Lab RSMortgage Customer Account Service

Spring Cloud RSMortgage Customer Account REST Service

Udemy Exploring Spring Cloud Course
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Rolling Stone Technology

Formatted: December, 2016

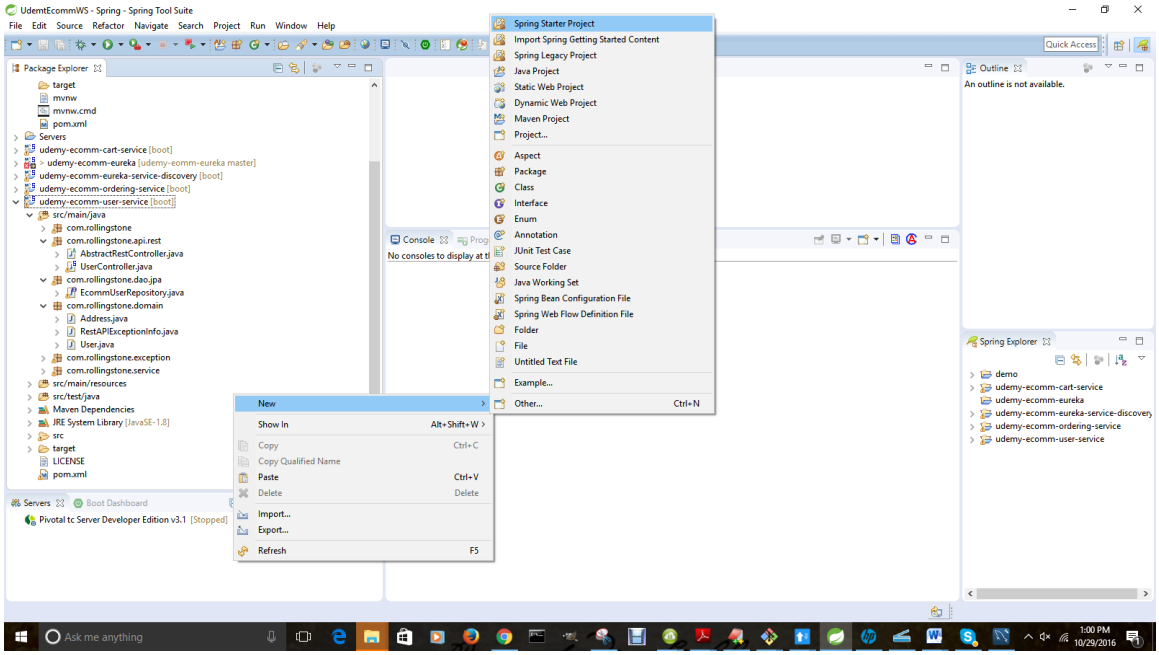
Table of Content

Chapter 1
Spring Cloud Customer Account Service Project Creation

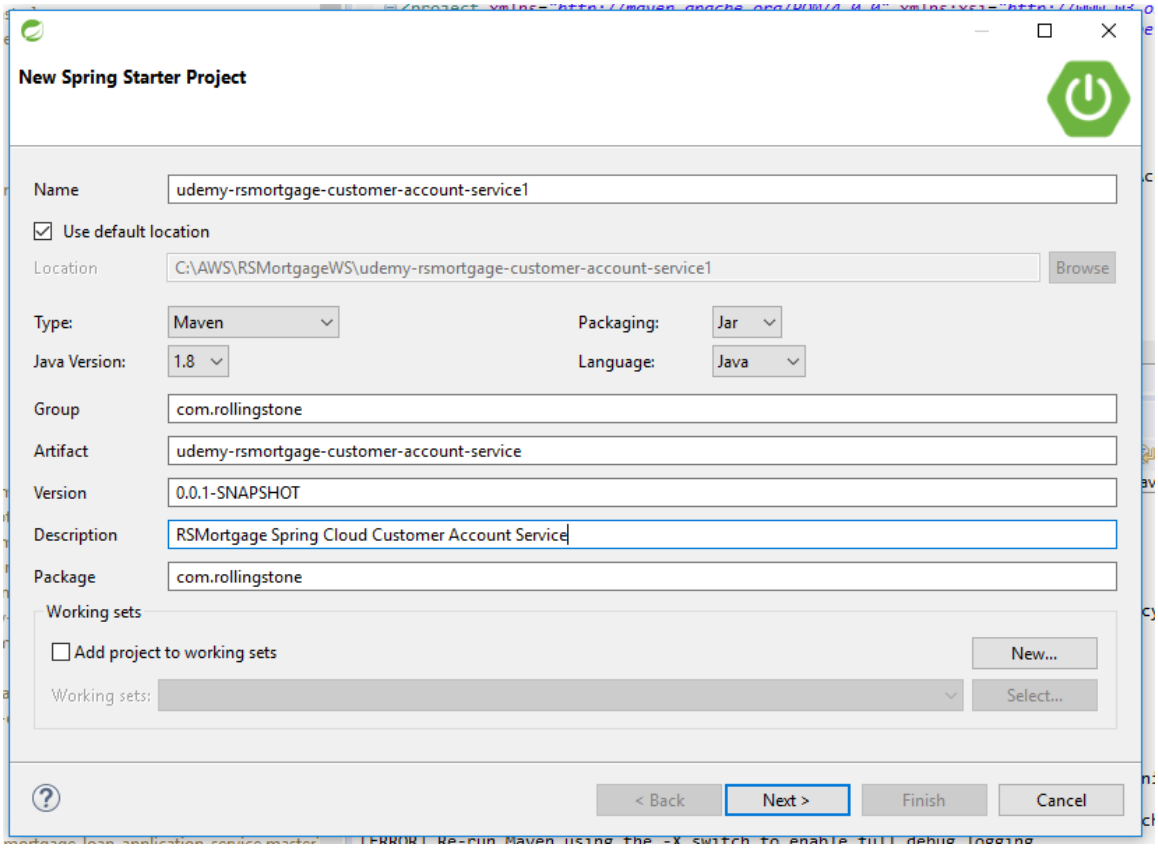
1.0 - Introduction

The following sections will lead us through creating the Spring Cloud Customer Account Microservice, one step at a time.

