OpenSource Keycloak Configuration Procedure

Introduction

Authorization and authentication are needed for medical devices. There are many providers online such as Azure App Service. However, OpenSource Keycloak is the ideal option for less configuration adoption in both on-premises and cloud settings.

Description

Keycloak is an open source software product to allow single sign-on with identity and access management aimed at modern applications and services.

The features of Keycloak include:

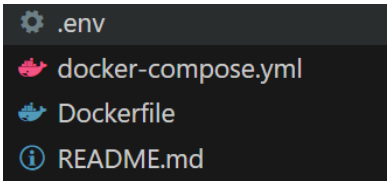
- User registration
- Social login
- Single sign-on/sign-off across all applications belonging to the same realm
- Two-factor authentication
- LDAP integration
- Kerberos broker
- Multitenancy with per-realm customizable skin
- Custom extensions to extend the core functionality

There are two main components of Keycloak:

- Keycloak server, including the API and graphical interface.
- Keycloak application adapter: a set of libraries to call the server.[8]

Steps for configuring Keycloak

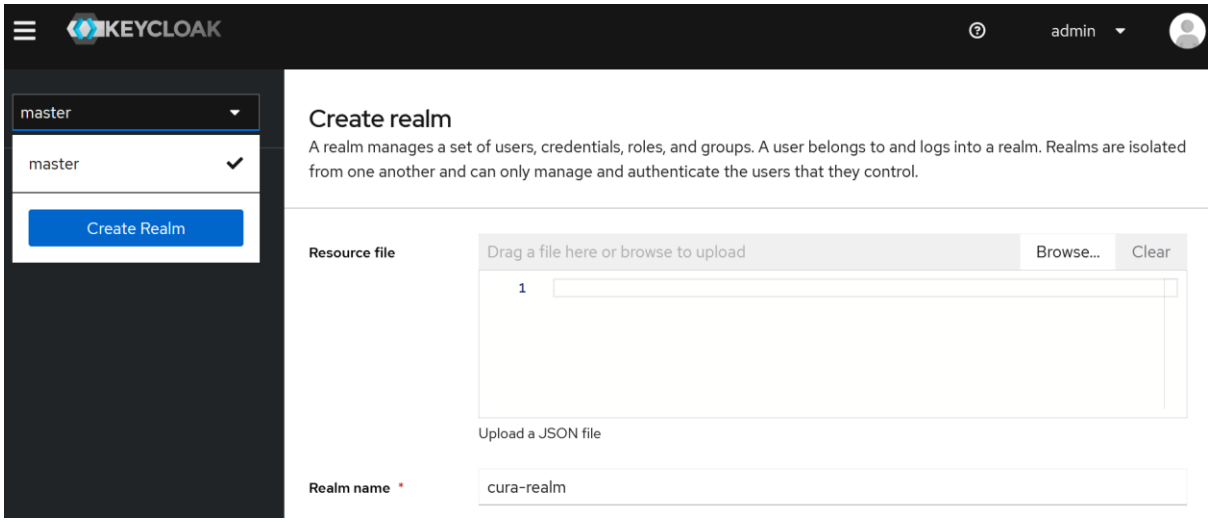
1) Ensure that the following files exist in your project folder.



