

Rapport

Activité Pratique N° 4 (Contrôle)

Objectif :

Créer une application basée sur une architecture micro-service qui permet de gérer les factures contenant des produits et appartenant à un client.



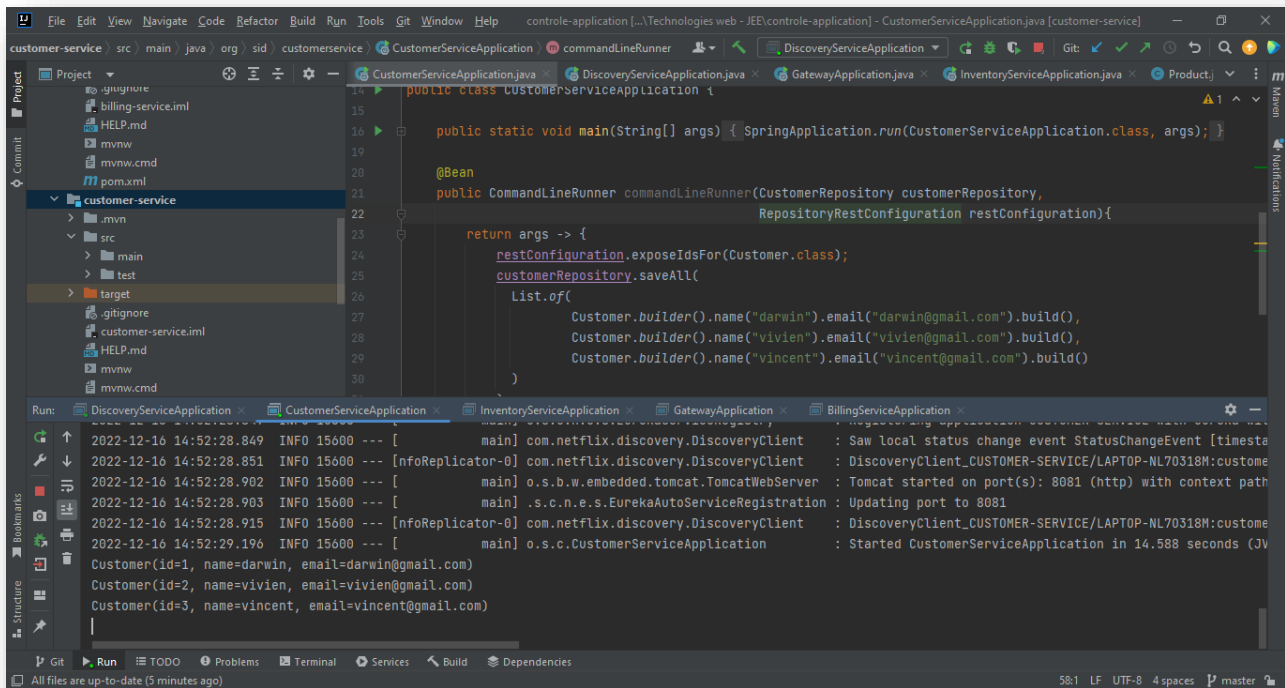
Nom : DITONGA ESSONO

Prénom : Darwine Vivien Vincent

Table des matières

1) Création du micro-service qui permet de gérer les clients	3
2) Création du micro-service inventory-service qui permet de gérer les produits	4
3) Création de la Gateway Spring cloud Gateway	5
4) Configuration statique du système de routage.....	5
5) Créer l'annuaire Eureka Discovery Service	6
6) Faire une configuration dynamique des routes de la gateway	7
7) Créer le service de facturation Billing-Service en utilisant Open Feign	8

1) Création du micro-service qui permet de gérer les clients



```

public class CustomerServiceApplication {
    public static void main(String[] args) { SpringApplication.run(CustomerServiceApplication.class, args); }

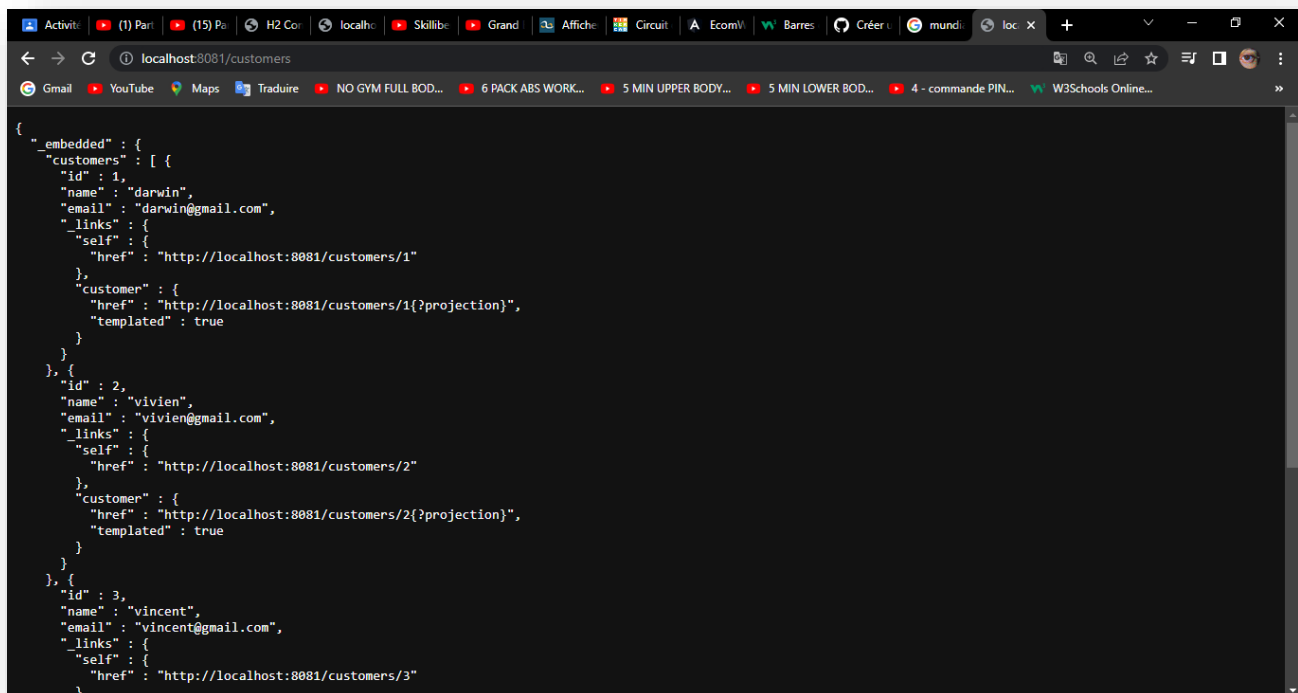
    @Bean
    public CommandLineRunner commandLineRunner(CustomerRepository customerRepository,
        RepositoryRestConfiguration restConfiguration) {
        return args -> {
            restConfiguration.exposeIdsFor(Customer.class);
            customerRepository.saveAll(
                List.of(
                    Customer.builder().name("darwin").email("darwin@gmail.com").build(),
                    Customer.builder().name("vivien").email("vivien@gmail.com").build(),
                    Customer.builder().name("vincent").email("vincent@gmail.com").build()
                )
            );
        };
    }
}
    
```