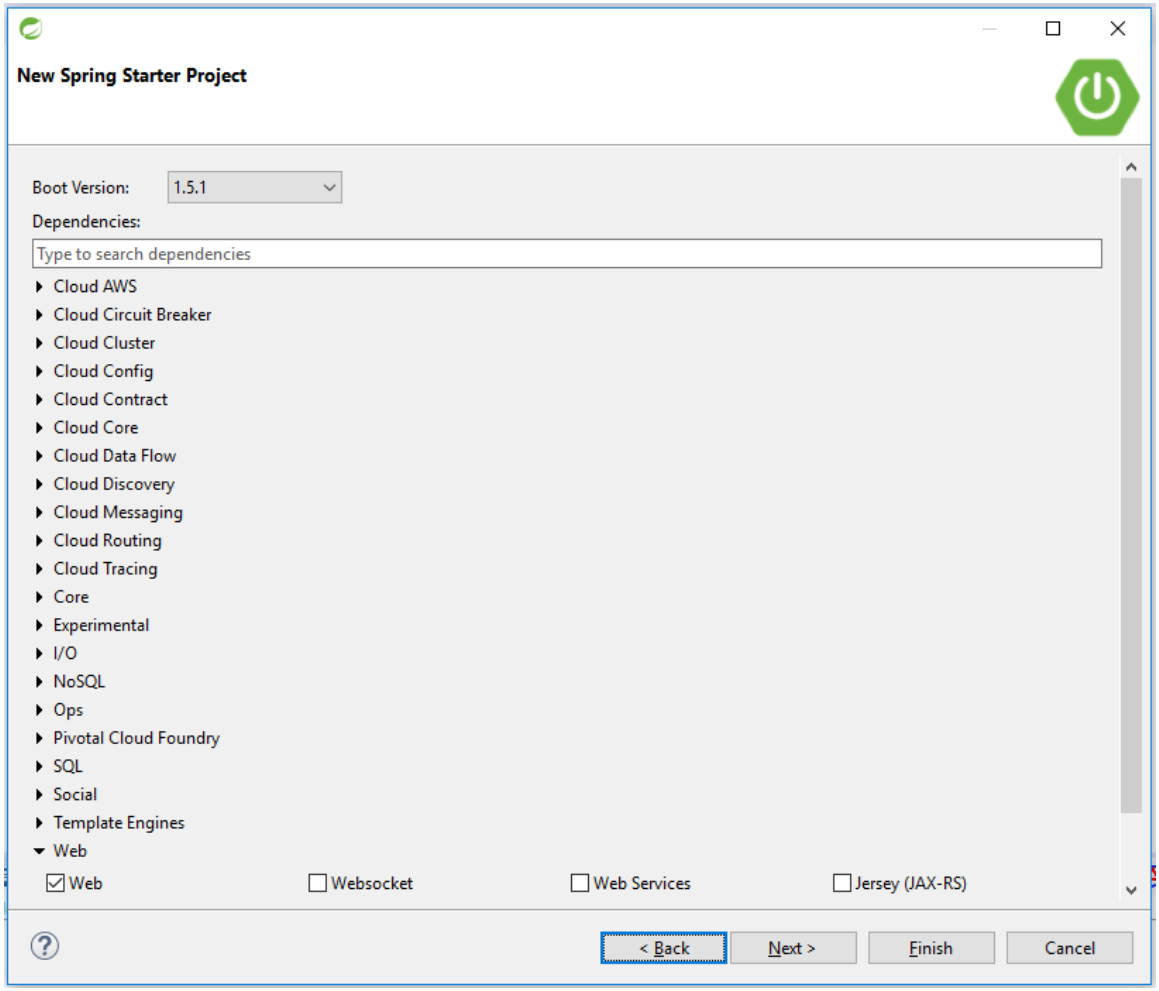
1.1 – Create a new Spring Starter Project



1.2 – Fill initial values



1.3 – Choose Eureka and Web as starter projects



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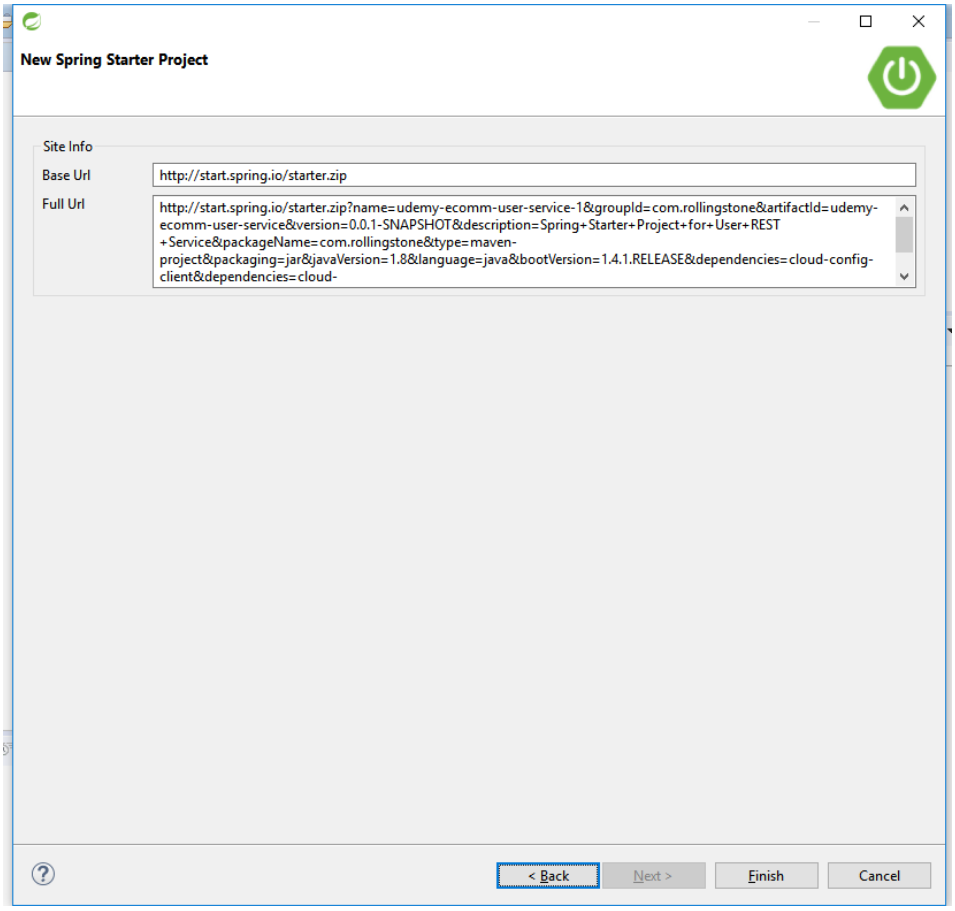
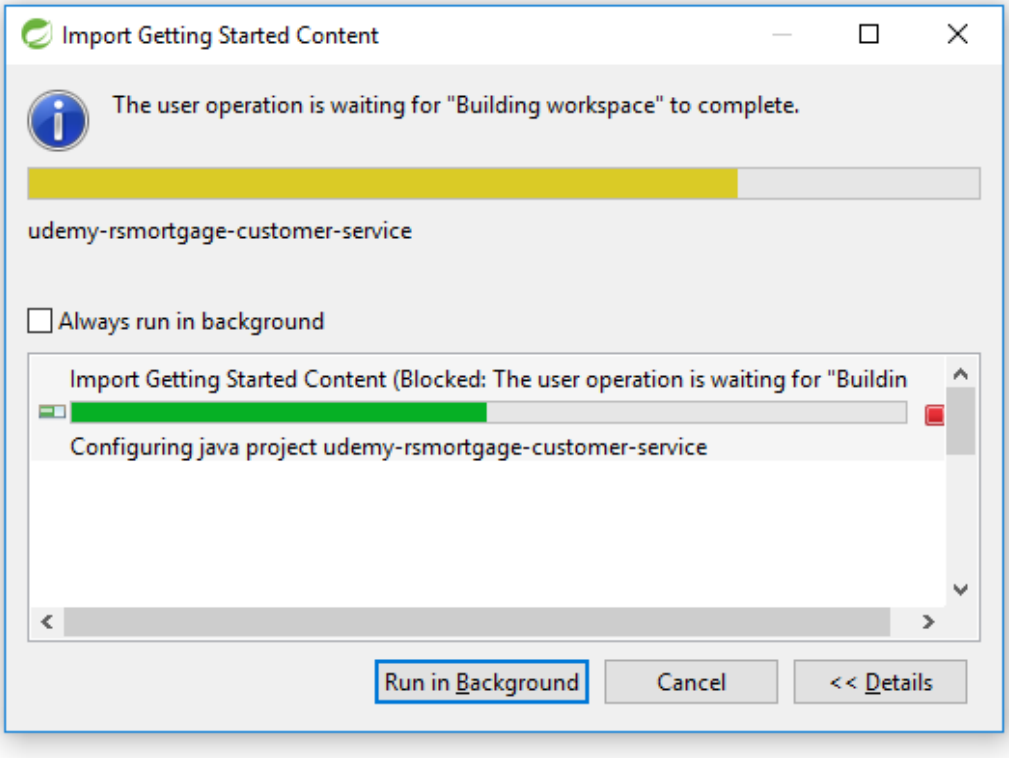
1.4 – Click Finish Now



