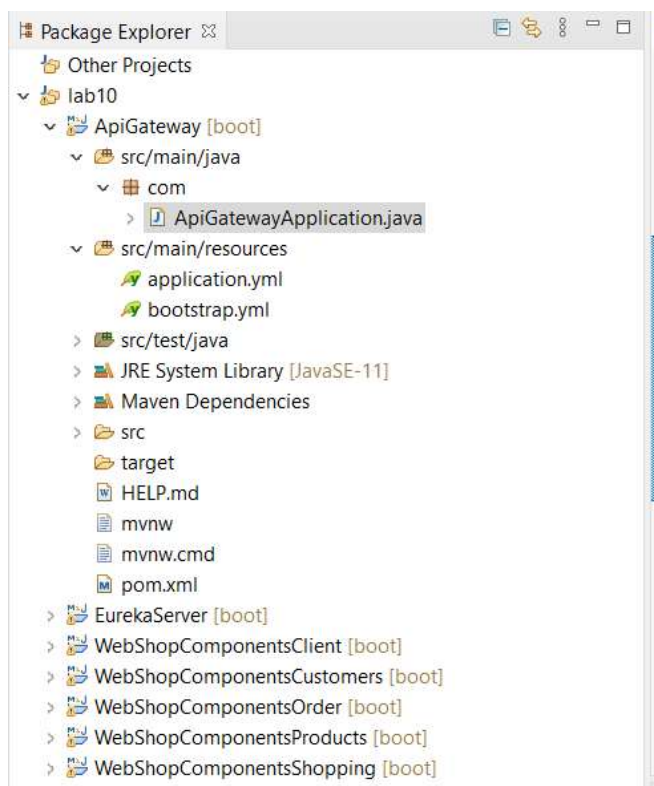


<b>Subject</b>	SWA – CS590
<b>Assignment</b>	Lab 10
<b>Date</b>	9/4/2021
<b>Students</b>	Vo Ngoc Huy Nguyen - 611066
<b>Professor</b>	Rene de Jong

## Lab Assignment 10: API gateway, Zipkin, Sleuth, Hystrix

### Exercise 1: API Gateway

Refer the structure to add Zuu as new ApiGateway



Package Explorer

- Other Projects
- lab10
  - ApiGateway [boot]
    - src/main/java
      - com
        - ApiGatewayApplication.java
    - src/main/resources
      - application.yml
      - bootstrap.yml
    - src/test/java
    - JRE System Library [JavaSE-11]
    - Maven Dependencies
    - src
      - target
      - HELP.md
      - mvnw
      - mvnw.cmd
      - pom.xml
  - EurekaServer [boot]
  - WebShopComponentsClient [boot]
  - WebShopComponentsCustomers [boot]
  - WebShopComponentsOrder [boot]
  - WebShopComponentsProducts [boot]
  - WebShopComponentsShopping [boot]

ApiGatewayAp... | bootstrap.yml | application.yml | OrderProxy.java | ProductCatal... | WebShopAp

```

1 package com;
2
3 import org.springframework.boot.SpringApplication;
4 import org.springframework.boot.autoconfigure.SpringBootApplication;
5 import org.springframework.cloud.client.discovery.EnableDiscoveryClient;
6 import org.springframework.cloud.netflix.zuul.EnableZuulProxy;
7
8 @SpringBootApplication
9 @EnableZuulProxy
10 @EnableDiscoveryClient
11 public class ApiGatewayApplication {
12
13     public static void main(String[] args) {
14         SpringApplication.run(ApiGatewayApplication.class, args);
15     }
16 }
17
18

```

Problems | Javadoc | Declaration | Console

EurekaServer - EurekaServerApplication [Spring Boot App] D:\sources\Eclipse\sts-4.11.0.RELEASE\plugins\org.eclipse.justi.openjdk

