

Micro Services Problem statement

Part-1 – Micro Services creation

1. Create following 4 micro service applications
 - a. Product-Catalog-Service
 - b. Price-Service
 - c. Cart-Service
 - d. Order-Service
2. Configure following port number for above created applications
 - a. Product-Catalog-Service : 8081
 - b. Price-Service : 8082
 - c. Cart-Service : 8083
 - d. Order-Service : 8084

Add following business scenarios for the above -mentioned micro services

- a. **Product-Catalog-Service** : Create a RestController for adding a single product as JSON, or for adding multiple products as Array of JSON objects. Details for Product object properties are given below.

Table/Collection name : **Product**

Properties:

```
@Id
@GeneratedValue
private int id;
private String name;
private double price;
private String description;
```

Table/Collection name: **Review**

Properties:

```
@Id
@GeneratedValue
private int reviewId;
private int stars;
private String author;
private String body;
@ManyToOne
@JoinColumn(name = "id")
private Product product;
```

Now Create end point url to retrieve Product and Reviews information

Finding all products

GET request: <http://localhost:8081/api/products>

```
[
  {
    "id": 1,
    "name": "Pen",
    "price": 25,
    "description": "Red Ink"
  },
  {
    "id": 2,
    "name": "Mobile",
    "price": 16000,
    "description": "Samsung A7 Mobile"
  }
]
```

Finding specified product. (ex: finding a product whose id is 1)

GET request: <http://localhost:8081/api/products/1>

```
{
  "id": 1,
  "name": "Pen",
  "price": 25,
  "description": "Red Ink"
}
```

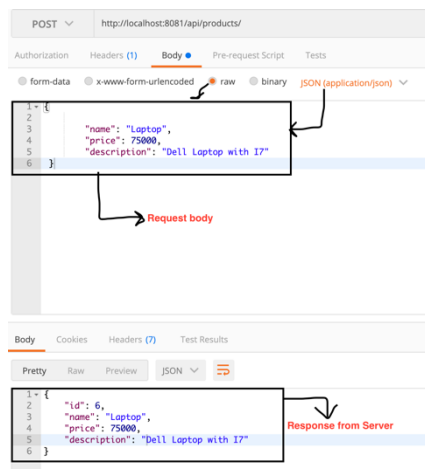
Finding all products by product name.(ex: any product having a letter 'e')

GET request: <http://localhost:8081/api/products/ByName/e>

```
[
  {
    "id": 1,
    "name": "Pen",
    "price": 25,
    "description": "Red Ink"
  },
  {
    "id": 2,
    "name": "Mobile",
    "price": 16000,
    "description": "Samsung A7 Mobile"
  }
]
```

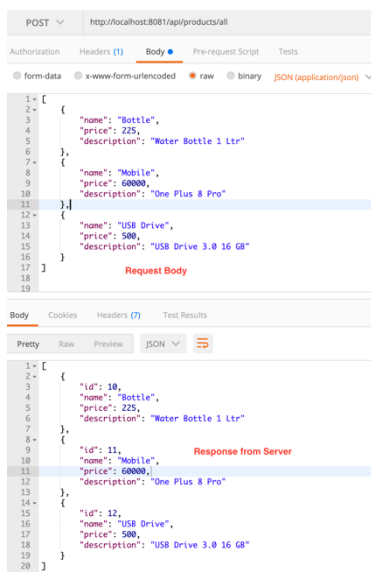
Posting a single product

POST request: <http://localhost:8081/api/products>



Posting more than a product

POST request: `http://localhost:8081/api/products/all`



Finding a product with Reviews

GET request: `http://localhost:8081/api/products/2/reviews`

```
[
  {
    "stars": 5,
    "author": "Praveen",
    "body": "Very Good Mobile",
    "product": {
      "id": 2,
      "name": "Mobile",
      "price": 16000,
      "description": "Samsung A7 Mobile"
    }
  }
]
```

```

    },
    "id": 3
  },
  {
    "stars": 4,
    "author": "Ozvitha",
    "body": "Poor Display",
    "product": {
      "id": 2,
      "name": "Mobile",
      "price": 16000,
      "description": "Samsung A7 Mobile"
    },
    "id": 4
  }
]

```

Posting a review for a specified product

POST request: <http://localhost:8081/api/products/6/reviews>

The screenshot displays a REST client interface with a POST request to `http://localhost:8081/api/products/6/reviews`. The request body is a JSON object with the following structure:

```

{
  "stars": 4,
  "author": "Praveen",
  "body": "Good Laptop in this price range"
}

```

The response is also in JSON format, showing the created review and the product details:

```

{
  "stars": 4,
  "author": "Praveen",
  "body": "Good Laptop in this price range",
  "product": {
    "id": 6,
    "name": "Laptop",
    "price": 75000,
    "description": "Dell Laptop with I7"
  },
  "id": 9
}

```

Annotations in the image include "Request Body" pointing to the request JSON and "Response from sever" (sic) pointing to the response JSON.

