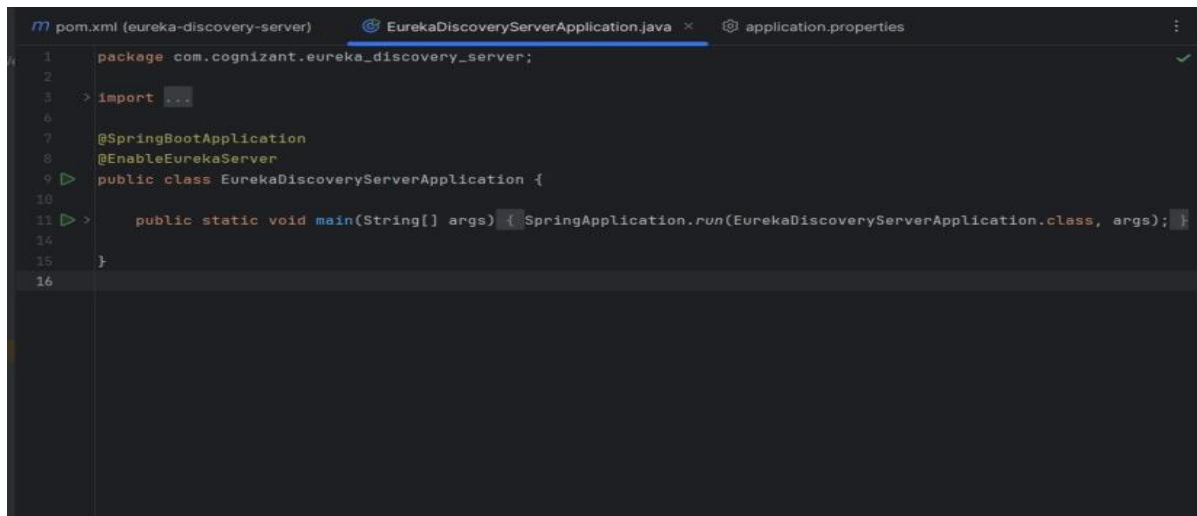


Week 5 : Microservice

Create Eureka Discovery Server and register and Microservices

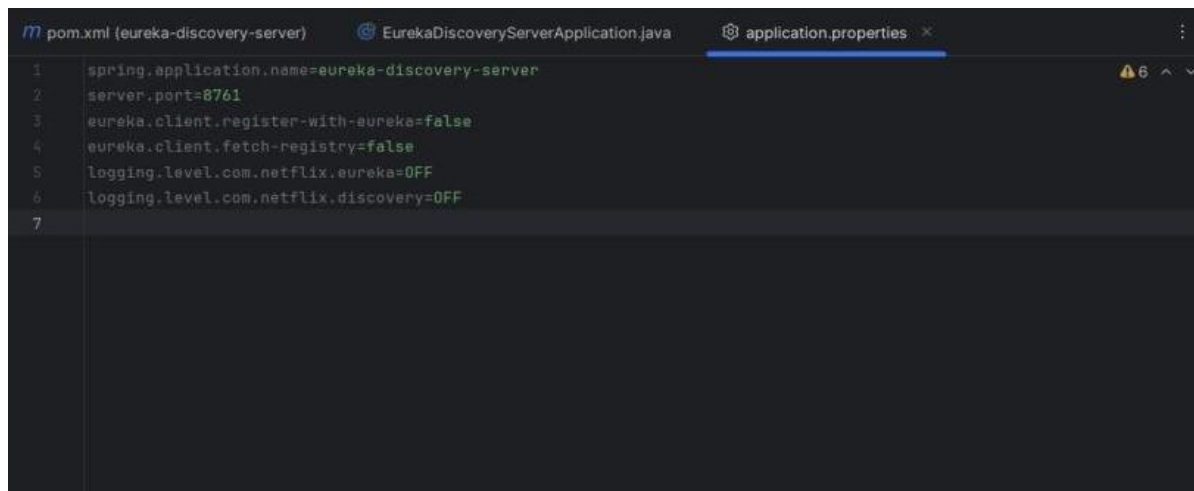
1.Eureka Discovery Server

Eurekadiscoveryserver.java



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

Application.property



```
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

