

## DEPARTEMENT MATHÉMATIQUES ET INFORMATIQUE

**Filière :**  
**« Génie du Logiciel et des Systèmes Informatiques Distribués »**  
**GLSID3**

# Examen Blanc “Systèmes Distribués”

**Sujet : Système Réactif d'automatisation du processus des contraventions routières liées aux excès vitesses détectés par des radars automatiques**

**Module : Architecture des Systèmes Distribués**

Élaboré par :

ELMAJNI Khaoula

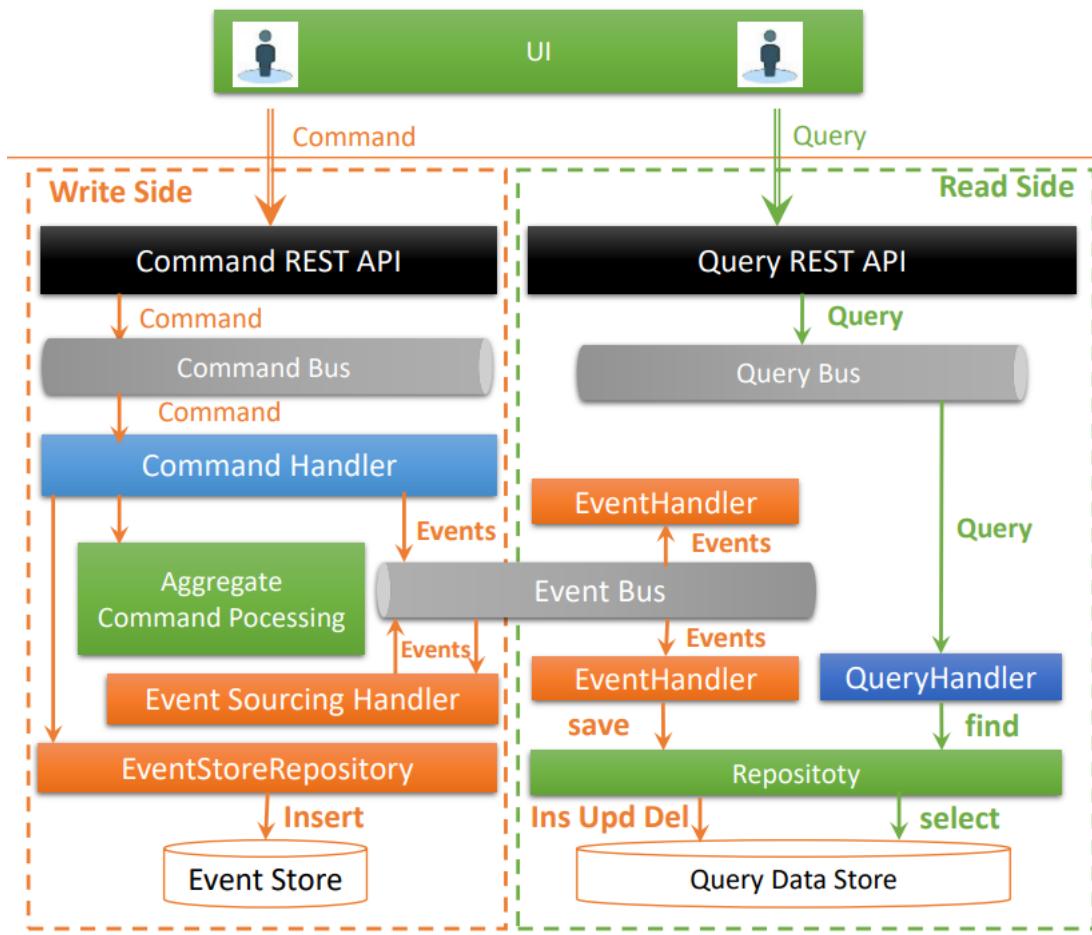
Encadré par :

M. EL YOUSSEFI Mohammed

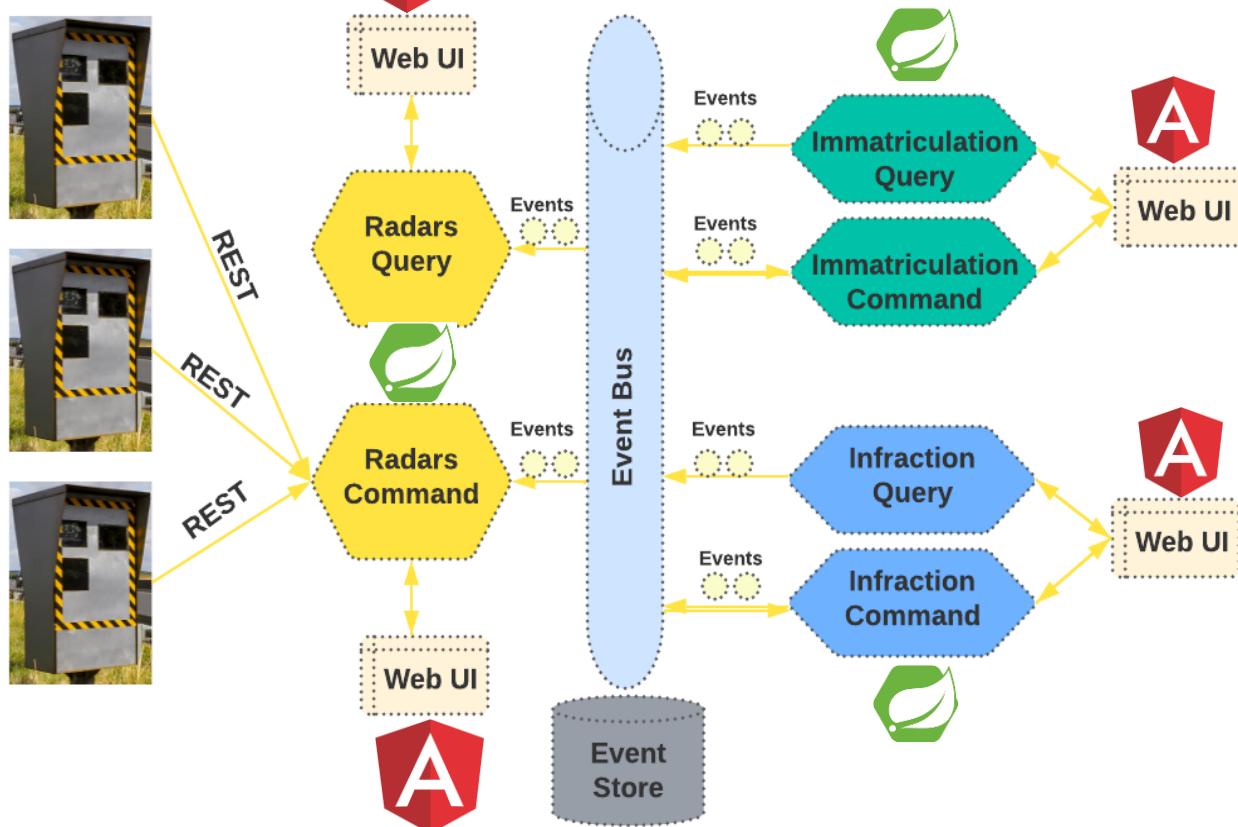
**Année Universitaire : 2022-2023**

## 1. Etablir une architecture technique du projet

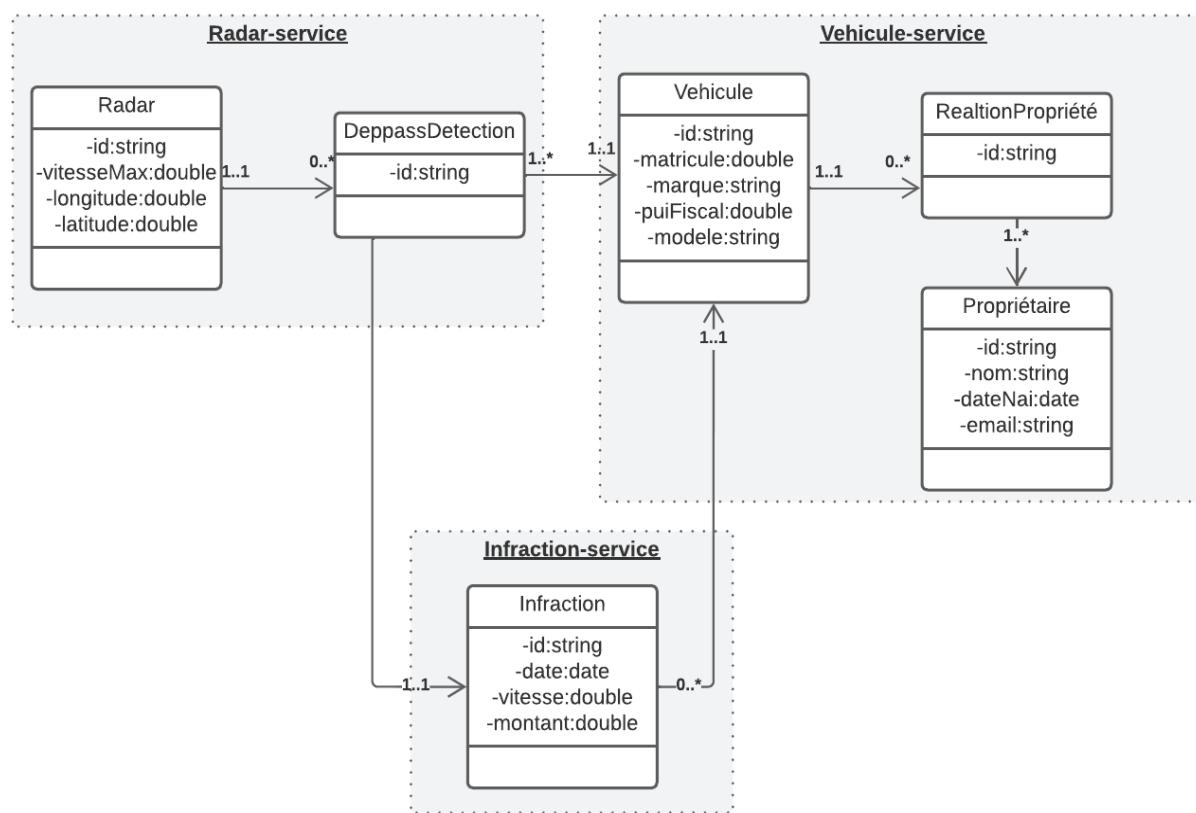
Architecture CQRS :