Part-2 – Config Server, Microservices communication

Create a Config server with the following configuration.

server.port=8888

spring.cloud.config.server.git.uri=https://github.com/ctsjava/osp-git.git

management.security.enabled=false

spring.application.name=spring-config-server-app

management.endpoints.web.exposure.include=*

- b. **Price-Service:** Add the following features for this service

Make sure database configuration for this service should be maintained by ConfigServer from github repository

Price-service application properties file

spring.application.name=price-service

server.port=8082

ConfigServer application properties file

server.port=8888

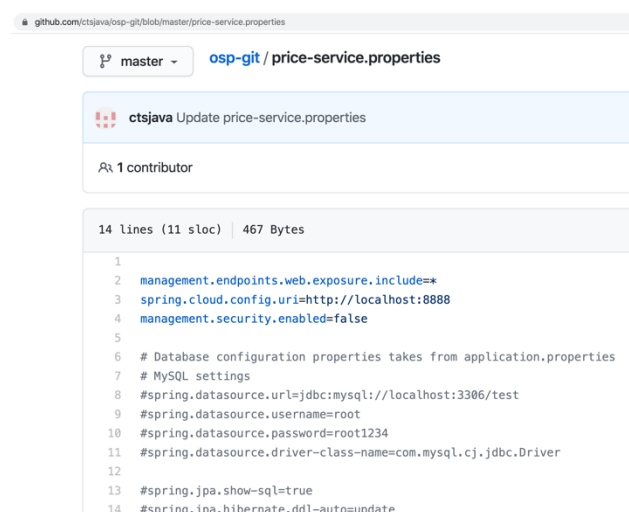
spring.cloud.config.server.git.uri=https://github.com/ctsjava/osp-git.git

management.security.enabled=false

spring.application.name=spring-config-server-app

management.endpoints.web.exposure.include=*

price-service application database properties from github



The screenshot shows a GitHub repository page for the file `price-service.properties` in the `osp-git` repository. The file is 14 lines long (11 sloc) and 467 Bytes. The content of the file is as follows:

```
1
2 management.endpoints.web.exposure.include=*
3 spring.cloud.config.uri=http://localhost:8888
4 management.security.enabled=false
5
6 # Database configuration properties takes from application.properties
7 # MySQL settings
8 #spring.datasource.url=jdbc:mysql://localhost:3306/test
9 #spring.datasource.username=root
10 #spring.datasource.password=root1234
11 #spring.datasource.driver-class-name=com.mysql.cj.jdbc.Driver
12
13 #spring.jpa.show-sql=true
14 #spring.jpa.hibernate.ddl-auto=update
```

Finding price for a given Product

GET request: `http://localhost:8082/api/price/2`

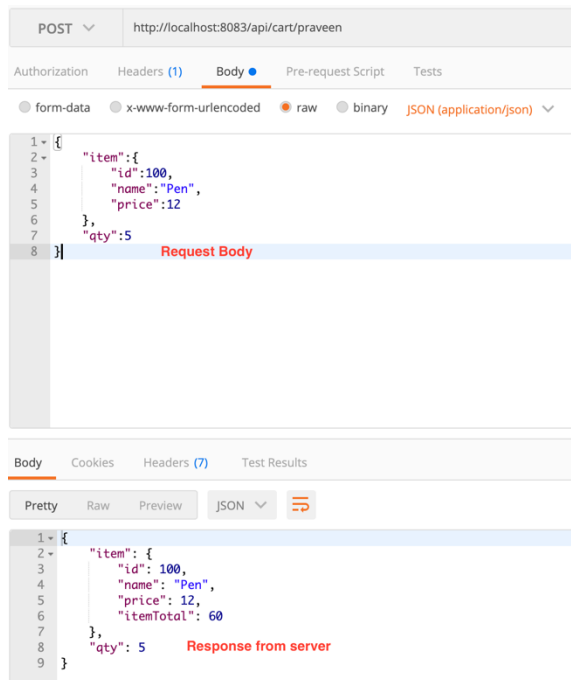
Should return price of product id 2

- c. **Cart-Service:** Add the following capabilities for this service

Add a Product Item to the cart with following end point url

POST request <http://localhost:8083/api/cart/praveen> (Here Praveen is the logged user)

