Implementing SSO with Nginx and Keycloak

Introduction

This article's purpose is to guide you through creating a basic security system. I will demonstrate how you can protect your web app and manage the users that are permitted to access it. A nice feature is that the login procedure is done using the Maplaz (/), so you wouldn't have to deal much with user management and credentials.

At the end of this article, you should have a secured web app. You could get information on who tried to login to your site, and you could choose who has access to your app and who doesn't. As mentioned, the login procedure would be with the Maplaz (although you could define Username-Password interface).

Recommended way to study

Firstly, read the introduction (you are already in the right direction).

I recommend dividing the System Setup into two parts:

- Local Setup – where everything is running on your computer. All of the routes would be localhost, and the setup would use docker-compose.
- OpenShift Setup – all of the components would be uploaded to OpenShift (OS). This is a system that is much more production ready, but is harder to set up because of OpenShift networking. In addition to the previous Local Setup, you would have to build Service and Route objects in OS.

This way is recommended because you would understand the system better, and you could handle the issues better (and there will be issues, trust me).

If you need to strengthen your OpenShift skills, you are invited to read my OpenShift Guide (shameless self-advertising #1).

Basic terminology

- Authentication - The processs of confirming the identity of the user \ website.
- Authorization – The process of granting permissions to a certain user. For example allowing only users in the admin group to enter a site, while blocking it for other users.
- IDP – Identity Provider, a database that holds user information in a specific network. It can authenticate the user that tries to log in. myIDP is the IDP of the "my" network, we will use it.
- OAuth 2.0 - A common authentication protocol in which a certain site gets user information from an IDP, without giving the site your sensitive information.
- OIDC - OpenID Connect, it's a protocol that expands OAuth 2.0. For our purpose it is the same as OAuth 2.0 (although there is a difference!).

Architecture Overview

Components

There are two main components at the heart of our security system:

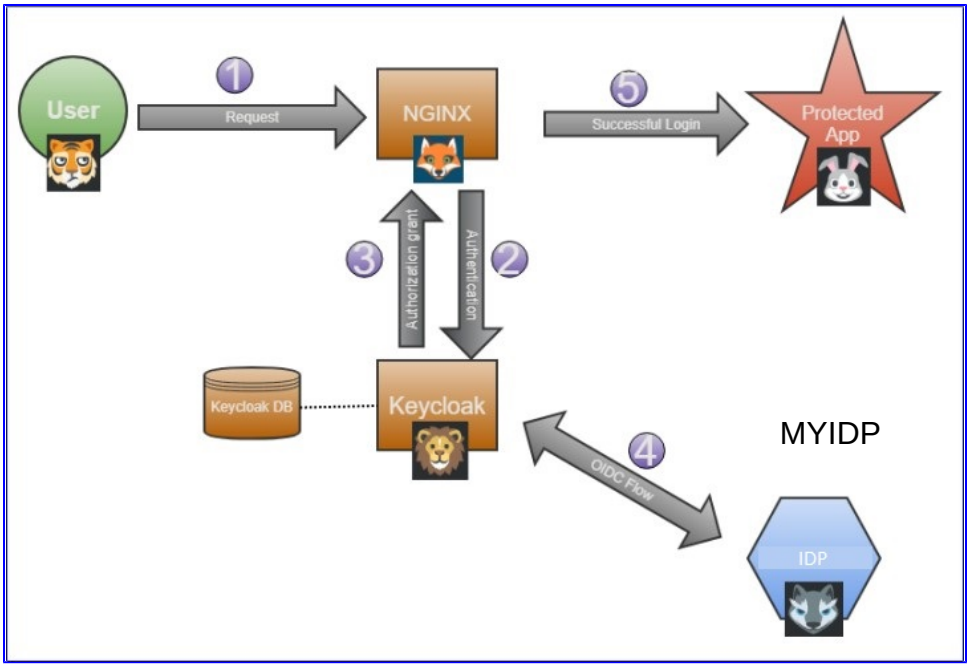
Keycloak – An opensource app that provides a security layer. It will manage the login page, OIDC authentication flow with myIDP, authorization, user-management and so on. Basically everything regarding the configuration of your security layer.

Nginx – A popular framework that combines maintaining a server and proxy. We will use it as proxy, it will transfer the incoming requests to Keycloak. If Keycloak approves the user enterence, Nginx will forward you to the requested site.

In addition you would have to connect Keycloak to a **PostgreSQL DB**, and have an **app** that you want to protect.

Flow

The flow of the request is sketched in this great diagram that I made (it's beautiful, I know). The parts we would have to set up are the **brown parts and the arrows**, assuming you already have an app \ website.



You can think about the flow this way:

1. The Tiger (user) wants to get the Rabbit (protected app) because it is hungry (needs to work). The Tiger has to ask for permission from the wise Fox (Nginx), because the Fox is in charge of all the network communication in the forest.
2. The Fox (Nginx) transfers the request to the Lion (Keycloak).
3. The Lion (Keycloak) doesn't recognize the Tiger (user), so he turns to his wife the Lioness (myIDP). The Lioness (myIDP), being much smarter than her husbend the Lion, recognizes the Tiger (user) and **authenticates** him using OIDC protocol.
4. The Lion (Keycloak) can now **authorize** the Tiger (user). He tells the Fox (Nginx) that all is good.
5. The Tiger (user) is now both authenticated and authorized. So the Fox (Nginx) forwards him to the Rabbit (website).
6. Bonus: Everyone is happy (except maybe the Rabbit's kids).