Time	Level	Message	Source
2021-09-04 18:57:54.364	INFO 12712	[a-EvictionTimer]	c.n.e.registry.AbstractInstanceRegist
2021-09-04 18:58:53.117	INFO 12712	[nio-8761-exec-4]	c.n.e.registry.AbstractInstanceRegist
2021-09-04 18:58:53.633	INFO 12712	[nio-8761-exec-2]	c.n.e.registry.AbstractInstanceRegist
2021-09-04 18:58:54.372	INFO 12712	[a-EvictionTimer]	c.n.e.registry.AbstractInstanceRegist
2021-09-04 18:58:56.159	INFO 12712	[nio-8761-exec-5]	c.n.e.registry.AbstractInstanceRegist
2021-09-04 18:58:56.671	WARN 12712	[nio-8761-exec-6]	c.n.e.registry.AbstractInstanceRegist
2021-09-04 18:58:56.671	INFO 12712	[nio-8761-exec-6]	c.n.eureka.resources.InstanceResourc
2021-09-04 18:58:56.673	WARN 12712	[et_localhost-10]	c.n.eureka.cluster.ReplicationTask
2021-09-04 18:58:56.673	WARN 12712	[et_localhost-10]	c.netflix.eureka.cluster.PeerEurekaN
2021-09-04 18:59:02.810	INFO 12712	[nio-8761-exec-7]	c.n.e.registry.AbstractInstanceRegist
2021-09-04 18:59:03.322	INFO 12712	[io-8761-exec-10]	c.n.e.registry.AbstractInstanceRegist
2021-09-04 18:59:54.380	INFO 12712	[a-EvictionTimer]	c.n.e.registry.AbstractInstanceRegist

Boot Dashboard

Type tags, projects, or working set names to match (incl. \* and ? wildc

- local
  - ApiGateway [:8080]
  - EurekaServer [:8761]
  - WebShopComponentsClient [:8090]
  - WebShopComponentsCustomers [:8092]
  - WebShopComponentsOrder [:8094]
  - WebShopComponentsProducts [:8091]
  - WebShopComponentsShopping [:8093]