1.5 – Let Spring Tool Suite Prepare the Project



1.6 – Make sure the following looks like below

```
<groupId>com.rollingstone</groupId>
   <artifactId>udemy-rsmortgage-customer-account-service</artifactId>
   <version>1.0</version>
   <packaging>jar</packaging>
   <description>Example project demonstrating Spring Cloud based
Customer Account Microservice as a REST API</description>
```

1.7 – Spring Boot Maven Parent Section

```
   <parent>
       <groupId>org.springframework.boot</groupId>
       <artifactId>spring-boot-starter-parent</artifactId>
       <version>1.4.1.RELEASE</version>
   </parent>
```

1.8 – Maven Properties Section

```
   <properties>
       <start-
class>com.rollingstone.RsMortgageCustomerAccountRestAPIApplication</start-class>
   </properties>
```

1.9 – Maven Dependency Management Section

```
<dependencyManagement>
        <dependencies>
            <dependency>
                <groupId>org.springframework.cloud</groupId>
                <artifactId>spring-cloud-dependencies</artifactId>
                <version>Camden.SR1</version>
                <type>pom</type>
                <scope>import</scope>
            </dependency>
        </dependencies>
    </dependencyManagement>
```

1.10 – Spring Boot Actuator Dependency

```
<dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-actuator</artifactId>
</dependency>
```

1.11 – Spring Boot Web Dependency

```
<!-- web development, including Tomcat and spring-webmvc -->
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-web</artifactId>
</dependency>
```

1.12 – Spring Boot JPA Dependency

```
<!-- spring-data-jpa, spring-orm and Hibernate -->
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-data-jpa</artifactId>
    </dependency>
```

1.13 – Spring Boot H2 Dependency

```
<dependency>
        <groupId>com.h2database</groupId>
        <artifactId>h2</artifactId>
        <version>1.4.181</version>
    </dependency>
```

1.14 – Spring Boot Test Dependency

```
<!-- spring-test, hamcrest, ... -->
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-test</artifactId>
            <scope>test</scope>
        </dependency>
```

1.15 – Spring Boot Jackson DataBind Dependency

```
<dependency>
            <groupId>com.fasterxml.jackson.core</groupId>
            <artifactId>jackson-databind</artifactId>
        </dependency>
```

1.16 – Spring Boot Jackson HAL Browser Dependency

```
<dependency>
        <groupId>org.springframework.data</groupId>
        <artifactId>spring-data-rest-hal-browser</artifactId>
</dependency>
```

1.17 – Spring Boot Jackson JSON Test Dependency

```
<!-- attribute level json comparisons -->
    <dependency>
        <groupId>com.jayway.jsonpath</groupId>
        <artifactId>json-path</artifactId>
        <version>0.9.1</version>
        <scope>test</scope>
    </dependency>
    <dependency>
        <groupId>com.jayway.jsonpath</groupId>
        <artifactId>json-path-assert</artifactId>
        <version>0.9.1</version>
        <scope>test</scope>
    </dependency>
```

1.18 – Spring Boot Jackson Swagger Dependency

```
<dependency>
        <groupId>io.springfox</groupId>
        <artifactId>springfox-swagger2</artifactId>
        <version>2.3.1</version>
    </dependency>
    <dependency>
        <groupId>io.springfox</groupId>
        <artifactId>springfox-swagger-ui</artifactId>
        <version>2.3.1</version>
    </dependency>
```

1.19 – Spring Boot HSQL Dependency

```
<dependency>
        <groupId>org.hsqldb</groupId>
        <artifactId>hsqldb</artifactId>
        <scope>runtime</scope>
    </dependency>
```

1.20 – Spring Boot MySQL Dependency

```
<dependency>
        <groupId>mysql</groupId>
        <artifactId>mysql-connector-java</artifactId>
        <version>5.1.40</version>
    </dependency>
```

1.21 – Spring Cloud Eureka Dependency

```
<dependency>
        <groupId>org.springframework.cloud</groupId>
        <artifactId>spring-cloud-starter-eureka</artifactId>
</dependency>
```

1.22 – Spring Cloud Feign Dependency

```
<dependency>
        <groupId>org.springframework.cloud</groupId>
        <artifactId>spring-cloud-starter-feign</artifactId>
    </dependency>
```

