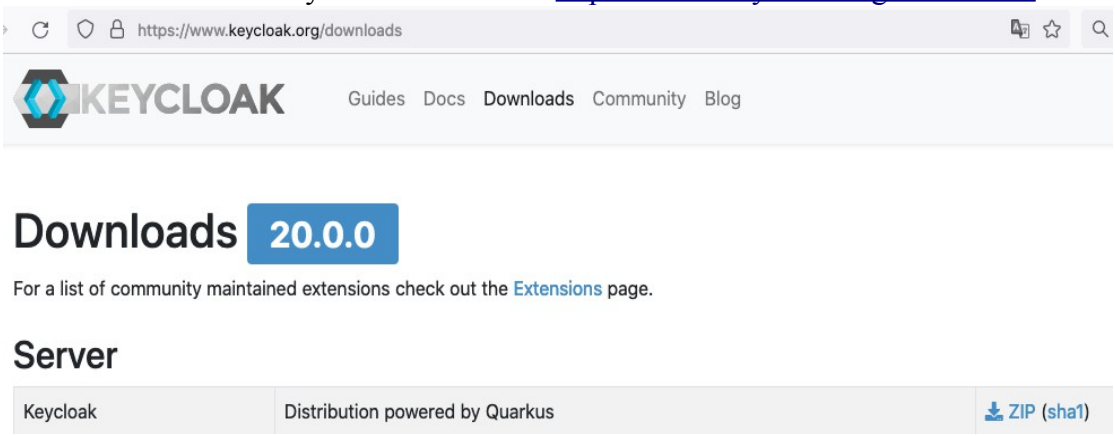
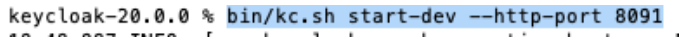
Inhaltsverzeichnis

1 Setup Keycloak Server

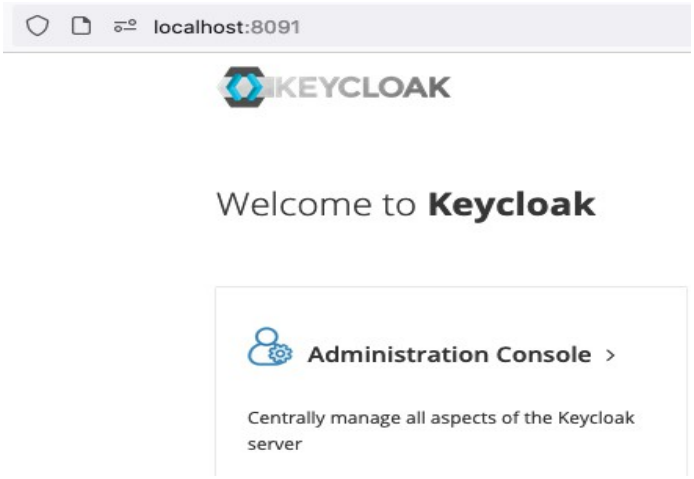
1. Download the latest keycloak server from https://www.keycloak.org/downloads.



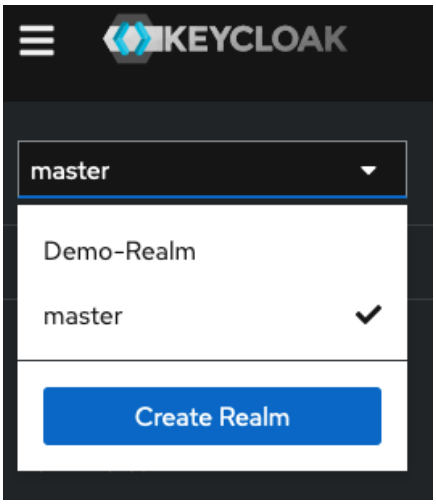
2. Unzip, open a terminal and change to directory keycloak-20.0.0 an run: *bin/kc.sh start-dev --http-port 8091*



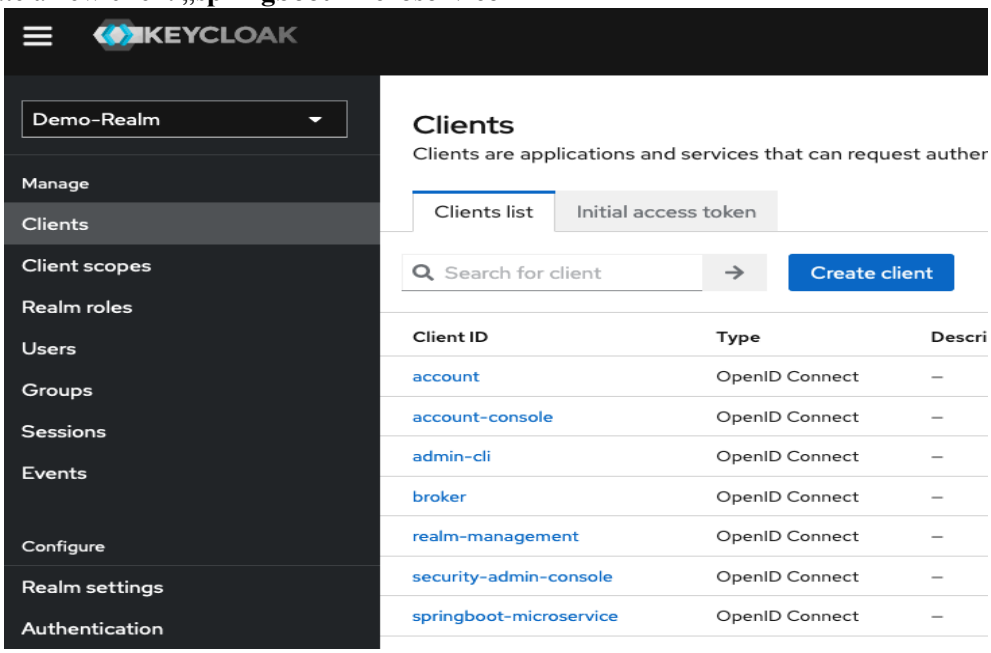
3. Open keycloak admin console



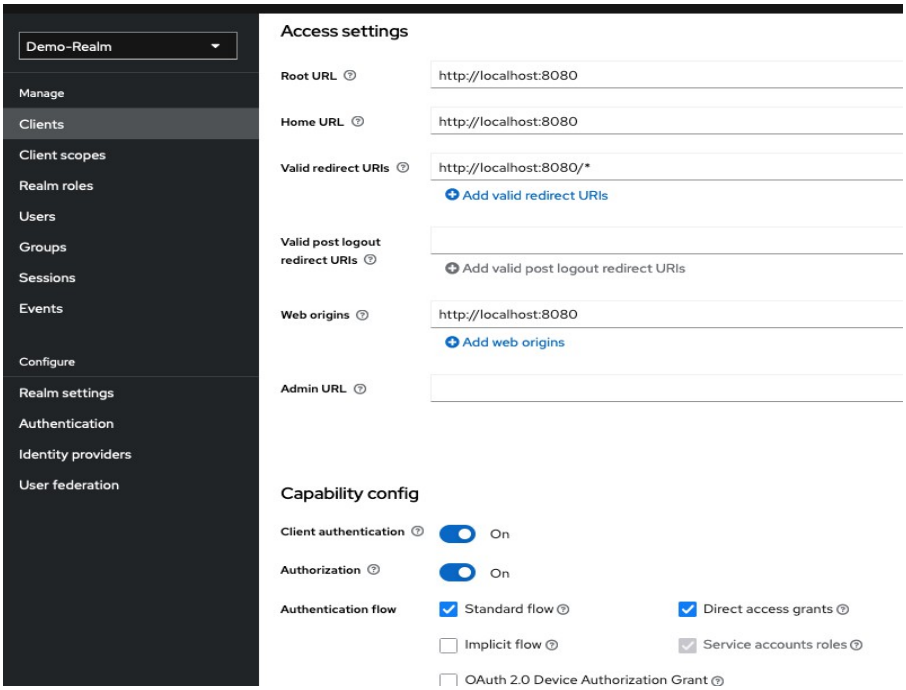
4. Have as look at https://www.djamware.com/post/6225b66ba88c55c95abca0b6/spring-boot-security-postgresql-and-keycloak-rest-api-oauth2
5. Create an admin account
6. Create a new Realm **Demo-Realm** and select it



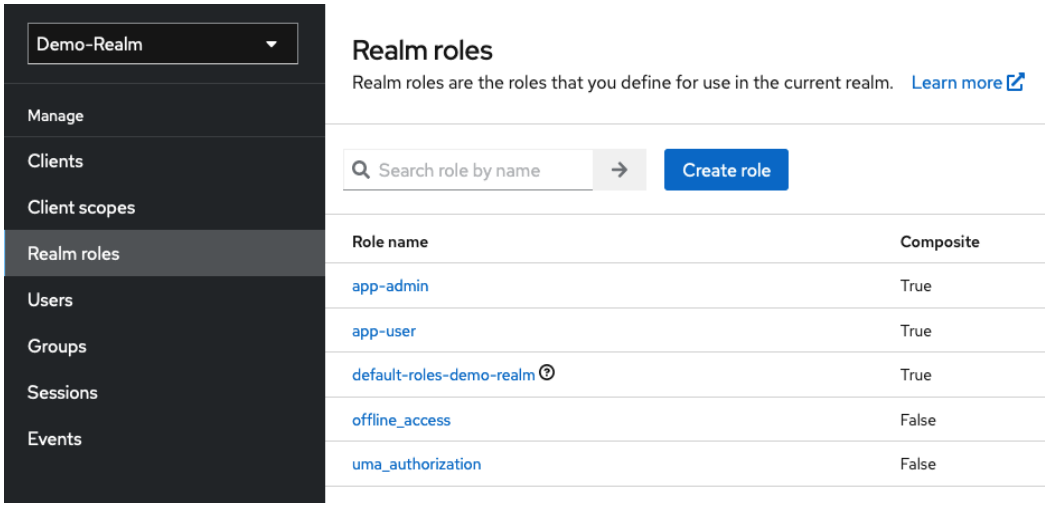
7. Create a new client „**springboot-microservice“**