Package Explorer

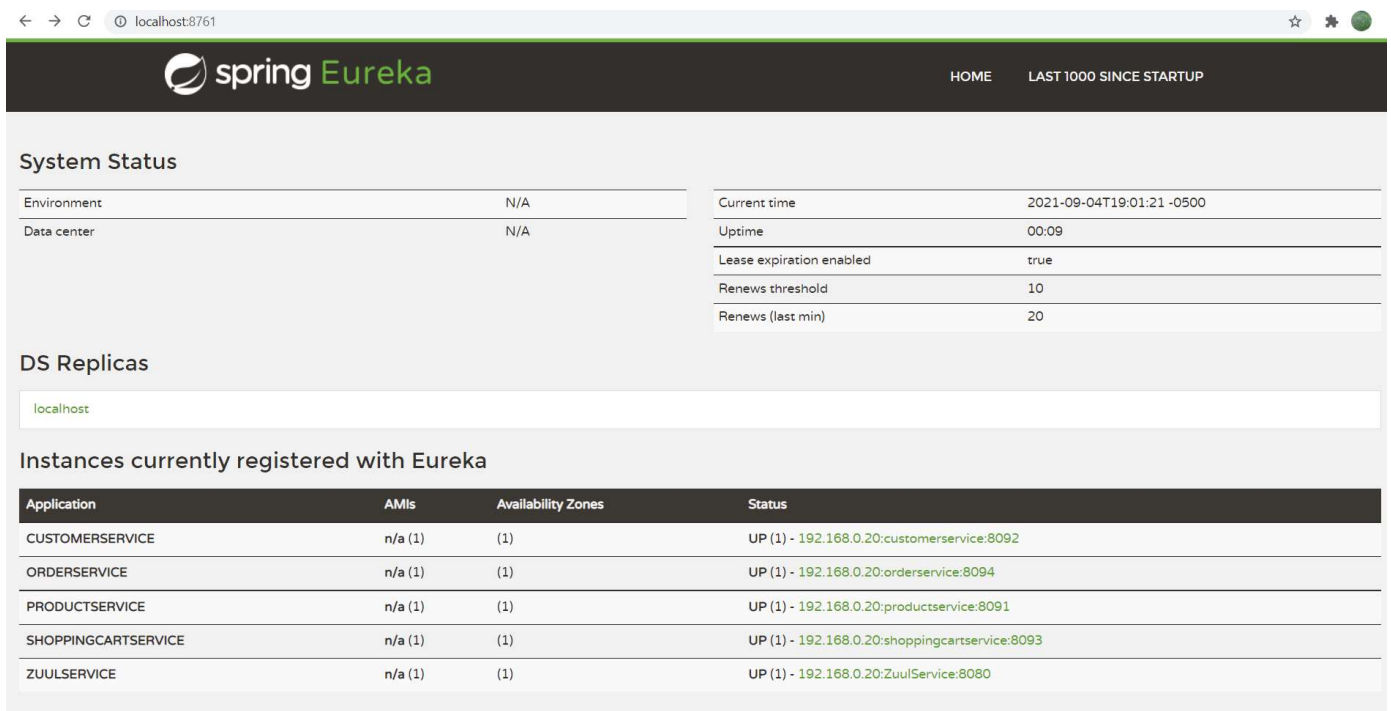
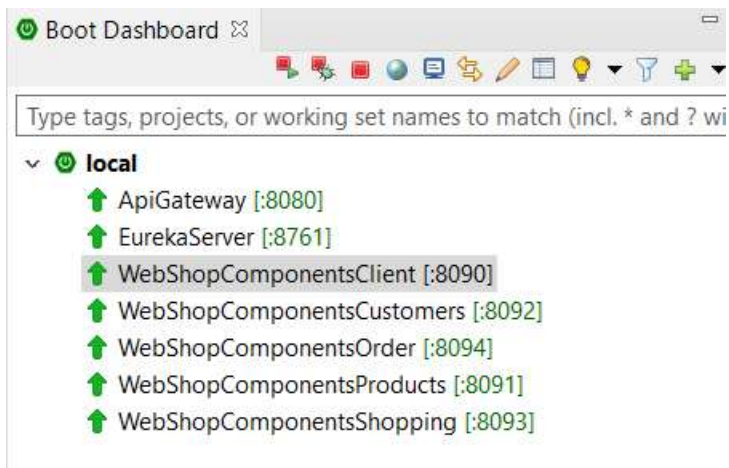
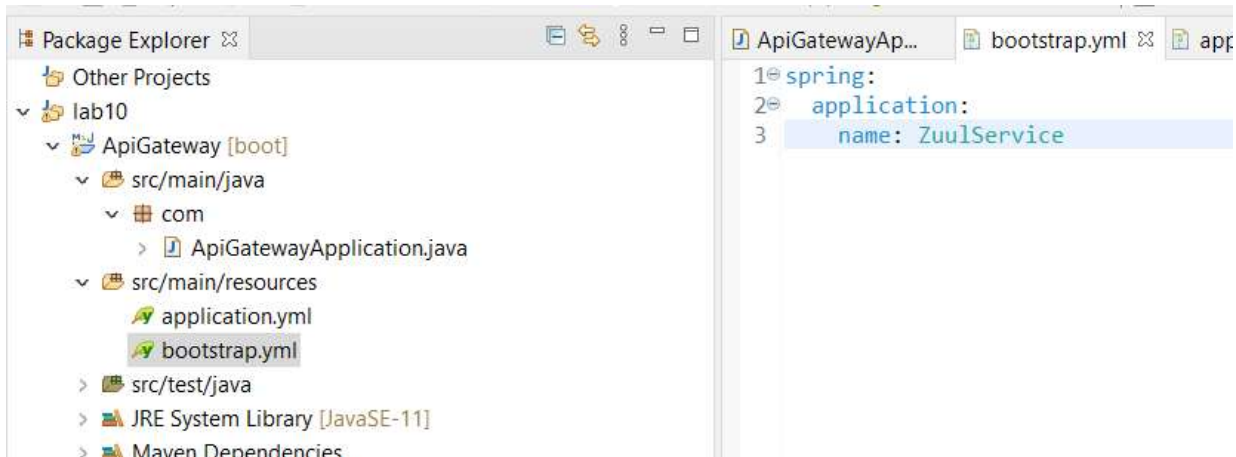
- Other Projects
- lab10
  - ApiGateway [boot]
    - src/main/java
      - com
        - ApiGatewayApplication.java
    - src/main/resources
      - application.yml
      - bootstrap.yml
    - src/test/java
    - JRE System Library [JavaSE-11]
    - Maven Dependencies
    - src
      - target
      - HELP.md
      - mvnw
      - mvnw.cmd
      - pom.xml
  - EurekaServer [boot]
  - WebShopComponentsClient [boot]