BTW the Keycloak DB is not a part of the flow, it's just that Keycloak can't work without a DB to store configuration and user information.

Local installation

We will use docker compose to upload four components:

- App/website - The app you want to upload and protect. I will use a simple python-flask server (you can just as easily use nodejs express server).
- Keycloak
- Keycloak DB
- Nginx

In the following subsections I will explain the configuration of the important parts. I would refer to the docker-compose yaml file below and the GitHub repository (in the local_setup folder).

> **Note - Client Registration**
>
> In order for the IDP to respect your requests and the whole thing to work, you need to register a client to the myIDP (the IDP). It is described in the Client Registration section.

Docker-Compose YAML

```
version: "3.7"

networks:
  mynetwork:
    name: mynetwork
    attachable: true

services:

  postgres:
           image:   <registry>/rhscl/postgresql-10-rhel7@sha256:
13703497b40861b4c0563020c17b9bb2d68f6956ed53312577c7ef09e8ff9fa7
     volumes:
      - keycloak_data:/var/lib/pgsql/data
    environment:
      POSTGRESQL_DATABASE: keycloak
      POSTGRESQL_USER: keycloak
      POSTGRESQL_PASSWORD: password
    ports:
      - 5432:5432
    networks:
      - mynetwork

  keycloak:
    image: <registry>/my-keycloak/keycloak-certs@sha256:
3a13fd0e01587d2790f4695b5129b20f1112039742cb7c96831f529dad10a202
    environment:
      DB_VENDOR: POSTGRES
      DB_ADDR: postgres
      DB_DATABASE: keycloak
      DB_USER: keycloak
      DB_SCHEMA: public
      DB_PASSWORD: password
      KEYCLOAK_USER: admin
      KEYCLOAK_PASSWORD: password
      # Uncomment the line below if you want to specify JDBC parameters. The parameter below is just an
example, and it shouldn't be used in production without knowledge. It is highly recommended that you read
the PostgreSQL JDBC driver documentation in order to use it.
      #JDBC_PARAMS: "ssl=true"
    ports:
      - 3333:8080
    depends_on:
      - postgres
    networks:
      - mynetwork

  nginx:
    image: <registry>/my-keycloak/ngnix_base@sha256:
5fb160a510eeb11b72a2e17de0d6b8da3c05c4d51e6f60afca10733b6b655d52
  logging:
      driver: "json-file"
      options:
        max-size: "10m"

    ports:
      - "90:90"

    volumes:
      - C:\Users\<your_user>\Desktop\SSO\local_setup\nginx-default.conf:/etc/nginx/conf.d/default.conf:ro

    environment:
      KEYCLOAK_URL: '"http://host.docker.internal:3333/auth/realms/myrealm/.well-known/openid-configuration"'
      KEYCLOAK_LOGOUT: '"http://host.docker.internal:3333/auth/realms/myrealm/protocol/openid-connect/logout?
redirect_uri=http://localhost/"'
      LOCATION1: /whatever
      LOCATION2: /
      PROXY_URL: http://web:5000/
```

```
      CLIENT_ID: '"nginx"'
      CLIENT_SECRET: '"efbb35c8-6984-460a-b55f-7f1f025acb2f"'

    networks:
      - mynetwork


  web:
              image:    <registry>/my-keycloak/test-app@sha256:
54a022bfe2c4bb2599ed6cbf39f7c3f1f42292b8df79fb75d953ff766f54e21b
    restart: always
    networks:
      - mynetwork


# Uncomment the ports section if you want to test your application. But the whole point in this setup is that
# the web app is not open to external connections, so the only way to reach it is through Nginx and Keycloak.

#    ports:
#    - "5000:5000"

volumes:
  keycloak_data:
```

Note - Docker Volume on Windows

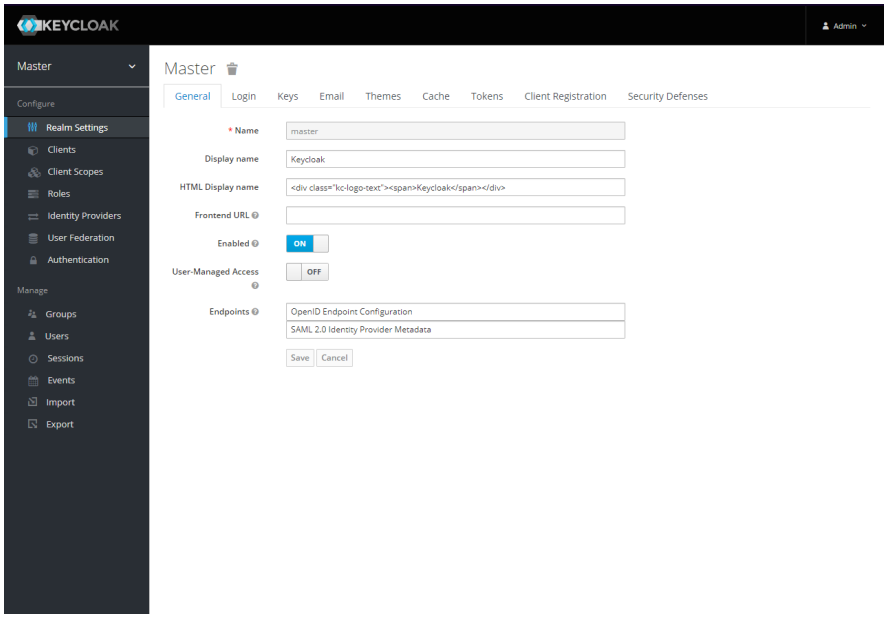
In Windows, before creating a volume in docker, you need to configure it in Docker-Desktop. In Dcker-Desktop go to Settings ResourcesFile Sharing, there add your desired volume directory.