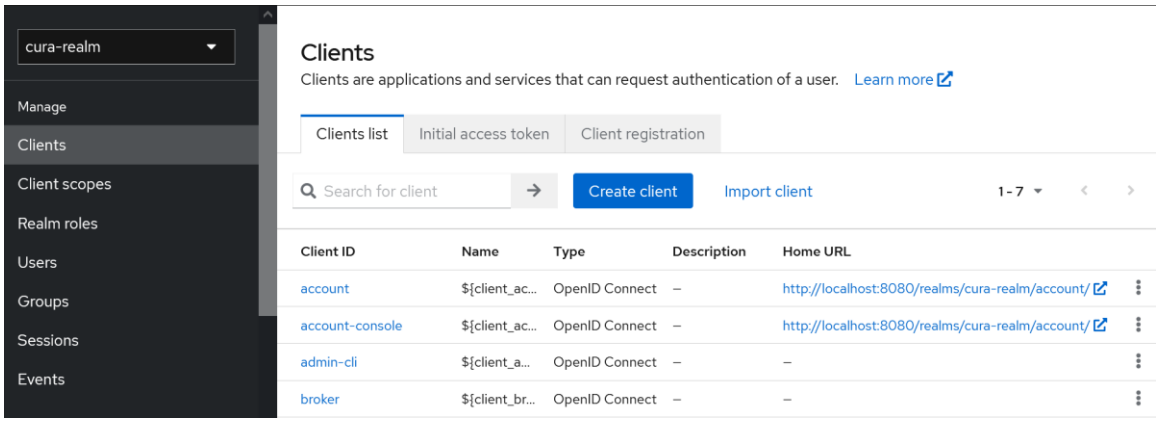
2) Run the command “docker compose up” in terminal to download an image of Keycloak and run an instance of it as container.

```
PS C:\Users\vaitesswar\Desktop\keycloak new> docker compose up
[+] Running 2/0
 ✓ Container keycloaknew-identity-db-1  Running                    0.0s
Attaching to keycloaknew-identity-1, keycloaknew-identity-db-1
Aborting on container exit...
[+] Stopping 2/2
 ✓ Container keycloaknew-identity-db-1  Stopped
```

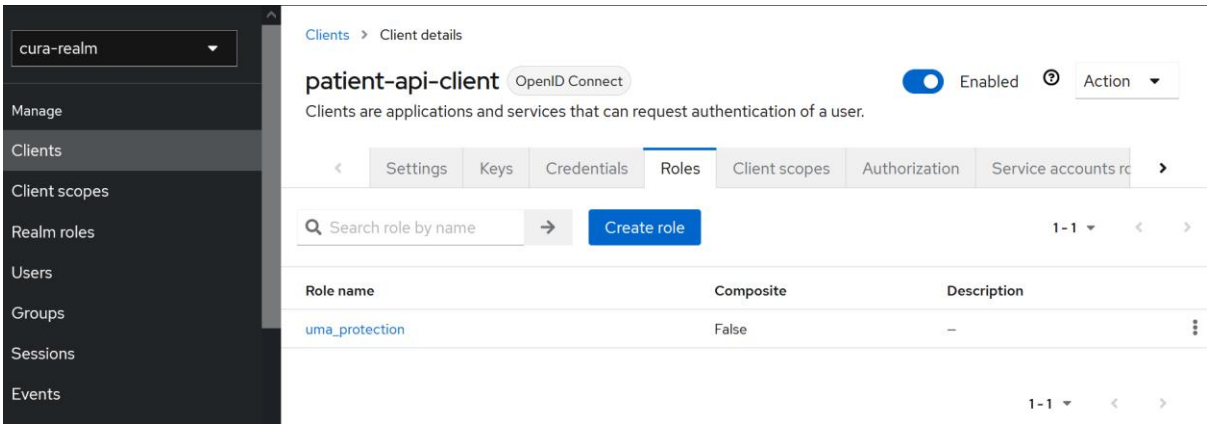
3) Create a new realm.