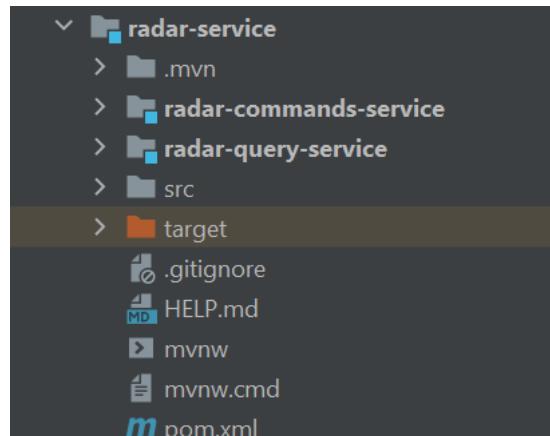
### Architecture du système : A



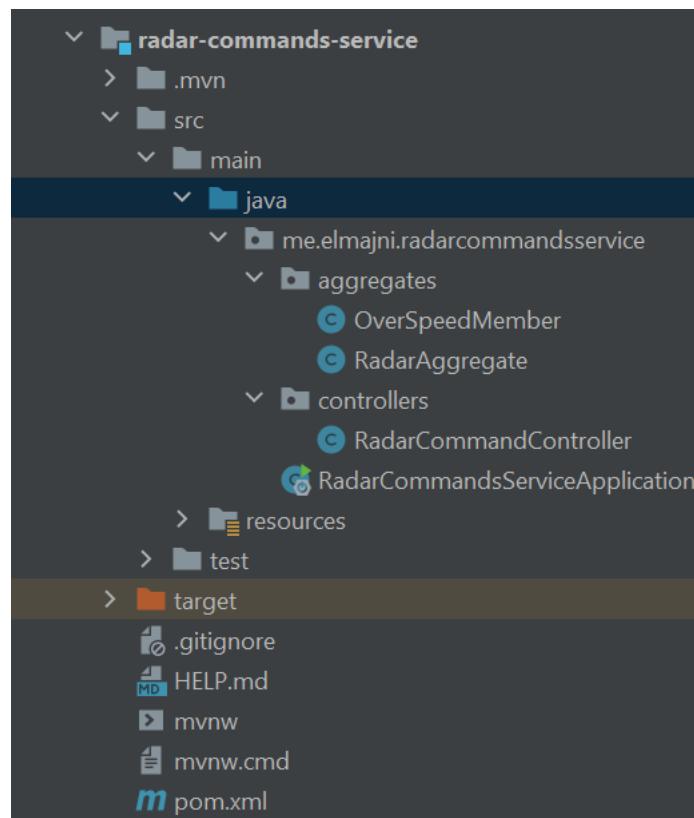
2. Etablir un diagramme de classe global du projet



### 3. Développer le micro-service Radar



**Le service « radar-commands-service » :**



## Les détails du micro service dans AXON :

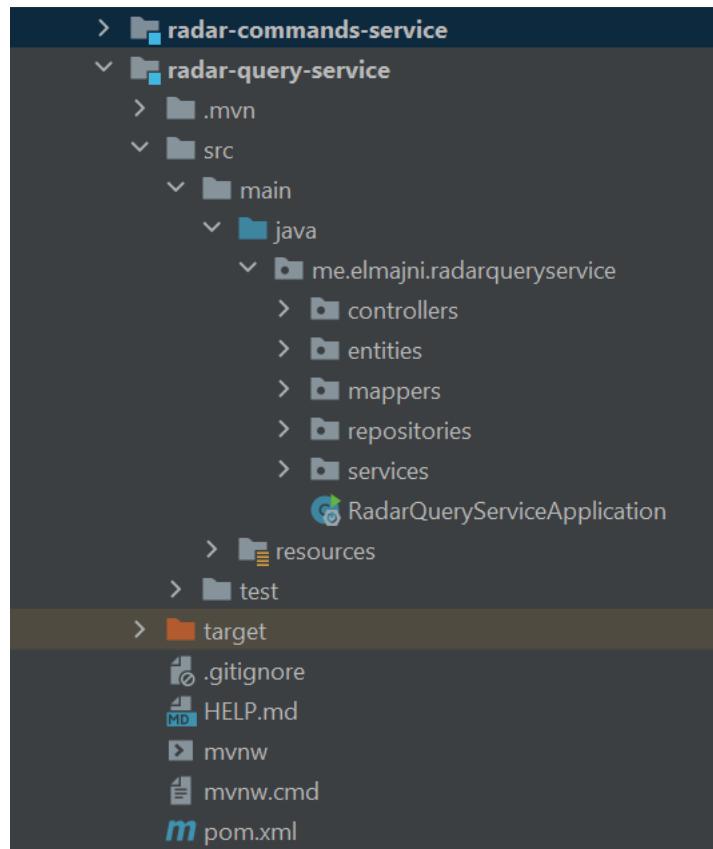
Subscription Queries	#Total Subscription Queries	0
#Active Subscription Queries	0	
#Updates to Subscription Queries	0	

Instance Name	AxonServer Node	Tags
24100@DESKTOP-BUTTERFLY	4ef5ce7bb07e --default	

Command	Response Types	#Subscriptions	#Active Subscriptions	#Updates

Processor Name	Processing Mode	Active Segments	Processor Operations

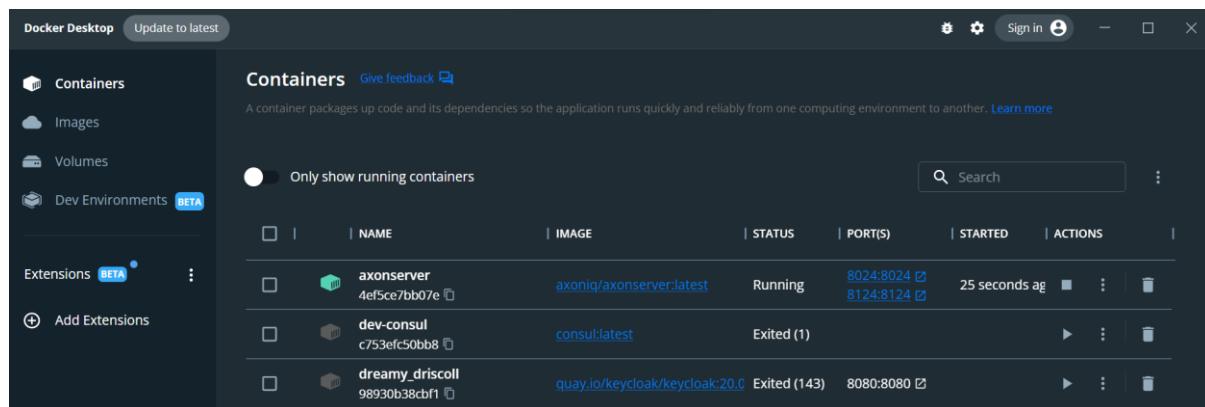
## Le service « radar-query-service » :



### Les détails du micro service dans AXON :

Query	Response Types	#Subscriptions	#Active Subscriptions	#Updates
me.elmajni.commonapi.SubscribeToE...	java.util.List<me.elmajni.commonapi....	0	0	0
me.elmajni.commonapi.GetAllOverSp...	java.util.List<me.elmajni.commonapi....	0	0	0
me.elmajni.commonapi.GetOverSpee...	java.util.List<me.elmajni.commonapi....	0	0	0
me.elmajni.commonapi.GetAllRadar...	java.util.List<me.elmajni.commonapi....	0	0	0
me.elmajni.commonapi.GetRadarByI...	me.elmajni.commonapi.RadarOverSp...	0	0	0
me.elmajni.commonapi.GetAllOverSp...	java.util.List<me.elmajni.commonapi....	0	0	0

Lancement de Axon dans Docker compose :