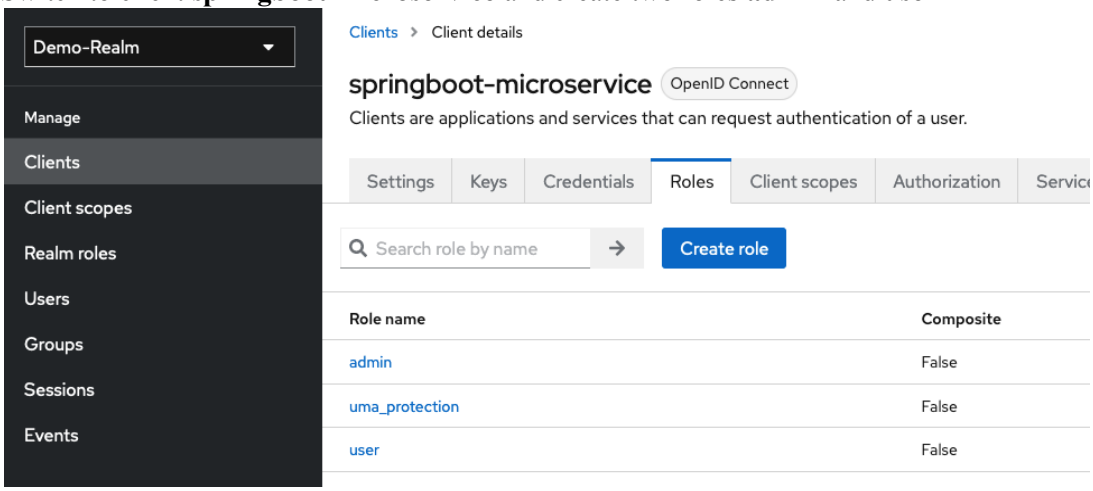
8. Fill in Root-Url, Home-Url, Valid-Redirect-Urls and Web-Origins and switch on „Client authenication“ and „Authorization“



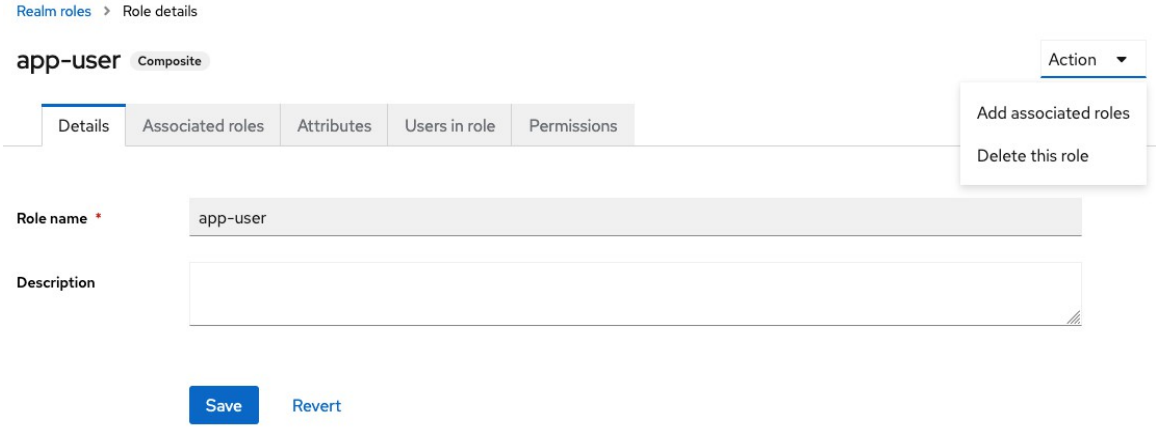
9. Create two Realm-Roles **app-admin** and **app-user**



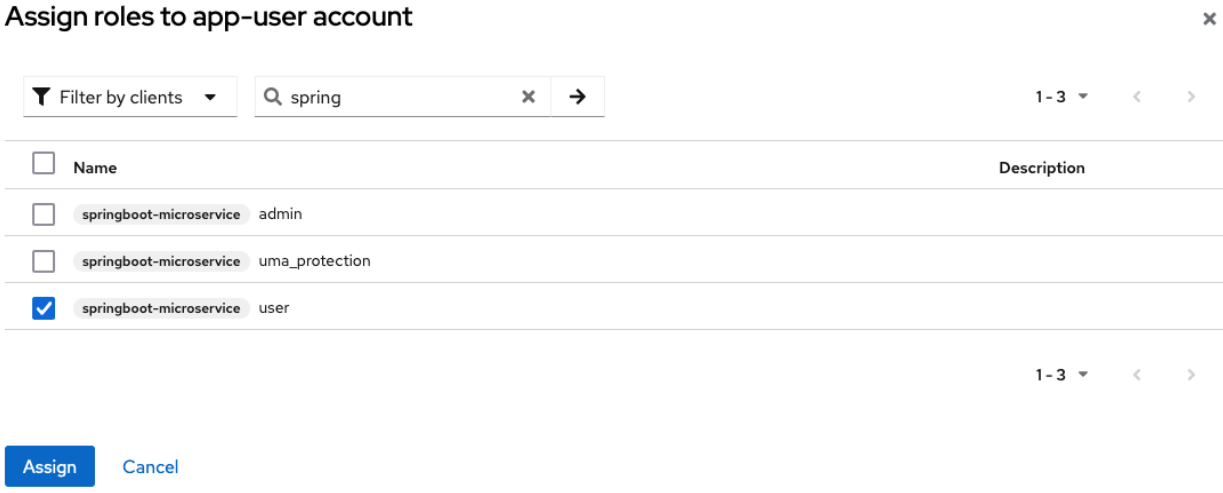
10. Switch to client **springboot-microservice** and create two roles **admin** and **user**



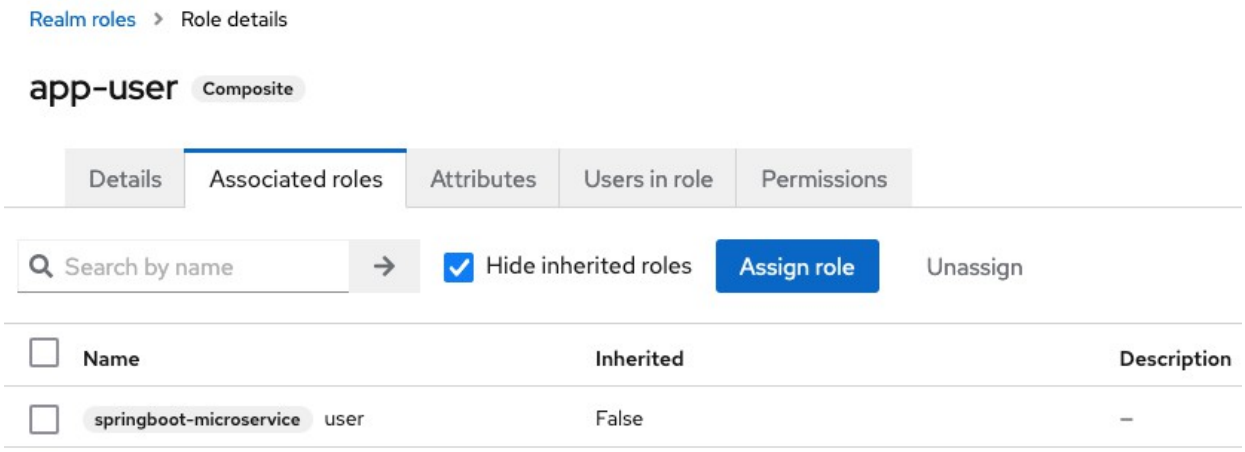
11. Switch to Realm-Roles and select Role **app-user**, click on Action and select **„Add associated roles“**



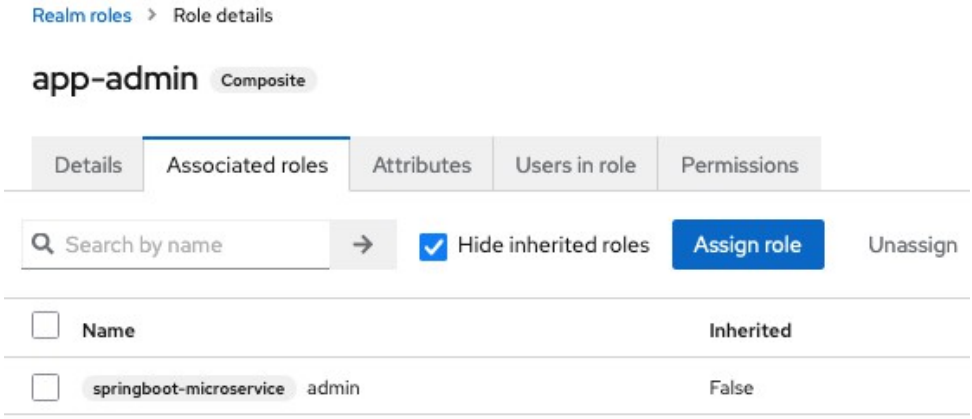
12. Select „filter by clients“ and enter „springboot-microservices“ and select role **user**



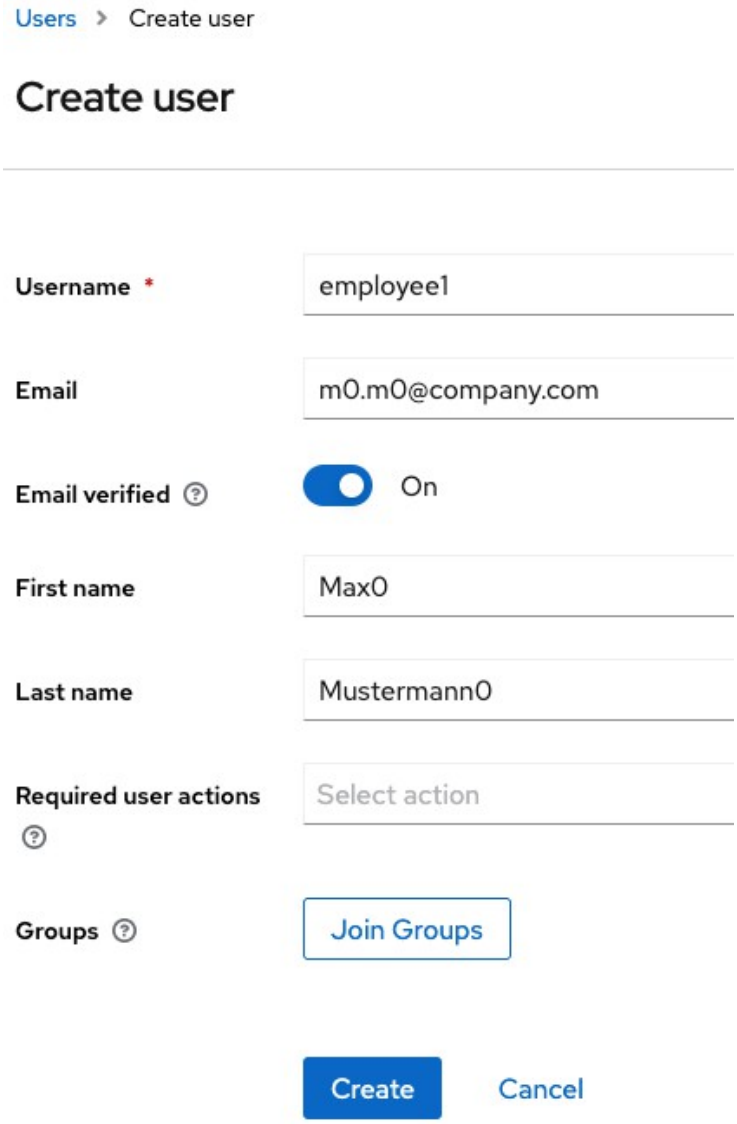
13. Realm-Role app-user is now a composite role