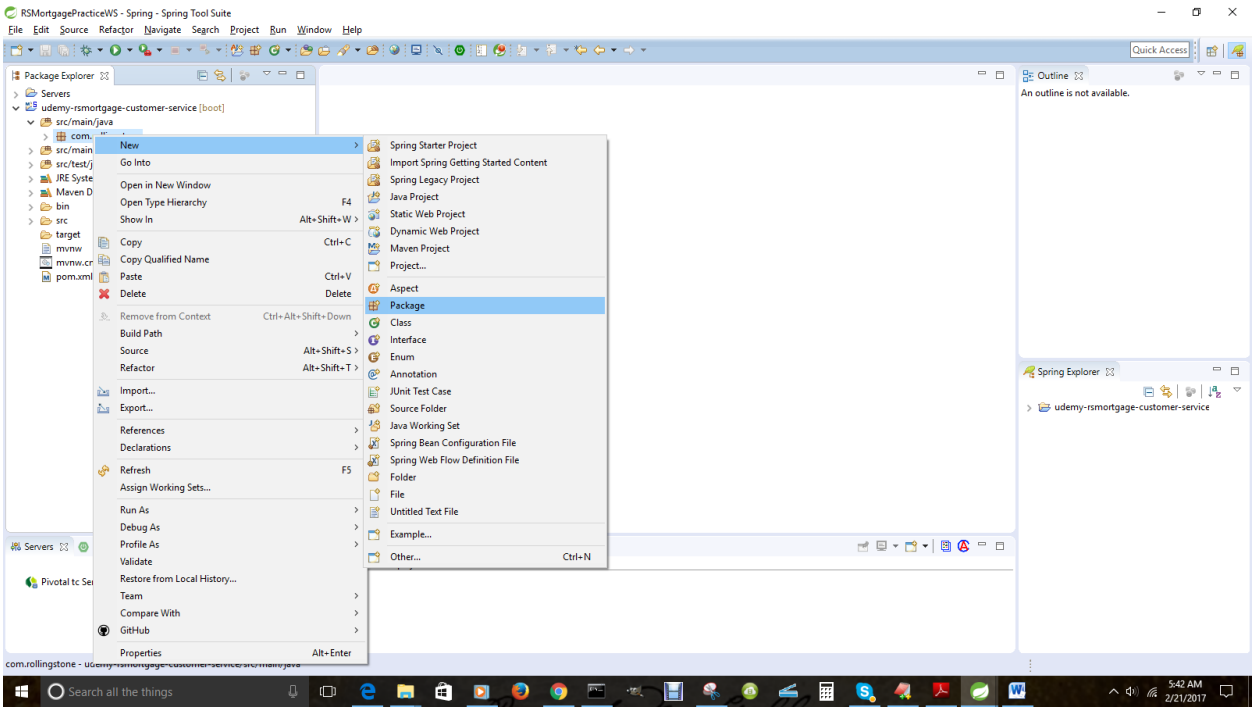
1.23 – Spring Cloud Config Dependency

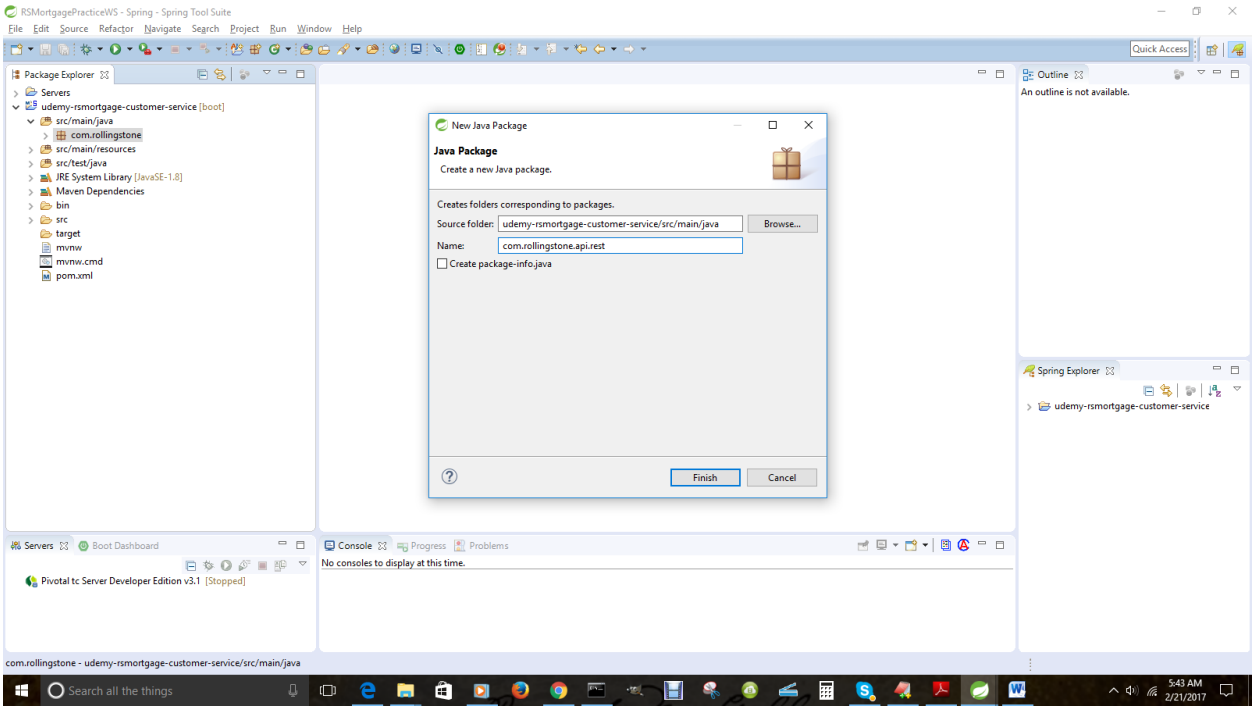
```
<dependency>
        <groupId>org.springframework.cloud</groupId>
        <artifactId>spring-cloud-starter-config</artifactId>
    </dependency>

<dependency>
        <groupId>org.springframework.cloud</groupId>
        <artifactId>spring-cloud-config-client</artifactId>
    </dependency>
```

1.24 – Maven Build configuration

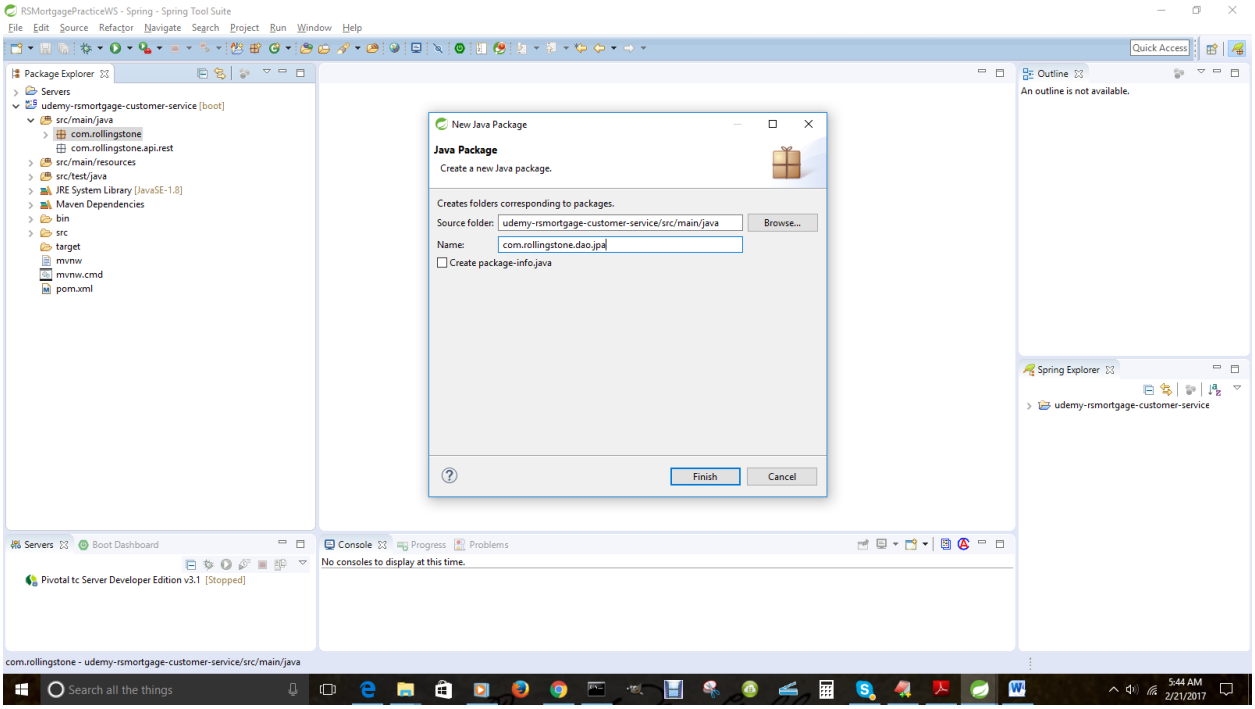
```
<build>
        <resources>
            <resource>
                <directory>src/main/resources</directory>
                <filtering>true</filtering>
            </resource>
        </resources>
        <plugins>
            <plugin>
                <groupId>org.apache.maven.plugins</groupId>
                <artifactId>maven-compiler-plugin</artifactId>
                <version>3.1</version>
                <configuration>
                    <source>1.8</source>
                    <target>1.8</target>
                </configuration>
            </plugin>
            <!-- Spring boot support -->
            <plugin>
                <groupId>org.springframework.boot</groupId>
                <artifactId>spring-boot-maven-plugin</artifactId>
                <configuration>
                    <addResources>false</addResources>
                </configuration>
            </plugin>
        </plugins>
    </build>
```