### Axon dashboard :

localhost:8024

**Axon Server**

SSL disabled

Authentication disabled

**Configuration**

Node Name	4ef5ce7bb07e
Host Name	4ef5ce7bb07e
Http Port	8024
GRPC Port	8124

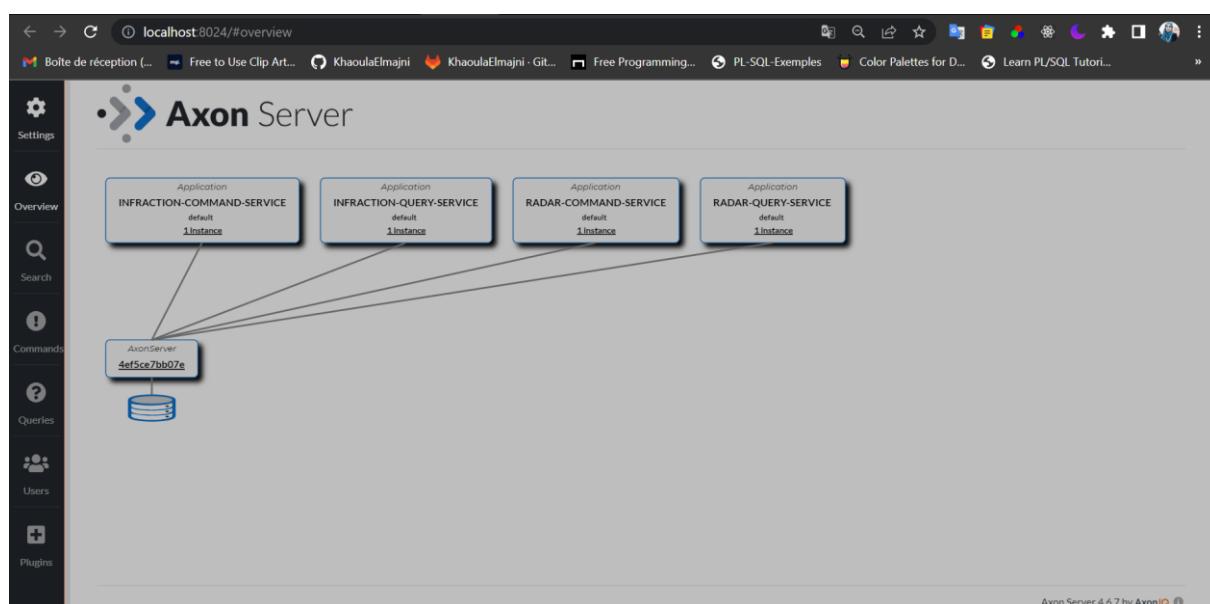
**Status**

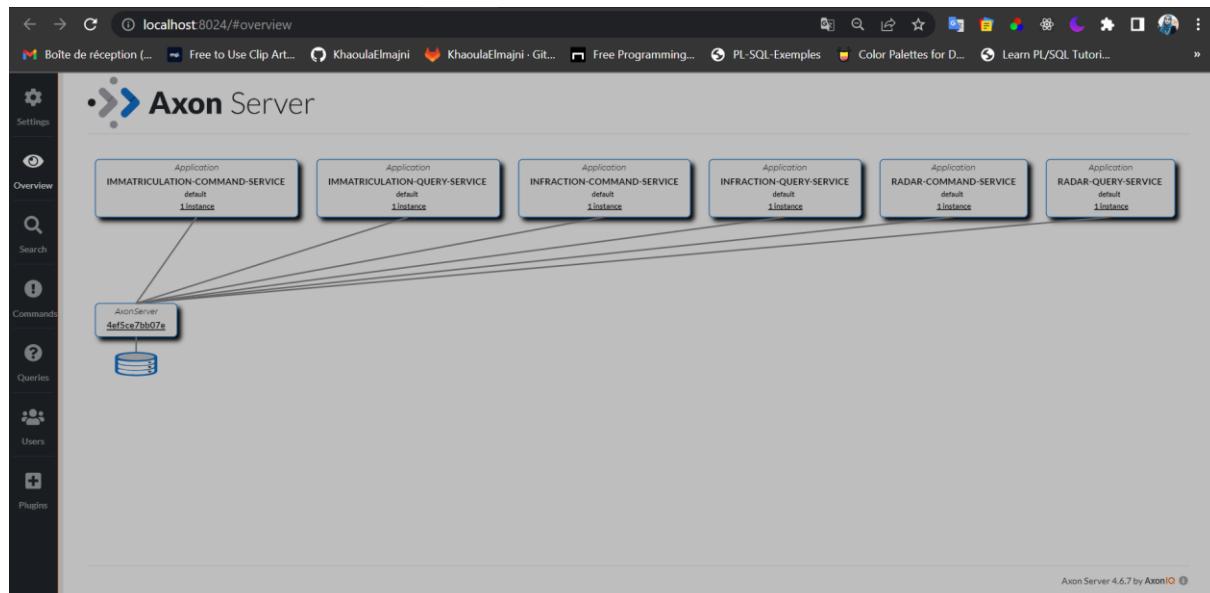
Last event token	-1
Activity in the last minute	
Commands received / second	0
Queries received / second	0
Events stored / second	0
Snapshots stored / second	0

**License**

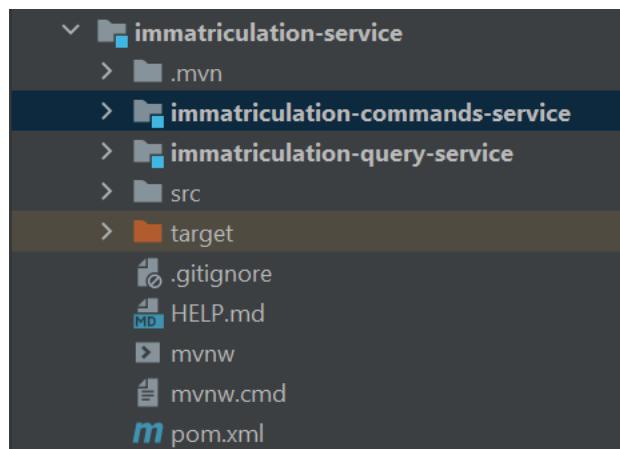
Edition	Standard Edition
---------	------------------

Axon Server 4.6.7 by AxonIQ

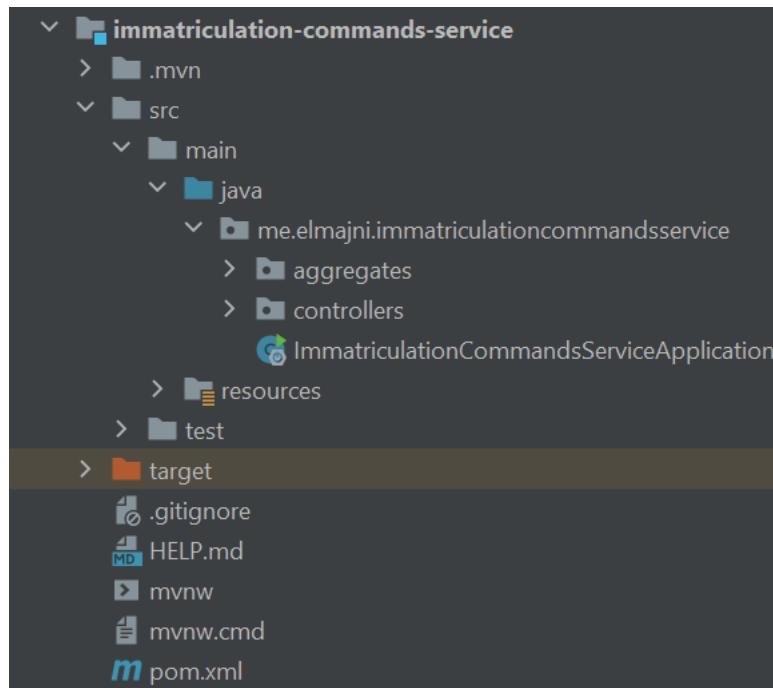




#### 4. Développer le micro-service Immatriculation



**Le service « Immatriculation-commands-service » :**



### Les détails du micro service dans AXON :

localhost:8024/#overview

Application details for IMMATRICATION-COMMAND-SERVICE

Subscription Queries	AxonServer Node	Tags
#Total Subscription Queries: 0	4ef5ce7bb07e ← default	
#Active Subscription Queries: 0		
#Updates to Subscription Queries: 0		

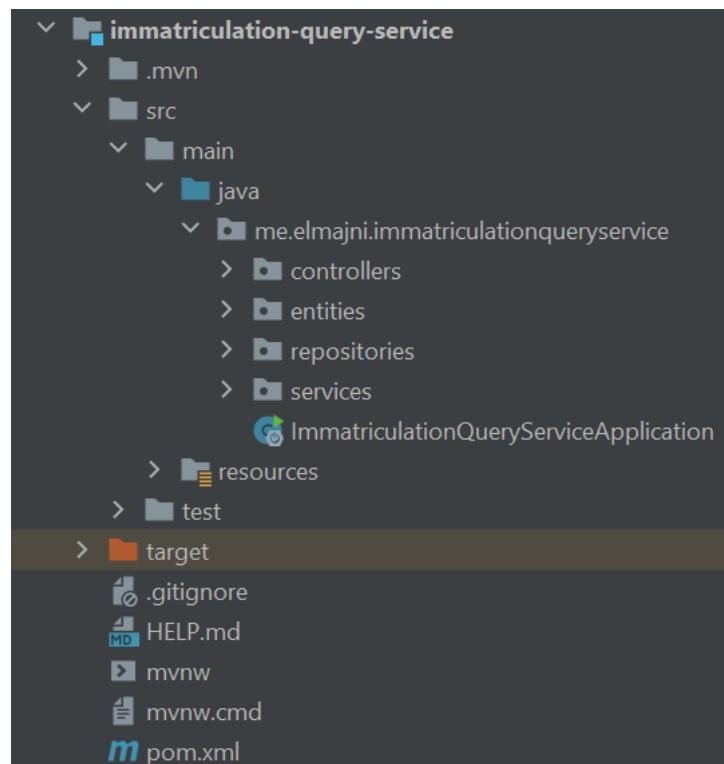
Command
me.elmajni.commonapi.CreateOwnerCommand
me.elmajni.commonapi.CreateVehicleCommand

Query	Response Types	#Subscriptions	#Active Subscriptions	#Updates

Processor Name	Processing Mode	Active Segments	Processor Operations

Axon Server 4.6.7 by AxoniQ

### Le service « Immatriculation-query-service » :



### Les détails du micro service dans AXON :

**Application details for IMMATRICULATION-QUERY-SERVICE**

**Subscription Queries**

#Total Subscription Queries	0
#Active Subscription Queries	0
#Updates to Subscription Queries	0

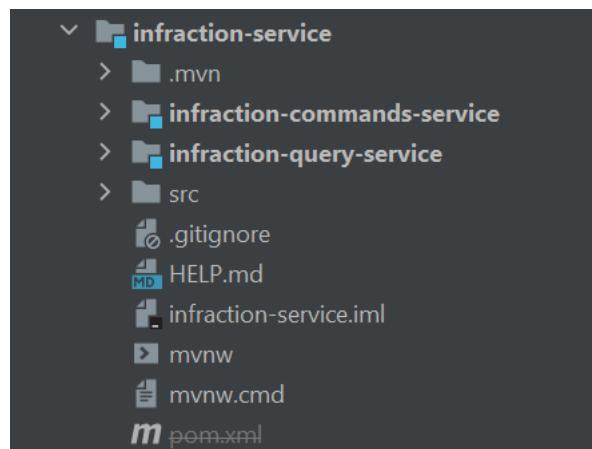
**Commands**

Instance Name	AxonServer Node	Tags
21536@DESKTOP-BUTTERFLY	4ef5ce7bb07e ← default	