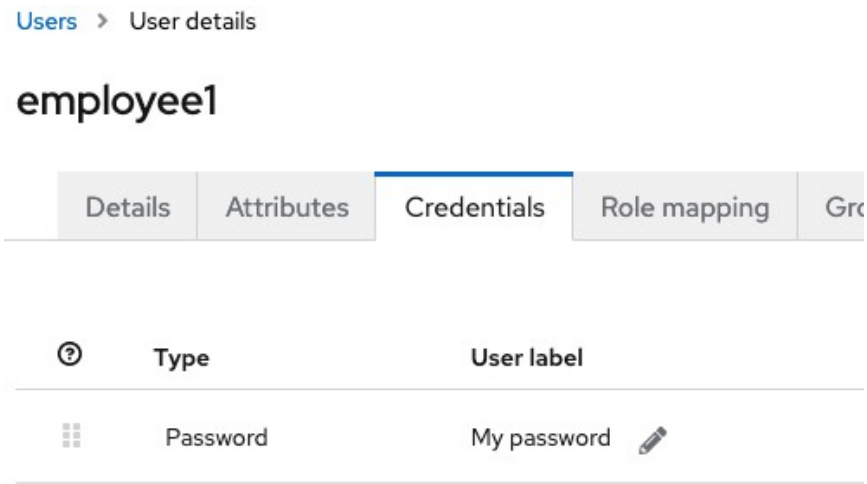
14. Do the same with Realm-Role app-admin and associate role admin



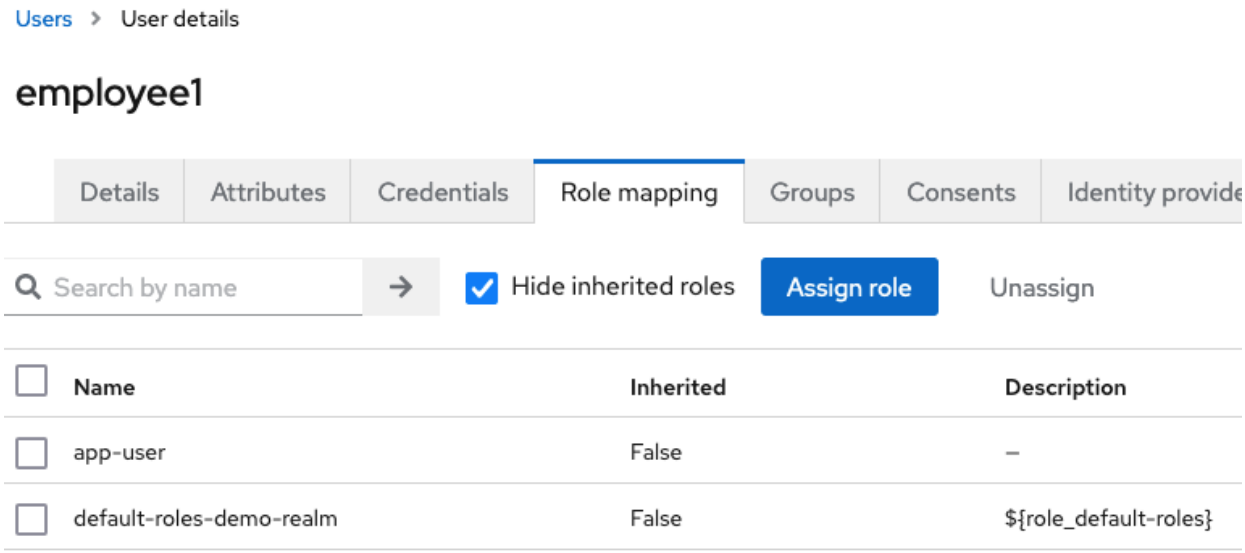
15. Create 3 Users named employee1 – employee3, set „Email verified“ to „On“



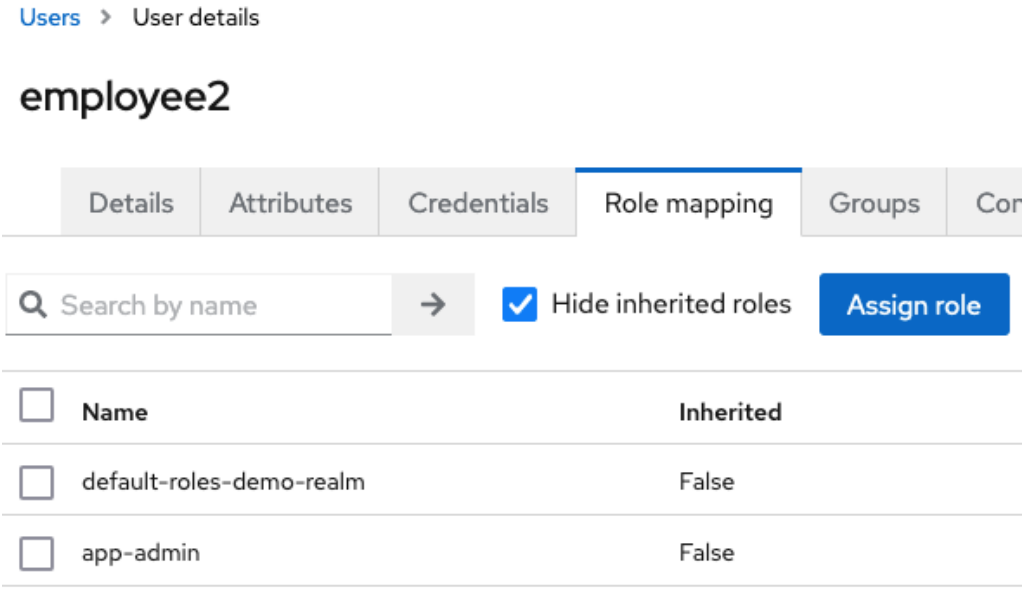
16. Set user credentials



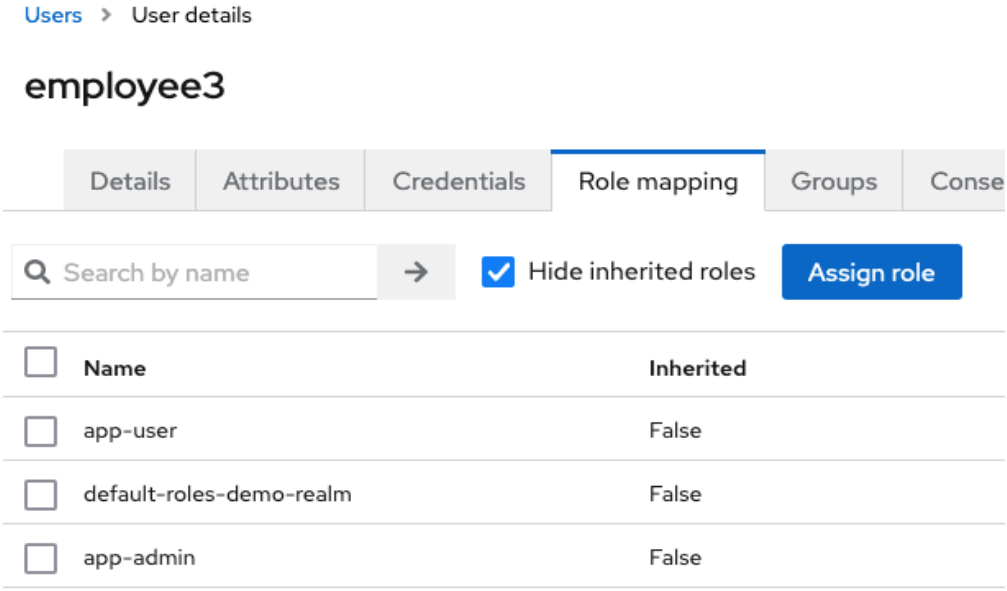
17. Assign Realm-Role **app-user** to employee1



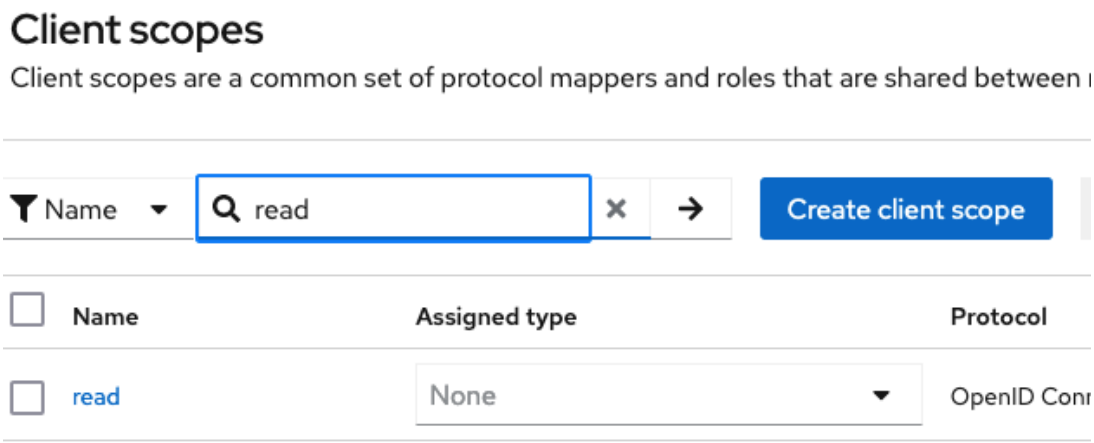
18. Remove all actions in field „Required user action“ and save
19. Repeat everything from point 14-17 with employee2 and assign Realm-Role app-admin