```
1 pom.xml (eureka-discovery-server) x EurekaDiscoveryServerApplication.java application.properties
2 <?xml version="1.0" encoding="UTF-8"?>
3 <project xmlns="http://maven.apache.org/POM/4.0.0"
4         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
5         xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
6     <modelVersion>4.0.0</modelVersion>
7     <groupId>com.example</groupId>
8     <artifactId>eureka-discovery-server</artifactId>
9     <version>0.0.1-SNAPSHOT</version>
10    <packaging>war</packaging>
11    <name>Eureka Discovery Server</name>
12    <description>Eureka Discovery Server</description>
13    <dependencies>
14        <!-- Spring Web for hosting the dashboard -->
15        <dependency>
16            <groupId>org.springframework.boot</groupId>
17            <artifactId>spring-boot-starter-web</artifactId>
18        </dependency>
19        <!-- Eureka Server -->
20        <dependency>
21            <groupId>org.springframework.cloud</groupId>
22            <artifactId>spring-cloud-starter-netflix-eureka-server</artifactId>
23        </dependency>
24        <!-- Devtools for auto-reload -->
25        <dependency>
26            <groupId>org.springframework.boot</groupId>
27            <artifactId>spring-boot-devtools</artifactId>
28            <scope>runtime</scope>
29            <optional>true</optional>
30        </dependency>
31        <!-- For testing (optional) -->
32        <dependency>
33            <groupId>org.springframework.boot</groupId>
34            <artifactId>spring-boot-starter-test</artifactId>
35            <scope>test</scope>
36        </dependency>
37    </dependencies>
38    <build>
39        <plugins>
40            <plugin>
41                <groupId>org.springframework.boot</groupId>
42                <artifactId>spring-boot-maven-plugin</artifactId>
43            </plugin>
44        </plugins>
45    </build>
46    <properties>
47        <java.version>17</java.version>
48    </properties>
49 </project>
```

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] igurationLoadBalancerCaffeineWarnLogger : 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.s.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.s.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

```
AccountController.java  application.properties  pom.xml (account)  AccountApplication.java x
1  package com.cognizant.account;
2
3  > import
4
5
6
7  @SpringBootApplication
8  @EnableDiscoveryClient
9  public class AccountApplication {
10
11  > public static void main(String[] args) { SpringApplication.run(AccountApplication.class, args); }
12
13
14
15
16
```

Controller

```
AccountController.java x  application.properties  pom.xml (account)  AccountApplication.java
1  package com.cognizant.account.controller;
2
3
4  import org.springframework.web.bind.annotation.GetMapping;
5  import org.springframework.web.bind.annotation.PathVariable;
6  import org.springframework.web.bind.annotation.RequestMapping;
7  import org.springframework.web.bind.annotation.RestController;
8
9  import java.util.Map;
10
11  @RestController no usages
12  @RequestMapping("/accounts")
13  public class AccountController {
14
15      @GetMapping("/{number}") no usages
16      public Map<String, Object> getAccountDetails(@PathVariable String number) {
17          return Map.of(
18              k1: "number", number,
19              k2: "type", v2: "savings",
20              k3: "balance", v3: 234343
21          );
22      }
23  }
```

Application.property

```
AccountController.java  application.properties  pom.xml (account)  AccountApplication.java
1  spring.application.name=account-service
2  server.port=8080
3  eureka.client.service-url.defaultZone=http://localhost:8761/eureka
4
```

Pom.xml