ApiGatewayAp... | bootstrap.yml | application.yml | OrderProxy.java

```

1 server:
2   port: 8080
3
4 eureka:
5   client:
6     serviceUrl:
7       defaultZone: http://localhost:8761/eureka/
8     registerWithEureka: true
9     fetchRegistry: true
10
11 zuul:
12   routes:
13     productservice:
14       url: http://localhost:8091
15     customerservice:
16       url: http://localhost:8092
17     shoppingcartservice:
18       url: http://localhost:8093
19     orderservice:
20       url: http://localhost:8094
21
22
23

```



And application run:

```
Problems Javadoc Declaration Console
WebShopComponentsClient - WebShopApplication [Spring Boot App] D:\sources\Eclipse\sts-4.11.0.RELEASE\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_16.0.1.v20210528-1205\jre\bin\javaw.exe (
=====
:: Spring Boot ::
(v2.4.0)

-----Customer-----
customer: 101 , Frank , Brown , fBrown@hotmail.com , 123456
address:1000 N main Street , Fairfield , 52557 , USA

-----Product-----
A33 : TV : 250.0

-----Shoppingcart-----
Content of the shoppingcart:
93 A33 TV 250.0
6 A34 MP3 75.0
Total price = 23700.0

-----Order-----
Content of the order:
Ordernr: 1 , Date : Sat Sep 04 18:59:16 CDT 2021 , Status : placed
93 A33 TV 250.0
6 A34 MP3 75.0
Total price =23700.0

-----Confirmed Order-----
Content of the order:
Ordernr: 1 , Date : Sat Sep 04 18:59:16 CDT 2021 , Status : placed
93 A33 TV 250.0
6 A34 MP3 75.0
Total price =23700.0
Customername =Frank Brown
```

Refer source code for more details

## Exercise 2: Use Zipkin and Sleuth

workspace-spring-tool-suite-4-4.11.0.RELEASE\_2 - ServiceC/src/main/java/shop/ServiceController.java - Spring Tool Suite 4

File Edit Source Refactor Navigate Search Project Run Window Help

Package Explorer

- ServiceB [boot]
- src/main/java
  - shop
    - ServiceBApplication.java
    - ServiceBController.java
  - src/main/resources
    - static
    - templates
    - application.yml
    - bootstrap.yml
  - src/test/java
    - JRE System Library [JavaSE-11]
    - Maven Dependencies
    - Referenced Libraries
  - src
    - target
      - mvnw
      - mvnw.cmd
    - pom.xml
- ServiceC [boot]
- src/main/java
  - shop
    - ServiceCApplication.java
    - ServiceCController.java

Outline

- shop
  - ServiceController
    - getText():String

```
1 package shop;
2
3 import org.springframework.beans.factory.annotation.Autowired;
4
5 @RestController
6 public class ServiceController {
7
8
9     @RequestMapping("/text")
10    public String getText() {
11        return "World from ServiceC";
12    }
13
14 }
15
16
17
18
19
20
21
```

