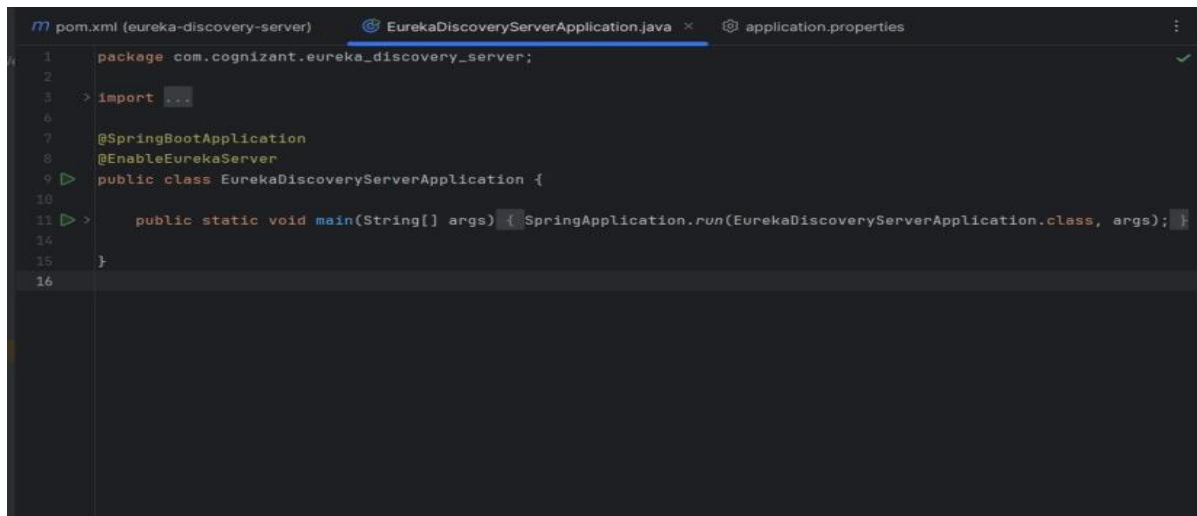# Week 5 : Microservice

Create Eureka Discovery Server and register and Microservices
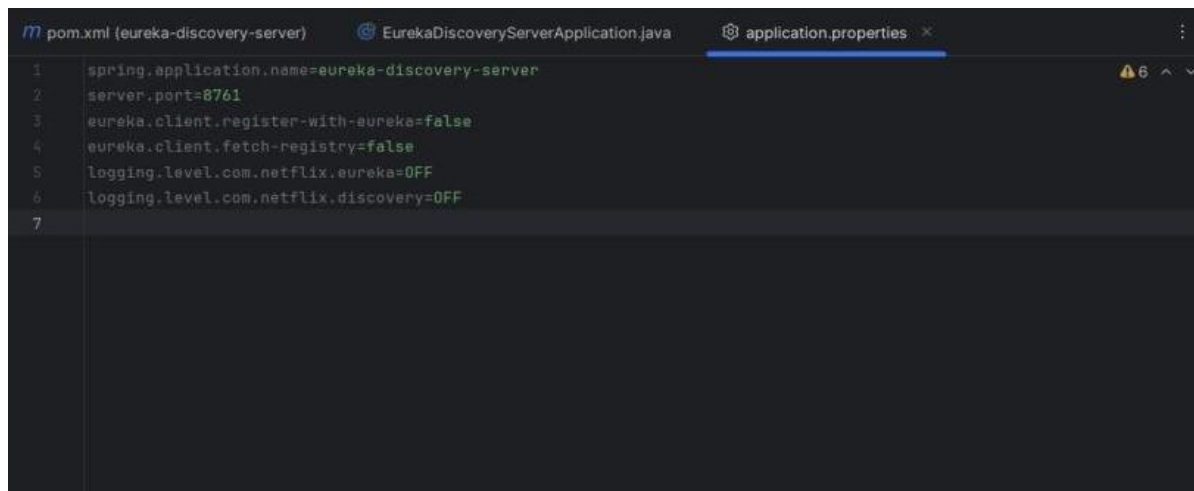
1. Eureka Discovery Server

Eurekadiscoveryserver.java

```
m pom.xml (eureka-discovery-server)    EurekaDiscoveryServerApplication.java ×    application.properties

1    package com.cognizant.eureka_discovery_server;
2
3  > import ...
6
7    @SpringBootApplication
8    @EnableEurekaServer
9  ▷ public class EurekaDiscoveryServerApplication {
10
11 ▷>     public static void main(String[] args) { SpringApplication.run(EurekaDiscoveryServerApplication.class, args); }
14
15    }
16
```