Keycloak

We will use an image of Keycloak that I modified, it is the *keycloak-certs* repo. The important modification is the installation of the myNET certs, so that Keycloak can communicate in HTTPS (basically it adds the myNET CA's to Keycloak trusted CA's).

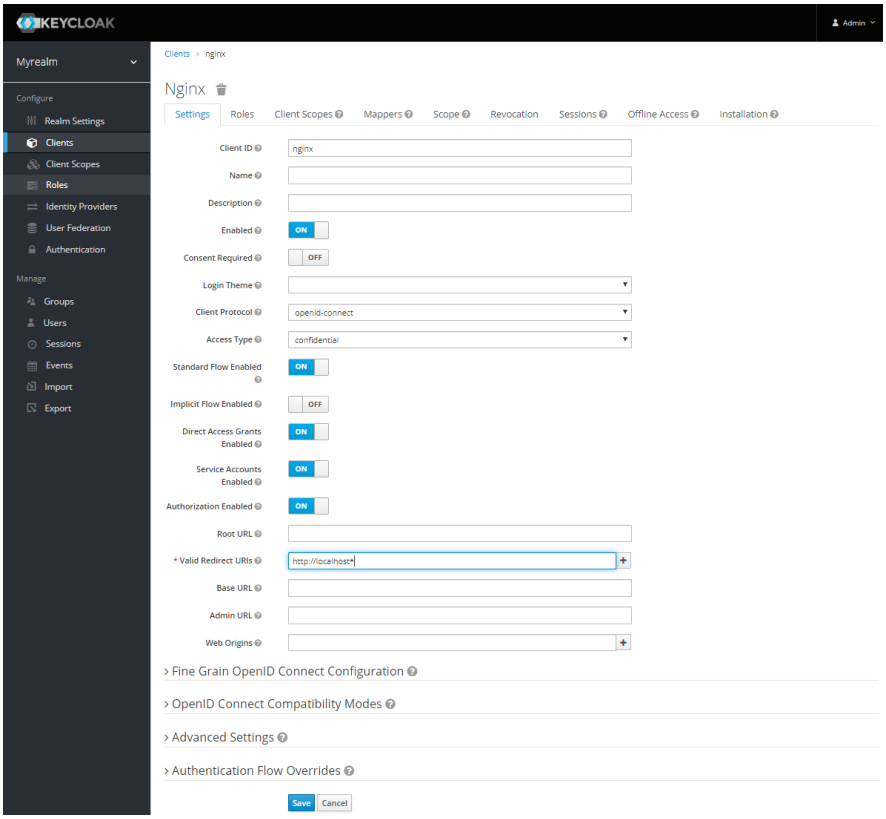
Create a Realm and a Client

After you ran the Keycloak container, open it in the web browser (with the current docker-compose it's in *http://localhost:3333/*). Click on *Admin-Console* and enter your admin credentials. Then you should see the following screen:



Click on Master in the upleft corner and choose "Add realm", give it some name. Then click on "Clients" in the sidebar and choose "create" in order to create a new client, give it an ID (I like to call it "nginx"). The client defines inner-configuration inside a realm, you should have a unique client for each application you protect.

In the client configuration page, configure it to look like this:



There are loads of configuration options for the client, the important ones for us are:

- *Access Type* - Choose *public* if you are testing. Otherwise choose *confidential* and save the *Client Secret* from the credentials tab (it appears after you hit save).
- *Valid Redirect URI's* – In these you specify the valid paths that the client receives. In the local version it should be *http://localhost/** and *http://host.docker.internal/**
- Under *Authentication Flow Overrides* there are the default client *Authentication Flow's*. We will reconfigure it in the Configuring Authorization section.

> **Tip - Client Configuration**
>
> Under Roles you can create client specific roles. If you make access type confidential and enable Authorization than a new sub-tab opens. It is the Authorization tab. with it you can control your client authorization much more flexibly (for example block a certain role from a specific route). It requires extending Keycloak with scripts (to enable a policy-enforcer) and diving into the Keycloak world.

Create and configure the IDP

The identity provider (IDP) is the part of the system that will allow users to log in without entering a username and password, it will get their user info using OIDC and the Maplaz. Frankly it's the coolest part of this system. The steps to configure

1. In the sidebar choose "Identity Providers" and create a new one using the dropdown. Choose "OpenID Connect v1".
2. In the IDP configuration, first you should choose an Alias. Notice – the Alias is not an unimportant name! The unimportant name is the Display Name, the Alias goes automatically into the Redirect URI (above). That is very important, because we need to configure the OIDC client to accept our particular Redirect URI.
3. Enter the following address that are needed for the OIDC protocol taken from this json (https://myIDP/auth/realms/prod/.well-known/openid-configuration). In case you use Mamram and not Marganit, change "mr" to "mm".

```
"Authorization URL": "https://myIDP/auth/realms/prod/protocol/openid-connect/auth
"Token URL": "https://myIDP/auth/realms/prod/protocol/openid-connect/token"
"User Info URL": "https://myIDP/auth/realms/prod/protocol/openid-connect/userinfo"
```

4. Under "Client Authentication" choose "Client secret sent as post".
5. Enter your Client ID and Client Secret

Finally, your IDP should look like this:

Important Notes

- You need to make sure the *client-id* and the *redirect-uri* are known to the IDP. Registration to the IDP is described in the Client Registration section.
- In order to actually **block users**, I refer you to the last section in this article called Configuring Authorization.
- After logging in with the IDP it would redirect you to the *redirect URI* you gave it with HTTPS. For the local installation, I reccommend to just remove the 's' from 'https' when you get redirected.