Problems Javadoc Declaration Console

EurekaServer - EurekaServerApplication [Spring Boot App] D:\sources\Eclipse\sts-4.11.0.RELEASE\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86\_64\_16.0.1.v20210528-1205\jre\bin\javaw.exe (Sep 5, 2021, 8:20:47:36.195)

```
2021-09-05 20:47:36.195 INFO 26996 --- [nio-8761-exec-8] c.n.e.registry.AbstractInstanceRegistry : Registered instance SERVICEA/192.168.0.20:ServiceA:9090
2021-09-05 20:47:36.213 WARN 26996 --- [io-8761-exec-10] c.n.e.registry.AbstractInstanceRegistry : DS: Registry: lease doesn't exist, registering resource:
2021-09-05 20:47:36.213 WARN 26996 --- [io-8761-exec-10] c.n.eureka.resources.InstanceResource : Not Found (Renew): SERVICEC - 192.168.0.20:ServiceC:9092
2021-09-05 20:47:36.226 INFO 26996 --- [nio-8761-exec-3] c.n.e.registry.AbstractInstanceRegistry : Registered instance SERVICEC/192.168.0.20:ServiceC:9092
2021-09-05 20:47:36.778 INFO 26996 --- [nio-8761-exec-4] c.n.e.registry.AbstractInstanceRegistry : Registered instance SERVICEA/192.168.0.20:ServiceA:9090
2021-09-05 20:47:36.779 INFO 26996 --- [nio-8761-exec-4] c.n.e.registry.AbstractInstanceRegistry : Registered instance SERVICEB/192.168.0.20:ServiceB:9091
2021-09-05 20:47:36.779 INFO 26996 --- [nio-8761-exec-4] c.n.e.registry.AbstractInstanceRegistry : Registered instance SERVICEC/192.168.0.20:ServiceC:9092
2021-09-05 20:47:44.334 WARN 26996 --- [nio-8761-exec-11] c.n.e.registry.AbstractInstanceRegistry : DS: Registry: lease doesn't exist, registering resource:
2021-09-05 20:47:44.335 WARN 26996 --- [nio-8761-exec-11] c.n.eureka.resources.InstanceResource : Not Found (Renew): ZUULSERVICE - 192.168.0.20:ZuulService
2021-09-05 20:47:44.362 INFO 26996 --- [nio-8761-exec-8] c.n.e.registry.AbstractInstanceRegistry : Registered instance ZUULSERVICE/192.168.0.20:ZuulService
2021-09-05 20:47:44.362 INFO 26996 --- [nio-8761-exec-7] c.n.e.registry.AbstractInstanceRegistry : Registered instance ZUULSERVICE/192.168.0.20:ZuulService
2021-09-05 20:47:44.873 INFO 26996 --- [nio-8761-exec-6] c.n.e.registry.AbstractInstanceRegistry : Registered instance ZUULSERVICE/192.168.0.20:ZuulService
2021-09-05 20:48:34.837 INFO 26996 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 0ms
```

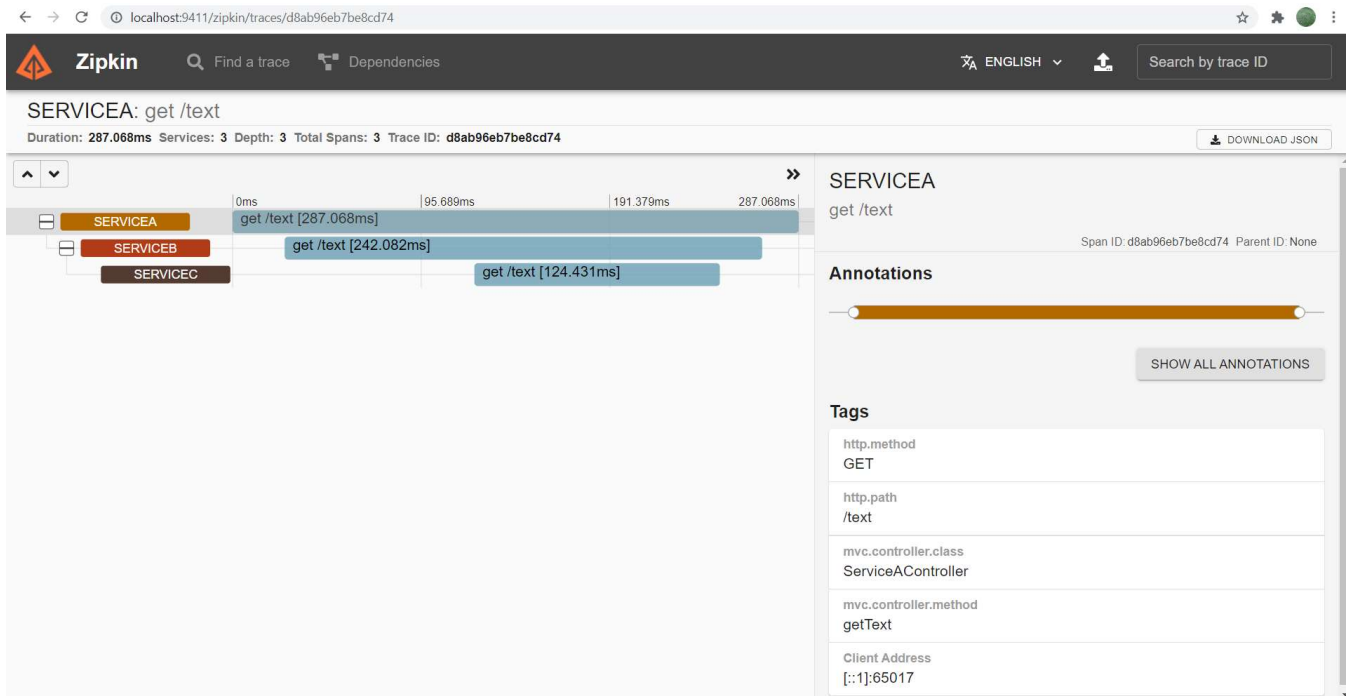
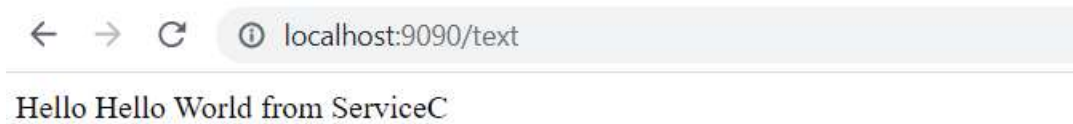
Boot Dashboard