Run console logs:

```

2022-12-16 14:52:28.849 INFO 15600 --- [main] com.netflix.discovery.DiscoveryClient : Saw local status change event StatusChangeEvent [timestamp=2022-12-16T14:52:28.849Z, currentVersion=1, previousVersion=0]
2022-12-16 14:52:28.851 INFO 15600 --- [nfoReplicator-0] com.netflix.discovery.DiscoveryClient : DiscoveryClient_CUSTOMER-SERVICE/LAPTOP-NL70318M:customer-service-1-15600-15600
2022-12-16 14:52:28.902 INFO 15600 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8081 (http) with context path=/
2022-12-16 14:52:28.903 INFO 15600 --- [main] s.c.n.e.s.EurekaAutoServiceRegistration : Updating port to 8081
2022-12-16 14:52:28.915 INFO 15600 --- [nfoReplicator-0] com.netflix.discovery.DiscoveryClient : DiscoveryClient_CUSTOMER-SERVICE/LAPTOP-NL70318M:customer-service-1-15600-15600
2022-12-16 14:52:29.196 INFO 15600 --- [main] o.s.c.CustomerServiceApplication : Started CustomerServiceApplication in 14.588 seconds (JVM running for 15.014)
    
```

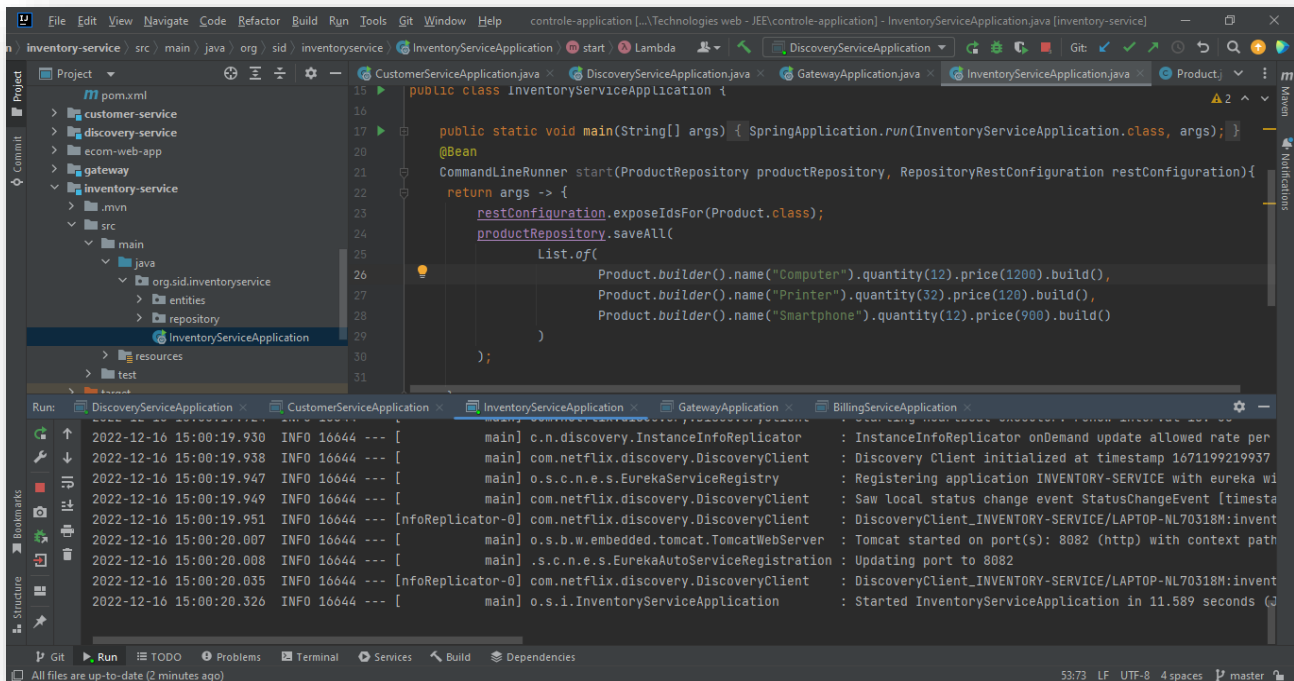
➤ Consultation du micro-service Customer-service



```

{
  "_embedded": {
    "customers": [ {
      "id": 1,
      "name": "darwin",
      "email": "darwin@gmail.com",
      "_links": {
        "self": {
          "href": "http://localhost:8081/customers/1"
        }
      },
      "customer": {
        "href": "http://localhost:8081/customers/1{?projection}",
        "templated": true
      }
    }, {
      "id": 2,
      "name": "vivien",
      "email": "vivien@gmail.com",
      "_links": {
        "self": {
          "href": "http://localhost:8081/customers/2"
        }
      },
      "customer": {
        "href": "http://localhost:8081/customers/2{?projection}",
        "templated": true
      }
    }, {
      "id": 3,
      "name": "vincent",
      "email": "vincent@gmail.com",
      "_links": {
        "self": {
          "href": "http://localhost:8081/customers/3"
        }
      },
      "customer": {
        "href": "http://localhost:8081/customers/3{?projection}",
        "templated": true
      }
    }
      ]
    }
  }
}
    
```

2) Création du micro-service inventory-service qui permet de gérer les produits



The screenshot shows an IDE with the following components:

- Project Explorer:** Shows the project structure with folders for customer-service, discovery-service, ecom-web-app, gateway, inventory-service, and repository. The inventory-service folder is expanded, showing src/main/java/org.sid.inventoryservice.
- Code Editor:** Displays the code for `InventoryServiceApplication.java`. The code includes a `main` method that runs `SpringApplication.run` and a `CommandLineRunner` interface implementation that saves a list of products to the database.
- Run Console:** Shows the execution logs for the `InventoryServiceApplication`. The logs indicate that the application started successfully on port 8082 and that the products were saved to the database.

```

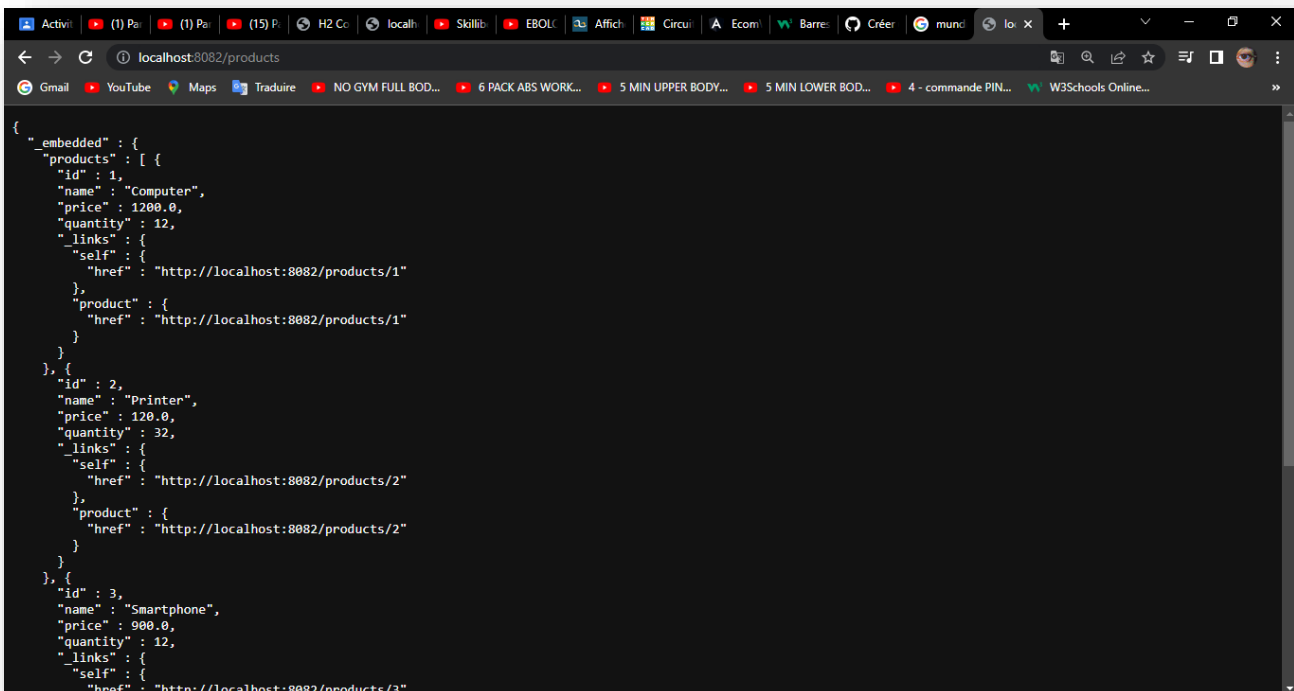
public class InventoryServiceApplication {
    public static void main(String[] args) { SpringApplication.run(InventoryServiceApplication.class, args); }
    @Bean
    CommandLineRunner start(ProductRepository productRepository, RepositoryRestConfiguration restConfiguration){
        return args -> {
            restConfiguration.exposeIdsFor(Product.class);
            productRepository.saveAll(
                List.of(
                    Product.builder().name("Computer").quantity(12).price(1200).build(),
                    Product.builder().name("Printer").quantity(32).price(120).build(),
                    Product.builder().name("Smartphone").quantity(12).price(900).build()
                )
            );
        };
    }
}
    
```

Run Console Output:

```

2022-12-16 15:00:19.930 INFO 16644 --- [main] c.n.discovery.InstanceInfoReplicator : InstanceInfoReplicator onDemand update allowed rate per
2022-12-16 15:00:19.938 INFO 16644 --- [main] com.netflix.discovery.DiscoveryClient : Discovery Client initialized at timestamp 1671199219937
2022-12-16 15:00:19.947 INFO 16644 --- [main] o.s.c.n.e.s.EurekaServiceRegistry : Registering application INVENTORY-SERVICE with eureka wl
2022-12-16 15:00:19.949 INFO 16644 --- [main] com.netflix.discovery.DiscoveryClient : Saw local status change event StatusChangeEvent [timesta
2022-12-16 15:00:19.951 INFO 16644 --- [nfoReplicator-0] com.netflix.discovery.DiscoveryClient : DiscoveryClient_INVENTORY-SERVICE/LAPTOP-NL70318M:invent
2022-12-16 15:00:20.007 INFO 16644 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8082 (http) with context path
2022-12-16 15:00:20.008 INFO 16644 --- [main] .s.c.n.e.s.EurekaAutoServiceRegistration : Updating port to 8082
2022-12-16 15:00:20.035 INFO 16644 --- [nfoReplicator-0] com.netflix.discovery.DiscoveryClient : DiscoveryClient_INVENTORY-SERVICE/LAPTOP-NL70318M:invent
2022-12-16 15:00:20.326 INFO 16644 --- [main] o.s.i.InventoryServiceApplication : Started InventoryServiceApplication in 11.589 seconds
    
```