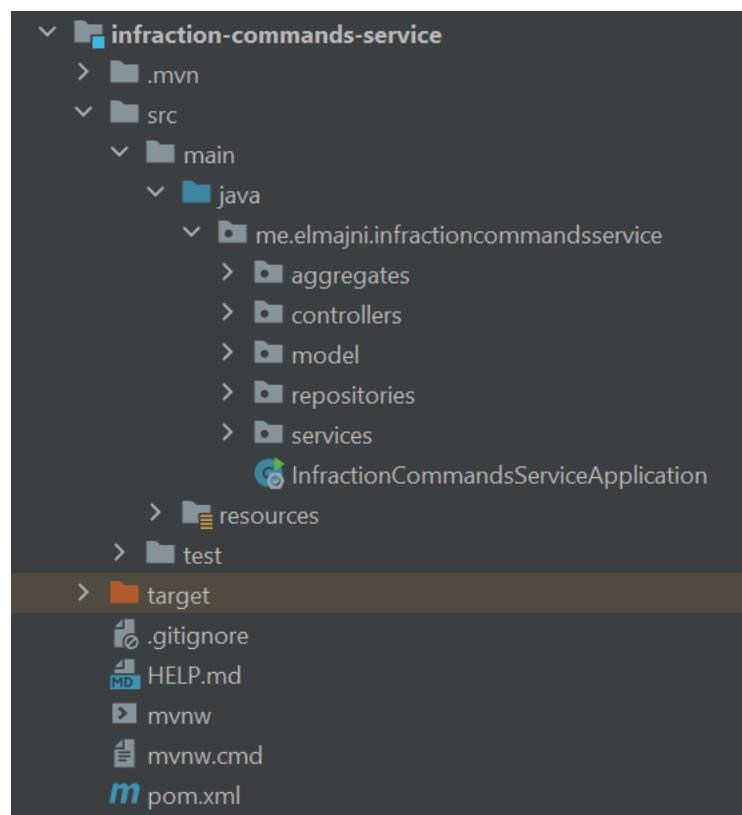
**Processor Operations**

Processor Name	Processing Mode	Active Segments	Processor Operations
me.elmajni.commonapi.GetAllVehicle... (1)	Parallel	1	10
me.elmajni.commonapi.GetAllOwners (1)	Parallel	1	10
me.elmajni.commonapi.GetVehicleBy... (1)	Parallel	1	10

### 5. Développer le micro-service Infractions



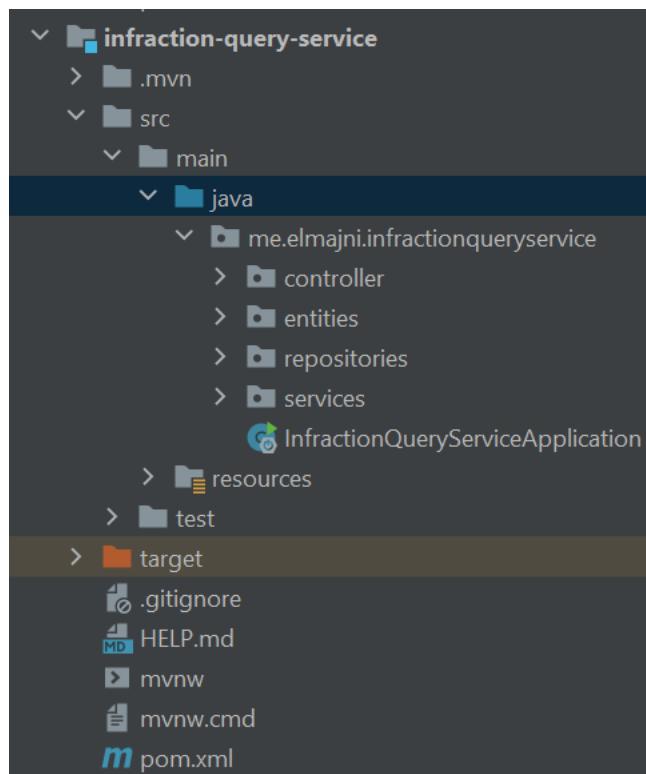
### Le service « Infractions-commands-service » :



### Les détails du micro service dans AXON :

The screenshot shows the Axon Server interface at [localhost:8024/#overview](http://localhost:8024/#overview). The left sidebar includes links for Settings, Overview, Search, Commands, Queries, Users, and Plugins. The main content area is titled "Axon Server" and shows "Application details for INFRACTION-COMMAND-SERVICE". Under "Subscription Queries", it lists #Total Subscription Queries (0), #Active Subscription Queries (0), and #Updates to Subscription Queries (0). Below this is a table with columns for Instance Name, Axon Server Node, and Tags, showing 20336@DESKTOP-BUTTERFLY and 4ef5ce7bb07e --default. The next section, "Command", has a table with columns for Query, Response Types, #Subscriptions, #Active Subscriptions, and #Updates, showing me.elmajni.infractioncommon... and Tracking. At the bottom right, it says "Axon Server 4.6.7 by AxoniO".

### Le service « Infractions -query-service » :



### Les détails du micro service dans AXON :

The screenshot shows the Axon Server interface at [localhost:8024/#/overview](http://localhost:8024/#/overview). The left sidebar has icons for Settings, Overview, Search, Commands, Queries, Users, and Plugins. The main area displays application details for 'INFRACTION-QUERY-SERVICE'. It includes sections for Subscription Queries (Total: 0, Active: 0, Updates: 0), Instance Name (24344@DESKTOP-BUTTERFLY, Tags: AxonServer Node, 4ef5ce7bb07e ← default), Command (me.elmajni.commonapi.GetContravent...), and Processor Operations (Processor Name: me.elmajni.infractionqueryser..., Processing Mode: Tracking, Active Segments: 1, Processor Operations: ④ + ④). At the bottom right, it says 'Axon Server 4.6.7 by AxoniQ'.

6. Mettre en place les services techniques de l'architecture micro-service (Gateway, Eureka Discovery service)

### Le service « Eureka-discovery-service » :

The screenshot shows the Eureka discovery service interface at [localhost:8761](http://localhost:8761). The top navigation bar includes links for Boîte de réception, Free to Use Clip Art, KhaoulaElmajni, Free Programming, PL-SQL-Exemples, Color Palettes for D, Learn PL/SQL Tutor, and others. The main sections are 'System Status' and 'DS Replicas'.

**System Status**

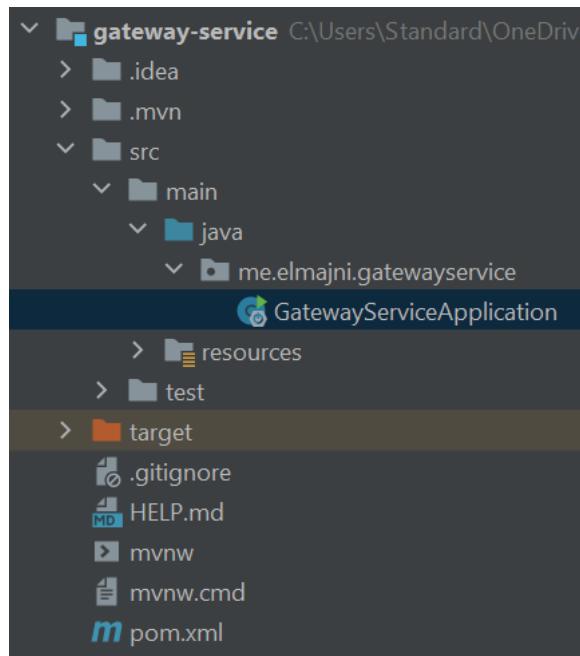
Environment	test	Current time	2022-12-24T22:55:23 +0100
Data center	default	Uptime	00:10
		Lease expiration enabled	true
		Renews threshold	13
		Renews (last min)	22

**DS Replicas**

Instances currently registered with Eureka			
Application	AMIs	Availability Zones	Status
GATEWAY-SERVICE	n/a (1)	(1)	UP (1) - localhost:GATEWAY-SERVICE:9999
IMMATRICULATION-COMMAND-SERVICE	n/a (1)	(1)	UP (1) - DESKTOP-BUTTERFLY:IMMATRICULATION-COMMAND-SERVICE:8081
IMMATRICULATION-QUERY-SERVICE	n/a (1)	(1)	UP (1) - localhost:IMMATRICULATION-QUERY-SERVICE:8082
INFRACTION-COMMAND-SERVICE	n/a (1)	(1)	UP (1) - DESKTOP-BUTTERFLY:INFRACTION-COMMAND-SERVICE:8090
INFRACTION-QUERY-SERVICE	n/a (1)	(1)	UP (1) - DESKTOP-BUTTERFLY:INFRACTION-QUERY-SERVICE:8091
RADAR-COMMAND-SERVICE	n/a (1)	(1)	UP (1) - localhost:RADAR-COMMAND-SERVICE:8181
RADAR-QUERY-SERVICE	n/a (1)	(1)	UP (1) - localhost:RADAR-QUERY-SERVICE:8883

**General Info**

### Le service « Gateway-service » :



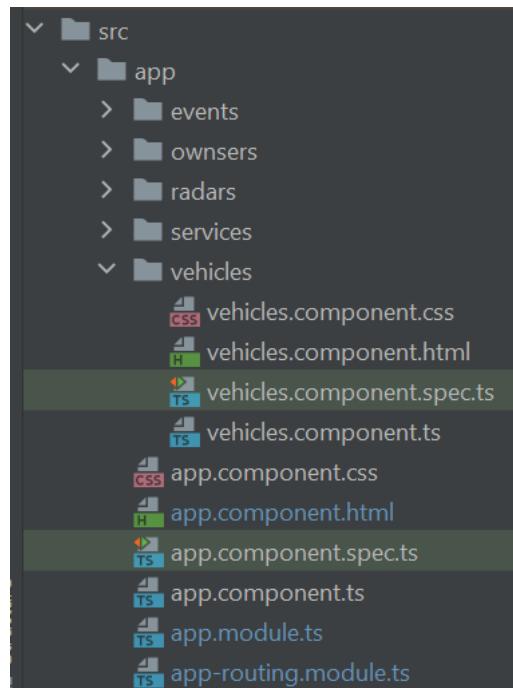
## 7. Développer votre application Frontend avec Angular ou React

```

{
  "name": "radar-web-ui",
  "version": "0.0.0",
  "scripts": {
    "ng": "ng",
    "start": "ng serve",
    "build": "ng build",
    "watch": "ng build --watch --configuration development",
    "test": "ng test"
  },
  "private": true,
  "dependencies": {
    "@angular/animations": "^15.0.0",
    "@angular/common": "^15.0.0",
    "@angular/compiler": "^15.0.0",
    "@angular/core": "^15.0.0"
  }
}