```
AccountController.java  application.properties  pom.xml (account)  AccountApplication.java
2  <project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
33  <dependencies>
34      <dependency>
35          <groupId>org.springframework.boot</groupId>
36          <artifactId>spring-boot-starter-web</artifactId>
37      </dependency>
38      <dependency>
39          <groupId>org.springframework.boot</groupId>
40          <artifactId>spring-boot-starter-test</artifactId>
41          <scope>test</scope>
42      </dependency>
43      <dependency>
44          <groupId>org.springframework.cloud</groupId>
45          <artifactId>spring-cloud-starter-netflix-eureka-client</artifactId>
46      </dependency>
47  </dependencies>
48  <dependencyManagement>
49      <dependencies>
50          <dependency>
51              <groupId>org.springframework.cloud</groupId>
52              <artifactId>spring-cloud-dependencies</artifactId>
53              <version>2025.0.0</version>
54              <type>pom</type>
55              <scope>import</scope>
56          </dependency>
57      </dependencies>
58  </dependencyManagement>
59  </project>
```

Console output

```
AccountApplication
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-Xd] com.netflix.discovery.DiscoveryClient : DiscoveryClient_ACCOUNT-SERVICE/Babu-R.mshome
.net:account-service:8080: registering service...
2025-07-19T15:48:49.080+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-Xd] 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-Xd] 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-Xd] c.n.d.s.r.aws.ConfigClusterResolver : Resolving eureka endpoints via configuration
```

ii) Loan-Service

LoanApplication.java

```
LoanController.java  application.properties  pom.xml (loan)  LoanApplication.java x
1 package com.cognizant.loan;
2
3 import org.springframework.boot.SpringApplication;
4 import org.springframework.boot.autoconfigure.SpringBootApplication;
5 import org.springframework.cloud.client.discovery.EnableDiscoveryClient;
6
7 @SpringBootApplication
8 @EnableDiscoveryClient
9 public class LoanApplication {
10
11     public static void main(String[] args) { SpringApplication.run(LoanApplication.class, args); }
12
13 }
14
15
16
```

Controller

```
LoanController.java  application.properties  pom.xml (loan)  LoanApplication.java
1 package com.cognizant.loan.controller;
2
3 import org.springframework.web.bind.annotation.GetMapping;
4 import org.springframework.web.bind.annotation.PathVariable;
5 import org.springframework.web.bind.annotation.RequestMapping;
6 import org.springframework.web.bind.annotation.RestController;
7
8 import java.util.Map;
9
10 @RestController no usages
11 @RequestMapping("/loans")
12 public class LoanController {
13
14     @GetMapping("/{number}") no usages
15     public Map<String, Object> getLoanDetails(@PathVariable String number) {
16         return Map.of(
17             k1: "number", number,
18             k2: "type", v2: "car",
19             k3: "loan", v3: 400000,
20             k4: "emi", v4: 3258,
21             k5: "tenure", v5: 18
22         );
23     }
24 }
```


Application.property

```
LoanController.java  application.properties  pom.xml (loan)  LoanApplication.java

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

Pom.xml

```
LoanController.java  application.properties  pom.xml (loan)  LoanApplication.java

2  <project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
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