➤ Consultation du micro-service Inventory-service

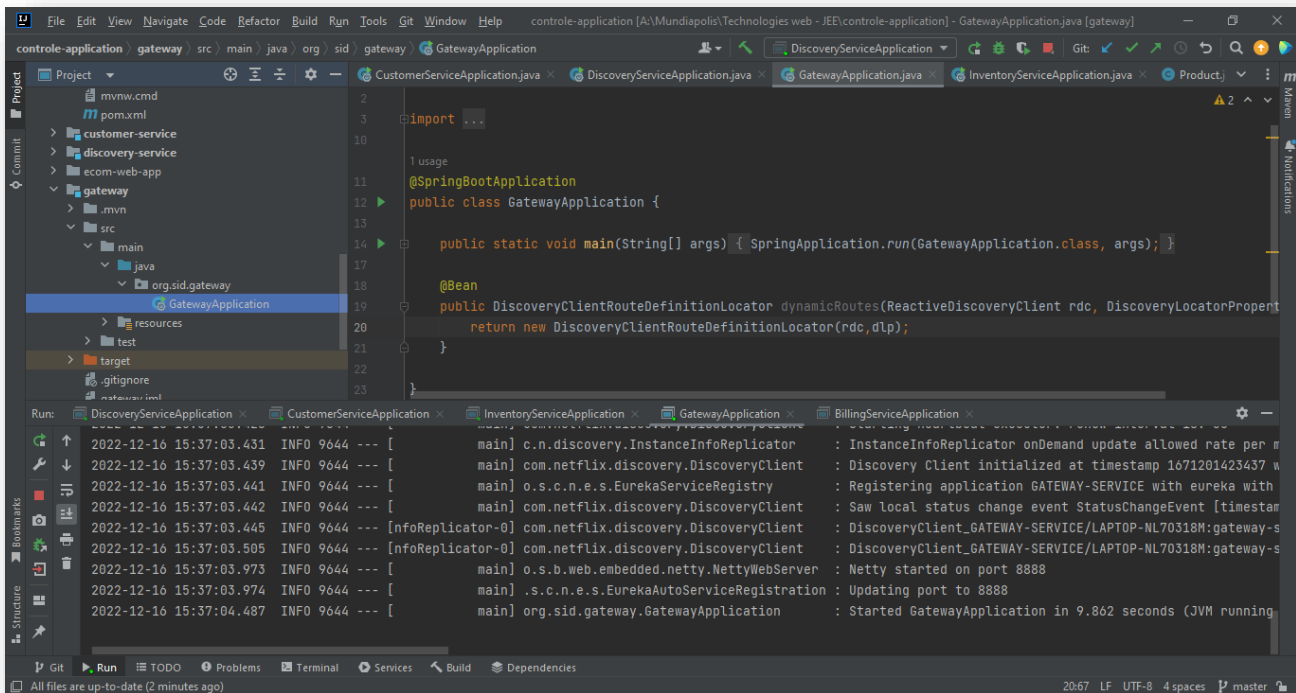


The screenshot shows a web browser with the URL `localhost:8082/products`. The browser displays the JSON response from the REST API, which lists three products: Computer, Printer, and Smartphone.

```

{
  "_embedded": {
    "products": [ {
      "id": 1,
      "name": "Computer",
      "price": 1200.0,
      "quantity": 12,
      "links": {
        "self": {
          "href": "http://localhost:8082/products/1"
        }
      },
      "product": {
        "href": "http://localhost:8082/products/1"
      }
    }, {
      "id": 2,
      "name": "Printer",
      "price": 120.0,
      "quantity": 32,
      "links": {
        "self": {
          "href": "http://localhost:8082/products/2"
        }
      },
      "product": {
        "href": "http://localhost:8082/products/2"
      }
    }, {
      "id": 3,
      "name": "Smartphone",
      "price": 900.0,
      "quantity": 12,
      "links": {
        "self": {
          "href": "http://localhost:8082/products/3"
        }
      }
    }
  ]
}
    
```

3) Création de la Gateway Spring cloud Gateway

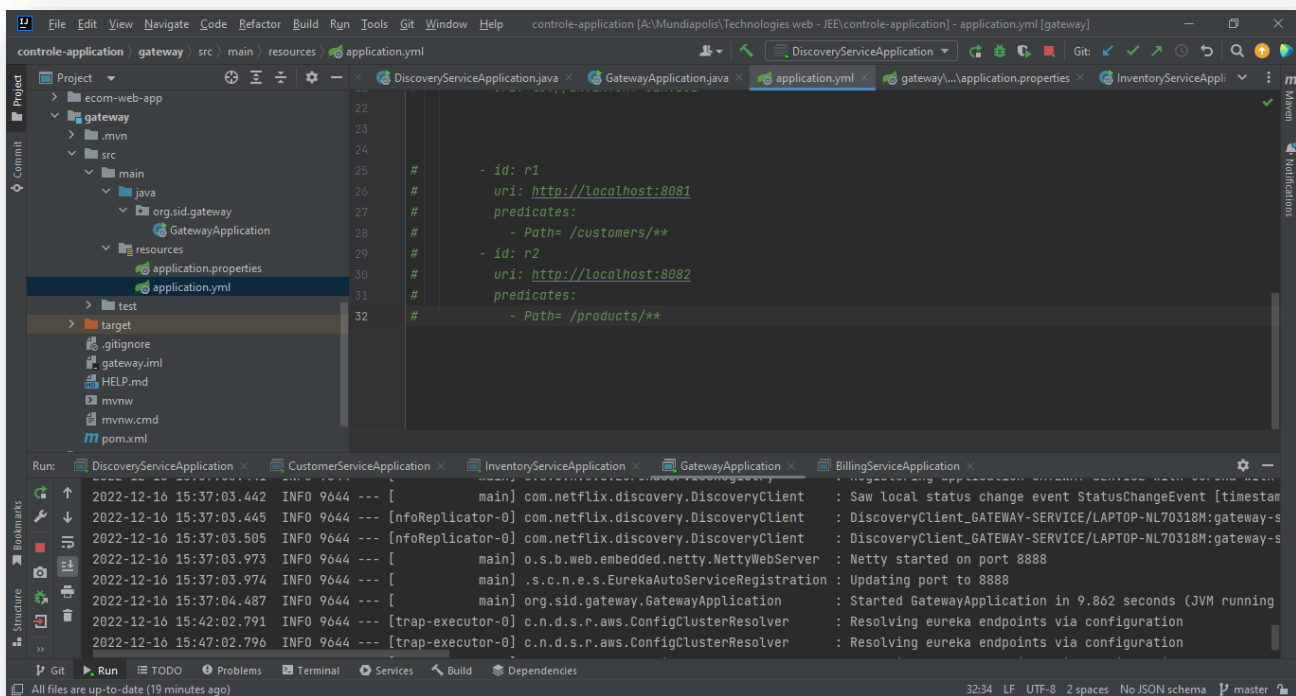


```

1  import ...
2
3  1 usage
4
5  @SpringBootApplication
6  public class GatewayApplication {
7
8      public static void main(String[] args) { SpringApplication.run(GatewayApplication.class, args); }
9
10
11      @Bean
12      public DiscoveryClientRouteDefinitionLocator dynamicRoutes(ReactiveDiscoveryClient rdc, DiscoveryLocatorProperties properties) {
13          return new DiscoveryClientRouteDefinitionLocator(rdc, properties);
14      }
15  }
    
```

Run: 2022-12-16 15:37:03.431 INFO 9644 --- [main] c.n.discovery.InstanceInfoReplicator : InstanceInfoReplicator onDemand update allowed rate per m
 2022-12-16 15:37:03.439 INFO 9644 --- [main] com.netflix.discovery.DiscoveryClient : Discovery Client initialized at timestamp 1671201423437 w
 2022-12-16 15:37:03.441 INFO 9644 --- [main] o.s.c.n.e.s.EurekaServiceRegistry : Registering application GATEWAY-SERVICE with eureka with
 2022-12-16 15:37:03.442 INFO 9644 --- [main] com.netflix.discovery.DiscoveryClient : Saw local status change event StatusChangeEvent [timestar
 2022-12-16 15:37:03.445 INFO 9644 --- [infoReplicator-0] com.netflix.discovery.DiscoveryClient : DiscoveryClient_GATEWAY-SERVICE/LAPTOP-NL70318M:gateway-s
 2022-12-16 15:37:03.505 INFO 9644 --- [infoReplicator-0] com.netflix.discovery.DiscoveryClient : DiscoveryClient_GATEWAY-SERVICE/LAPTOP-NL70318M:gateway-s
 2022-12-16 15:37:03.973 INFO 9644 --- [main] o.s.b.web.embedded.netty.NettyWebServer : Netty started on port 8888
 2022-12-16 15:37:03.974 INFO 9644 --- [main] .s.c.n.e.s.EurekaAutoServiceRegistration : Updating port to 8888
 2022-12-16 15:37:04.487 INFO 9644 --- [main] org.sid.gateway.GatewayApplication : Started GatewayApplication in 9.862 seconds (JVM running