```

Les composants :



### La liste des radars :

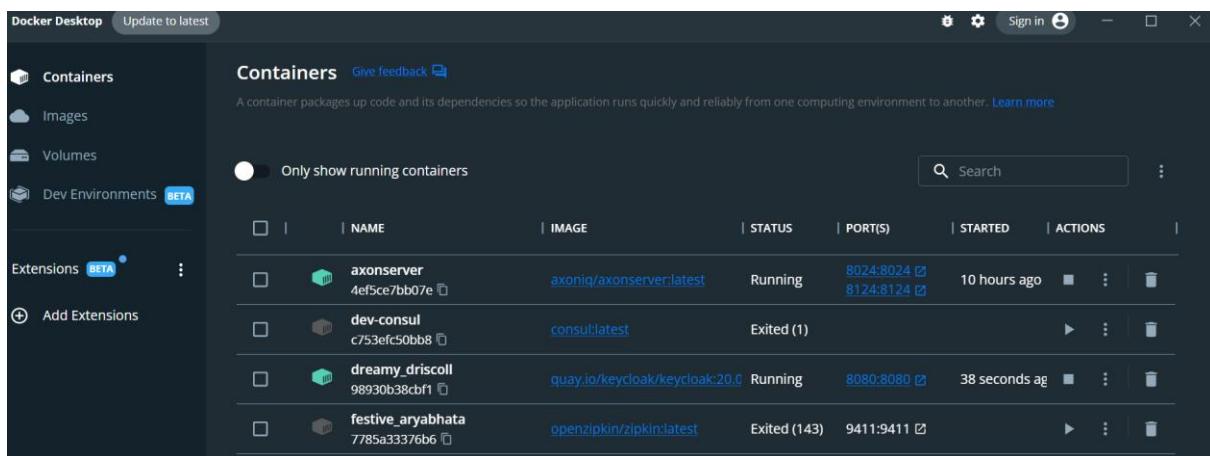
RadarId	Name	Longitude	Latitude	Max Speed	Road	Status	Actions
80f634ac-1187-413f-938e-eb2c00bf2713		string	0	200	string	ACTIVE	[ ] [ ] [ ] [ ]
e998578f-28c7-41ae-9283-20808d874147	R1	20	10	180	A5	ACTIVE	[ ] [ ] [ ] [ ]
f8a5028e-6b20-4581-b5e3-30b20c9537fe	R2	10	20	200	A4	ACTIVE	[ ] [ ] [ ] [ ]
38cf3f08-f316-42b9-b334-bfce376975f	R2	10	20	200	A4	ACTIVE	[ ] [ ] [ ] [ ]
b644e859-e8b7-43c3-8a21-84b5905bbac4	R3	20	15	180	T5	ACTIVE	[ ] [ ] [ ] [ ]

Angular is running in development mode. Call enableProdMode() to enable production mode.

### Les événements passés sur un radar :

Type	Date	Identifier	PayloadType	Action
RadarAggregate	25/12/2022	80f634ac-1187-413f-938e-eb2c00bf2713	me.elmajni.commonapi.RadarCreatedEvent	<button>Event Details</button>
RadarAggregate	25/12/2022	80f634ac-1187-413f-938e-eb2c00bf2713	me.elmajni.commonapi.VehicleOverSpeedDetectedEvent	<button>Event Details</button>
RadarAggregate	25/12/2022	80f634ac-1187-413f-938e-eb2c00bf2713	me.elmajni.commonapi.VehicleOverSpeedDetectedEvent	<button>Event Details</button>
RadarAggregate	25/12/2022	80f634ac-1187-413f-938e-eb2c00bf2713	me.elmajni.commonapi.VehicleOverSpeedDetectedEvent	<button>Event Details</button>
RadarAggregate	25/12/2022	80f634ac-1187-413f-938e-eb2c00bf2713	me.elmajni.commonapi.VehicleOverSpeedDetectedEvent	<button>Event Details</button>
RadarAggregate	25/12/2022	80f634ac-1187-413f-938e-eb2c00bf2713	me.elmajni.commonapi.VehicleOverSpeedDetectedEvent	<button>Event Details</button>
RadarAggregate	25/12/2022	80f634ac-1187-413f-938e-eb2c00bf2713	me.elmajni.commonapi.VehicleOverSpeedDetectedEvent	<button>Event Details</button>
RadarAggregate	25/12/2022	80f634ac-1187-413f-938e-eb2c00bf2713	me.elmajni.commonapi.VehicleOverSpeedDetectedEvent	<button>Event Details</button>
RadarAggregate	25/12/2022	80f634ac-1187-413f-938e-eb2c00bf2713	me.elmajni.commonapi.VehicleOverSpeedDetectedEvent	<button>Event Details</button>

## 8. Sécuriser votre système avec un système de d'authentification OAuth2 comme Keycloak



Création d'un realm :

Create realm

A realm manages a set of users, credentials, roles, and groups. A user belongs to and logs into a realm. Realms are isolated from one another and can only manage and authenticate the users that they control.

Resource file  Drag a file here or browse to upload [Browse...](#) [Clear](#)

Upload a JSON file

Realm name \* radar-realm

Enabled  On

[Create](#) [Cancel](#)

### Création d'un client :

Clients > Create client

Clients are applications and services that can request authentication of a user.

General Settings

Client type OpenID Connect

Client ID \* radar-app

Name radar-app

Description

Always display in console  Off

[Next](#) [Back](#) [Cancel](#)

Manage

Clients

Client scopes

Realm roles

Users

Groups

Sessions

Events

Configure

Realm settings

Authentication

Identity providers

User federation

Access settings

Jump to section

General Settings

Access settings

Capability config

Login settings

Logout settings

Root URL

Home URL

Valid redirect URIs

Valid post logout redirect URIs

Web origins

Admin URL

Save Revert

### Création des utilisateurs :

Users > Create user

Create user

Enabled Action

Username \*

Email

Email verified

First name

Last name

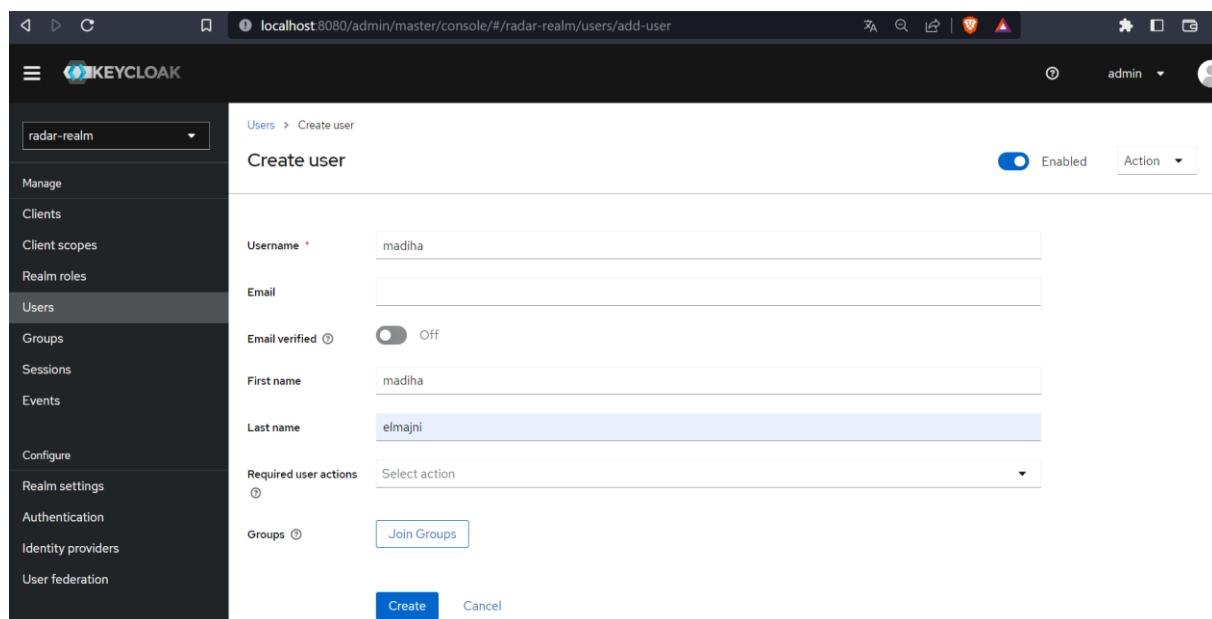
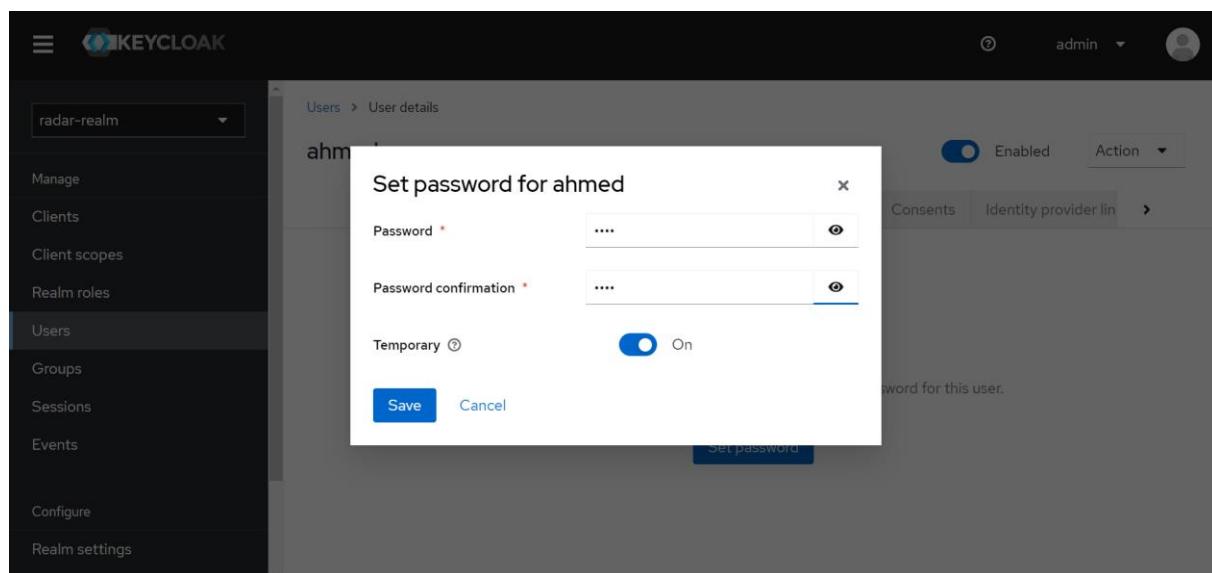
Required user actions