```
loan - Version control
Run LoanApplication

rate per min is 4
2025-07-19T15:48:01.518+05:30 INFO 29524 --- [loan-service] [ restartedMain] com.netflix.discovery.DiscoveryClient : Discovery Client initialized at timestamp
1752920281517 with initial instances count: 0
2025-07-19T15:48:01.523+05:30 INFO 29524 --- [loan-service] [ restartedMain] o.s.c.n.e.s.EurekaServiceRegistry : Registering application LOAN-SERVICE with eureka
with status UP
2025-07-19T15:48:01.526+05:30 INFO 29524 --- [loan-service] [ restartedMain] com.netflix.discovery.DiscoveryClient : Saw local status change event StatusChangeEvent
2025-07-19T15:48:01.528+05:30 INFO 29524 --- [loan-service] [foRepliator-%d] com.netflix.discovery.DiscoveryClient : DiscoveryClient_LOAN-SERVICE/Babu-R.mshome
.net:loan-service:8081: registering service...
2025-07-19T15:48:01.558+05:30 INFO 29524 --- [loan-service] [ restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 8081 (http) with context
path /
2025-07-19T15:48:01.569+05:30 INFO 29524 --- [loan-service] [ restartedMain] s.c.n.e.s.EurekaAutoServiceRegistration : Updating port to 8081
2025-07-19T15:48:01.591+05:30 INFO 29524 --- [loan-service] [ restartedMain] com.cognizant.loan.LoanApplication : Started LoanApplication in 3.673 seconds (process
running for 4.38)
2025-07-19T15:48:01.603+05:30 INFO 29524 --- [loan-service] [foRepliator-%d] com.netflix.discovery.DiscoveryClient : DiscoveryClient_LOAN-SERVICE/Babu-R.mshome
.net:loan-service:8081 - registration status: 204
2025-07-19T15:48:31.519+05:30 INFO 29524 --- [loan-service] [reshExecutor-%d] com.netflix.discovery.DiscoveryClient : Disable delta property : false
2025-07-19T15:48:31.519+05:30 INFO 29524 --- [loan-service] [reshExecutor-%d] com.netflix.discovery.DiscoveryClient : Single vip registry refresh property : null
2025-07-19T15:48:31.519+05:30 INFO 29524 --- [loan-service] [reshExecutor-%d] com.netflix.discovery.DiscoveryClient : Force full registry fetch : false
2025-07-19T15:48:31.520+05:30 INFO 29524 --- [loan-service] [reshExecutor-%d] com.netflix.discovery.DiscoveryClient : Application is null : false
2025-07-19T15:48:31.520+05:30 INFO 29524 --- [loan-service] [reshExecutor-%d] com.netflix.discovery.DiscoveryClient : Registered Applications size is zero : true
2025-07-19T15:48:31.520+05:30 INFO 29524 --- [loan-service] [reshExecutor-%d] com.netflix.discovery.DiscoveryClient : Application version is -1: false
2025-07-19T15:48:31.520+05:30 INFO 29524 --- [loan-service] [reshExecutor-%d] com.netflix.discovery.DiscoveryClient : Getting all instance registry info from the eureka
server
2025-07-19T15:48:31.549+05:30 INFO 29524 --- [loan-service] [reshExecutor-%d] com.netflix.discovery.DiscoveryClient : The response status is 200
2025-07-19T15:53:00.963+05:30 INFO 29524 --- [loan-service] [rap-executor-%d] c.n.d.s.p.aws.ConfigClusterResolver : Resolving eureka endpoints via configuration
2025-07-19T15:58:00.971+05:30 INFO 29524 --- [loan-service] [rap-executor-%d] c.n.d.s.p.aws.ConfigClusterResolver : Resolving eureka endpoints via configuration
2025-07-19T16:03:00.986+05:30 INFO 29524 --- [loan-service] [rap-executor-%d] c.n.d.s.p.aws.ConfigClusterResolver : Resolving eureka endpoints via configuration
```

Eureka Server

← → ↻ localhost:8761

☆ ⬇️ School

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

← → ↻ localhost:8761

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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

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

← → ↻ localhost:8761

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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

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

Postman interface showing a GET request to `http://localhost:8080/accounts/00987987973432`. The response is a 200 OK status with a JSON body containing account details.

Query Params

Key	Value	Description
Key	Value	Description

Body

```
1 {
2   "number": "00987987973432",
3   "balance": 234343,
4   "type": "savings"
5 }
```

200 OK · 106 ms · 225 B

Loan Service

Postman interface showing a GET request to `http://localhost:8081/loans/H00987987972342`. The response is a 200 OK status with a JSON body containing loan details.

Query Params

Key	Value	Description
Key	Value	Description

Body

```
1 {
2   "type": "car",
3   "number": "H00987987972342",
4   "tenure": 18,
5   "emi": 3258,
6   "loan": 400000
7 }
```

200 OK · 127 ms · 242 B