4) Configuration statique du système de routage

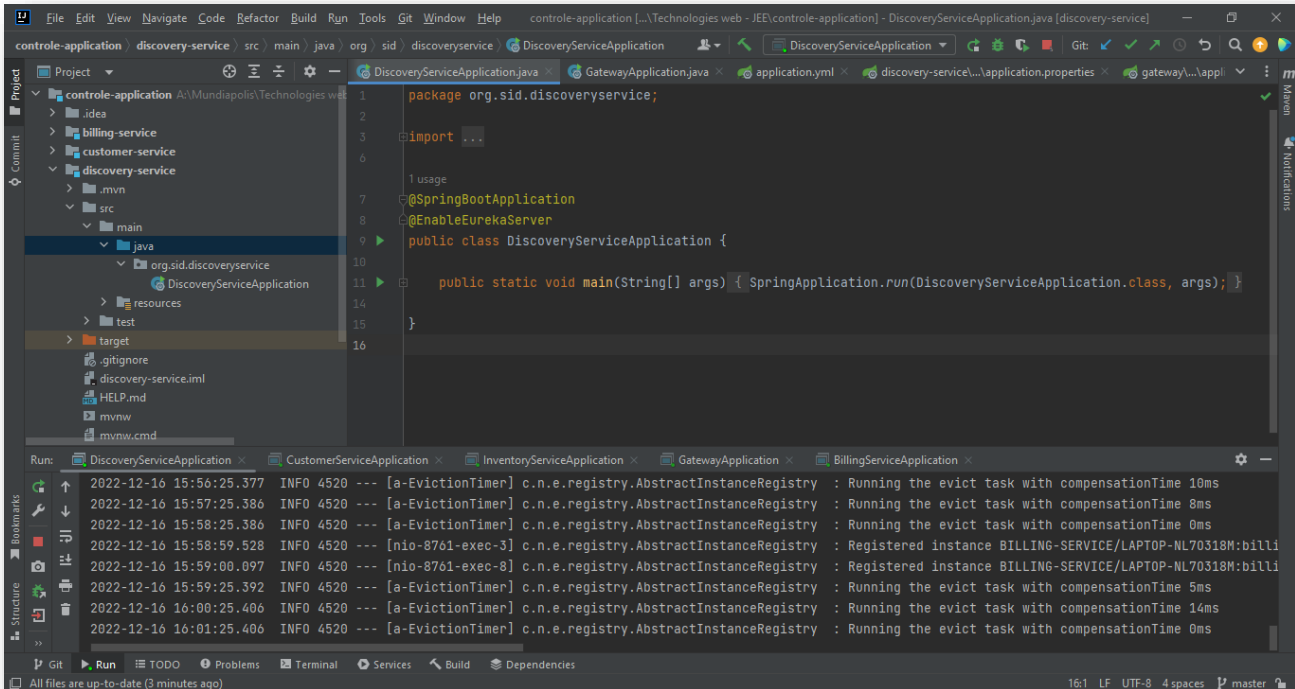


```

22
23
24
25  # - id: r1
26  uri: http://localhost:8081
27  predicates:
28  # - Path= /customers/**
29
30  # - id: r2
31  uri: http://localhost:8082
32  predicates:
33  # - Path= /products/**
    
```

Run: 2022-12-16 15:37:03.442 INFO 9644 --- [main] com.netflix.discovery.DiscoveryClient : Saw local status change event StatusChangeEvent [timestar
 2022-12-16 15:37:03.445 INFO 9644 --- [infoReplicator-0] com.netflix.discovery.DiscoveryClient : DiscoveryClient_GATEWAY-SERVICE/LAPTOP-NL70318M:gateway-s
 2022-12-16 15:37:03.505 INFO 9644 --- [infoReplicator-0] com.netflix.discovery.DiscoveryClient : DiscoveryClient_GATEWAY-SERVICE/LAPTOP-NL70318M:gateway-s
 2022-12-16 15:37:03.973 INFO 9644 --- [main] o.s.b.web.embedded.netty.NettyWebServer : Netty started on port 8888
 2022-12-16 15:37:03.974 INFO 9644 --- [main] .s.c.n.e.s.EurekaAutoServiceRegistration : Updating port to 8888
 2022-12-16 15:37:04.487 INFO 9644 --- [main] org.sid.gateway.GatewayApplication : Started GatewayApplication in 9.862 seconds (JVM running
 2022-12-16 15:42:02.791 INFO 9644 --- [trap-executor-0] c.n.d.s.r.aws.ConfigClusterResolver : Resolving eureka endpoints via configuration
 2022-12-16 15:47:02.796 INFO 9644 --- [trap-executor-0] c.n.d.s.r.aws.ConfigClusterResolver : Resolving eureka endpoints via configuration

5) Création de l'annuaire Eureka Discovery Service



```

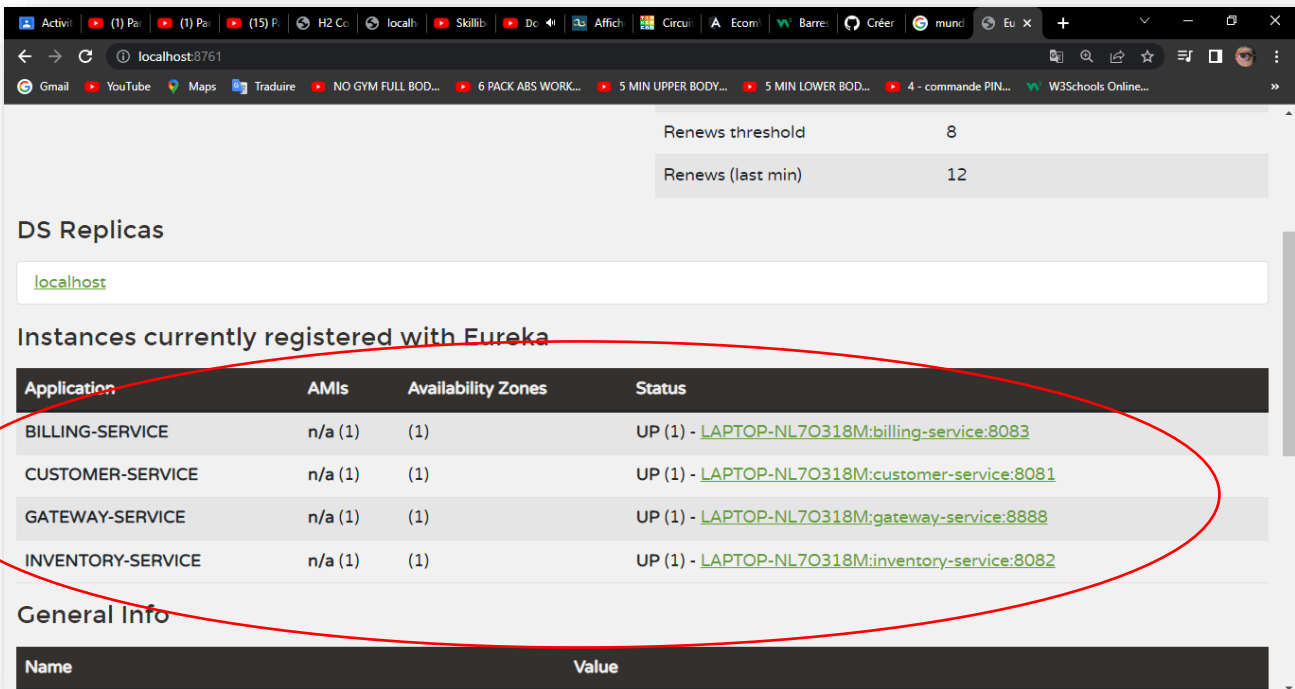
1 package org.sid.discoveryService;
2
3 import ...
4
5 1 usage
6
7 @SpringBootApplication
8 @EnableEurekaServer
9 public class DiscoveryServiceApplication {
10
11     public static void main(String[] args) { SpringApplication.run(DiscoveryServiceApplication.class, args); }
12
13 }
14
15
16
    
```