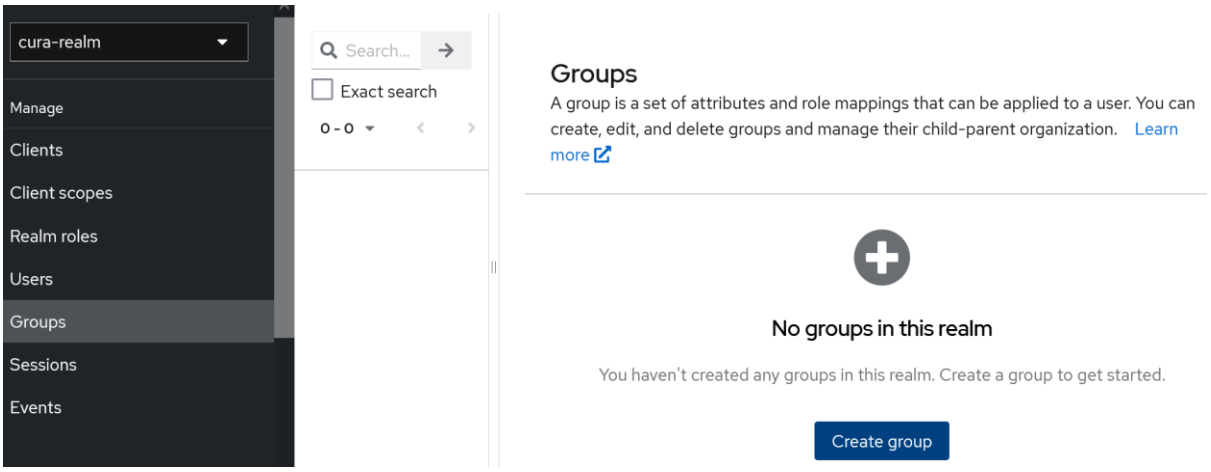
4) Create a new client with the following details.
   a. Client Id: patient-api-client
   b. Name: patient-api-client
   c. Client authentication: **On**
   d. Authorization: **On**
   e. Valid redirect URIs: http://127.0.0.1:8001/*
   f. Valid post logout re-direct URIs: http://127.0.0.1:8001/*
   g. Web origins: http://127.0.0.1:8001



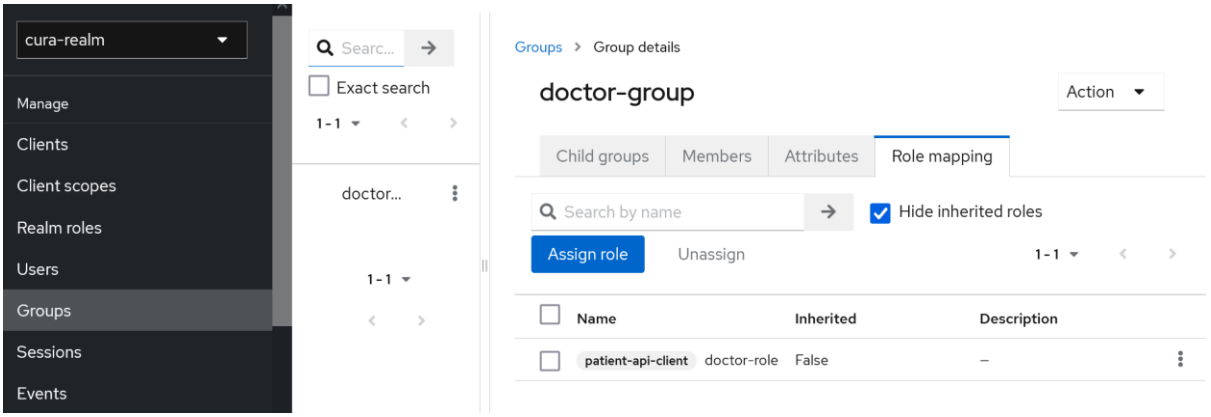
5) Go to Clients -> Roles. Create a new role with the following details.
   a. Role name: doctor-role