Nginx

In the local setup the Nginx image I used is the *nginx_base* image in the our repo my-*keycloak*. It is just Nginx version openresty, with Lua modules

that support OIDC. You can find a reference for the Dockerfile in git.

You need to configure the conf file using the env variables. In the local version we are going to add to the main conf file (that is in the The conf file is in */etc/nginx/conf.d/default.conf*, you can find the conf file also in the GiHub repository under local_setup. The file is this one:

Tip - Nginx conf

Actually this is not the main Nginx conf file. This is just added to the main conf, in our *openresty* version of Nginx, the main conf file is: */usr/local/openresty/nginx/conf/nginx.conf* .

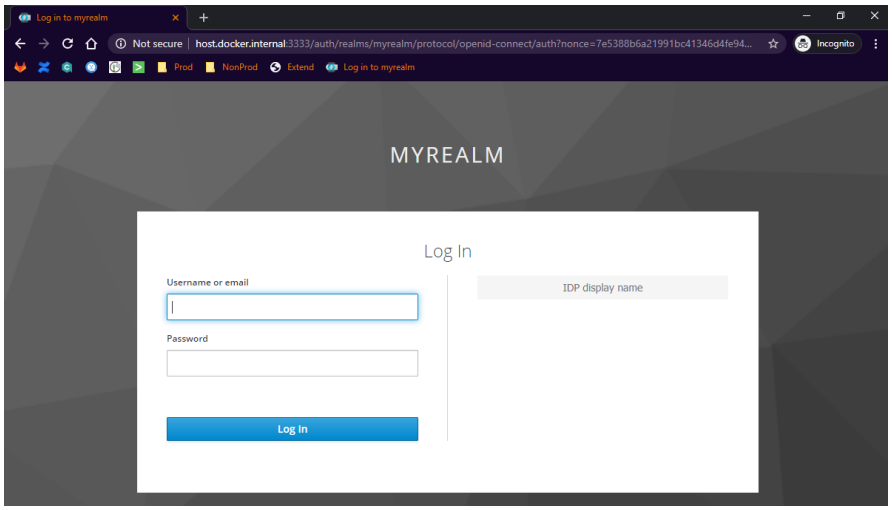
```
server {
  listen     90 default_server;
  root     /opt/nginx/html;
  resolver 127.0.0.11 valid=1s ipv6=off;
  access_by_lua '
   local opts = {
     redirect_uri_path = "/",
     accept_none_alg = true,
     discovery = "http://host.docker.internal:3333/auth/realms/<myrealm>/.well-known/openid-configuration",
     client_id = "<client_name>",
     client_secret = "<secret from keycloak nginx client>",
     redirect_uri_scheme = "http",
     logout_path = "/logout",
     redirect_after_logout_uri = "http://host.docker.internal:3333/auth/realms/<myrealm>/protocol/openid-
connect/logout?redirect_uri=http://localhost/",
     redirect_after_logout_with_id_token_hint = false,
     session_contents = {id_token=true}
   }
   -- call introspect for OAuth 2.0 Bearer Access Token validation
   local res, err = require("resty.openidc").authenticate(opts)
   if err then
     ngx.status = 403
     ngx.say(err)
     ngx.exit(ngx.HTTP_FORBIDDEN)
   end
  ';

  # I disabled caching so the browser won't cache the site.
  expires           0;
  add_header        Cache-Control private;
  location / {

  }
  location /web {
    proxy_pass http://web:5000/;
  }
  # redirect server error pages to the static page /40x.html
  #
  error_page 404 /404.html;
    location = /40x.html {
  }
  # redirect server error pages to the static page /50x.html
  #
  error_page 500 502 503 504 /50x.html;
    location = /50x.html {
  }
}
```

Notice:

- The discovery url is set to the Keycloak container under a realm <myrealm>.
- Client name should be specified, (I usually use 'nginx').
- If your client is defiend as confidential than you should also provide the client secret.
- I used port 90 becasue 80 was taken.
- In the current setup, because the proxy is defined under location */web*, you need to go to *http://localhost:90/web* in order to be redirected.

Result

If all is configured correctly, when you enter to the Nginx url (mine is *http://localhost:90/web*), you should be redirected to a Keycloak login page that looks like this:



Then you click on the IDP in the right, and it should redirect you. If you don't use https, you need to change *https* *http* in the redirected url (as noted in the important notes). Then, you should be redirectet to your app.

If you want to actually block users, look at the Configuring Authorization section.

OpenShift installation

After dealing with the Local Installation, you should have basic familiarity with the system (honestly i'll be impressed if you read and followed this long-ass article).
The OpenShift installation shouldn't be much harder if you managed all of the previous stuff, it would mainly require re-configuration, and knowladge of OS (OpenShift) networking with Services and Routes. If your'e OS is rusty, you can read my OpenShift Guide (shameless self-advertising #2).

Upload to OpenShift using a Template

I am going to use an OpenShift Template file in order to create all of the objects needed to make the system work (4 Deployments, 4 Services and 2 Routes).