Run: DiscoveryServiceApplication x CustomerServiceApplication x InventoryServiceApplication x GatewayApplication x BillingServiceApplication x

```

2022-12-16 15:56:25.377 INFO 4520 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 10ms
2022-12-16 15:57:25.386 INFO 4520 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 8ms
2022-12-16 15:58:25.386 INFO 4520 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 0ms
2022-12-16 15:58:59.528 INFO 4520 --- [nio-8761-exec-3] c.n.e.registry.AbstractInstanceRegistry : Registered instance BILLING-SERVICE/LAPTOP-NL70318M:billi
2022-12-16 15:59:00.097 INFO 4520 --- [nio-8761-exec-8] c.n.e.registry.AbstractInstanceRegistry : Registered instance BILLING-SERVICE/LAPTOP-NL70318M:billi
2022-12-16 15:59:25.392 INFO 4520 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 5ms
2022-12-16 16:00:25.406 INFO 4520 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 14ms
2022-12-16 16:01:25.406 INFO 4520 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 0ms
    
```

➤ Spring Eureka



Renews threshold: 8

Renews (last min): 12

DS Replicas: localhost

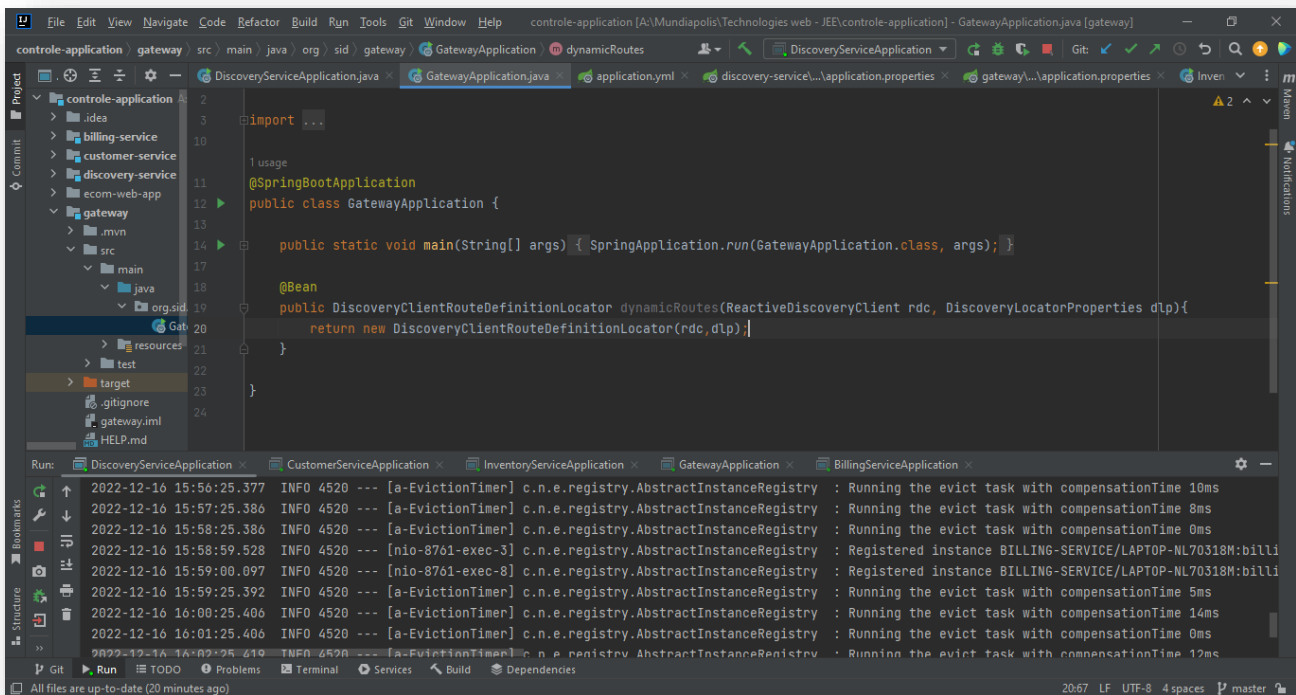
Instances currently registered with Eureka

Application	AMIs	Availability Zones	Status
BILLING-SERVICE	n/a (1)	(1)	UP (1) - LAPTOP-NL70318M:billing-service:8083
CUSTOMER-SERVICE	n/a (1)	(1)	UP (1) - LAPTOP-NL70318M:customer-service:8081
GATEWAY-SERVICE	n/a (1)	(1)	UP (1) - LAPTOP-NL70318M:gateway-service:8888
INVENTORY-SERVICE	n/a (1)	(1)	UP (1) - LAPTOP-NL70318M:inventory-service:8082