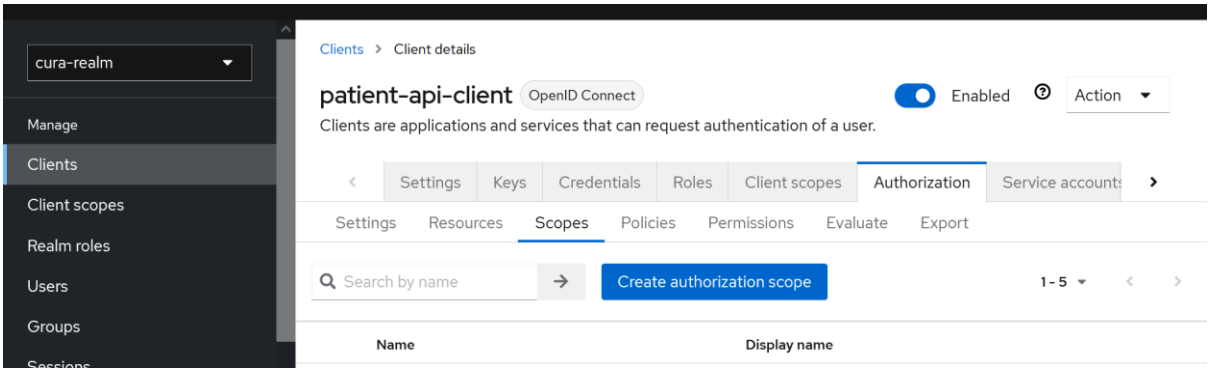
6) Create a new group with the following details.
   a. Name: doctor-group



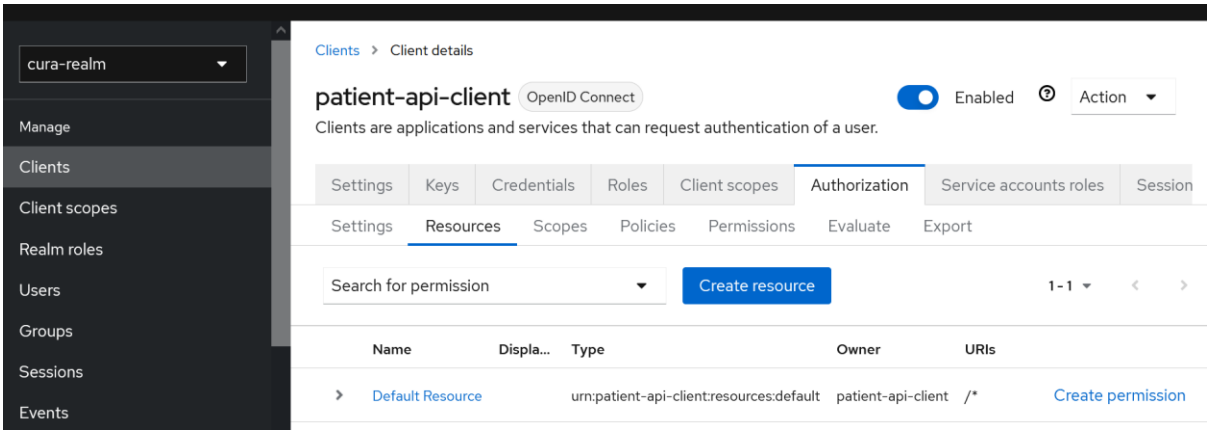
7) Under “Role mapping” tab, assign patient-api-client (doctor role) to this group.