> **Tip - Using OC and Templates**
>
> You can upload the template file using the following OC (OpenShift client) command:
>
> *oc process -f path/to/template.yaml | oc create -f -*
>
> And since the objects created in the Template get their labels from the template, you can delete them all using:
>
> *oc delete all -l <label_name>=<label_value>*

The Template file I used:

OpenShift Template

```
kind: Template
apiVersion: template.openshift.io/v1
metadata:
  name: test-keycloak

# These labels would pass to all objects created in this template!
labels:
  group: keycloak


objects:
  - kind: Deployment
    apiVersion: apps/v1
    metadata:
      name: ${KEYCLOAK_NAME}
```

```
      labels:
        name: ${KEYCLOAK_NAME}

    spec:
      replicas: 1
      selector:
        matchLabels:
          name: ${KEYCLOAK_NAME}

      template:
        metadata:
          labels:
            name: ${KEYCLOAK_NAME}

        spec:
          containers:
            - name: ${KEYCLOAK_NAME}
              image: ${KEYCLOAK_IMAGE}
              ports:
                - containerPort: 8080
                  protocol: TCP

              env:
                - name: DB_VENDOR
                  value: POSTGRES

                - name: DB_ADDR
                  value: ${DB_SER_NAME}

                - name: DB_DATABASE
                  value: keycloak

                - name: DB_USER
                  value: ${DB_USERNAME}

                - name: DB_SCHEMA
                  value: public

                - name: DB_PASSWORD
                  value: ${DB_PASSWORD}

                - name: KEYCLOAK_USER
                  value: ${KEYCLOAK_USERNAME}

                - name: KEYCLOAK_PASSWORD
                  value: ${KEYCLOAK_PASSWORD}

                - name: PROXY_ADDRESS_FORWARDING
                  value: 'true'

  - kind: Service
    apiVersion: v1
    metadata:
      name: ${KEYCLOAK_SER_NAME}

    spec:
      ports:
        - port: 8080
          targerPort: 8080
          protocol: TCP

      selector:
        name: ${KEYCLOAK_NAME}

  - kind: Route
    apiVersion: route.openshift.io/v1
    metadata:
      name: ${KEYCLOAK_SER_NAME}-route

    spec:
      host: ${KEYCLOAK_URL}
```

```
      kind: Service
      name: ${KEYCLOAK_SER_NAME}

    tls:
      termination: edge


- kind: Deployment
  apiVersion: apps/v1
  metadata:
    name: ${DB_NAME}

    labels:
      name: ${DB_NAME}

  spec:
    replicas: 1
    selector:
      matchLabels:
        name: ${DB_NAME}

    template:
      metadata:
        labels:
          name: ${DB_NAME}

      spec:
        containers:
          - name: ${DB_NAME}
            image: ${DB_IMAGE}

            env:
              - name: POSTGRESQL_DATABASE
                value: keycloak

              - name: POSTGRESQL_USER
                value: ${DB_USERNAME}

              - name: POSTGRESQL_PASSWORD
                value: ${DB_PASSWORD}

            ports:
              - containerPort: 5432
                protocol: TCP

            volumeMounts:
              - name: "keycloak-data"
                mountPath: /var/lib/pgsql/data

        volumes:
          - name: "keycloak-data"
            presistentVolumeClaim:
              claimName: "keycloak-data"

- kind: Service
  apiVersion: v1
  metadata:
    name: ${DB_SER_NAME}

  spec:
    ports:
      - port: 5432
        targerPort: 5432
        protocol: TCP

    selector:
      name: ${DB_NAME}

  # There is a need to check whats going on with the volume and the persistent volume claim (at least in
prod)!
```

```
  - kind: Deployment
    apiVersion: apps/v1
    metadata:
      name: ${NGINX_NAME}

      labels:
        name: ${NGINX_NAME}

    spec:
      replicas: 1
      selector:
        matchLabels:
          name: ${NGINX_NAME}

      template:
        metadata:
          labels:
            name: ${NGINX_NAME}

        spec:
          containers:
            - name: ${NGINX_NAME}
              image: ${NGINX_IMAGE}

              env:
                # NOTICE: The current dockerfile overrides the system env vars. Stuff like $host wont work.

                - name: KEYCLOAK_URL
                  value: '"https://${KEYCLOAK_URL}/auth/realms/myrealm/.well-known/openid-configuration"'

                - name: KEYCLOAK_LOGOUT
                  value: '"https://${KEYCLOAK_URL}/auth/realms/myrealm/protocol/openid-connect/logout?
redirect_uri=http://localhost/"'

                - name: PROXY_URL
                  value: http://${APP_SER_NAME}

                - name: LOCATION1
                  value: /web

                - name: LOCATION2
                  value: /

                - name: CLIENT_ID
                  value: '"nginx"'

                - name: CLIENT_SECRET
                  value: '"49165460-e763-4ad5-a1f3-184504f7dbe3"'

                - name: DNS
                  value: resolver 172.30.0.10 ipv6=off;

              ports:
                - containerPort: 80
                  protocol: TCP

  - kind: Service
    apiVersion: v1
    metadata:
      name: ${NGINX_SER_NAME}

    spec:
      ports:
        - port: 80
          targetPort: 8080
          protocol: TCP

      selector:
        name: ${NGINX_NAME}
```

```
    - kind: Route
      apiVersion: route.openshift.io/v1
      metadata:
        name: ${NGINX_SER_NAME}-route

      spec:
        host: ${APP_URL}
        to:
          kind: Service
          name: ${NGINX_SER_NAME}
        tls:
          termination: edge


    - kind: Deployment
      apiVersion: apps/v1
      metadata:
        name: ${APP_NAME}

        labels:
          name: ${APP_NAME}

      spec:
        replicas: 1
        selector:
          matchLabels:
            name: ${APP_NAME}

        template:
          metadata:
            labels:
              name: ${APP_NAME}

          spec:
            containers:
              - name: ${APP_NAME}
                image: ${APP_IMAGE}
                ports:
                  - containerPort: 5000
                    protocol: TCP

    - kind: Service
      apiVersion: v1
      metadata:
        name: ${APP_SER_NAME}

      spec:
        ports:
          - port: 80
            targetPort: 5000
            protocol: TCP

        selector:
          name: ${APP_NAME}


parameters:
    - name: DB_NAME
      value: keycloak-db

    - name: KEYCLOAK_NAME
      value: keycloak

    - name: NGINX_NAME
      value: keycloak-ngnix

    - name: APP_NAME
      value: keycloak-testapp

    - name: KEYCLOAK_IMAGE
      value: <registry>/my-keycloak/keycloak-certs@sha256:
```