Application.property

```
m pom.xml (eureka-discovery-server)    EurekaDiscoveryServerApplication.java    application.properties ×

1    spring.application.name=eureka-discovery-server
2    server.port=8761
3    eureka.client.register-with-eureka=false
4    eureka.client.fetch-registry=false
5    logging.level.com.netflix.eureka=OFF
6    logging.level.com.netflix.discovery=OFF
7
```

Pom.xml

```xml
<project xmlns="http://maven.apache.org/POM/4.0.0"
    <dependencies>
        <!-- Spring Web for hosting the dashboard -->
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-web</artifactId>
        </dependency>
        <!-- Eureka Server -->
        <dependency>
            <groupId>org.springframework.cloud</groupId>
            <artifactId>spring-cloud-starter-netflix-eureka-server</artifactId>
        </dependency>
        <!-- Devtools for auto-reload -->
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-devtools</artifactId>
            <scope>runtime</scope>
            <optional>true</optional>
        </dependency>
        <!-- For Testing (optional) -->
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-test</artifactId>
            <scope>test</scope>
        </dependency>
    </dependencies>
```

Console Output

```
2025-07-19T15:38:20.987+05:30  INFO 21524 --- [eureka-discovery-server] [  restartedMain] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext:
    initialization completed in 1764 ms
2025-07-19T15:38:22.401+05:30  INFO 21524 --- [eureka-discovery-server] [  restartedMain] o.s.v.b.OptionalValidatorFactoryBean     : Failed to set up a Bean Validation
    provider: jakarta.validation.NoProviderFoundException: Unable to create a Configuration, because no Jakarta Bean Validation provider could be found. Add a provider like
    Hibernate Validator (RI) to your classpath.
2025-07-19T15:38:23.211+05:30  INFO 21524 --- [eureka-discovery-server] [  restartedMain] o.s.b.d.a.OptionalLiveReloadServer       : LiveReload server is running on port
    35729
2025-07-19T15:38:23.291+05:30  WARN 21524 --- [eureka-discovery-server] [  restartedMain] iguration$LoadBalancerCaffeineWarnLogger : Spring Cloud LoadBalancer is currently
    working with the default cache. While this cache implementation is useful for development and tests, it's recommended to use Caffeine cache in production.You can switch to
    using Caffeine cache, by adding it and org.springframework.cache.caffeine.CaffeineCacheManager to the classpath.
2025-07-19T15:38:23.315+05:30  INFO 21524 --- [eureka-discovery-server] [  restartedMain] o.s.c.n.eureka.InstanceInfoFactory       : Setting initial instance status as:
    STARTING
2025-07-19T15:38:23.571+05:30  INFO 21524 --- [eureka-discovery-server] [  restartedMain] o.s.b.a.e.web.EndpointLinksResolver      : Exposing 1 endpoint beneath base path
    '/actuator'
2025-07-19T15:38:23.633+05:30  INFO 21524 --- [eureka-discovery-server] [  restartedMain] o.s.c.n.e.s.EurekaServiceRegistry        : Registering application
    EUREKA-DISCOVERY-SERVER with eureka with status UP
2025-07-19T15:38:23.651+05:30  INFO 21524 --- [eureka-discovery-server] [     Thread-15] o.s.c.n.e.server.EurekaServerBootstrap   : isAws returned false
2025-07-19T15:38:23.652+05:30  INFO 21524 --- [eureka-discovery-server] [     Thread-15] o.s.c.n.e.server.EurekaServerBootstrap   : Initialized server context
2025-07-19T15:38:23.657+05:30  INFO 21524 --- [eureka-discovery-server] [     Thread-15] e.s.EurekaServerInitializerConfiguration : Started Eureka Server
2025-07-19T15:38:23.665+05:30  INFO 21524 --- [eureka-discovery-server] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer  : Tomcat started on port 8761 (http) with
    context path '/'
2025-07-19T15:38:23.666+05:30  INFO 21524 --- [eureka-discovery-server] [  restartedMain] .s.c.n.e.s.EurekaAutoServiceRegistration : Updating port to 8761
2025-07-19T15:38:23.690+05:30  INFO 21524 --- [eureka-discovery-server] [  restartedMain] c.c.e.EurekaDiscoveryServerApplication   : Started
    EurekaDiscoveryServerApplication in 5.169 seconds (process running for 6.113)
2025-07-19T15:39:13.374+05:30  INFO 21524 --- [eureka-discovery-server] [nio-8761-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]       : Initializing Spring DispatcherServlet 
    'dispatcherServlet'
2025-07-19T15:39:13.375+05:30  INFO 21524 --- [eureka-discovery-server] [nio-8761-exec-1] o.s.web.servlet.DispatcherServlet        : Initializing Servlet 'dispatcherServlet'
2025-07-19T15:39:13.376+05:30  INFO 21524 --- [eureka-discovery-server] [nio-8761-exec-1] o.s.web.servlet.DispatcherServlet        : Completed initialization in 1 ms
```