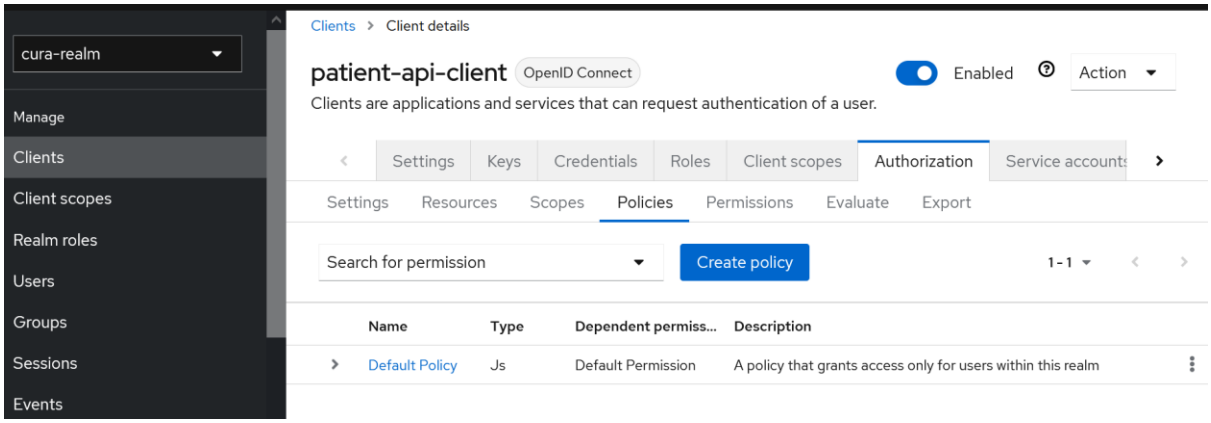
8) Go to Clients -> Authorization -> Scopes. Create a list of new authorization scopes as follows.
   a. delete-scope
   b. register-scope
   c. save-scope
   d. update-scope
   e. view-scope



9) Go to Clients -> Authorization -> Resources. Create a new resource with the following details.
   a. Name: appointment-resource
   b. Authorization scope: save-scope, view-scope, update-scope

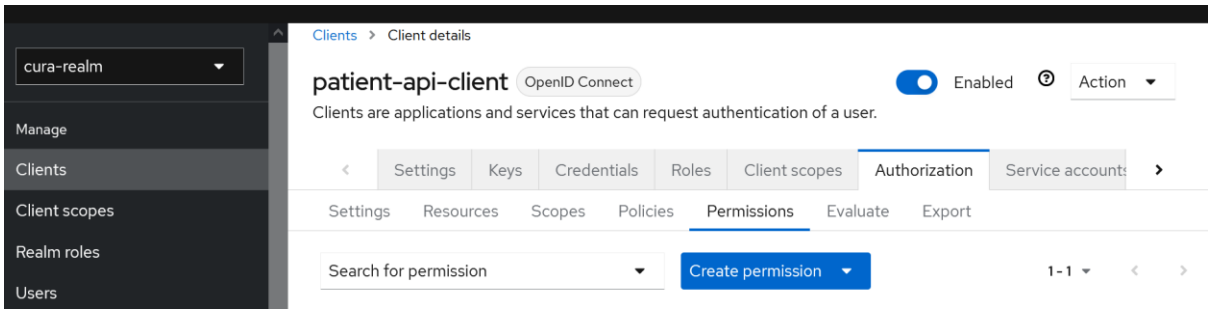


10) Go to Clients -> Authorization -> Policies. Create a new policy with the following details.
    a. Choose policy type: Role
    b. Name: doctor-role-policy
    c. Description: doctor-role-policy
    d. Add roles: doctor-role (patient-api-client)