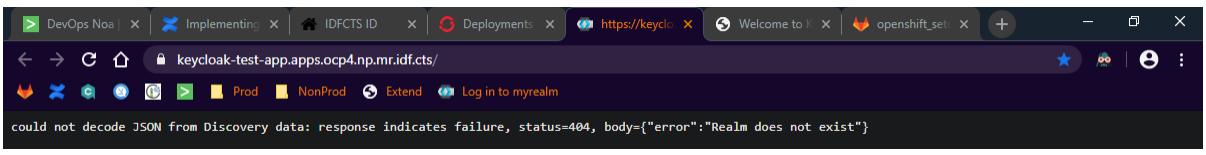
```
                3cc01b0ca3b4aa5e6db4588a5247f3f1e948cdf2315ae0672a433ac8c3bc889f

  - name: DB_IMAGE
           value:   <registry>/rhscl/postgresql-10-rhel7@sha256:
13703497b40861b4c0563020c17b9bb2d68f6956ed53312577c7ef09e8ff9fa7

  - name: NGINX_IMAGE
    value: <registry>/my-keycloak/configured_ngnix@sha256:
24a4a8bb3f139009620c80c4482662aedad85408f1c4bc0c36fddbe83cd65e9c

  - name: APP_IMAGE
               value:    <registry>/my-keycloak/test-app@sha256:
54a022bfe2c4bb2599ed6cbf39f7c3f1f42292b8df79fb75d953ff766f54e21b

  - name: DB_SER_NAME
    value: keycloak-db-service

  - name: KEYCLOAK_SER_NAME
    value: keycloak-service

  - name: NGINX_SER_NAME
    value: keycloak-nginx-service

  - name: APP_SER_NAME
    value: keycloak-app-service

  - name: DB_USERNAME
    value: admin

  - name: KEYCLOAK_USERNAME
    value: nadavDaKing

  - name: DB_PASSWORD
    value: admin

  - name: KEYCLOAK_PASSWORD
    value: 1to6

  - name: APP_URL
    value: keycloak-test-app.ocp4.myNET

  - name: KEYCLOAK_URL
    value: keycloak-admin.ocp4.myNET
```

DONT PANIC from the Template's size, it's just the configuration for 4 Deployments, 4 matching Services and 2 Routes. If you'll break it to its parts you'll find they're quite simple.

Notice:

- Nginx *conf* file is now built from environment variables, and it is the real *conf* file and not the fake one (as mentioned in the Local Setup Nginx section).
- Nginx discovery is the **Route** of Keycloak, instead of the Keycloak Service (I couldn't manage to make it work with the service, it had resolver-dns issues. If you manage to make it work pls tell me).
- Nginx proxy is the service of the Protected App.
- Keycloak's database address is changed to the database service.
- The ports had changed because all of the Services and Routes. Now you just enter the routes at regular port 80.

If all worked well, you should be able to get the Admin Console from the *keycloak-service-route*. And when you go to the *keycloak-nginx-service-route* URL you should see the following error:



Which means that you have not created a Keycloak realm yet.
If you got so far, honestly, either you are crazy or your commander is crazy. Either way you deserve a prize.

Extra Configuration

We'd have to reconfigure some of the realm, client, IDP and IDP-client settings.
Open up Keycloak admin-console (using the previously defined route) and enter the admin credentials ("nadavDaKing", "1to6"). Create a realm and and a client similarly to the Local Setup configuration. Now, in the **Valid redirect URI's**, enter *http://keycloak** and *https://keycloak .*

For the IDP configuration, again follow the steps in the Local Setup IDP configuration. Make sure to copy the new Redirect URI and to put it in the

valid IDP-Client URI list, as explained in the myIDP Client Registration.

If all is done correctly, you should be able to enter the Nginx route, get a Keycloak login prompt, login with the IDP and then be redirected to your Protected App!
Now - if you haven't done it already - the last step is to actually block the users using authentication flows. It is explained in the Configuring Authorization section.

Authenticate and Authorize

myIDP Client Registration

As mentioned, Keycloak communicates with the myIDP (our IDP) using OIDC protocol. The protocol requires that you define a client, and send a

valid redirect URI (so that the IDP would know where to redirect you after it authenticates you).