2. Service Discovery Clients

i)Account – Service

AccountApplication.java

```java
package com.cognizant.account;

import ...


@SpringBootApplication
@EnableDiscoveryClient
public class AccountApplication {

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

}
```

Controller

```java
package com.cognizant.account.controller;


import org.springframework.web.bind.annotation.GetMapping;
import org.springframework.web.bind.annotation.PathVariable;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;

import java.util.Map;


@RestController   no usages
@RequestMapping("/accounts")
public class AccountController {

    @GetMapping("/{number}")   no usages
    public Map<String, Object> getAccountDetails(@PathVariable String number) {
        return Map.of(
                k1: "number", number,
                k2: "type", v2: "savings",
                k3: "balance", v3: 234343
        );
    }
}
```

Application.property


```
1   spring.application.name=account-service
2   server.port=8080
3   eureka.client.service-url.defaultZone=http://localhost:8761/eureka
4
```

Pom.xml


```xml
     <project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
32       <dependencies>
33           <dependency>
34               <groupId>org.springframework.boot</groupId>
35               <artifactId>spring-boot-starter-web</artifactId>
36           </dependency>
37           <dependency...>
43           <dependency>
44               <groupId>org.springframework.boot</groupId>
45               <artifactId>spring-boot-starter-test</artifactId>
46               <scope>test</scope>
47           </dependency>
48           <dependency>
49               <groupId>org.springframework.cloud</groupId>
50               <artifactId>spring-cloud-starter-netflix-eureka-client</artifactId>
51           </dependency>
52       </dependencies>
53       <dependencyManagement>
54           <dependencies>
55               <dependency>
56                   <groupId>org.springframework.cloud</groupId>
57                   <artifactId>spring-cloud-dependencies</artifactId>
58                   <version>2025.0.0</version>
59                   <type>pom</type>
60                   <scope>import</scope>
61               </dependency>
62           </dependencies>
```

Console output


```
2025-07-19T15:48:48.611+05:30  INFO 12984 --- [account-service] [  restartedMain] com.netflix.discovery.DiscoveryClient    : Force full registry fetch : false
2025-07-19T15:48:48.612+05:30  INFO 12984 --- [account-service] [  restartedMain] com.netflix.discovery.DiscoveryClient    : Application is null : false
2025-07-19T15:48:48.612+05:30  INFO 12984 --- [account-service] [  restartedMain] com.netflix.discovery.DiscoveryClient    : Registered Applications size is zero : true
2025-07-19T15:48:48.612+05:30  INFO 12984 --- [account-service] [  restartedMain] com.netflix.discovery.DiscoveryClient    : Application version is -1: true
2025-07-19T15:48:48.612+05:30  INFO 12984 --- [account-service] [  restartedMain] com.netflix.discovery.DiscoveryClient    : Getting all instance registry info from the
eureka server
2025-07-19T15:48:49.050+05:30  INFO 12984 --- [account-service] [  restartedMain] com.netflix.discovery.DiscoveryClient    : The response status is 200
2025-07-19T15:48:49.052+05:30  INFO 12984 --- [account-service] [  restartedMain] com.netflix.discovery.DiscoveryClient    : Starting heartbeat executor: renew interval is:
 30
2025-07-19T15:48:49.054+05:30  INFO 12984 --- [account-service] [  restartedMain] c.n.discovery.InstanceInfoReplicator     : InstanceInfoReplicator onDemand update allowed
rate per min is 4
2025-07-19T15:48:49.055+05:30  INFO 12984 --- [account-service] [  restartedMain] com.netflix.discovery.DiscoveryClient    : Discovery Client initialized at timestamp
1752920329054 with initial instances count: 2
2025-07-19T15:48:49.060+05:30  INFO 12984 --- [account-service] [  restartedMain] o.s.c.n.e.s.EurekaServiceRegistry        : Registering application ACCOUNT-SERVICE with
eureka with status UP
2025-07-19T15:48:49.060+05:30  INFO 12984 --- [account-service] [  restartedMain] com.netflix.discovery.DiscoveryClient    : Saw local status change event StatusChangeEvent
 [timestamp=1752920329060, current=UP, previous=STARTING]
2025-07-19T15:48:49.063+05:30  INFO 12984 --- [account-service] [foReplicator-%d] com.netflix.discovery.DiscoveryClient    : DiscoveryClient_ACCOUNT-SERVICE/Babu-R.mshome
.net:account-service:8080: registering service...
2025-07-19T15:48:49.088+05:30  INFO 12984 --- [account-service] [  restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer  : Tomcat started on port 8080 (http) with context
 path '/'
2025-07-19T15:48:49.089+05:30  INFO 12984 --- [account-service] [  restartedMain] .s.c.n.e.s.EurekaAutoServiceRegistration : Updating port to 8080
2025-07-19T15:48:49.112+05:30  INFO 12984 --- [account-service] [  restartedMain] c.cognizant.account.AccountApplication   : Started AccountApplication in 3.324 seconds
 (process running for 4.004)
2025-07-19T15:48:49.117+05:30  INFO 12984 --- [account-service] [foReplicator-%d] com.netflix.discovery.DiscoveryClient    : DiscoveryClient_ACCOUNT-SERVICE/Babu-R.mshome
.net:account-service:8080 - registration status: 204
2025-07-19T15:53:48.628+05:30  INFO 12984 --- [account-service] [rap-executor-%d] c.n.d.s.r.aws.ConfigClusterResolver      : Resolving eureka endpoints via configuration
2025-07-19T15:58:48.632+05:30  INFO 12984 --- [account-service] [rap-executor-%d] c.n.d.s.r.aws.ConfigClusterResolver      : Resolving eureka endpoints via configuration
```