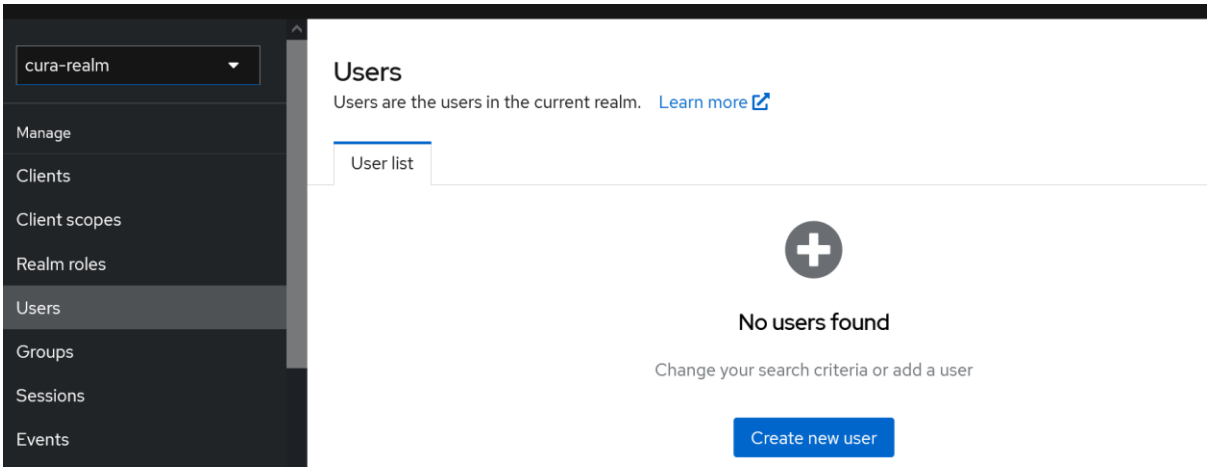


11) Go to Clients -> Authorization -> Permissions. Create new permissions with the following details.
    a. Permission 1
        i. Type: Create scope-based permission
        ii. Name: appointment-advance-permission
        iii. Resources: appointment-resource
        iv. Authorization scopes: save-scope, update-scope
        v. Policy: doctor-role-policy

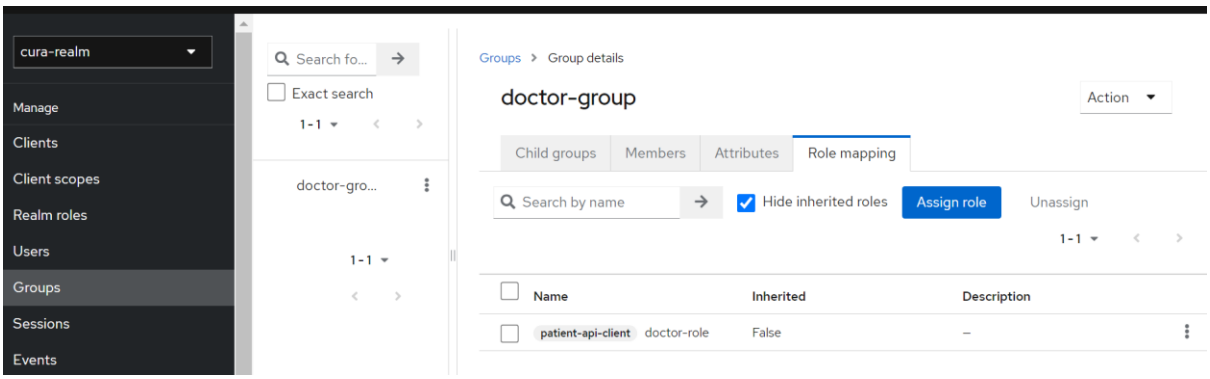
    b. Permission 2
        i. Type: Create scope-based permission
        ii. Name: appointment-basic-permission
        iii. Resources: appointment-resource
        iv. Authorization scopes: view-scope
        v. Policy: doctor-role-policy



12) Create a new user with the following details.
    a. Username: doctor1
    b. Email: doctor1@example.com
    c. Change “Email verified” to “Yes”.
    d. Join “doctor-group”
    e. Create -> doctor1 -> Credentials
    f. password: ********
    g. Set temporary off

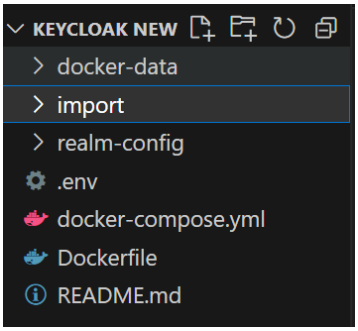


13) Go to Groups -> doctor-group -> Role Mapping. Assign “doctor role” in patient-api-client to this group.