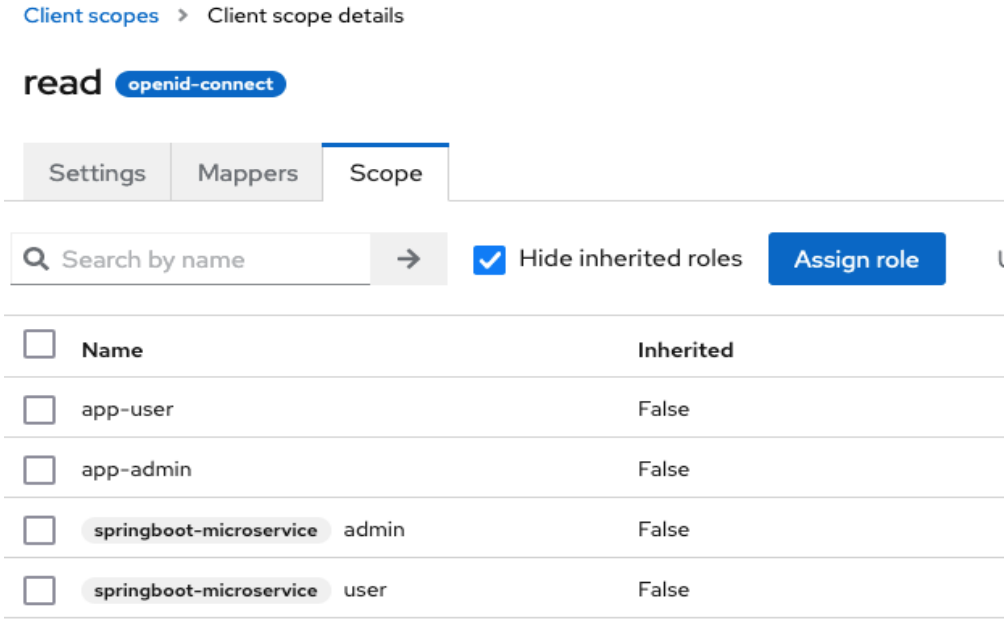
20. Repeat everything from point 14-17 with employee3 and assign Realm-Role **app-admin** and **app-user**



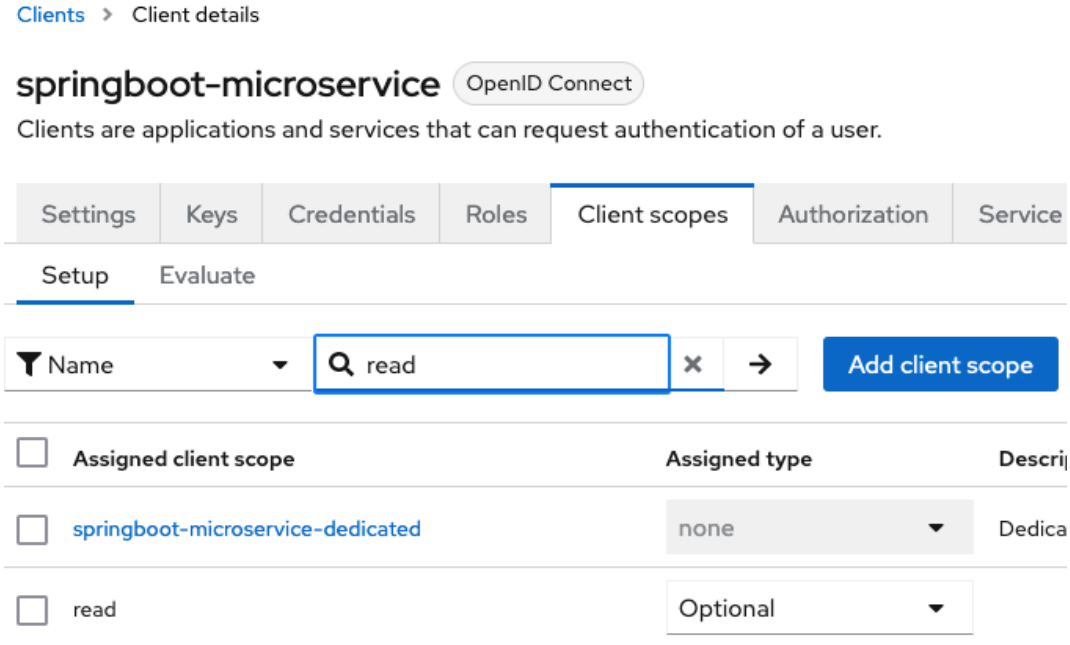
21. Switch to client scopes and add new scope read



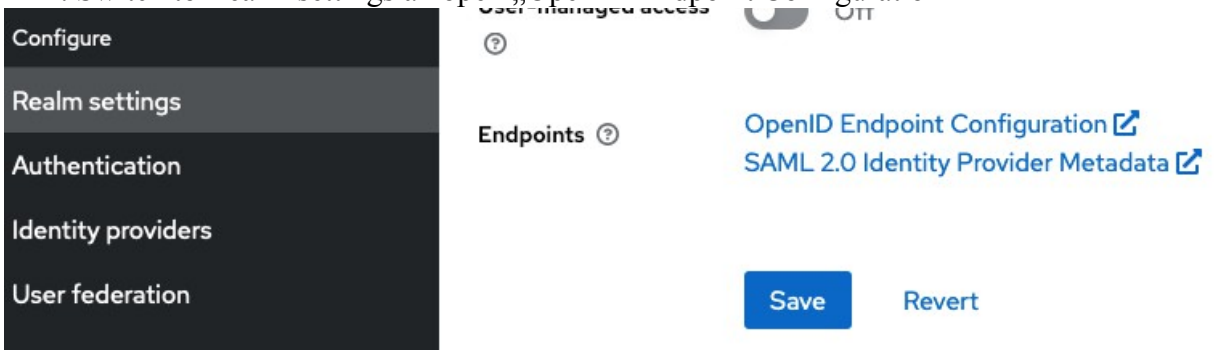
22. Assign Realm-Roles app-admin, app-user and Roles user and admin to scope read