ii) Loan-Service

LoanApplication.java

```java
package com.cognizant.loan;

import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.cloud.client.discovery.EnableDiscoveryClient;

@SpringBootApplication
@EnableDiscoveryClient
public class LoanApplication {

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

}
```

Controller

```java
package com.cognizant.loan.controller;

import org.springframework.web.bind.annotation.GetMapping;
import org.springframework.web.bind.annotation.PathVariable;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;

import java.util.Map;

@RestController  no usages
@RequestMapping("/loans")
public class LoanController {

    @GetMapping("/{number}")  no usages
    public Map<String, Object> getLoanDetails(@PathVariable String number) {
        return Map.of(
                "number", number,
                "type", "car",
                "loan", 400000,
                "emi", 3258,
                "tenure", 18
        );
    }
}
```

Application.property


```
1    spring.application.name=loan-service
2    server.port=8081
3    eureka.client.service-url.defaultZone=http://localhost:8761/eureka
4
```

Pom.xml


```
2      <project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"   ⚠5 ∧ ∨
30            <java.version>17</java.version>
31         </properties>
32         <dependencies>
33  >          <dependency...>
37  >          <dependency...>
43             <dependency>
44                <groupId>org.springframework.boot</groupId>
45                <artifactId>spring-boot-starter-test</artifactId>
46                <scope>test</scope>
47             </dependency>
48             <dependency>
49                <groupId>org.springframework.cloud</groupId>
50                <artifactId>spring-cloud-starter-netflix-eureka-client</artifactId>
51             </dependency>
52         </dependencies>
53         <dependencyManagement>
54             <dependencies>
55                <dependency>
56                   <groupId>org.springframework.cloud</groupId>
57                   <artifactId>spring-cloud-dependencies</artifactId>
58                   <version>2025.0.0</version>
59                   <type>pom</type>
60                   <scope>import</scope>
61                </dependency>
62             </dependencies>
63         </dependencyManagement>
```

Console Output

Eureka Server

spring Eureka

HOME   LAST 1000 SINCE STARTUP

System Status

Environment	test	Current time	2025-07-19T16:04:39 +0530
Data center	default	Uptime	00:26
		Lease expiration enabled	true
		Renews threshold	5
		Renews (last min)	8

DS Replicas

localhost

Instances currently registered with Eureka

Application	AMIs	Availability Zones	Status
ACCOUNT-SERVICE	n/a (1)	(1)	UP (1) - Babu-R.mshome.net:account-service:8080
LOAN-SERVICE	n/a (1)	(1)	UP (1) - Babu-R.mshome.net:loan-service:8081

General Info

General Info

Name	Value
total-avail-memory	92mb
num-of-cpus	16
current-memory-usage	78mb (84%)
server-uptime	00:26
registered-replicas	http://localhost:8761/eureka/
unavailable-replicas	http://localhost:8761/eureka/,
available-replicas	

Instance Info

Name	Value
ipAddr	172.19.192.1
status	UP

Account Service

GET http://localhost:8080/accounts/00987987973432

```json
{
    "number": "00987987973432",
    "balance": 234343,
    "type": "savings"
}
```

200 OK · 106 ms · 225 B

Loan Service

GET http://localhost:8081/loans/H00987987972342

```json
{
    "type": "car",
    "number": "H00987987972342",
    "tenure": 18,
    "emi": 3258,
    "loan": 400000
}
```

200 OK · 127 ms · 242 B