Groups

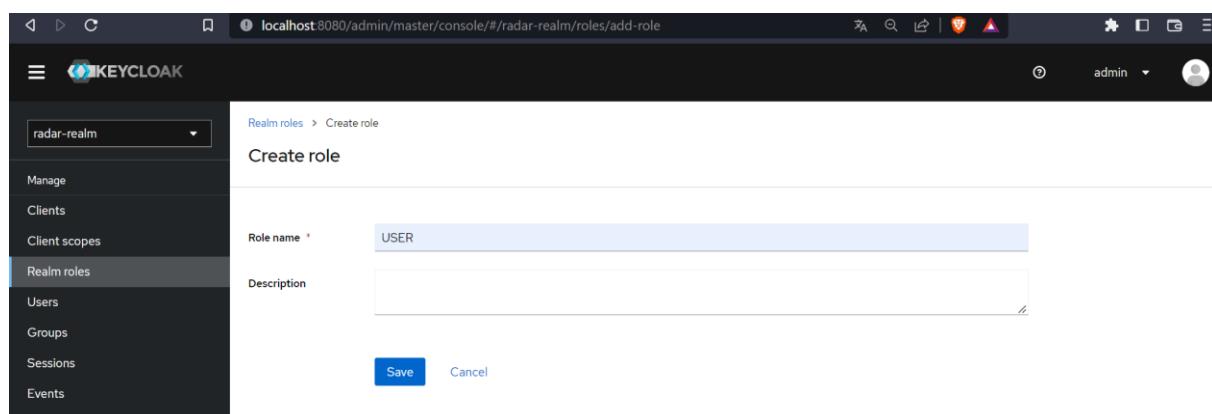
Create Cancel

The screenshot shows the 'Create user' page in the Keycloak Admin Console. The left sidebar is collapsed. The main area shows a form for creating a user named 'ahmed'. The 'Email verified' field is set to 'Off'. The 'First name' and 'Last name' fields are filled with 'ahmed' and 'choukairi' respectively. The 'Required user actions' dropdown is set to 'Select action'. A 'Join Groups' button is visible. At the bottom are 'Create' and 'Cancel' buttons.

The screenshot shows a 'Set password for khaoula' dialog box. It contains fields for 'Password' and 'Password confirmation', both containing '....'. A 'Temporary' toggle switch is turned 'On'. Below the dialog, a message says 'Set a permanent password for this user.' At the bottom are 'Save' and 'Cancel' buttons.



### Création des rôles :



The screenshots illustrate the creation of two new realm roles in the Keycloak admin console:

- Role name:** ADMIN
- Description:** (Empty)
- Role name:** MANAGER
- Description:** (Empty)

### Assignation des roles aux utilisateurs :

The screenshot shows the 'Assign roles to khaoula account' dialog in the Keycloak admin console. The listed roles are:

Name	Description
ADMIN	
MANAGER	
offline_access	#[role_offline-access]
uma_authorization	#[role_uma_authorization]
USER	

Both the ADMIN and USER checkboxes are checked.

Assign roles to ahmed account

Name	Description
<input type="checkbox"/> ADMIN	
<input checked="" type="checkbox"/> MANAGER	
<input type="checkbox"/> offline_access	\${role_offline-access}
<input type="checkbox"/> uma_authorization	\${role_uma_authorization}
<input type="checkbox"/> USER	

Assign roles to madiha account

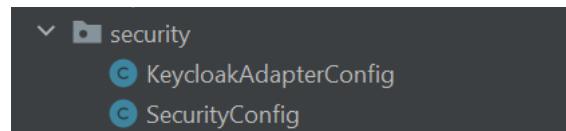
Name	Description
<input type="checkbox"/> ADMIN	
<input type="checkbox"/> MANAGER	
<input type="checkbox"/> offline_access	\${role_offline-access}
<input type="checkbox"/> uma_authorization	\${role_uma_authorization}
<input checked="" type="checkbox"/> USER	

Ajouter les dépendances suivantes dans les 6 micro services:

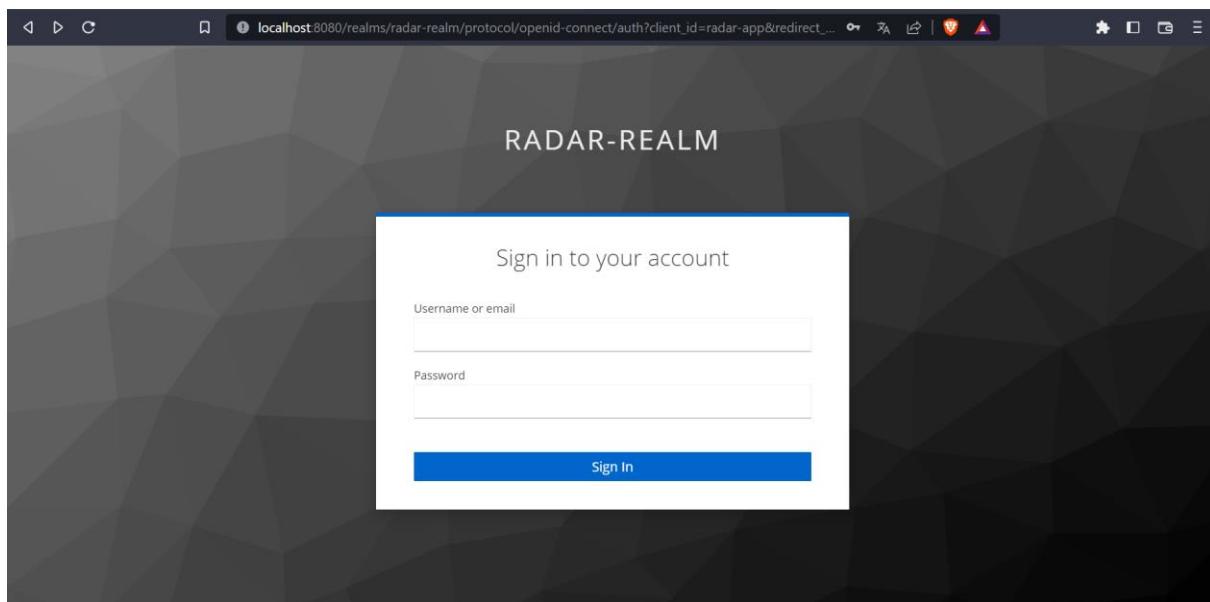
```
<dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-security</artifactId>
</dependency>

<dependency>
    <groupId>org.keycloak</groupId>
    <artifactId>keycloak-spring-boot-starter</artifactId>
    <version>20.0.1</version>
</dependency>
```

Après, la partie de sécurité dans chaque micro-service :



La partie front « Authentification pour accéder » :



9. Ecrire un script docker-compose.yml pour le déploiement de ce système distribué dans des conteneurs docker.

Le script docker-compose :

```
version: '3'
services:
  eureka-service:
    build: ./discovery-service/
    hostname: discovery-service
    ports:
      - "8761:8761"
    networks:
      - default-network

  immatriculation-commands-service:
    build: ./immatriculation-commands-service/
    hostname: immatriculation-commands-service
    ports:
      - "8081:8081"
    depends_on:
      - eureka-service
    environment:
      - eureka.client.service-url.defaultZone=http://discovery-service:8761
    networks:
      - default-network

  immatriculation-query-service:
    build: ./immatriculation-query-service/
```

```
hostname: immatriculation-query-service
ports:
  - "8082:8082"
restart: on-failure
depends_on:
  - eureka-service
environment:
  - eureka.client.service-url.defaultZone=http://discovery-service:8761
networks:
  - default-network

infraction-command-service:
build: ./infraction-command-service/
hostname: infraction-command-service
ports:
  - "8090:8090"
restart: on-failure
depends_on:
  - eureka-service
environment:
  - eureka.client.service-url.defaultZone=http://discovery-service:8761
networks:
  - default-network

infraction-query-service:
build: ./infraction-query-service/
hostname: infraction-query-service
ports:
  - "8091:8091"
restart: on-failure
depends_on:
  - eureka-service
environment:
  - eureka.client.service-url.defaultZone=http://discovery-service:8761
networks:
  - default-network

radar-command-service:
build: ./radar-command-service/
hostname: radar-command-service
ports:
  - "8181:8181"
restart: on-failure
depends_on:
  - eureka-service
environment:
  - eureka.client.service-url.defaultZone=http://discovery-service:8761
networks:
  - default-network

radar-query-service:
build: ./radar-query-service/
hostname: radar-query-service
ports:
  - "8883:8883"
restart: on-failure
depends_on:
  - eureka-service
environment:
  - eureka.client.service-url.defaultZone=http://discovery-service:8761
```

```

networks:
  - default-network

gateway-service:
  build: ./gateway-service/
  hostname: gateway-service
  ports:
    - "9999:9999"
  depends_on:
    - eureka-service
    - immatriculation-query-service
    - immatriculation-command-service
    - infraction-command-service
    - infraction-query-service
    - radar-command-service
    - radar-query-service
  environment:
    - eureka.client.service-url.defaultZone=http://discovery-
service:8761/eureka
  networks:
    - default-network

networks:
  default-network:
    driver: bridge

```

la documentation swagger du « radar-command-service » :

la documentation swagger du « infraction-command-service » :

The screenshot shows the Swagger UI interface for an OpenAPI definition. At the top, it says "OpenAPI definition v0 OAS3". Below that is a "Servers" section with a dropdown set to "http://localhost:8090 - Generated server url". Under the heading "contravention-command-controller", there is a single API endpoint listed: "GET /commands/events/{contraventionId}".