1.25 – Add api.rest package

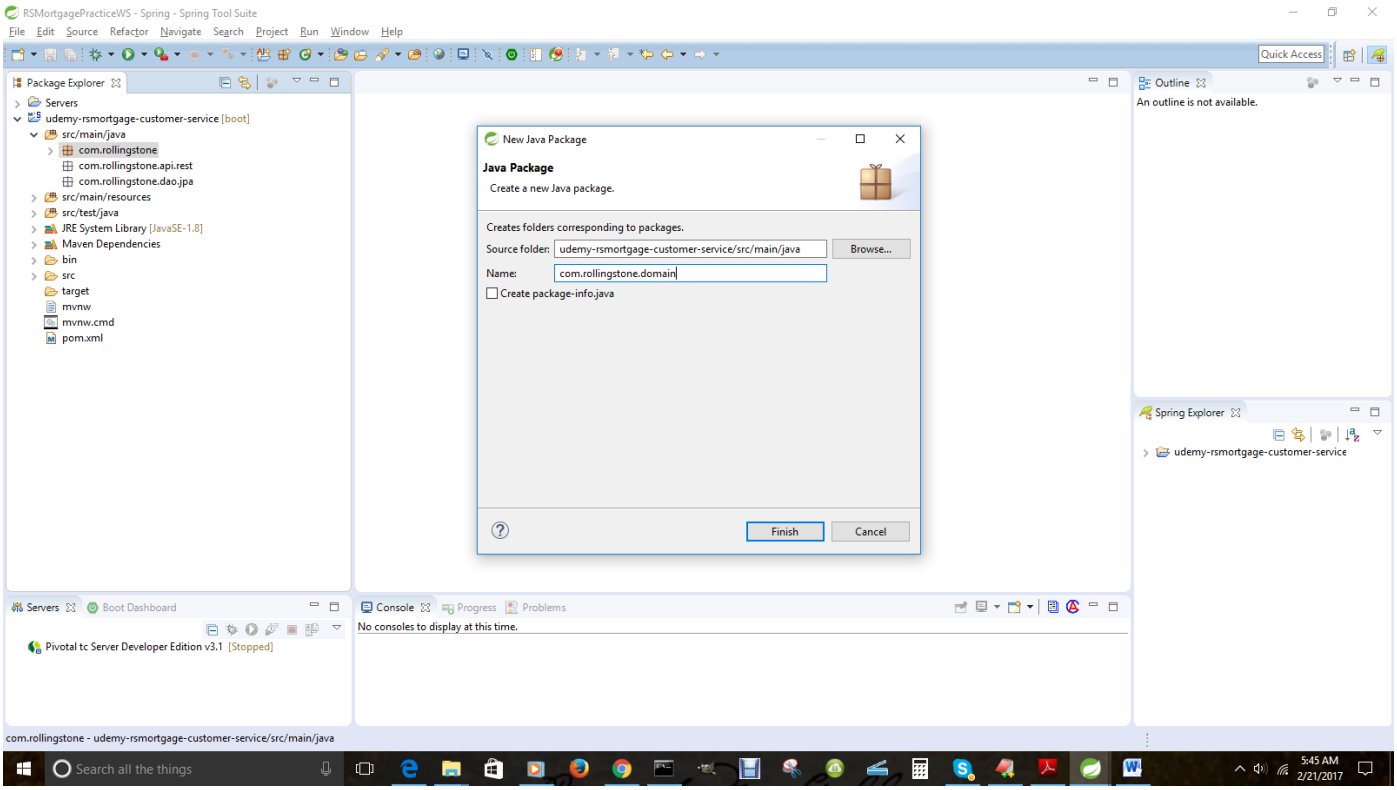



RSMortgagePracticeWS - Spring - Spring Tool Suite
File Edit Source Refactor Navigate Search Project Run Window Help
Quick Access
Package Explorer
Servers
udemy-rsmortgage-customer-service [boot]
src/main/java
com.rollingstone
src/main/resources
src/test/java
JRE System Library [JavaSE-1.8]
Maven Dependencies
bin
src
target
mvnw
mvnw.cmd
pom.xml
New Java Package
Java Package
Create a new Java package.
Creates folders corresponding to packages.
Source folder: udemy-rsmortgage-customer-service/src/main/java
Browse...
Name: com.rollingstone.api.rest
Create package-info.java
Finish
Cancel
Outline
An outline is not available.
Spring Explorer
udemy-rsmortgage-customer-service
Servers
Boot Dashboard
Pivotal tc Server Developer Edition v3.1 [Stopped]
Console
Progress
Problems
No consoles to display at this time.
com.rollingstone - udemy-rsmortgage-customer-service/src/main/java
Search all the things
5:43 AM
2/21/2017