Note: Passing price here is optional. You should get the price for the product id 100 from the Price-Service application. (You may use RestTemplate or FeignClient as per your convenience for micro services intercommunications)



- d. **Order-Service** : Add the following capabilities for the order-service application

You have already added a Item in the cart. Now lets make an order for the items which are available in the cart only. You can not order any items which are not available in the cart. PFB the end point URL for ordering an Item or Items. Please make sure that you are passing only user name who added Product in the cart.

POST request. <http://localhost:8084/api/orders/praveen>

You should pull the cart items for the user Praveen from the Cart-Service application.

Use Feign client or RestTemplate for the Microservices inter-communications.

When the above url is posted, Return the following response from the server and delete the ordered items from the cart for the user Praveen ion the Cart-Service application.

```
{  "id": 13,  "date": "2020-08-03T23:32:31.443",
```

```

    "amount": 60,
    "user": "praveen"
}

```

Part-3 – Load Balancing with Ribbon

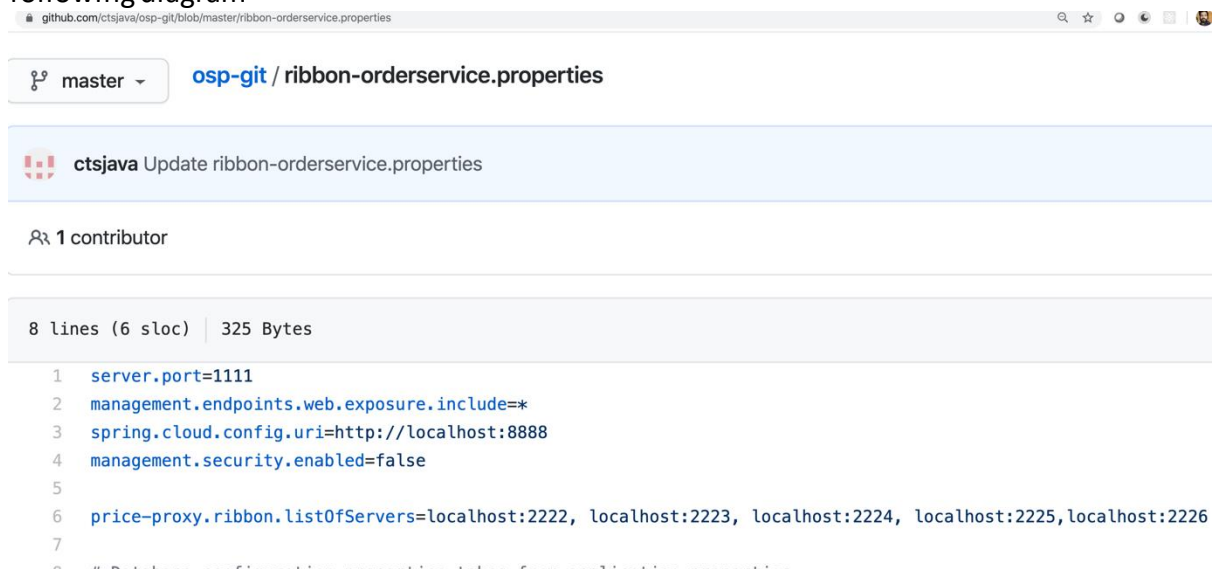
Create Ribbon Service application for the Order-Service with following configuration in the application.properties file.

spring.application.name=ribbon-orderservice

Now create 5 different Price-Service Instances with port numbers 2222, 2223,2224,2225 and 2226 as following diagram.



Now add Ribbon-Order-Service application properties in the github config server like following diagram



Please note that you have configured Above created 5 instances of Price-Service applications port numbers with Ribbon for load balancing.

```

server.port=1111
management.endpoints.web.exposure.include=*
spring.cloud.config.uri=http://localhost:8888
management.security.enabled=false
price-proxy.ribbon.listOfServers=localhost:2222, localhost:2223, localhost:2224,
localhost:2225,localhost:2226

```