La documentation swagger du « infraction-query-service » :

The screenshot shows the Swagger UI interface for an OpenAPI definition. At the top, it says "OpenAPI definition v0 OAS3". Below that is a "Servers" section with a dropdown set to "http://localhost:8091 - Generated server url". Under the heading "contravention-query-controller", there is a single API endpoint listed: "GET /query/contraventions".

la documentation swagger du « immatriculation-command-service » :

The screenshot shows the Swagger UI interface for an OpenAPI definition. At the top, it says "OpenAPI definition v0 OAS3". Below that is a "Servers" section with a dropdown set to "http://localhost:8081 - Generated server url". Under the heading "vehicle-command-controller", there are two API endpoints: "POST /commands/vehicle/create" and "GET /commands/eventStore/{id}". Under the heading "owner-command-controller", there are two API endpoints: "POST /command/owner/create" and "GET /command/owner/eventStore/{id}".

La documentation swagger du « immatriculation-query-service » :



The screenshot shows the Swagger UI interface for a REST API. At the top, it displays the URL `localhost:8082/swagger-ui/index.html?configUrl=/v3/api-docs/swagger-config#`. Below this, the title "OpenAPI definition" is shown with a "v0 OAS3" badge. A dropdown menu under "Servers" is set to `http://localhost:8082 - Generated server url`.

**vehicle-query-controller**

- `GET /query/vehicle/{id}`
- `GET /query/vehicle/all`

**owner-query-controller**

- `GET /query/owner/{id}`
- `GET /query/owner/`

La liste des dépassements de vitesse :

The screenshot shows a browser window with the URL `localhost:8883/query/watchOverSpeeds`. The page displays a large JSON array of speed violation data. Each entry includes fields such as `overSpeedId`, `dateTimeStamp`, `radarId`, `vehicleRegistrationNumber`, and `vehicleSpeed`.

```

[{"overSpeedId": "6ed9e6f0-5a8e-43a1-b733-73d56b5b762", "timeStamp": "2022-12-25T11:35:51.477Z", "radarId": "", "vehicleRegistrationNumber": "1-E-2", "vehicleSpeed": 9}, {"overSpeedId": "8da987e4-5e8f-4c9e-a0c0-686e68ab471a", "timeStamp": "2022-12-25T11:35:51.680Z", "radarId": "", "vehicleRegistrationNumber": "2-E-2", "vehicleSpeed": 30}, {"overSpeedId": "9d518899-4ea6-4271-87bf-5bec5243ebdh", "timeStamp": "2022-12-25T11:35:51.799Z", "radarId": "", "vehicleRegistrationNumber": "4-D-3", "vehicleSpeed": 59}, {"overSpeedId": "af577a56-997e-4888-93fa-3c929aa113c", "timeStamp": "2022-12-25T11:35:51.891Z", "radarId": "", "vehicleRegistrationNumber": "7-E-3", "vehicleSpeed": 62}, {"overSpeedId": "f0e746f3-9cf7-4402-aec9-315f4d399785", "timeStamp": "2022-12-25T11:35:52.611Z", "radarId": "", "vehicleRegistrationNumber": "1-C-1", "vehicleSpeed": 6}, {"overSpeedId": "d7c8436a-dace-49db-aef7-49a8f6a4a25", "timeStamp": "2022-12-25T11:35:53.600Z", "radarId": "", "vehicleRegistrationNumber": "1-C-1", "vehicleSpeed": 17}, {"overSpeedId": "2f19cd3-3dde-4b24-af68-427928378024", "timeStamp": "2022-12-25T11:35:54.599Z", "radarId": "", "vehicleRegistrationNumber": "9-F-1", "vehicleSpeed": 11}, {"overSpeedId": "3c44b2d4-1613-47c9-982a-ffedce65a3ec", "timeStamp": "2022-12-25T11:35:55.605Z", "radarId": "", "vehicleRegistrationNumber": "8-B-3", "vehicleSpeed": 30}, {"overSpeedId": "15465483-32b8-4b22-1b85-5d48d36a556c", "timeStamp": "2022-12-25T11:35:56.603Z", "radarId": "", "vehicleRegistrationNumber": "2-D-1", "vehicleSpeed": 64}, {"overSpeedId": "932d42b6-9d9-4a03-997e-c5a395ff62a", "timeStamp": "2022-12-25T11:35:57.606Z", "radarId": "", "vehicleRegistrationNumber": "7-E-3", "vehicleSpeed": 55}, {"overSpeedId": "cafcd514-9bf7-4fc3-a084-b2ab1139ca069", "timeStamp": "2022-12-25T11:35:58.603Z", "radarId": "", "vehicleRegistrationNumber": "0-F-1", "vehicleSpeed": 5}, {"overSpeedId": "840439ec-e470-4075-b0e9-a83c98e92ch1", "timeStamp": "2022-12-25T11:35:59.603Z", "radarId": "", "vehicleRegistrationNumber": "7-D-2", "vehicleSpeed": 14}, {"overSpeedId": "5cd14da-07cc-46c8-9be2-f9570b7a261", "timeStamp": "2022-12-25T11:36:00.605Z", "radarId": "", "vehicleRegistrationNumber": "0-A-2", "vehicleSpeed": 26}, {"overSpeedId": "8a9f1331-b70a-48f8-8f7a-f646f9e612af", "timeStamp": "2022-12-25T11:36:01.635Z", "radarId": "", "vehicleRegistrationNumber": "2-E-1", "vehicleSpeed": 20}, {"overSpeedId": "77163255-08b0-4670-8abd-17db75d6a34d", "timeStamp": "2022-12-25T11:36:02.627Z", "radarId": "", "vehicleRegistrationNumber": "1-B-3", "vehicleSpeed": 6}, {"overSpeedId": "56264628-9255-4bfd-9a6f-8d8804fa096f", "timeStamp": "2022-12-25T11:36:03.719Z", "radarId": "", "vehicleRegistrationNumber": "9-B-3", "vehicleSpeed": 56}, {"overSpeedId": "eb6991f6-1f26-4a15-9202-7cffd0a16c5", "timeStamp": "2022-12-25T11:36:04.604Z", "radarId": "", "vehicleRegistrationNumber": "5-A-3", "vehicleSpeed": 11}, {"overSpeedId": "3219c3dc-aef5-4836-1bbf-547c9f89a7f7", "timeStamp": "2022-12-25T11:36:05.601Z", "radarId": "", "vehicleRegistrationNumber": "8-C-3", "vehicleSpeed": 28}, {"overSpeedId": "33394b43-85ff-4206-9ac5-9eae406b314", "timeStamp": "2022-12-25T11:36:06.602Z", "radarId": "", "vehicleRegistrationNumber": "5-E-1", "vehicleSpeed": 20}, {"overSpeedId": "3597f784-9860-4bf4-b2ab-4dd282471859", "timeStamp": "2022-12-25T11:36:07.621Z", "radarId": "", "vehicleRegistrationNumber": "8-C-3", "vehicleSpeed": 32}, {"overSpeedId": "9960c7ef-46e1-438c-82c0-0ed3a5b5adba", "timeStamp": "2022-12-25T11:36:08.637Z", "radarId": "", "vehicleRegistrationNumber": "5-C-1", "vehicleSpeed": 45}, {"overSpeedId": "fb273d4b8-d635-4979-9a2d-d047dd67df0", "timeStamp": "2022-12-25T11:36:09.879Z", "radarId": "", "vehicleRegistrationNumber": "4-E-3", "vehicleSpeed": 50}, {"overSpeedId": "aca37972-4001-41e5-90fa-bac93295d55a", "timeStamp": "2022-12-25T11:36:10.649Z", "radarId": "", "vehicleRegistrationNumber": "0-B-2", "vehicleSpeed": 29}

```

La liste des dépassements de vitesse :

```

[{"overSpeedId": "6ed9e6f0-5a8e-43a1-b731-75dd50a5b762", "timeStamp": "2022-12-25T11:35:51.477Z", "radarId": "", "vehicleRegistrationNumber": "1-E-2", "vehicleSpeed": 9}, {"overSpeedId": "8dca97e4-4edf-4c9e-a0cb-686e68ab4710", "timeStamp": "2022-12-25T11:35:51.600Z", "radarId": "", "vehicleRegistrationNumber": "2-E-2", "vehicleSpeed": 30}, {"overSpeedId": "9d518909-4ea6-4271-87bf-5bec5243ebdb", "timeStamp": "2022-12-25T11:35:51.790Z", "radarId": "", "vehicleRegistrationNumber": "4-D-0", "vehicleSpeed": 55}, {"overSpeedId": "af577a56-097e-4888-93f4-33c929aa113c", "timeStamp": "2022-12-25T11:35:51.891Z", "radarId": "", "vehicleRegistrationNumber": "7-C-3", "vehicleSpeed": 62}, {"overSpeedId": "f0e746f3-9cf7-4402-aec9-315f4d399785", "timeStamp": "2022-12-25T11:35:52.015Z", "radarId": "", "vehicleRegistrationNumber": "1-C-1", "vehicleSpeed": 6},]

```

La liste des radars :

```

[{"radarId": "80fb34ac-1187-413f-938e-e62c006f2713", "name": "string", "longitude": 0, "latitude": 0, "altitude": 0, "maxSpeed": 0, "roadDesignation": "string", "radarStatus": "ACTIVE"}, {"radarId": "e998578f-28c7-41ae-9283-20000d874147", "name": "R1", "longitude": 20, "latitude": 10, "altitude": 120, "maxSpeed": 100, "roadDesignation": "A9", "radarStatus": "ACTIVE"}, {"radarId": "f8a5026e-6b20-4581-b5e3-30620c9537fe", "name": "R2", "longitude": 10, "latitude": 20, "altitude": 120, "maxSpeed": 200, "roadDesignation": "A4", "radarStatus": "ACTIVE"}, {"radarId": "38cf3f08-f316-42b9-b334-bfcefd7697ef", "name": "R3", "longitude": 10, "latitude": 20, "altitude": 120, "maxSpeed": 200, "roadDesignation": "A4", "radarStatus": "ACTIVE"}]