23. Switch to client „**springboot-microservices**“ and add scope read as „**Optional**“

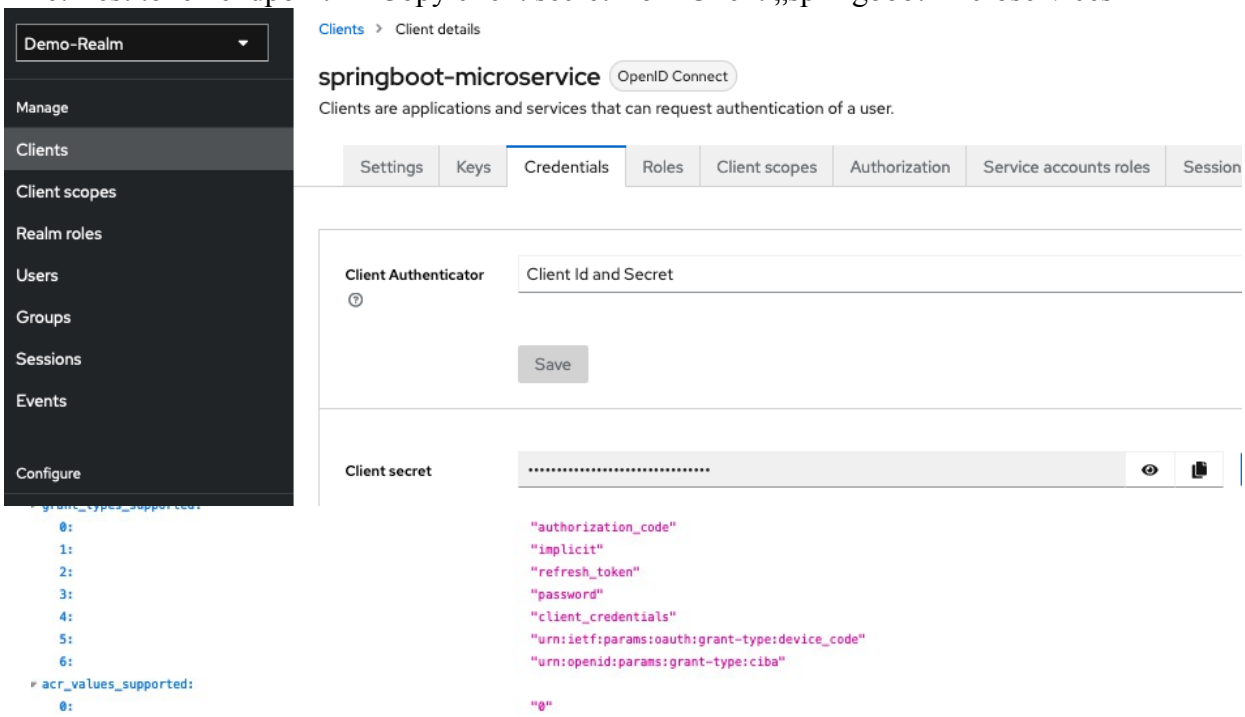


24. Switch to Realm settings an open „OpenID Endpoint Configuration“

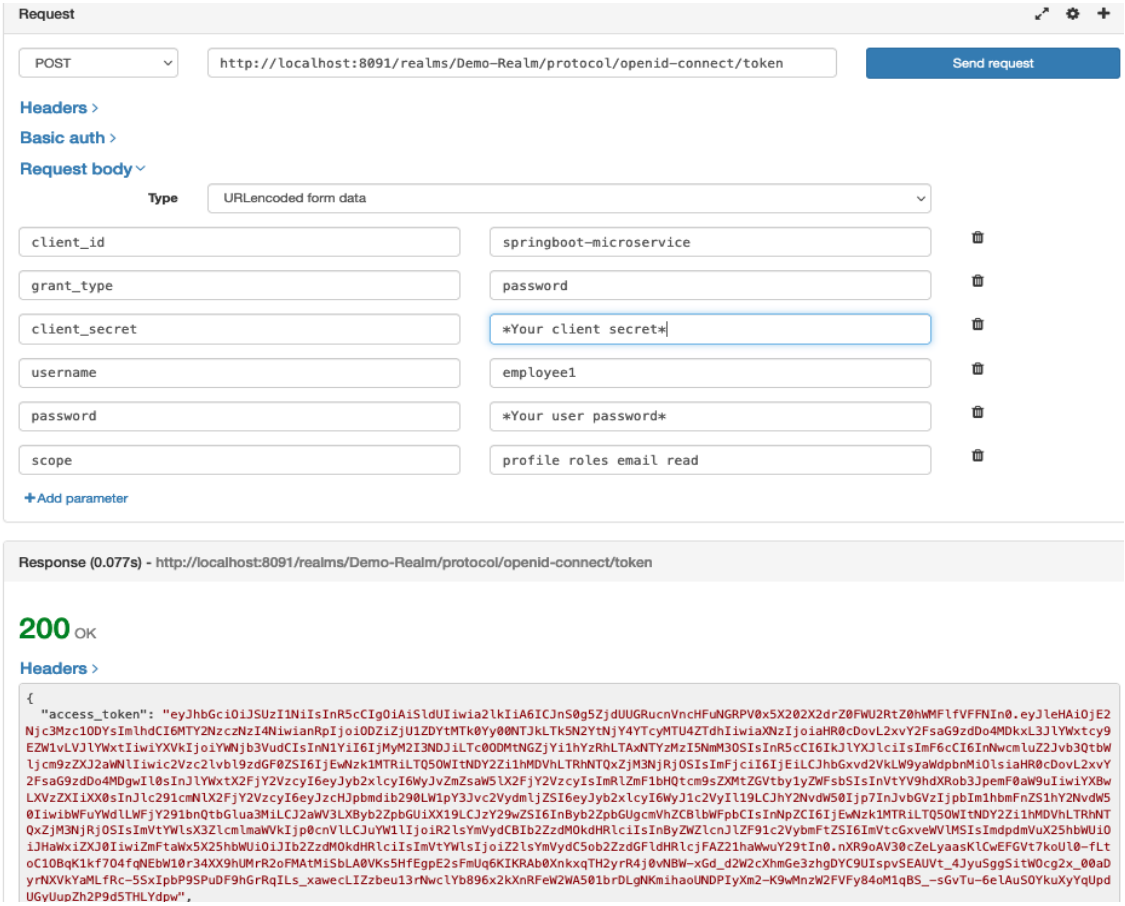


25. http://localhost:8091/realms/Demo-Realm/.well-known/openid-configuration

26. Test token endpoint → Copy client secret from Client „springboot-microservices“



27. Use Postman or a REST client of your choice to receive an access token


Request
POST
http://localhost:8091/realms/Demo-Realm/protocol/openid-connect/token
Send request
Headers >
Basic auth >
Request body
Type
URLencoded form data
client_id
springboot-microservice
grant_type
password
client_secret
Your client secret
username
employee1
password
Your user password
scope
profile roles email read
+Add parameter
Response (0.077s) - http://localhost:8091/realms/Demo-Realm/protocol/openid-connect/token
200 OK
Headers >
{
"access_token": "eyJhbGciOiJSUzI1NiIsInR5cCIgOiAiSldUIiwia2lkIiA6ICJnS0g5ZjdUUGRucnVncHFuNGRPV0x5X202X2drZ0FWU2RtZ0hWMFlfVFFNIn0.eyJleHAiOjE2
Njc3Mzc1ODYsImlhdCI6MTY2NzczNzI4NiwianRpIjoiODZiZjU1ZDYtMTk0Yy00NTJkLTk5N2YtNjY4YTcyMTU4ZTdhIiwiaXNzIjoiaHR0cDovL2xvY2FsaG9zdDo4MDkxL3JlYWxtcy9
EZW1vLVJlYWxtIiwiYXVkIjoiYWNjb3VudCIsInN1YiI6IjMyM2I3NDJiLTc0ODMtNGZjYi1hYzRhLTAxNTYzMzI5NmM3OSIsInR5cCI6IkJlYXJlciIsImF6cCI6InNwcmluZ2Jvb3QtbW
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2FsaG9zdDo4MDgwIl0sInJlYWxtX2FjY2VzcyI6eyJyb2xlcyI6WyJvZmZsaW5lX2FjY2VzcyIsImRlZmF1bHQtcm9sZXMtZGVtby1yZWFsbSIsInVtYV9hdXRob3JpemF0aW9uIiwiYXBw
LXVzZXIiXX0sInJlc291cmNlX2FjY2VzcyI6eyJzcHJpbmdib290LW1pY3Jvc2VydmljZSI6eyJyb2xlcyI6WyJ1c2VyIl19LCJhY2NvdW50Ijp7InJvbGVzIjpbIm1hbmFnZS1hY2NvdW5
0IiwibWFuYWdlLWFjY291bnQtbGlua3MiLCJ2aWV3LXByb2ZpbGUiXX19LCJzY29wZSI6InByb2ZpbGUgcmVhZCBlbWFpbCIsInNpZCI6IjEwNzk1MTRiLTQ5OWItNDY2Zi1hMDVhLTRhNT
QxZjM3NjRjOSIsImVtYWlsX3ZlcmlmaWVkIjp0cnVlLCJuYW1lIjoiR2lsYmVydCBIb2ZzdMOkdHRlciIsInByZWZlcnJlZF91c2VybmFtZSI6ImVtcGxveWVlMSIsImdpdmVuX25hbWUiO
iJHaWxiZXJ0IiwiZmFtaWx5X25hbWUiOiJIb2ZzdMOkdHRlciIsImVtYWlsIjoiZ2lsYmVydC5ob2ZzdGFldHRlcjFAZ21haWwuY29tIn0.nXR9oAV30cZeLyaasKlCwEFGVt7koUl0-fLt
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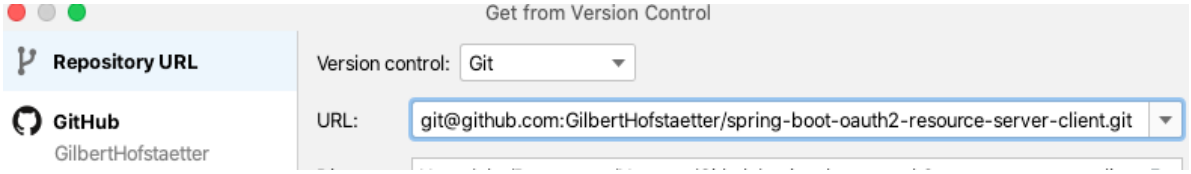
yrNXVkYaMLfRc-5SxIpbP9SPuDF9hGrRqILs_xawecLIZzbeu13rNwclYb896x2kXnRFeW2WA501brDLgNKmihaoUNDPIyXm2-K9wMnzW2FVFy84oM1qBS_-sGvTu-6elAuSOYkuXyYqUpd
UGyUupZh2P9d5THLYdpw",
28. Use Refresh token to receive a new access token
POST
http://localhost:8091/realms/Demo-Realm/protocol/openid-connect/token
Send request
Headers >
Basic auth >
Request body
Type
URLencoded form data
client_id
springboot-microservice
grant_type
refresh_token
client_secret
Your client secret
refresh_token
NGM5In0.HlDHATdRBcxc5GrB7zrEnTtYr2XbZIpVGMyqqT0ot1E
+Add parameter
Response (0.011s) - http://localhost:8091/realms/Demo-Realm/protocol/openid-connect/token
200 OK
Headers >
{
"access_token": "eyJhbGciOiJSUzI1NiIsInR5cCIgOiAiSldUIiwia2lkIiA6ICJnS0g5ZjdUUGRucnVncHFuNGRPV0x5X202X2drZ0FWU2RtZ0hWMFlfVFFNIn0.eyJleHAiOjE2
Njc3Mzc3NzEsImlhdCI6MTY2NzczNzQ3MSwianRpIjoiN2U1NmY1MzItNjc2Mi00ZGQ3LThlZTItZDg3MDMwZGY5N2M3IiwiaXNzIjoiaHR0cDovL2xvY2FsaG9zdDo4MDkxL3JlYWxtcy9
EZW1vLVJlYWxtIiwiYXVkIjoiYWNjb3VudCIsInN1YiI6IjMyM2I3NDJiLTc0ODMtNGZjYi1hYzRhLTAxNTYzMzI5NmM3OSIsInR5cCI6IkJlYXJlciIsImF6cCI6InNwcmluZ2Jvb3QtbW
ljcm9zZXJ2aWNlIiwic2Vzc2lvbl9zdGF0ZSI6IjEwNzk1MTRiLTQ5OWItNDY2Zi1hMDVhLTRhNTQxZjM3NjRjOSIsImFjciI6IjEiLCJhbGxvd2VkLW9yaWdpbnMiOlsiaHR0cDovL2xvY
2FsaG9zdDo4MDgwIl0sInJlYWxtX2FjY2VzcyI6eyJyb2xlcyI6WyJvZmZsaW5lX2FjY2VzcyIsImRlZmF1bHQtcm9sZXMtZGVtby1yZWFsbSIsInVtYV9hdXRob3JpemF0aW9uIiwiYXBw
LXVzZXIiXX0sInJlc291cmNlX2FjY2VzcyI6eyJzcHJpbmdib290LW1pY3Jvc2VydmljZSI6eyJyb2xlcyI6WyJ1c2VyIl19LCJhY2NvdW50Ijp7InJvbGVzIjpbIm1hbmFnZS1hY2NvdW5
0IiwibWFuYWdlLWFjY291bnQtbGlua3MiLCJ2aWV3LXByb2ZpbGUiXX19LCJzY29wZSI6InByb2ZpbGUgcmVhZCBlbWFpbCIsInNpZCI6IjEwNzk1MTRiLTQ5OWItNDY2Zi1hMDVhLTRhNT
QxZjM3NjRjOSIsImVtYWlsX3ZlcmlmaWVkIjp0cnVlLCJuYW1lIjoiR2lsYmVydCBIb2ZzdMOkdHRlciIsInByZWZlcnJlZF91c2VybmFtZSI6ImVtcGxveWVlMSIsImdpdmVuX25hbWUiO
iJHaWxiZXJ0IiwiZmFtaWx5X25hbWUiOiJIb2ZzdMOkdHRlciIsImVtYWlsIjoiZ2lsYmVydC5ob2ZzdGFldHRlcjFAZ21haWwuY29tIn0.wlYVeiuH9WIrutlYaiI8NDB05wj6oR9He5Pf
miyaZEQ1cxvc69jE5WURZAZf3t2fL5nDsDOvrru9fmcY0wOemqE6274tb9b_rzOhjWb3jbmPc0kX8BgdMXhDtsRiExOOCRhIq5oB-9BKEbzjiJNjLSym8AiB7vy6ouGQ0S9MsBhHmTutHMR
FZ0naNquMBVVfZ6XB_yIm3G1pmlkdY5KAttFJ_vLRpLwH_ZE3BXcssnccaRwTw_4p73OADi9daq-5sKd9teanyjePpezpXCrG2c27-RRqGHRFXNmthH8A_H2GG4jAmgdn-hQZVWV4AhjO6-
1metMU3EaSkbYac5VO0Q",
"expires_in": 300,
"refresh_expires_in": 1800,
"refresh_token": "eyJhbGciOiJIUzI1NiIsInR5cCIgOiAiSldUIiwia2lkIiA6ICI1OGM0MTM5Ny04MmRlLTRlNmYtYWJiYy1kM2IyM2E1ZTIzMDkifQ.eyJleHAiOjE2Njc3Mzky
NzEsImlhdCI6MTY2NzczNzQ3MSwianRpIjoiYjIyN2JiNzktYThiYi00YjMyLTkwZmMtY2FkMDZkNmY5OGYwIiwiaXNzIjoiaHR0cDovL2xvY2FsaG9zdDo4MDkxL3JlYWxtcy9EZW1vLVJ
lYWxtIiwiYXVkIjoiaHR0cDovL2xvY2FsaG9zdDo4MDkxL3JlYWxtcy9EZW1vLVJlYWxtIiwic3ViIjoiMzIzYjc0MmItNzQ4My00ZmNiLWFjNGEtMDE1NjMzMjk2Yzc5IiwidHlwIjoiUm
VmcmVzaCIsImF6cCI6InNwcmluZ2Jvb3QtbWljcm9zZXJ2aWNlIiwic2Vzc2lvbl9zdGF0ZSI6IjEwNzk1MTRiLTQ5OWItNDY2Zi1hMDVhLTRhNTQxZjM3NjRjOSIsInNjb3BlIjoicHJvZ
mlsZSByZWFkIGVtYWlsIiwic2lkIjoiMTA3OTUxNGItNDk5Yi00NjZmLWEwNWEtNGE1NDFmMzc2NGM5In0.p57rtrAGpOKmxnmKKUFK173C22bCwdGAZ-BdLEomPfQ",
29. Open https://jwt.io/ to decode our access token
30. See section resource-access for our applied user role