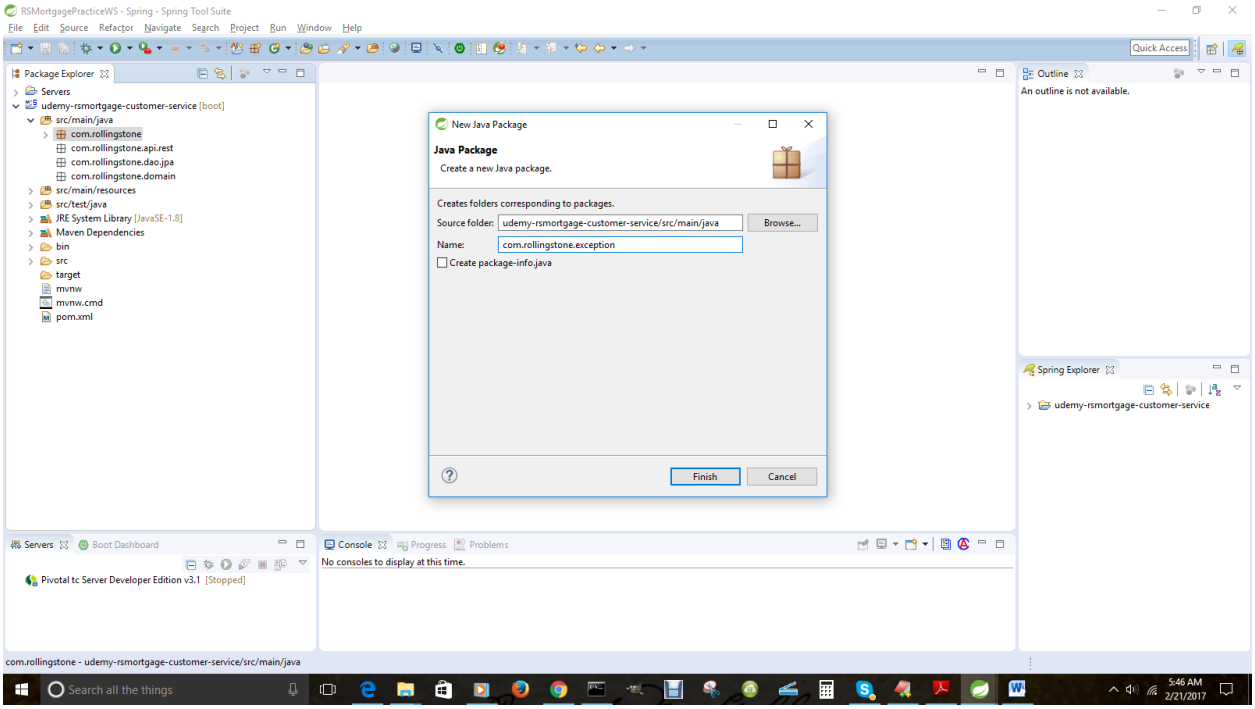
1.26– Add dao.jpa package



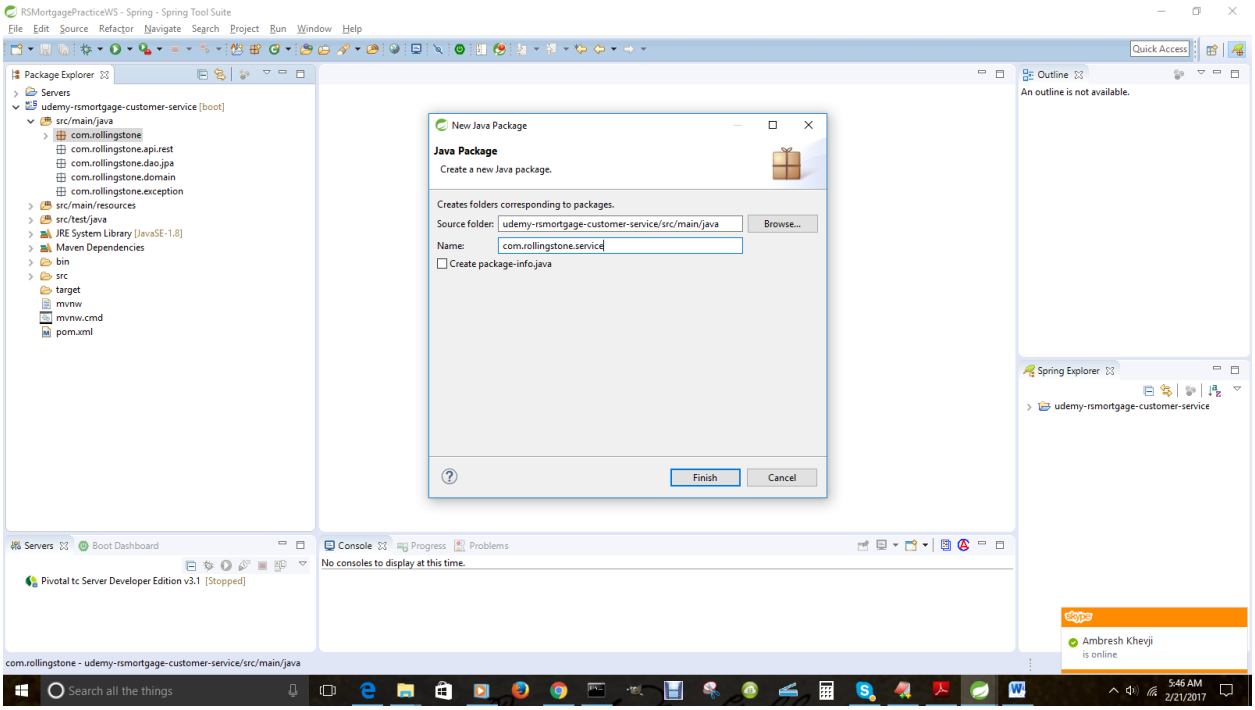
1.27– Add domain package



1.28– Add exception package



1.29– Add service package



1.30– Create Account Domain class in the domain package

```
package com.rollingstone.domain;

import java.util.Date;

/*
 * A Account  POJO serving as an Entity as well as a Data Transfer Object i.e DTO
 */
@Entity
@Table(name = "rsmortgage_account")
@XmlRootElement
@XmlAccessorType(XmlAccessType.FIELD)
public class Account {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private long id;

    @OneToOne
    @JoinColumn(name="account_type_id")
    private AccountType accountType;

    @Temporal(TemporalType.DATE)
    @Column(name = "date_created", unique = true, nullable = false, length = 10)
    private Date dateCreated;

    @Column(nullable = false)
    private double originalCreditAmount;

    @Column(nullable = false)
    private double balanceAmount;

    @Column(nullable = false)
    private boolean fullyPaid;

    @Column(nullable = false)
    private int term;

    @Column(nullable = false)
    private float rateOfInterest;

    @Column(nullable = false)
    private boolean escrowAttached;
```

```
    @Column(nullable = false)
    private boolean pmiAttached;

    @ManyToOne(fetch = FetchType.LAZY)
    @JoinColumn(name = "customer_id", nullable = false)
    @JsonBackReference
    Customer customer;

}
```

1.31– Generate the following for the Account class

- Getter and Setters
- hashCode
- equals
- toString
- A non-default constructor

1.32– Create AccountType Domain class in the domain package

```
 @Entity
@Table(name = "rsmortgage_account_type")
@XmlRootElement
@XmlAccessorType(XmlAccessType.FIELD)
public class AccountType {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private long id;

    @Column(nullable = false)
    private String accountTypeName;

    @Column(nullable = false)
    private String accountTypeDescription;

}
```

1.33– Generate the following for the AccountType class

- Press CTRL+Shift+O [Command + Shift + O in Mac] to import
- Choose java.persistence package
- Getter and Setters
- hashCode
- equals
- toString
- A non-default constructor

1.34– Create the Address Domain class in the domain package

```
package com.rollingstone.domain;

import javax.persistence.Column;
import javax.persistence.Entity;
import javax.persistence.FetchType;
import javax.persistence.GeneratedValue;
import javax.persistence.GenerationType;
import javax.persistence.Id;
import javax.persistence.JoinColumn;
import javax.persistence.ManyToOne;
import javax.persistence.Table;
import javax.xml.bind.annotation.XmlAccessType;
import javax.xml.bind.annotation.XmlAccessorType;
import javax.xml.bind.annotation.XmlRootElement;

import com.fasterxml.jackson.annotation.JsonBackReference;

@Entity
@Table(name = "rsmortgage_address")
@XmlRootElement
@XmlAccessorType(XmlAccessType.FIELD)
public class Address {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private long id;

    @Column(nullable = false)
    private String streetAddress;

    @Column(nullable = false)
    private String state;

    @Column(nullable = false)
    private String city;

    @Column(nullable = false)
    private String zipCode;

    @Column(nullable = false)
    private String country;
```

```
    @Column(nullable = false)
    private boolean isCurrentAddress;

    @Column(nullable = false)
    private boolean isMailingAddress;

    @Column(nullable = false)
    private boolean isBillingAddress;

    @Column(nullable = false)
    private boolean isPermanentResidence;

    @Column(nullable = false)
    private boolean isInvestmentProperty;


    @ManyToOne(fetch = FetchType.LAZY)
    @JoinColumn(name = "customer_id", nullable = false)
    @JsonBackReference
    Customer customer;

}
```

1.35– Do the following to the Address Class

- Press CTRL+Shift+O [Command + Shift + O in Mac] to import
- Choose java.persistence package
- Generate Getter Setter
- Generate Constructor using Fields
- Generate toString
- hashCode
- equals
- toString

1.36--Create the Address Domain class in the domain package

```
package com.rollingstone.domain;


/*
 * A Contact POJO serving as an Entity as well as a Data Transfer Object i.e DTO
 */
@Entity
@Table(name = "rsmortgage_contact")
@XmlRootElement
@XmlAccessorType(XmlAccessType.FIELD)
public class Contact {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private long id;

    @OneToOne
    @JoinColumn(name="contact_type_id")
    private ContactType contactType;

    @Temporal(TemporalType.DATE)
    @Column(name = "date_created", unique = true, nullable = false, length = 10)
    private Date dateCreated;

    @ManyToOne(fetch = FetchType.LAZY)
    @JoinColumn(name = "customer_id", nullable = false)
    @JsonBackReference
    Customer customer;

    @Column(nullable = true)
    private String emailAddress;

    @Column(nullable = true)
    private String phoneNumber;

    @Column(nullable = true)
    private String twitterHandles;

    @Column(nullable = true)
    private String faceBookId;
```

1.37– Do the following to the Contact Class

- Press CTRL+Shift+O [Command + Shift + O in Mac] to import
- Choose java.persistence package
- Generate Getter Setter
- Generate Constructor using Fields
- Generate toString
- hashCode
- equals
- toString