Type tags, projects, or working set names to match (incl. \* and ? wildc

- local
  - ApiGateway [8080]
  - EurekaServer [8761]
  - ServiceA [9090]
  - ServiceB [9091]
  - ServiceC [9092]
  - WebShopComponentsCustomers
  - WebShopComponentsOrder
  - WebShopComponentsProducts

8 elements hidden by filter





### Exercise 3: Use Hystrix circuit breaker

Set up Hystrix and run properly for ServiceA, ServiceB and stop ServiceC.  
Need to add below dependency to solve EnableCircuitBreaker is deprecated

```

67     </dependency>
68     <dependency>
69         <groupId>org.springframework.cloud</groupId>
70         <artifactId>spring-cloud-starter-zipkin</artifactId>
71         <version>2.2.1.RELEASE</version>
72     </dependency>
73     <dependency>
74         <groupId>org.springframework.cloud</groupId>
75         <artifactId>spring-cloud-starter-netflix-hystrix</artifactId>
76         <version>2.2.9.RELEASE</version>
77     </dependency>
78
79     <dependency>
80         <groupId>org.springframework.cloud</groupId>
81         <artifactId>spring-cloud-dependencies</artifactId>
82         <version>Brixton.SR6</version>
83         <type>pom</type>
84         <scope>runtime</scope>
85     </dependency>
86
87 </dependencies>
88 <dependencyManagement>
89     <dependencies>
90         <dependency>

```

- Stop Service C:

workspace-spring-tool-suite-4-4.11.0.RELEASE\_2 - ServiceB/src/main/java/shop/ServiceBController.java - Spring Tool Suite 4

File Edit Source Refactor Navigate Search Project Run Window Help

Package Explorer

- lab10
  - ApiGateway [boot]
  - EurekaServer [boot]
  - ServiceA [boot]
  - ServiceB [boot]
    - src/main/java
      - shop
        - ServiceBApplication.java
        - ServiceBController.java
      - src/main/resources
        - static
        - templates
        - application.yml
        - bootstrap.yml
      - src/test/java

JRE System Library (JavaSE-11)

Maven Dependencies

Referenced Libraries

src

target

mmw

mmw.cmd

pom.xml

ServiceC [boot]
 

- src/main/java

Boot Dashboard

Type tags, projects, or working set names to match (incl. \* and ? wild)

- local
  - ApiGateway [8080]
  - EurekaServer [8761]
  - ServiceA [9090]
  - ServiceB [9091]
  - ServiceC
    - WebShopComponentsCustomers
    - WebShopComponentsOrder
    - WebShopComponentsProduct

8 elements hidden by filter

```

11 @RestController
12 public class ServiceBController {
13
14     /*
15     @RequestMapping("/text")
16     public String getText() {
17         return "World";
18     }
19     */
20     @Autowired
21     RestTemplate restTemplate;
22
23     @RequestMapping("/text")
24     @HystrixCommand(fallbackMethod = "getTextFallback")
25     public String getText() {
26         String serviceText = restTemplate.getForObject("http://localhost:9092/text", String.class);
27         return "Hello " + serviceText;
28     }
29
30     public String getTextFallback() {
31         return "Hello Hystrix from B";
32     }
33
34     @Bean
35     RestTemplate getRestTemplate() {
36         return new RestTemplate();
37     }
38 }