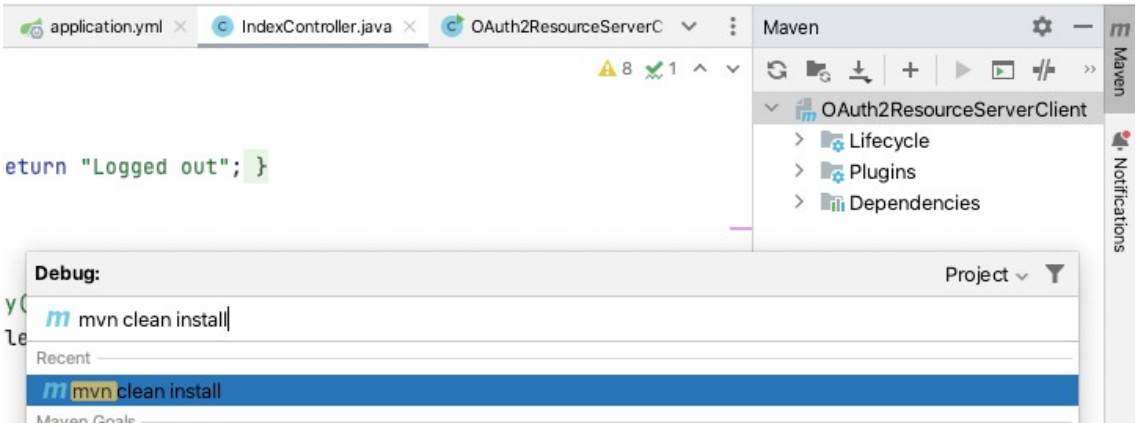
```
  },
  "realm_access": {
    "roles": [
      "offline_access",
      "default-roles-demo-realm",
      "uma_authorization",
      "app-user"
    ]
  },
  "resource_access": {
    "springboot-microservice": {
      "roles": [
        "user"
      ]
    },
    "account": {
```

2 Setup Spring boot project

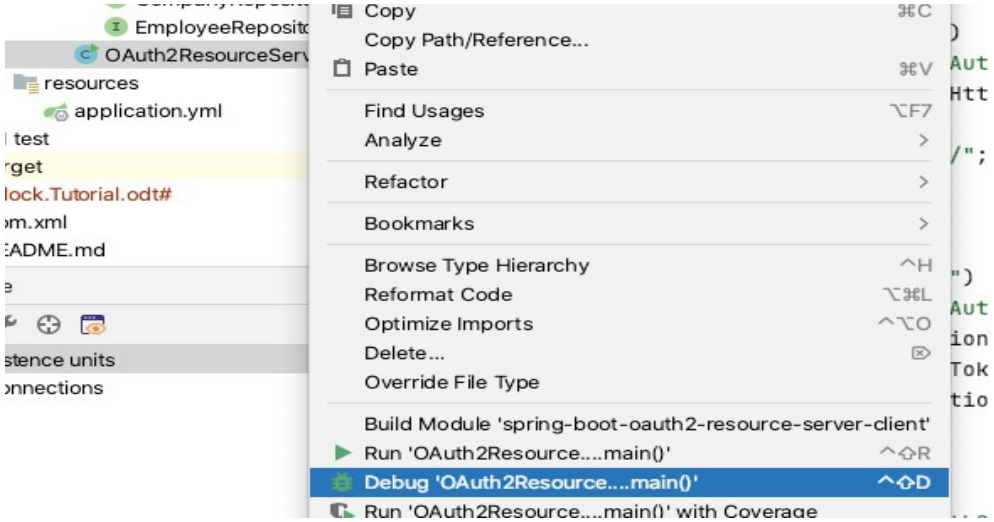
- Clone from git@github.com:GilbertHofstaetter/spring-boot-oauth2-resource-server-client.git