So in order for the whole thing to work, you need to register a client at your IDP. Fortunately for us, the great team of myIDP made it easy for us (tnx guys!).
Enter their portal at *https://portal.myNET/* and create a new client. You should be redirected to the new client page:

TEXT

The important parts are:

- *Client ID* - Choose a name to your likings, you'd enter it at the IDP configuration.
- *Client Secret* - Choose a secret (a password), you'd enter it at the IDP configuration. BTW this is a great place for easter eggs, I reccommend using base64.
- *Redirect URI's* - This is the place to enter the redirect URI's you saw at the Keycloak IDP configuration page. Notice that you can insert multiple addresses. Also notice that the Local Setup and the OpenShift Setup require different redirect URI's. My configuration looks like this:

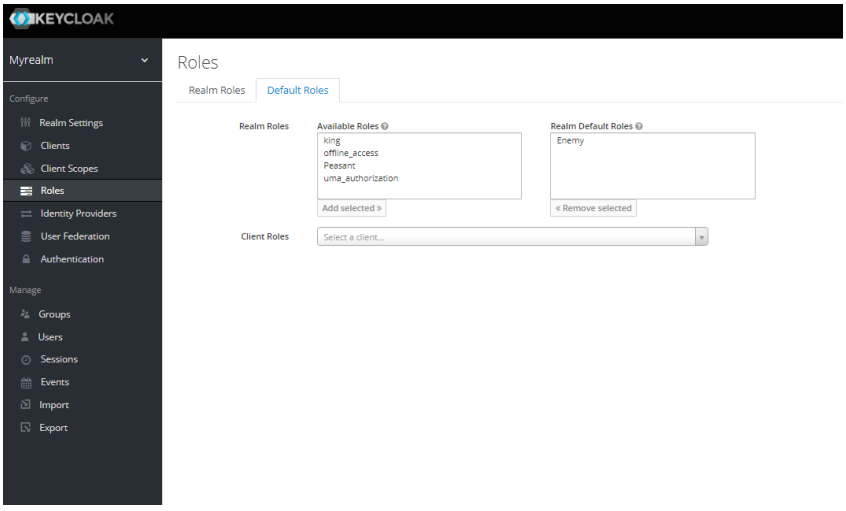
Click submit and your'e done!

Configuring Authorization (blocking users)

After reading this enormous article, trying to set up the system, failing, crying, looking up for other occupations, and finally somehow making this work – you might wonder how to actually block users from entering your site (or is it just me?). This is the authorization process, and Keycloak has a lot of ways to accomplish that. I will show a simple way I figured it out, but if you'd like to implement a more complex authorization, I recommend reading about Keycloak's roles, polices, scopes, groups and policy enforcers.

The way we are going to implement authorization is using Keycloak Authentication Flows. These are the processes every user is going through when he logs in (without him\her knowing). We are going to assign every new user that logs in an *Enemy* role, so that he can't get into the site. Than, the Admin (King) can view the user and decide if he is really an *Enemy* of the realm or not. If the Admin (King) decides to let the new traveler pass, he simply needs to unassign the user from the *Enemy* role.

First, let's create a Role: on Keycloak admin-console, click on *Roles* in the left sidebar. Then *Add Role*, name him something, I'm going with *Enemy*. Then go to the *Default Roles* tab and make sure he is the only *Realm Defauly Roles*:

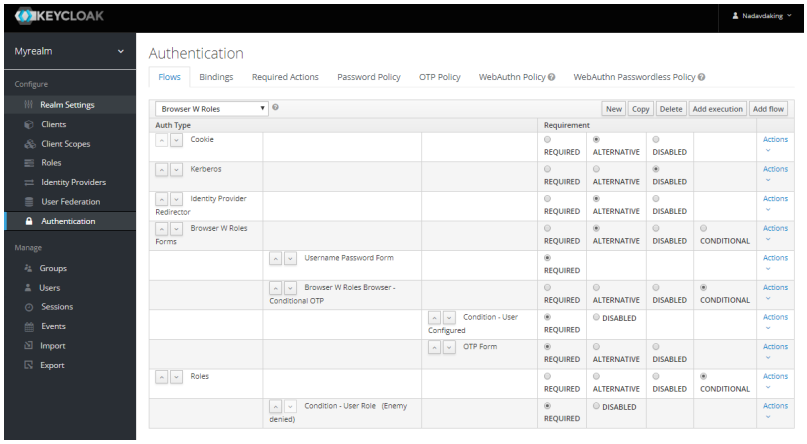


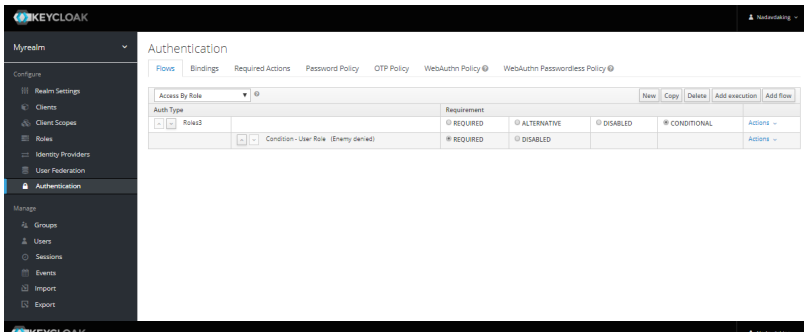
Follow these steps to configure the Authentication Flows that we will use for authorization:

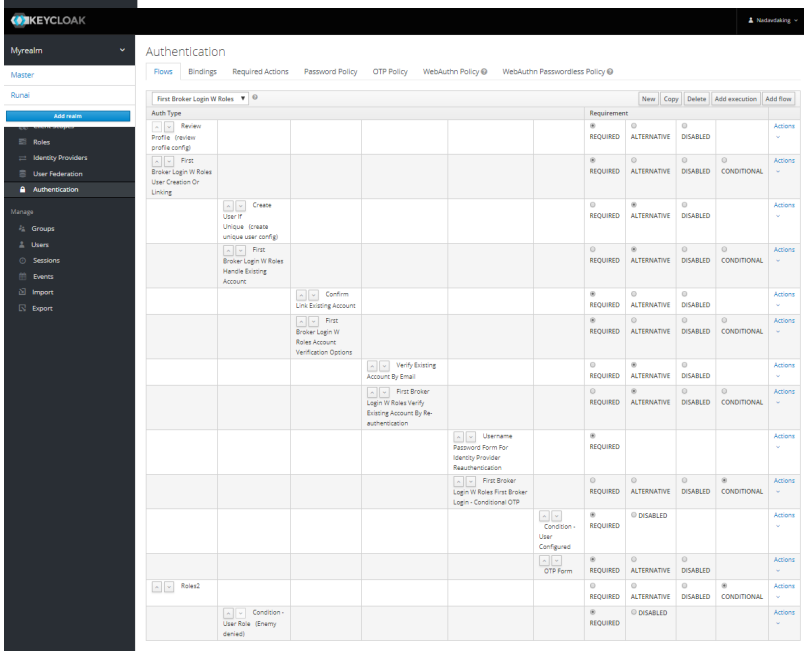
1. Select the *Authentication* tab from the left sidebar. You should see a browser Authentication Flow schema. That means that every regular browser log in attempt would go through these processes.
2. Click on *Copy*, in order to create a copy of this Flow and name him whatever you'd like *(*I chose *Browser w Roles).*
3. Click on *Add flow* in order to add a new Authentication Sub-Flow and give it some name. On the new subflow that you created, make sure *con ditional* is clicked.
4. Click on the *Actions* dropdown of the new sub-flow, choose *Add execution*. Then choose *Condition - User Role* from the drop down.

3. Click on *REQUIRED* in the new condition, then go to *Actions* and hit *config*.
6. You've reached the configuration of the execution. This basically means that any role that you would write in the *User role* tab would be **denied** from logging in. So write down *Enemy*, or the lame role name you chose earlier. Hit save.
7. Repeat steps 2-6 for the *First Broker Login* Flow. Also create a new Flow (using *new*) and apply steps 3-6 to it.

At the end of this process, you should have created 3 new Flows, two copies and one new. They should look like these:





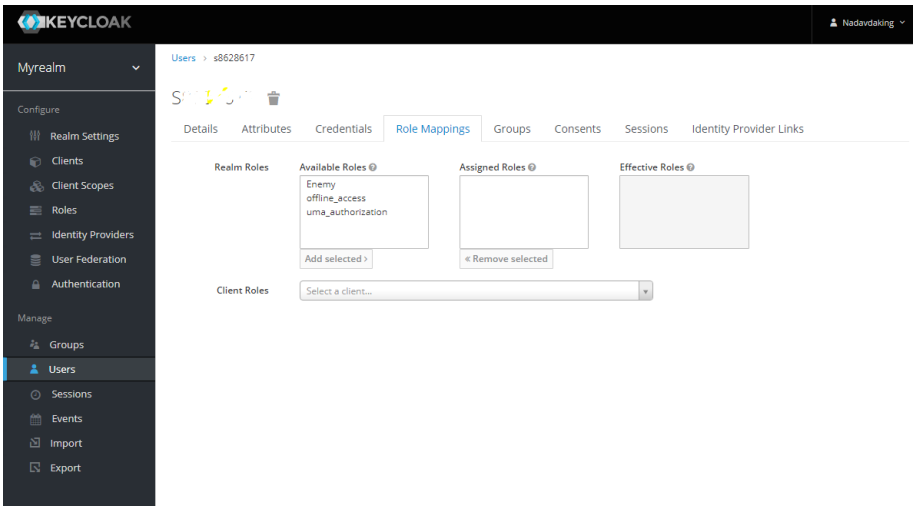


Finally, we'd have to tell the client and the IDP to use our modified Flows instead of the default ones:

- Go to the IDP configuration, in the *First Login Flow* tab choose the modified *first broker flow* that you created (*first broker flow w roles)*. In the *Post Login Flow* choose the new Flow you created (*Access by Role*).
- In the client configuration page, under *Authentication Flow Overrides,* choose the modified *Browser flow* that you created (*Browser w Roles*). NOTICE!! Currently the Browser Flow doesn't work, so don't change it. You can go on without it and nothing would change (the browser flow modifications are only there in order to deny username-password login). When I will remember how to make this work i'll add it.

Checking its actually working

We are finally done. Go to the nginx-route and get to the Keycloak login page. Click on the IDP provider and wait, you should be redirected to an "invalid login attempt". That means that Keycloak recognized you as an Enemy and denied your access.
Now enter as admin, and go to the *Users* tab from the sidebar. Click on *View all users* and you should see your user. Click on it and go to *Role Mapping*, change the user *Assigned Roles* and remove *Enemy* from there. It should look like this:



Then try to go to nginx-route again. If you can't get the login page, you should probably delete your cookies and cache (if it still doesn't work, go to *Real m Settings Tokens* and change the access token lifespan and other stuff to 1 minute).
Try to log in with the IDP provider.

It should work. Probably (:

By:

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