```

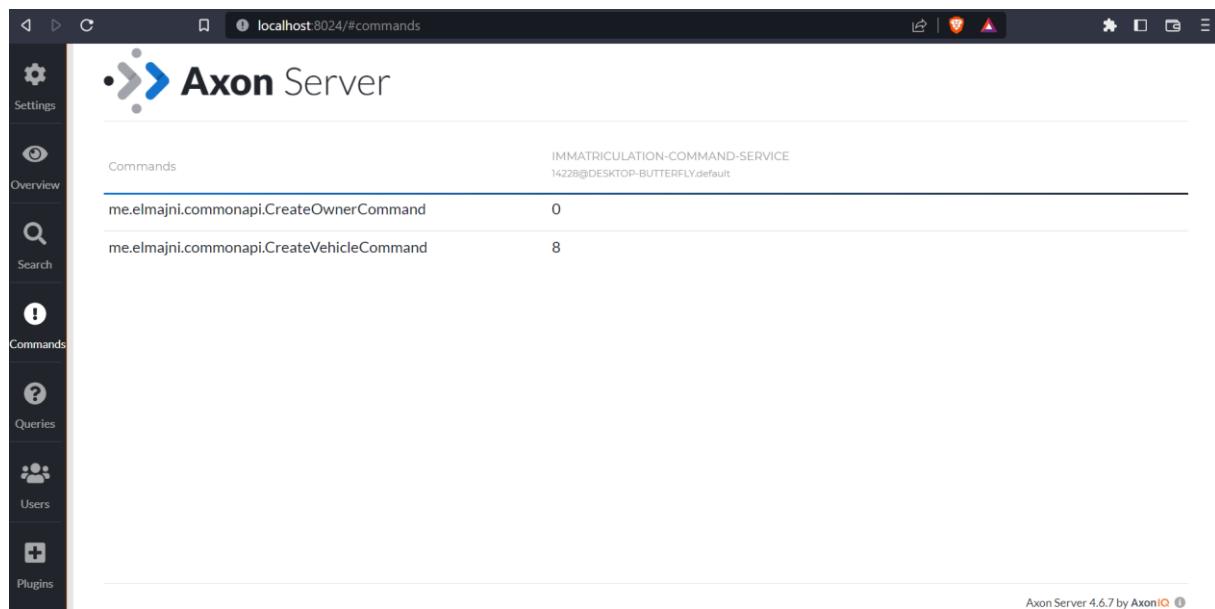
La liste des événements dans AXON:

token	eventIdentifier	aggregateIdentifier	aggregateSequenceNumber	aggregateType	payloadType	payloadData	timestamp	metaData
4119	3d06a52c...	80a3e105...	0	VehicleAgg...	me.elmajni.commonapi.V...	<me.elmajni.commonapi.VehicleCr...	2022-12...	{traceld...
4118	e9137f34...	e038b0df...	0	VehicleAgg...	me.elmajni.commonapi.V...	<me.elmajni.commonapi.VehicleCr...	2022-12...	{traceld...
4117	27fbda1...	5c47714d...	0	VehicleAgg...	me.elmajni.commonapi.V...	<me.elmajni.commonapi.VehicleCr...	2022-12...	{traceld...
4116	adfe4f12-d...	6772b1b2...	0	VehicleAgg...	me.elmajni.commonapi.V...	<me.elmajni.commonapi.VehicleCr...	2022-12...	{traceld...
4115	568cb691...	378a2785...	0	VehicleAgg...	me.elmajni.commonapi.V...	<me.elmajni.commonapi.VehicleCr...	2022-12...	{traceld...
4114	bc620251...	da245718...	0	VehicleAgg...	me.elmajni.commonapi.V...	<me.elmajni.commonapi.VehicleCr...	2022-12...	{traceld...
4113	b8edc8f2...	0bc66128...	0	VehicleAgg...	me.elmajni.commonapi.V...	<me.elmajni.commonapi.VehicleCr...	2022-12...	{traceld...
4112	9073fa6d...	1742e6a0...	0	VehicleAgg...	me.elmajni.commonapi.V...	<me.elmajni.commonapi.VehicleCr...	2022-12...	{traceld...

### Les détails d'un événement :

token	Name	Value	Copy
4121	f2 token	4120	
4120	bu eventIdentifier	b6e5b167-ea0e-4f86-a9c9-07905d271c63	
4119	3d aggregateIdentifier	e998578f-28c7-41ae-9283-20808d874147	
4118	aggregatelnentifier	50	
4117	e1 aggregateType	RadarAggregate	
4116	2 payloadType	me.elmajni.commonapi.VehicleOverSpeedDetectedEvent	
4115	ad payloadRevision		
4114	5 payloadData	<me.elmajni.commonapi.VehicleOverSpeedDetectedEvent><id class="string" defined-in="me.elmajni.commonapi.BaseEvent">e998578f-28c7-41ae-9283-20808d874147</id><id>e998578f-28c7-41ae-9283-20808d874147</id><payload><radarId>e998578f-28c7-41ae-9283-20808d874147</radarId><timeStamp>2022-12-	
4113	bu		
4112	9073fa6d... 1742e6a0... 0	VehicleAgg... me.elmajni.commonapi.V...	<me.elmajni.commonapi.VehicleCr... 2022-12... {traceld...

### Les commandes



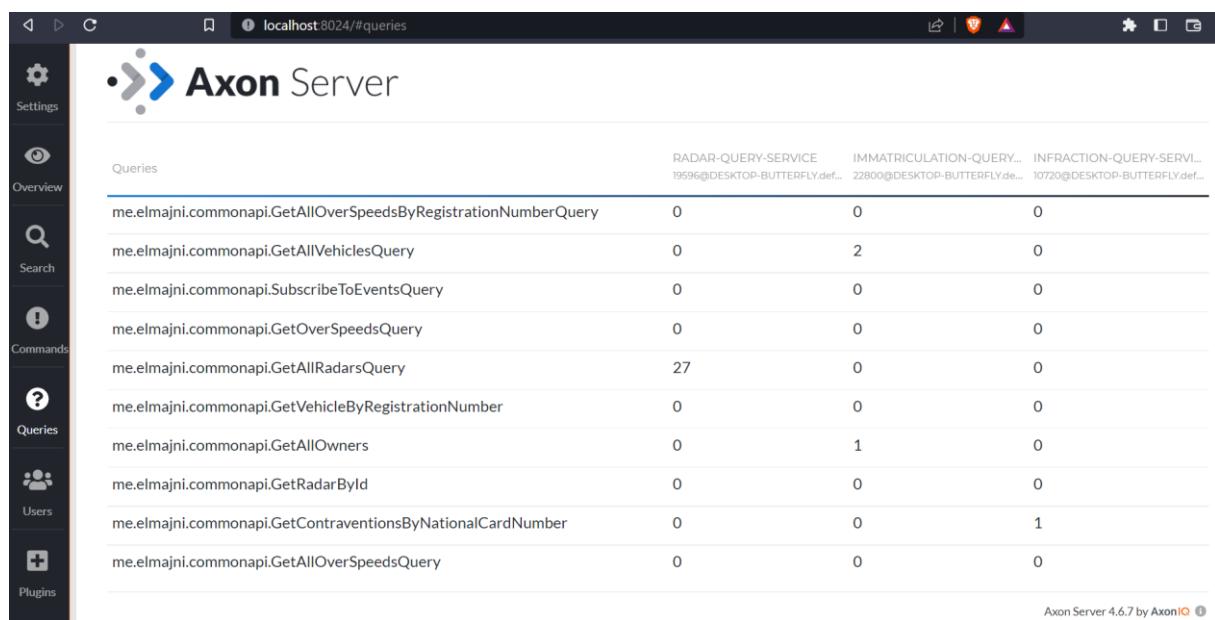
The screenshot shows the Axon Server interface at [localhost:8024/#commands](http://localhost:8024/#commands). The left sidebar has a 'Commands' icon selected. The main area displays a table of commands:

Command	Count
me.elmajni.commonapi.CreateOwnerCommand	0
me.elmajni.commonapi.CreateVehicleCommand	8

Header information: IMMATRICULATION-COMMAND-SERVICE, 14228@DESKTOP-BUTTERFLY.default.

Axon Server 4.6.7 by AxoniQ

La liste des queries des micro-services :



The screenshot shows the Axon Server interface at [localhost:8024/#queries](http://localhost:8024/#queries). The left sidebar has a 'Queries' icon selected. The main area displays a table of queries:

Query	RADAR-QUERY-SERVICE	IMMATRICULATION-QUERY-SERVICE	INFRACTION-QUERY-SERVICE
me.elmajni.commonapi.GetAllOverSpeedsByRegistrationNumberQuery	0	0	0
me.elmajni.commonapi.GetAllVehiclesQuery	0	2	0
me.elmajni.commonapi.SubscribeToEventsQuery	0	0	0
me.elmajni.commonapi.GetOverSpeedsQuery	0	0	0
me.elmajni.commonapi.GetAllRadarsQuery	27	0	0
me.elmajni.commonapi.GetVehicleByRegistrationNumber	0	0	0
me.elmajni.commonapi.GetAllOwners	0	1	0
me.elmajni.commonapi.GetRadarById	0	0	0
me.elmajni.commonapi.GetContraventionsByNationalCardNumber	0	0	1
me.elmajni.commonapi.GetAllOverSpeedsQuery	0	0	0

Header information: 19596@DESKTOP-BUTTERFLY.default., 22800@DESKTOP-BUTTERFLY.default., 10720@DESKTOP-BUTTERFLY.default.

Axon Server 4.6.7 by AxoniQ