1.38--Create the ContactType Domain class in the domain package

```
@Entity
@Table(name = "rsmortgage_contact_type")
@XmlRootElement
@XmlAccessorType(XmlAccessType.FIELD)
public class ContactType {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private long id;

    @Column(nullable = false)
    private String contactTypeName;

    @Column(nullable = false)
    private String contactTypeDescription;

}
```

1.39– Do the following to the ContactType Class

- Press CTRL+Shift+O [Command + Shift + O in Mac] to import
- Choose java.persistence package
- Generate Getter Setter
- Generate Constructor using Fields
- Generate toString
- hashCode
- equals
- toString

1.40--Create the Customer Domain class in the domain package

```
/*
 * A Customer POJO serving as an Entity as well as a Data Transfer Object i.e DTO
 */
@Entity
@Table(name = "rsmortgage_customer")
@XmlRootElement
@XmlAccessorType(XmlAccessType.FIELD)
public class Customer {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private long id;

    @Column(nullable = false)
    private String firstName;

    @Column(nullable = false)
    private String lastName;

    @Column(nullable = false)
    private String socialSecurityNumber;




    @Temporal(TemporalType.DATE)
    @Column(name = "dob", unique = true, nullable = false, length = 10)
    private Date dateOfBirth;

    @Column(nullable = false)
    private double totalLoanAmount;

    @Column(nullable = false)
    private int bonusPoints;

    @Temporal(TemporalType.DATE)
    @Column(name = "customer_since", unique = true, nullable = false, length = 10)
    private Date memberSince;

    @OneToMany(fetch = FetchType.LAZY, mappedBy = "customer")
  @JsonManagedReference
    private Set<Address> addresses = new HashSet<Address>();
```

```
    @OneToMany(fetch = FetchType.LAZY, mappedBy = "customer")
  @JsonManagedReference
    private Set<Account> accounts = new HashSet<Account>();

    @OneToMany(fetch = FetchType.LAZY, mappedBy = "customer")
  @JsonManagedReference
    private Set<Contact> contacts = new HashSet<Contact>();


    @OneToMany(fetch = FetchType.LAZY, mappedBy = "customer")
  @JsonManagedReference
    private Set<Education> education = new HashSet<Education>();

    @OneToMany(fetch = FetchType.LAZY, mappedBy = "customer")
  @JsonManagedReference
    private Set<Employment> employment = new HashSet<Employment>();

    @OneToMany(fetch = FetchType.LAZY, mappedBy = "customer")
  @JsonManagedReference
    private Set<Investment> investments = new HashSet<Investment>();


    @OneToMany(fetch = FetchType.LAZY, mappedBy = "customer")
  @JsonManagedReference
    private Set<Liability> liabilities = new HashSet<Liability>();


    @Column()
    private int rating;

}
```

1.41– Do the following to the Customer Class

- Press CTRL+Shift+O [Command + Shift + O in Mac] to import
- Choose java.persistence package
- Generate Getter Setter
- Generate Constructor using Fields
- Generate toString
- hashCode
- equals
- toString

1.42--Create the DegreeType Domain class in the domain package

```
@Entity
@Table(name = "rsmortgage_degree_type")
@XmlRootElement
@XmlAccessorType(XmlAccessType.FIELD)
public class DegreeType {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private long id;

    @Column(nullable = false)
    private String degreeTypeName;

    @Column(nullable = false)
    private String degreeTypeDescription;

}
```

1.43– Do the following to the DegreeType Class

- Press CTRL+Shift+O [Command + Shift + O in Mac] to import
- Choose java.persistence package
- Generate Getter Setter
- Generate Constructor using Fields
- Generate toString
- hashCode
- equals
- toString

1.44--Create the Education Domain class in the domain package

```
@Entity
@Table(name = "rsmortgage_education")
@XmlRootElement
@XmlAccessorType(XmlAccessType.FIELD)
public class Education {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private long id;

    @Temporal(TemporalType.DATE)
    @Column(name = "date_from", unique = true, nullable = false, length = 10)
    private Date fromDate;

    @Temporal(TemporalType.DATE)
    @Column(name = "date_to", unique = true, nullable = false, length = 10)
    private Date dateTo;

    @Column(nullable = false)
    private boolean isCurrentSchool;

    @Column(nullable = false)
    private boolean didGraduate;

    @Column(nullable = false)
    private float cumulativeGpa;

    @Column(nullable = false)
    private String schoolName;

    @OneToOne
    @JoinColumn(name="degree_type_id")
    private DegreeType degreeType;

    @Column(nullable = false)
    private String   schoolAdminPerson;

    @Column(nullable = false)
    private String schoolAdminPhone;

    @Column(nullable = false)
```

```
    private String schoolAdminEmail;

    @Column(nullable = false)
    private String schoolAdminFax;

    @Column(nullable = false)
    private String schoolAddressLine1;

    @Column(nullable = false)
    private String schoolAddressLine2;

    @Column(nullable = false)
    private String schoolAddressCity;

    @Column(nullable = false)
    private String schoolAddressState;

    @Column(nullable = false)
    private String schoolAddressCountry;

    @ManyToOne(fetch = FetchType.LAZY)
    @JoinColumn(name = "customer_id", nullable = false)
    @JsonBackReference
    Customer customer;

}
```

1.45– Do the following to the Education Class

- Press CTRL+Shift+O [Command + Shift + O in Mac] to import
- Choose java.persistence package
- Generate Getter Setter
- Generate Constructor using Fields
- Generate toString
- hashCode
- equals
- toString

1.46--Create the Employment Domain class in the domain package

```
@Entity
@Table(name = "rsmortgage_employment")
@XmlRootElement
@XmlAccessorType(XmlAccessType.FIELD)
public class Employment {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private long id;

    @Temporal(TemporalType.DATE)
    @Column(name = "date_from", unique = true, nullable = false, length = 10)
    private Date fromDate;

    @Temporal(TemporalType.DATE)
    @Column(name = "date_to", unique = true, nullable = false, length = 10)
    private Date dateTo;

    @Column(nullable = false)
    private float numYears;

    @Column(nullable = false)
    private float grossSalary;

    @Column(nullable = false)
    private float netSalary;

    @Column(nullable = false)
    private boolean isCurrentEmployer;

    @Column(nullable = false)
    private String jobTitle;

    @Column(nullable = false)
    private String jobDescription;

    @Column(nullable = false)
    private String employerName;

    @Column(nullable = false)
    private String employmentType;
```

```
    @Column(nullable = false)
    private String   employerHRPerson;

    @Column(nullable = false)
    private String employerHRPhone;

    @Column(nullable = false)
    private String employerHREmail;

    @Column(nullable = false)
    private String employerHRFax;

    @Column(nullable = false)
    private String employerAddressLine1;

    @Column(nullable = false)
    private String employerAddressLine2;

    @Column(nullable = false)
    private String employerAddressCity;

    @Column(nullable = false)
    private String employerAddressState;

    @Column(nullable = false)
    private String employerAddressCountry;

    @ManyToOne(fetch = FetchType.LAZY)
    @JoinColumn(name = "customer_id", nullable = false)
    @JsonBackReference
    Customer customer;

}
```

1.47– Do the following to the Employment Class

- Press CTRL+Shift+O [Command + Shift + O in Mac] to import
- Choose java.persistence package
- Generate Getter Setter
- Generate Constructor using Fields
- Generate toString
- hashCode
- equals
- toString

