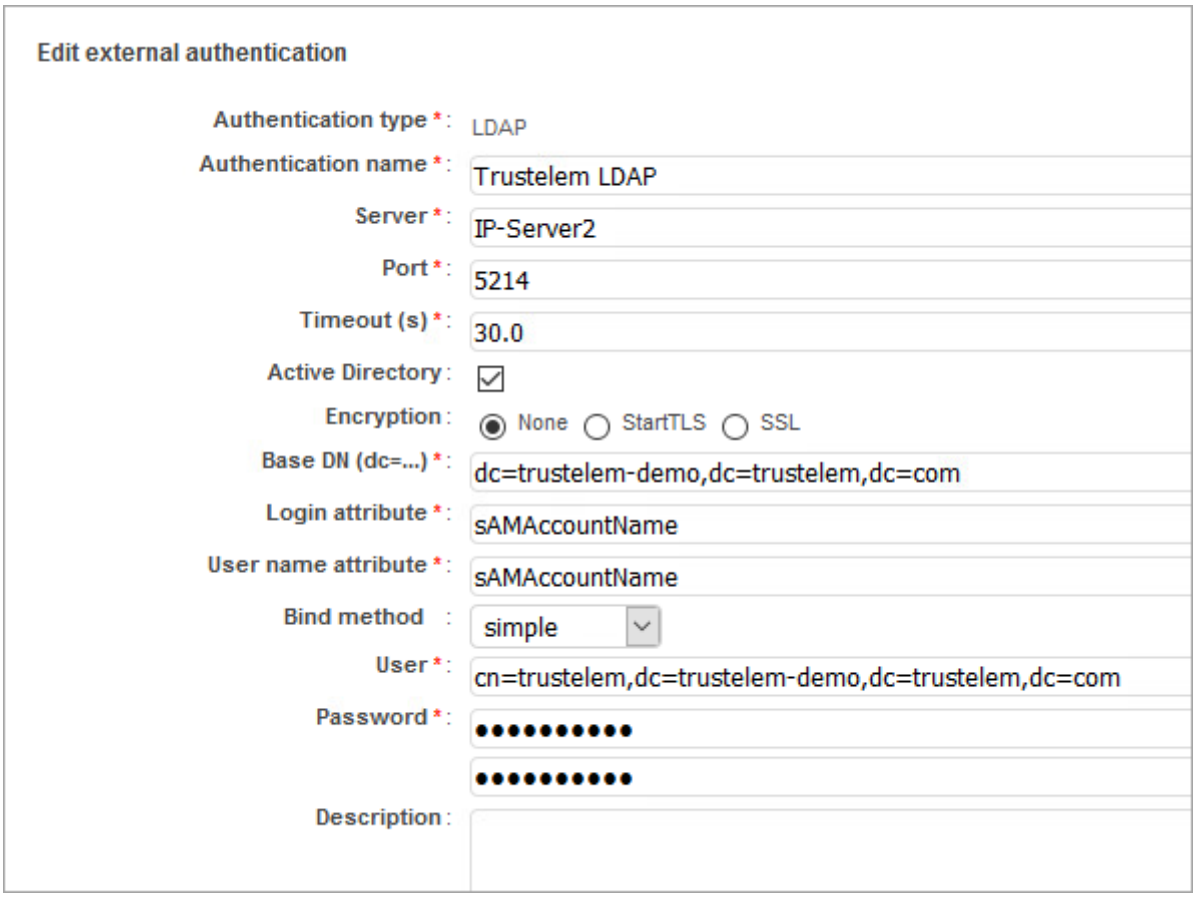
  - A group CN looks like that:

    ```
    CN=my_group,OU=Groups,DC=my_trustelem_domain,DC=trustelem,DC=com
    ```

  - A **Trustelem local user** must have the login sets to **mail**
  - A **user synchronized from Active Directory** can have the login sets to **sAMAccountName**, **userPrincipalName** or **mail**
  - If you want to use **MFA with push notification** with LDAP had a **sufficient timeout** to let the time to users to validate the notification
- For a **Radius server** the **secret** is provided on the setup of the Trustelem application.

With the example used in the first chapter, the setup is:





Debug

The connector doesn't appear in the setup page on the admin page

- ping **admin.trustelem.com** on the machine running the connector to verify the outgoing flows
- verify the synchronization ID
- verify the proxy setup

- if the VM is a Windows machine, verify that you clicked on **Validate** on Trustelem Connect program

The LDAP or Radius authentication is no working

- Go on your **Trustelm Logs page** and see if you have **LDAP or Radius** logs. If yes, the connector is working and you should know why the authentication failed:
  - if the user is not found, is the login attribute correct?
  - if the user doesn't have the permission for the app, is your access rule correct?
  - if the user doesn't have a 2nd factor, is your enrollment process correct?
- If your application tries to do a **LDAP search** and doesn't have access rule (LDAP 1 or 2 factors), no users will be found but you will not see any logs because it is not a bug
- Go on your **Service setup** and verify if the listen address is correct (should be * if the VM is dedicated to Trustelem)
- On the same page, see the **port** defined and the **setup information** clicking on the **eye button**
- Verify the setup of the application: server IP, port, DN/account/password for LDAP, secret for Radius
- Verify if the flow from the app to the VM running the connector is opened. If you have a doubt, use **Wireshark** on Windows or **tcpdump** on Linux.
  /! tcpdump displays the flow received, before applying local firewall rules. So if you are on Linux and see the requests, you should verify if there is a local firewall.

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