- mvn clean install

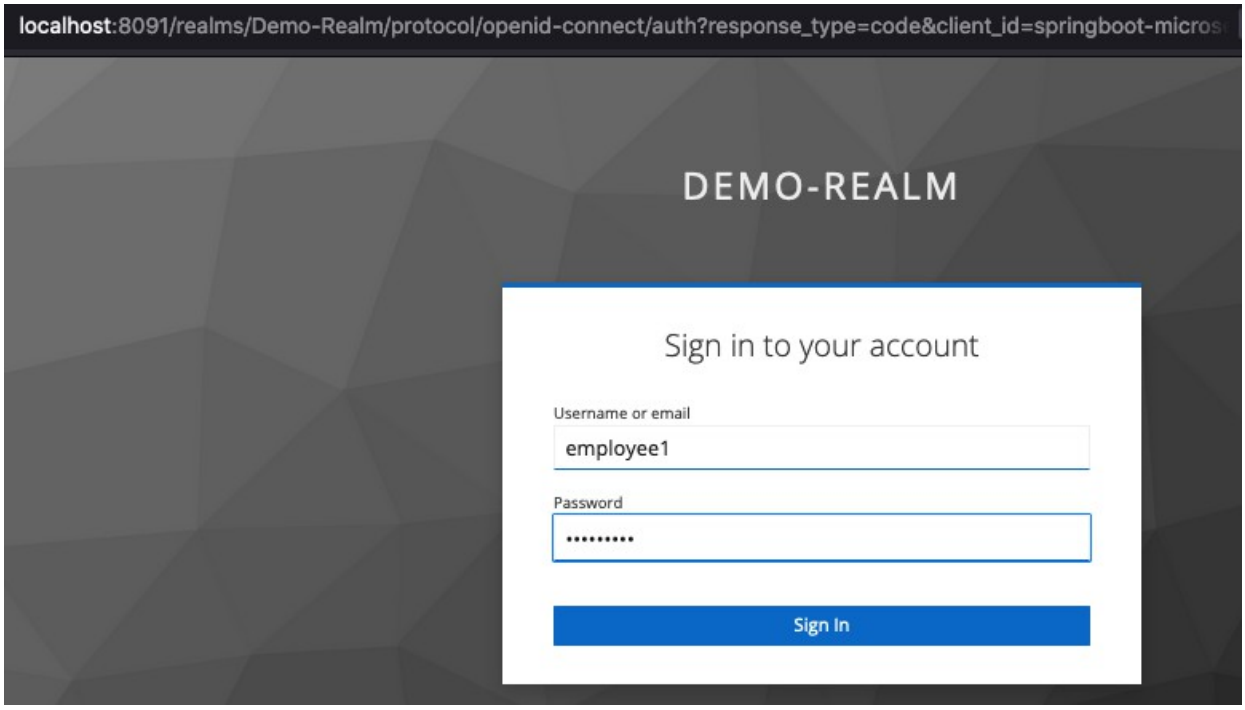


- Start project

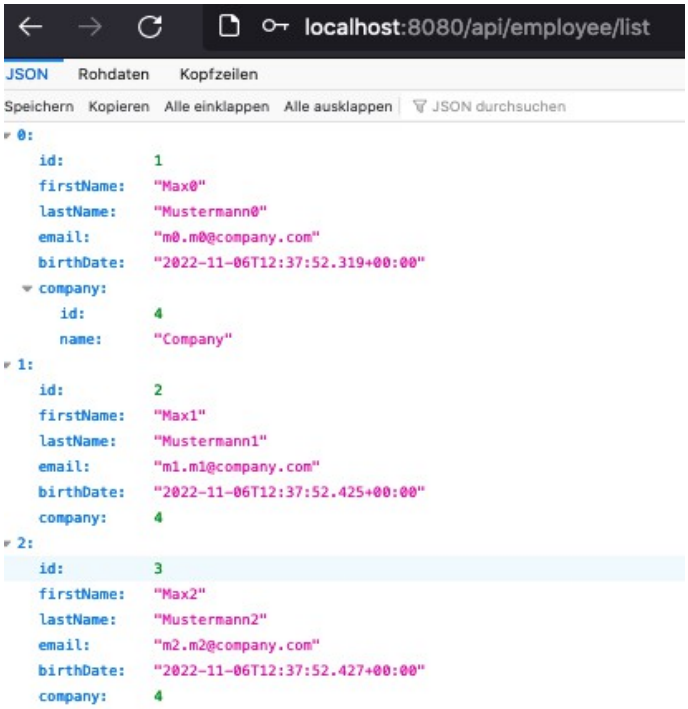


3 Test oauth2 login

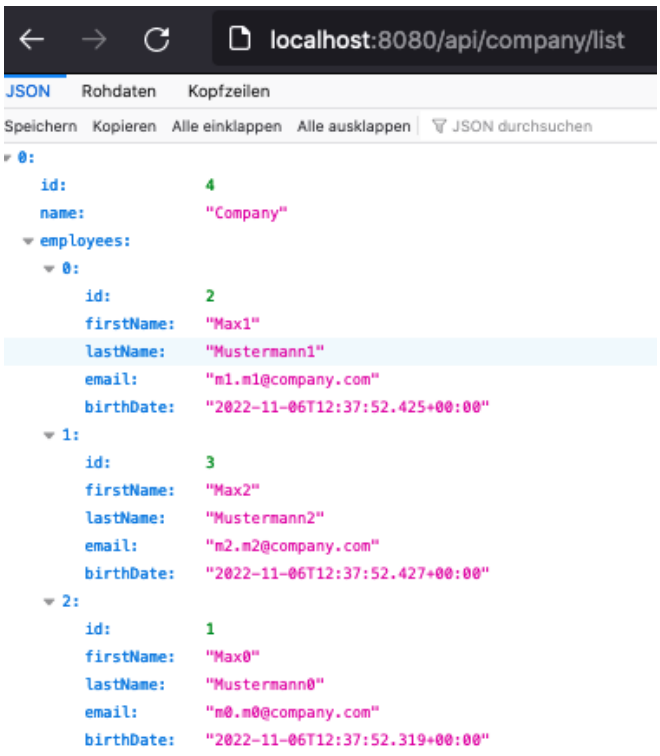
- Open http://localhost:8080/api/employee/list in your browser



- Enter login infos for user employee1 → Data gets listed → Role user is applied

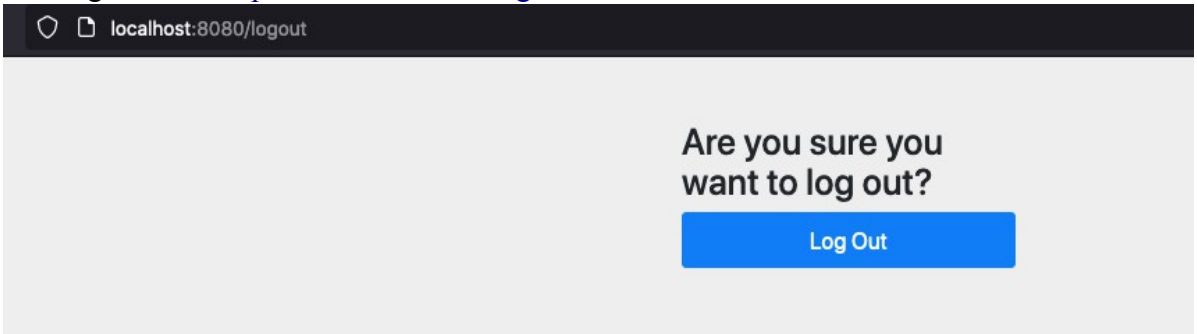


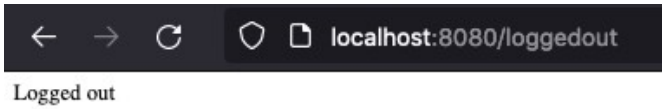
- Open http://localhost:8080/api/company/list → allready authenticated



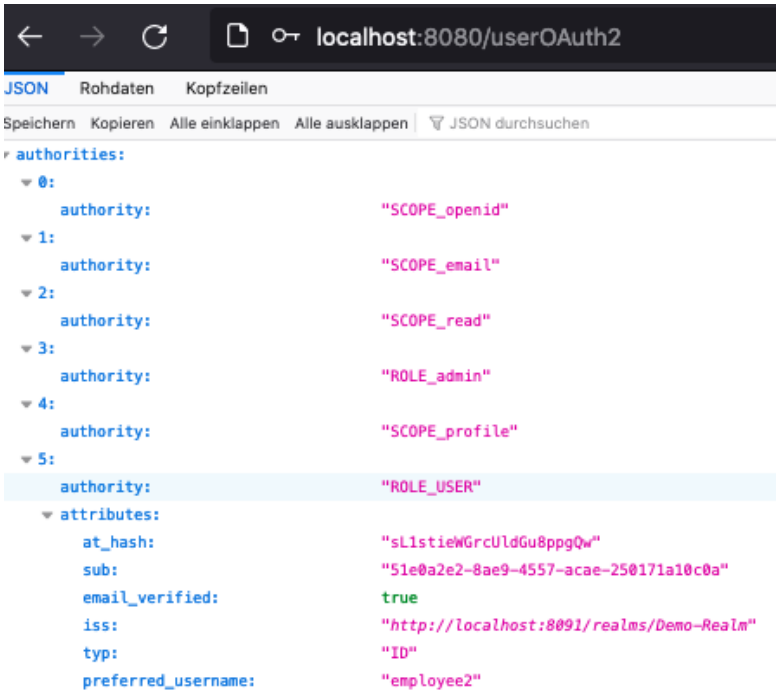
- Try to open http://localhost:8080/userOAuth2 → a blank page appears and status 403 is reported → endpoint ../userOAuth2 needs admin role to perform → logout and sign in as user employee2 or employee3

- Logout with http://localhost:8080/logout



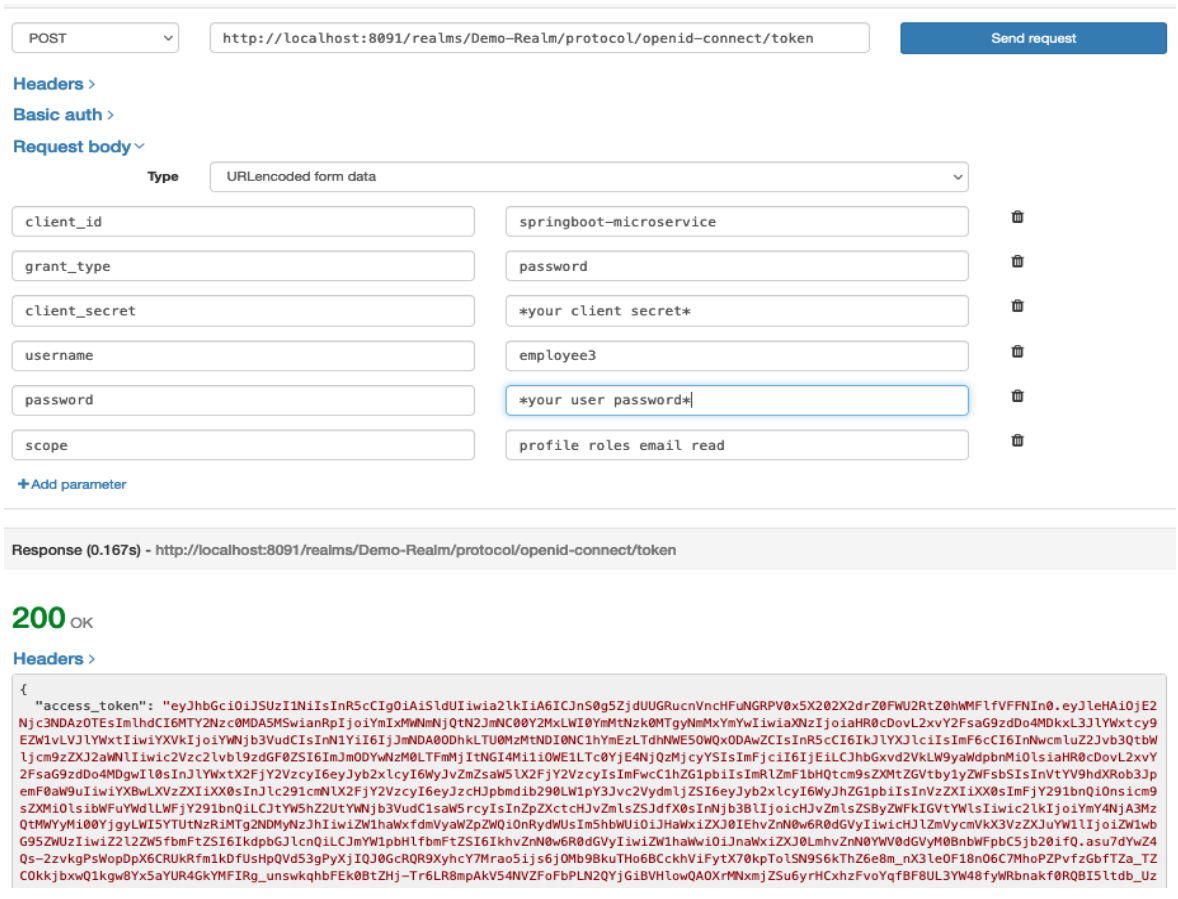


- Open again http://localhost:8080/userOAuth2 → login with user employee2 or employee3