General Info

Name	Value
------	-------

6) Configuration dynamique des routes de la Gateway



```

import ...

1 usage
@SpringBootApplication
public class GatewayApplication {

    public static void main(String[] args) { SpringApplication.run(GatewayApplication.class, args); }

    @Bean
    public DiscoveryClientRouteDefinitionLocator dynamicRoutes(ReactiveDiscoveryClient rdc, DiscoveryLocatorProperties dlp){
        return new DiscoveryClientRouteDefinitionLocator(rdc, dlp);
    }
}

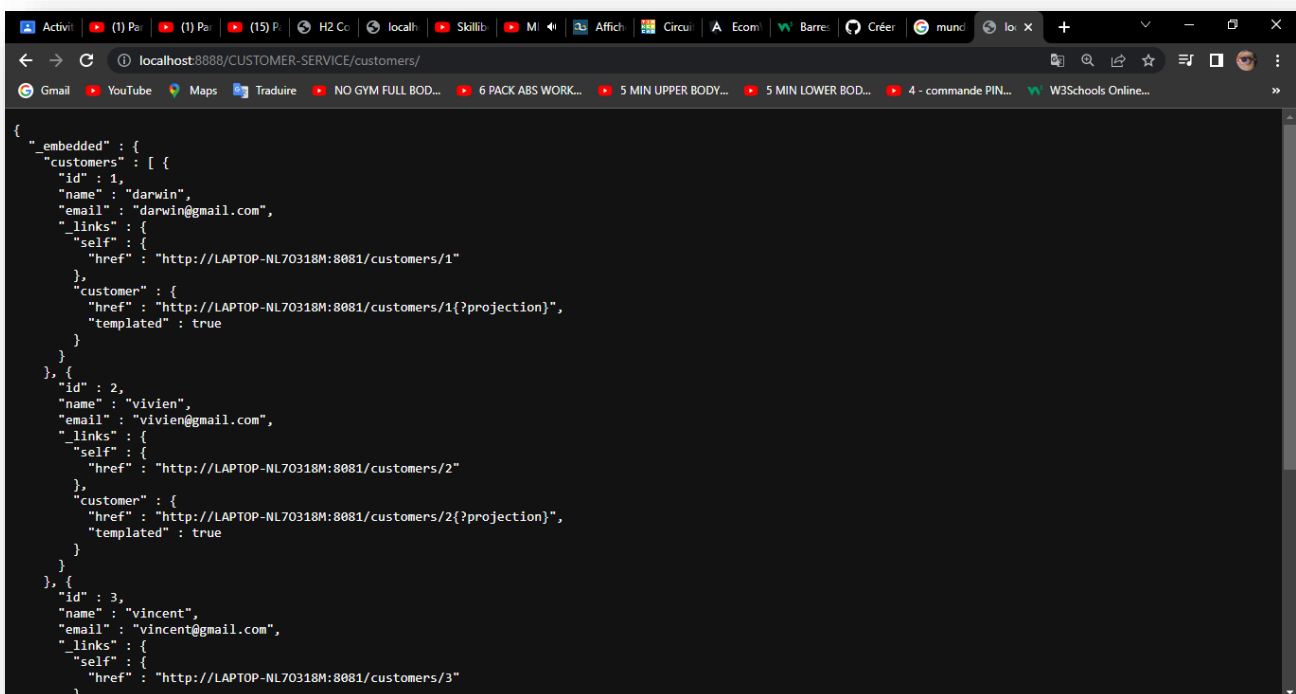
```

```

2022-12-16 15:56:25.377 INFO 4520 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 10ms
2022-12-16 15:57:25.386 INFO 4520 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 8ms
2022-12-16 15:58:25.386 INFO 4520 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 0ms
2022-12-16 15:58:59.528 INFO 4520 --- [nio-8761-exec-3] c.n.e.registry.AbstractInstanceRegistry : Registered instance BILLING-SERVICE/LAPTOP-NL70318M:billi
2022-12-16 15:59:00.097 INFO 4520 --- [nio-8761-exec-8] c.n.e.registry.AbstractInstanceRegistry : Registered instance BILLING-SERVICE/LAPTOP-NL70318M:billi
2022-12-16 15:59:25.392 INFO 4520 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 5ms
2022-12-16 16:00:25.406 INFO 4520 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 14ms
2022-12-16 16:01:25.406 INFO 4520 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 0ms