```

Outline

- shop
  - ServiceTemplate : RestTemplate
  - getText() : String
  - getTextFallback() : String
  - getRestTemplate() : RestTemplate

Problems

EurekaServer - EurekaServerApplication [Spring Boot App] D:\sources\Eclipse\sts-4.11.0.RELEASE\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86\_64.16.0.1.v20210528-1205\jre\bin\javaw.exe (Sep 5, 2021, 9:11)

```

2021-09-05 21:12:08.393 INFO 26788 --- [nio-8761-exec-3] c.n.e.registry.AbstractInstanceRegistry : Registered instance SERVICEA/192.168.0.20:ServiceA:9090
2021-09-05 21:12:08.394 INFO 26788 --- [nio-8761-exec-3] c.n.e.registry.AbstractInstanceRegistry : Registered instance SERVICEB/192.168.0.20:ServiceB:9091
2021-09-05 21:12:19.226 INFO 26788 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 0ms
2021-09-05 21:13:09.704 INFO 26788 --- [nio-8761-exec-1] c.n.e.registry.AbstractInstanceRegistry : Registered instance SERVICEC/192.168.0.20:ServiceC:9092
2021-09-05 21:13:10.211 INFO 26788 --- [nio-8761-exec-4] c.n.e.registry.AbstractInstanceRegistry : Registered instance SERVICEC/192.168.0.20:ServiceC:9092
2021-09-05 21:13:12.875 INFO 26788 --- [nio-8761-exec-7] c.n.e.registry.AbstractInstanceRegistry : Cancelled instance SERVICEC/192.168.0.20:ServiceC:9092 (
2021-09-05 21:13:13.380 INFO 26788 --- [nio-8761-exec-6] c.n.e.registry.AbstractInstanceRegistry : DS: Registry: cancel failed because Lease is not regist
2021-09-05 21:13:13.380 INFO 26788 --- [nio-8761-exec-6] c.n.eureka.resources.InstanceResource : Not Found (Cancel): SERVICEC - 192.168.0.20:ServiceC:909
2021-09-05 21:13:13.380 INFO 26788 --- [get_localhost-8] c.n.eureka.cluster.ReplicationTask : The replication of task SERVICEC/192.168.0.20:ServiceC:9
2021-09-05 21:13:13.380 WARN 26788 --- [get_localhost-8] c.netflix.eureka.cluster.PeerEurekaNode : SERVICEC/192.168.0.20:ServiceC:9092:Cancel@localhost: mi
2021-09-05 21:13:19.227 INFO 26788 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 0ms
2021-09-05 21:14:19.238 INFO 26788 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 11ms
2021-09-05 21:15:19.238 INFO 26788 --- [a-EvictionTimer] c.n.e.registry.AbstractInstanceRegistry : Running the evict task with compensationTime 0ms

```



## This site can't be reached

**localhost** refused to connect.

Try:

- Checking the connection
- [Checking the proxy and the firewall](#)

ERR\_CONNECTION\_REFUSED

Reload

And Call from serviceA or serviceB:

Hello Hello Histrich from B

Hello Histrich from B

Refer attached files for more details

localhost:9411/zipkin/?lookback=15m&endTs=1630894717746&limit=10

Zipkin Find a trace Dependencies ENGLISH Search by trace ID

+ RUN QUERY

10 Results EXPAND ALL COLLAPSE ALL Service filters

Root	Start Time	Spans	Duration
▼ servicea: get	6 minutes ago (09/05 21:13:01:871)	2	18.587ms SHOW
▼ serviceb: get /text	6 minutes ago (09/05 21:13:16:387)	1	10.535ms SHOW

localhost:9411/zipkin/traces/17c8634e964d3c41

Zipkin Find a trace Dependencies ENGLISH Search by trace ID

SERVICEA: get Duration: 18.587ms Services: 2 Depth: 1 Total Spans: 1 Trace ID: 17c8634e964d3c41 DOWNLOAD JSON

^ v >>

SERVICEB  
get /text  
Span ID: 17c8634e964d3c41 Parent ID: None

Annotations

SHOW ALL ANNOTATIONS

Tags

- http.method  
GET
- http.path  
/text
- mvc.controller.class  
ServiceBController
- mvc.controller.method  
getText
- Client Address  
127.0.0.1:57082