14) The above-mentioned steps are for configuring Keycloak for backend. For frontend, only perform step 4 (i.e., create a new client) with the following details.
    a. Client Id: patient-app-client
    b. Name: patient-app-client
    c. Client authentication: **Off**
    d. Authorization: **Off**
    e. Valid redirect URIs: http://localhost:3000/*
    f. Valid post logout re-direct URIs: http://localhost:3000/*
    g. Web origins: http://localhost:3000

15) Create a new folder called “import” in directory.



16) Run “docker ps” command to get container id in VS Code terminal.

```
PS C:\Users\vaitesswar\Desktop\keycloak new> docker ps
CONTAINER ID   IMAGE                                                    COMMAND                  CREATED
   STATUS                 PORTS                                          NAMES
fd1c15de0da4   internalproject.azurecr.io/patient-app-identity:latest   "/opt/keycloak/bin/k…"   3 hours ago
   Up 3 hours             0.0.0.0:8080->8080/tcp, 0.0.0.0:8443->8443/tcp   keycloaknew-identity-1
ef9b18563b30   postgres:14                                              "docker-entrypoint.s…"   3 hours ago
   Up 3 hours (healthy)   0.0.0.0:5433->5432/tcp                          keycloaknew-identity-db-1
```

17) Run “docker exec -it **<container id>** /bin/sh” command to access the docker container. In some cases, you might have to run **“/bin/bash”** instead if this command does not work.

```
PS C:\Users\vaitesswar\Desktop\keycloak new> docker exec -it fd1c15de0da4 /bin/sh
sh-5.1$
```

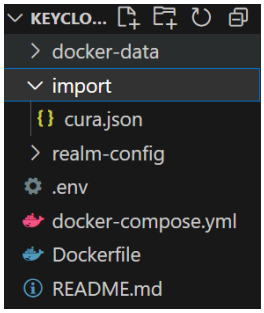
18) Run “cd /opt/keycloak/bin/” command.

```
sh-5.1$ cd /opt/keycloak/bin/
sh-5.1$
```

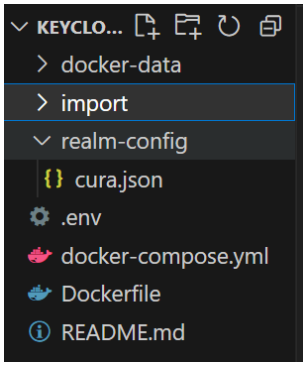
19) Run “cd /opt./kc.sh export --file /opt/keycloak/import**/<realm-name>**.json --realm **<realm-name>**.-realm” as shown below to get the realm configuration in a json file.

```
sh-5.1$ ./kc.sh export  --file /opt/keycloak/import/cura.json --realm cura-realm
```

20) Ensure that the realm configuration file exists in “import” folder.

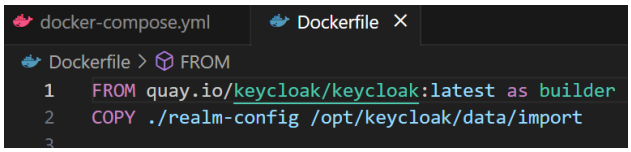


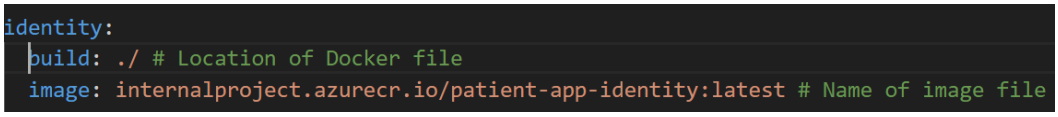
21) Shift the realm configuration file to “realm-config” folder. Delete both “import” and “docker-data” folders as they are unnecessary.



22) Delete “Default Policy” and “Default Permission” sessions in the realm configuration json file.

23) Uncomment all lines in all files. Delete all images and containers.





24) Run the command “docker compose up” in terminal to download an image of Keycloak and run an instance of it as a container using the saved realm configuration in realm-config folder.