```

➤ Test d'accès avec Customer-service

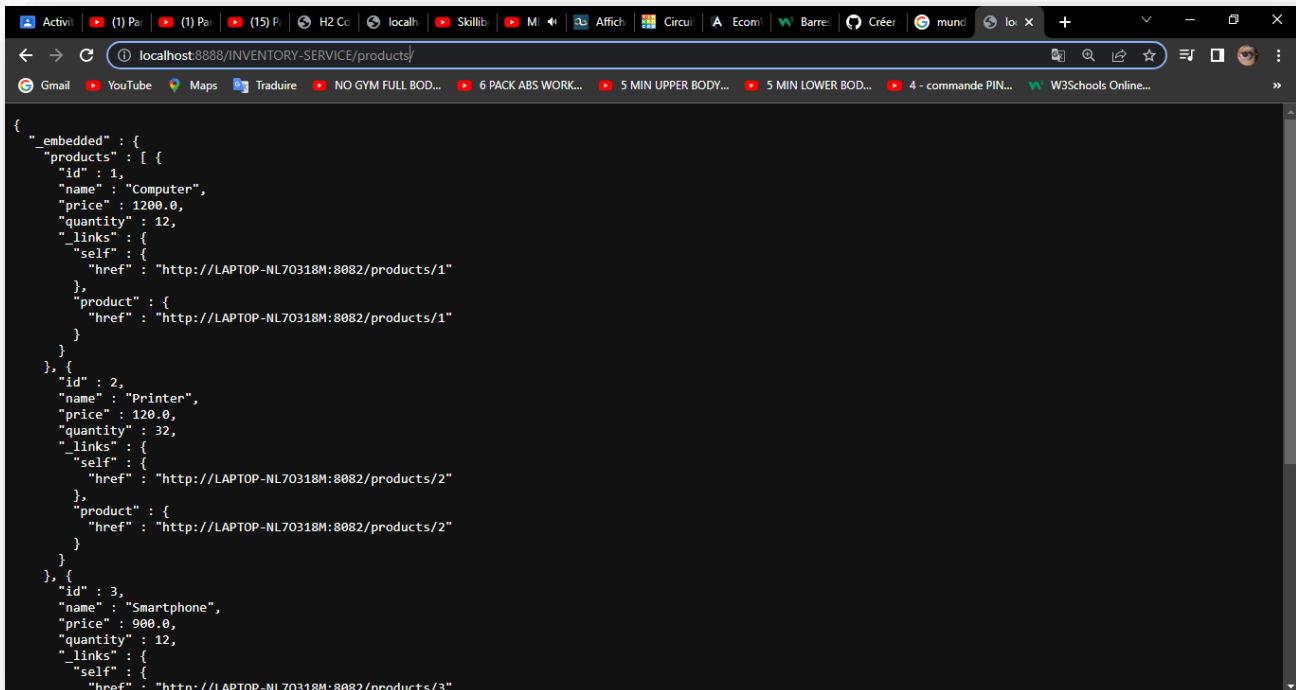


```

{
  "_embedded": {
    "customers": [ {
      "id": 1,
      "name": "darwin",
      "email": "darwin@gmail.com",
      "_links": {
        "self": {
          "href": "http://LAPTOP-NL70318M:8081/customers/1"
        },
        "customer": {
          "href": "http://LAPTOP-NL70318M:8081/customers/1{?projection}",
          "templated": true
        }
      }
    }, {
      "id": 2,
      "name": "vivien",
      "email": "vivien@gmail.com",
      "_links": {
        "self": {
          "href": "http://LAPTOP-NL70318M:8081/customers/2"
        },
        "customer": {
          "href": "http://LAPTOP-NL70318M:8081/customers/2{?projection}",
          "templated": true
        }
      }
    }, {
      "id": 3,
      "name": "vincent",
      "email": "vincent@gmail.com",
      "_links": {
        "self": {
          "href": "http://LAPTOP-NL70318M:8081/customers/3"
        }
      }
    }
  ]
}

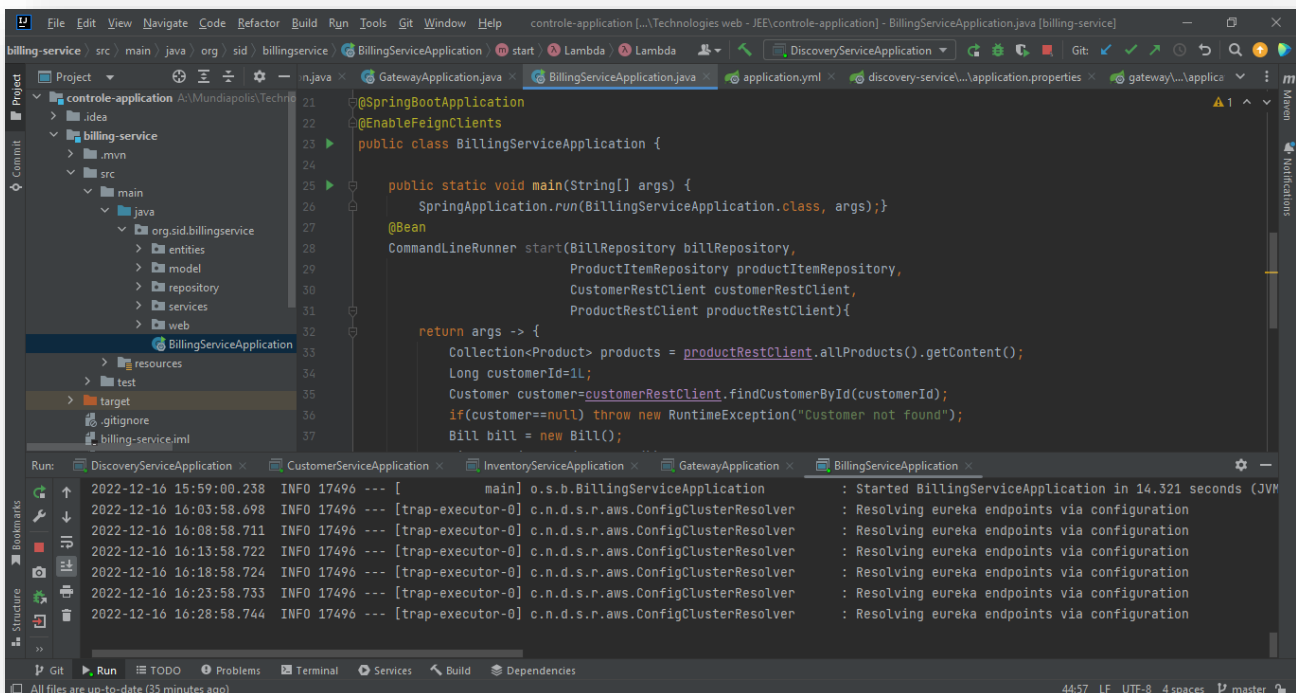
```

➤ Test d'accès avec Inventory-service



```
{
  "_embedded": {
    "products": [ {
      "id": 1,
      "name": "Computer",
      "price": 1200.0,
      "quantity": 12,
      "_links": {
        "self": {
          "href": "http://LAPTOP-NL70318M:8082/products/1"
        }
      },
      "product": {
        "href": "http://LAPTOP-NL70318M:8082/products/1"
      }
    }, {
      "id": 2,
      "name": "Printer",
      "price": 120.0,
      "quantity": 32,
      "_links": {
        "self": {
          "href": "http://LAPTOP-NL70318M:8082/products/2"
        }
      },
      "product": {
        "href": "http://LAPTOP-NL70318M:8082/products/2"
      }
    }, {
      "id": 3,
      "name": "Smartphone",
      "price": 900.0,
      "quantity": 12,
      "_links": {
        "self": {
          "href": "http://LAPTOP-NL70318M:8082/products/3"
        }
      }
    }
  ]
}
```

7) Créer le service de facturation Billing-Service en utilisant Open Feign



```
@SpringBootApplication
@EnableFeignClients
public class BillingServiceApplication {

    public static void main(String[] args) {
        SpringApplication.run(BillingServiceApplication.class, args);
    }

    @Bean
    CommandLineRunner start(BillRepository billRepository,
        ProductItemRepository productItemRepository,
        CustomerRestClient customerRestClient,
        ProductRestClient productRestClient){

        return args -> {
            Collection<Product> products = productRestClient.allProducts().getContent();
            Long customerId=1L;
            Customer customer=customerRestClient.findCustomerById(customerId);
            if(customer==null) throw new RuntimeException("Customer not found");
            Bill bill = new Bill();
        };
    }
}
```

Run: 2022-12-16 15:59:00.238 INFO 17496 --- [main] o.s.b.BillingServiceApplication : Started BillingServiceApplication in 14.321 seconds (JVM)

2022-12-16 16:03:58.698 INFO 17496 --- [trap-executor-0] c.n.d.s.r.aws.ConfigClusterResolver : Resolving eureka endpoints via configuration

2022-12-16 16:08:58.711 INFO 17496 --- [trap-executor-0] c.n.d.s.r.aws.ConfigClusterResolver : Resolving eureka endpoints via configuration

2022-12-16 16:13:58.722 INFO 17496 --- [trap-executor-0] c.n.d.s.r.aws.ConfigClusterResolver : Resolving eureka endpoints via configuration

2022-12-16 16:18:58.724 INFO 17496 --- [trap-executor-0] c.n.d.s.r.aws.ConfigClusterResolver : Resolving eureka endpoints via configuration

2022-12-16 16:23:58.733 INFO 17496 --- [trap-executor-0] c.n.d.s.r.aws.ConfigClusterResolver : Resolving eureka endpoints via configuration

2022-12-16 16:28:58.744 INFO 17496 --- [trap-executor-0] c.n.d.s.r.aws.ConfigClusterResolver : Resolving eureka endpoints via configuration