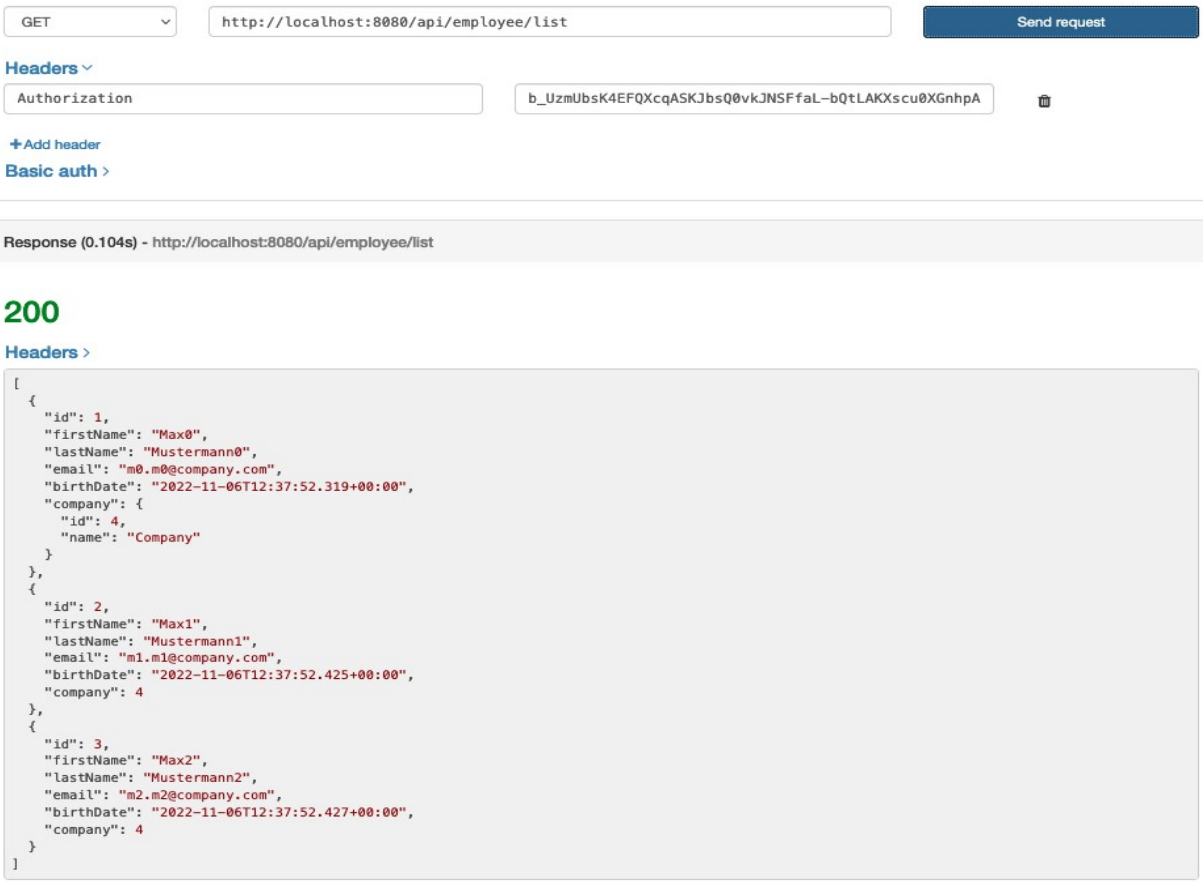


4 Test JWT access

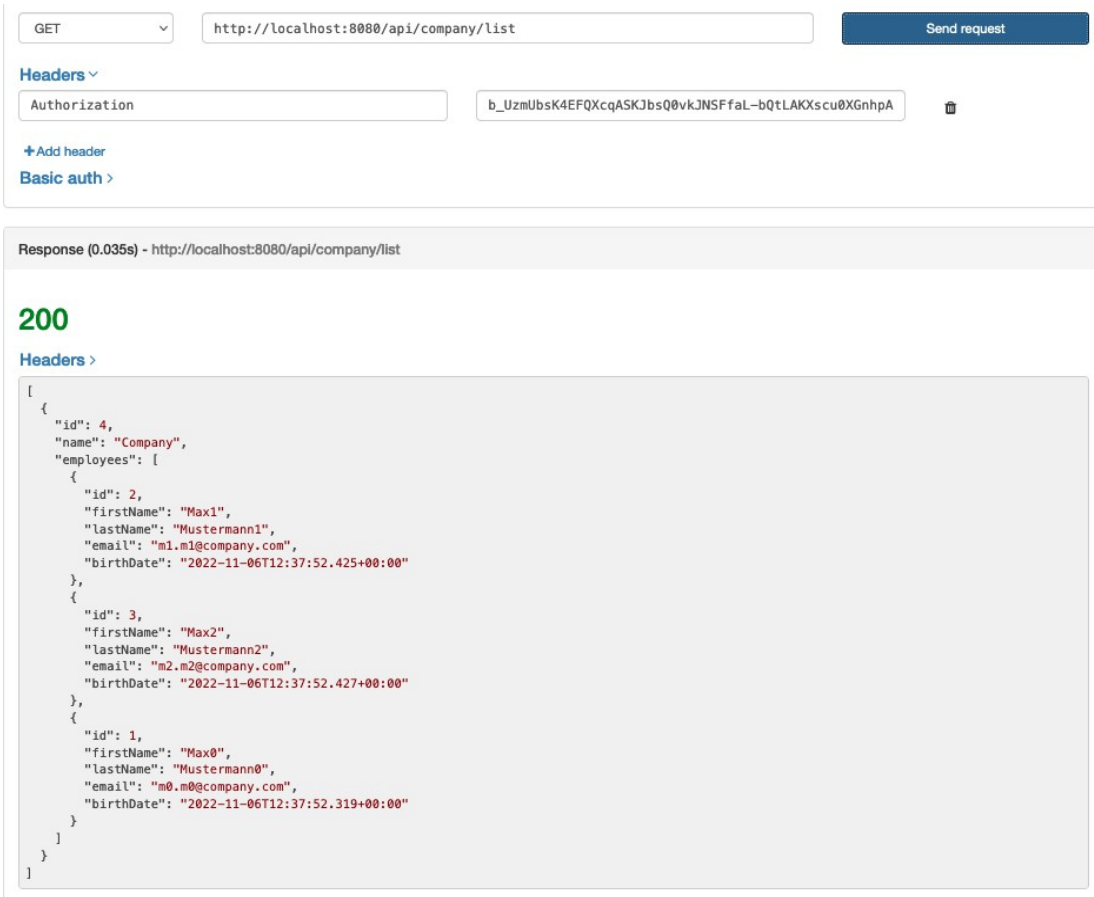
- Access http://localhost:8080/api/employee/list via REST client
- Retrieve an access token as employee3



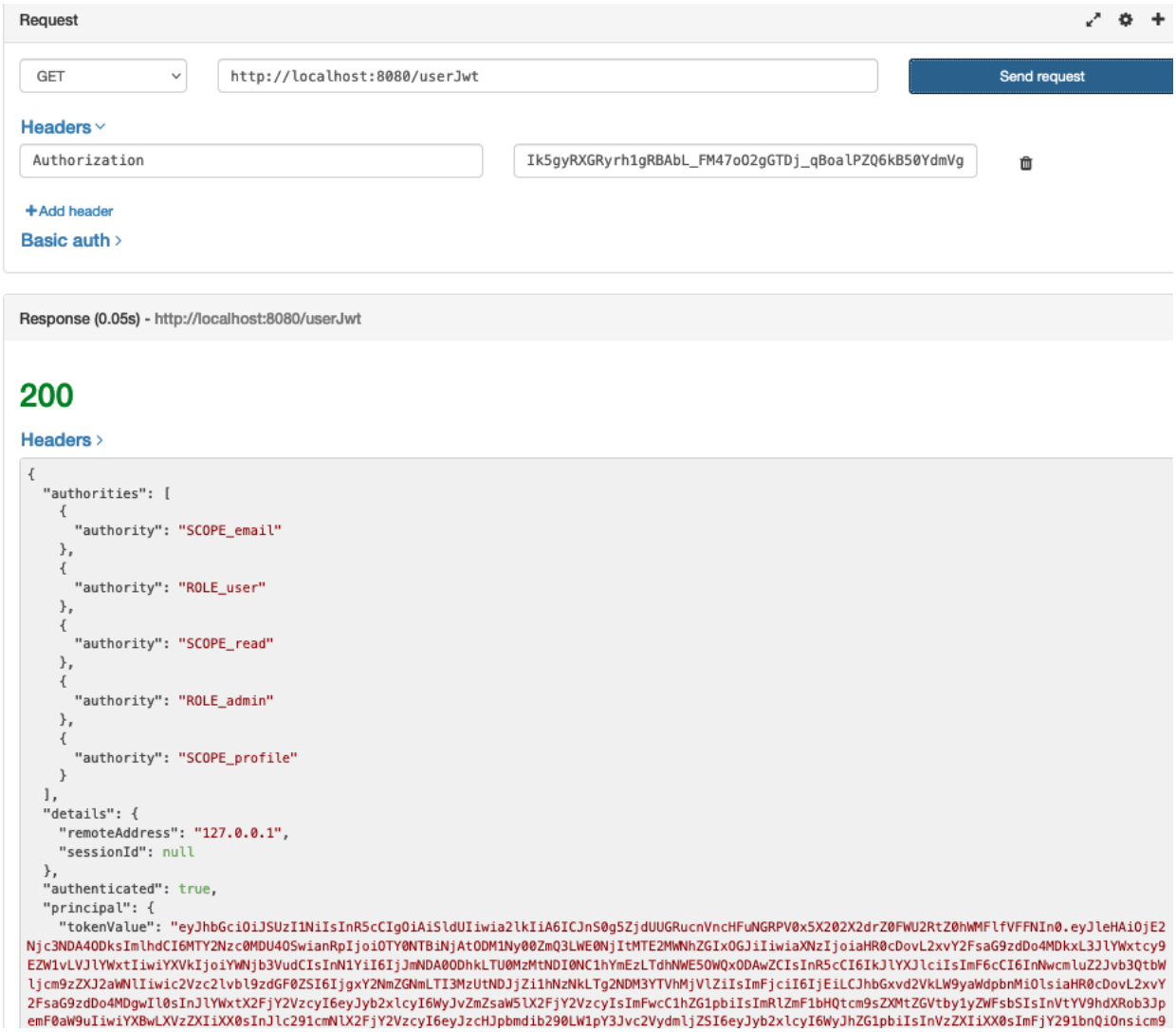
- Call http://localhost:8080/api/employee/list with Authorisation-Header Bearer *y**our access token** *



- Call http://localhost:8080/api/company/list



- Call http://localhost:8080/userJwt



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