1.48--Create the Investment Domain class in the domain package

```
@Entity
@Table(name = "rsmortgage_investment")
@XmlRootElement
@XmlAccessorType(XmlAccessType.FIELD)
public class Investment {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private long id;

    @Temporal(TemporalType.DATE)
    @Column(name = "date_from", unique = true, nullable = false, length = 10)
    private Date fromDate;

    @Temporal(TemporalType.DATE)
    @Column(name = "maturity_date", unique = true, nullable = false, length = 10)
    private Date dateMaturing;

    @OneToOne
    @JoinColumn(name="investment_type_id")
    private InvestmentType investmentType;

    @Column(nullable = false)
    private double currentValue;

    @Column(nullable = false)
    private double  investedValue;

    @Column(nullable = false)
    private float     monthlyIncome;

    @ManyToOne(fetch = FetchType.LAZY)
    @JoinColumn(name = "customer_id", nullable = false)
    @JsonBackReference
    Customer customer;

}
```

1.49– Do the following to the Investment Class

- Press CTRL+Shift+O [Command + Shift + O in Mac] to import
- Choose java.persistence package
- Generate Getter Setter
- Generate Constructor using Fields
- Generate toString
- hashCode
- equals
- toString

1.50--Create the InvestmentType class in the domain package

```
@Entity
@Table(name = "rsmortgage_investment_type")
@XmlRootElement
@XmlAccessorType(XmlAccessType.FIELD)
public class InvestmentType {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private long id;

    @Column(nullable = false)
    private String invetmentTypeName;

    @Column(nullable = false)
    private String investmentTypeDescription;

}
```

1.51– Do the following to the InvestmentType Class

- Press CTRL+Shift+O [Command + Shift + O in Mac] to import
- Choose java.persistence package
- Generate Getter Setter
- Generate Constructor using Fields
- Generate toString
- hashCode
- equals
- toString

1.52--Create the Liability Domain class in the domain package

```
@Entity
@Table(name = "rsmortgage_liability")
@XmlRootElement
@XmlAccessorType(XmlAccessType.FIELD)
public class Liability {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private long id;

    @Temporal(TemporalType.DATE)
    @Column(name = "date_from", unique = true, nullable = false, length = 10)
    private Date fromDate;

    @Temporal(TemporalType.DATE)
    @Column(name = "maturity_date", unique = true, nullable = false, length = 10)
    private Date dateMaturing;

    @OneToOne
    @JoinColumn(name="liability_type_id")
    private LiabilityType investmentType;

    @Column(nullable = false)
    private double originalTotalLiability;

    @Column(nullable = false)
    private double currentTotalLiability;

    @Column(nullable = false)
    private String   paymentFrequency;

    @Column(nullable = false)
    private float      periodEMI;

    @ManyToOne(fetch = FetchType.LAZY)
    @JoinColumn(name = "customer_id", nullable = false)
    @JsonBackReference
    Customer customer;

}
```

1.53– Do the following to the Liability Class

- Press CTRL+Shift+O [Command + Shift + O in Mac] to import
- Choose java.persistence package
- Generate Getter Setter
- Generate Constructor using Fields
- Generate toString
- hashCode
- equals
- toString

1.54--Create the LiabilityType Domain class in the domain package

```
@Entity
@Table(name = "rsmortgage_liability_type")
@XmlRootElement
@XmlAccessorType(XmlAccessType.FIELD)
public class LiabilityType {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private long id;

    @Column(nullable = false)
    private String liabilityTypeName;

    @Column(nullable = false)
    private String liabilityTypeDescription;

}
```

1.55– Do the following to the LiabilityType Class

- Press CTRL+Shift+O [Command + Shift + O in Mac] to import
- Choose java.persistence package
- Generate Getter Setter
- Generate Constructor using Fields
- Generate toString
- hashCode
- equals
- toString

1.56--Create the RestAPIExceptionInfo_class in the domain package

```
package com.rollingstone.domain;

import javax.xml.bind.annotation.XmlRootElement;

/*
 * A sample class for adding error information in the response
 */
@XmlRootElement
public class RestAPIExceptionInfo {
    public final String detail;
    public final String message;

    public RestAPIExceptionInfo(Exception ex, String detail) {
        this.message = ex.getLocalizedMessage();
        this.detail = detail;
    }
}
```

1.57– Generate HTTP400Exception in the exception package

```
package com.rollingstone.exception;

/**
 * for HTTP 400 Bad Request errors
 */
public final class HTTP400Exception extends RuntimeException {
    public HTTP400Exception() {
        super();
    }

    public HTTP400Exception(String message, Throwable cause) {
        super(message, cause);
    }

    public HTTP400Exception(String message) {
        super(message);
    }

    public HTTP400Exception(Throwable cause) {
        super(cause);
    }
}
```

1.58– Generate HTTP404Exception in the exception package

```
package com.rollingstone.exception;

/**
 * For HTTP 404 Not Found errros
 */
public class HTTP404Exception extends RuntimeException {
    /**
       *
       */
      private static final long serialVersionUID = 1L;

      public HTTP404Exception() {
        super();
    }

    public HTTP404Exception(String message, Throwable cause) {
        super(message, cause);
    }

    public HTTP404Exception(String message) {
        super(message);
    }

    public HTTP404Exception(Throwable cause) {
        super(cause);
    }

}
```

1.59– Generate DAOInterface in the dao.jpa package

```
package com.rollingstone.dao.jpa;

import java.util.List;

import org.springframework.data.domain.Page;
import org.springframework.data.domain.Pageable;
import org.springframework.data.repository.PagingAndSortingRepository;

import com.rollingstone.domain.Account;
import com.rollingstone.domain.Customer;
import com.rollingstone.domain.Employment;



public interface RsMortgageCustomerAccountRepository extends
PagingAndSortingRepository<Account, Long> {
   List<Account> findCustomerAccountsByCustomer(Customer customer);

   Page findAll(Pageable pageable);
}
```

1.60– Generate Service class in the service package

```
package com.rollingstone.service;

import java.util.ArrayList;
import java.util.List;

import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.actuate.metrics.CounterService;
import org.springframework.boot.actuate.metrics.GaugeService;
import org.springframework.data.domain.Page;
import org.springframework.data.domain.PageRequest;
import org.springframework.stereotype.Service;

import com.netflix.hystrix.contrib.javanica.annotation.HystrixCommand;
import com.rollingstone.dao.jpa.RsMortgageCustomerAccountRepository;
import com.rollingstone.domain.Account;
import com.rollingstone.domain.Customer;


/*
 * Service class to do CRUD for Customer Account through JPS Repository
 */
@Service
public class RsMortgageCustomerAccountService {

    private static final Logger log =
LoggerFactory.getLogger(RsMortgageCustomerAccountService.class);

    @Autowired
    private RsMortgageCustomerAccountRepository customerAccountRepository;

    @Autowired
    CounterService counterService;

    @Autowired
    GaugeService gaugeService;

    @Autowired
      private CustomerClient customerClient;

    public RsMortgageCustomerAccountService() {
    }
```

```
   @HystrixCommand(fallbackMethod = "createAccountWithoutCustomerValidation")
   public Account createAccount(Account account) throws Exception {
     Account createdAccount = null;
     if (account != null && account.getCustomer() != null){

          log.info("In service account create"+ account.getCustomer().getId());
          if (customerClient == null){
               log.info("In customerClient null got customer");
          }
          else {
               log.info("In customerClient not null got customer");
          }

          Customer customer = customerClient.getCustomer((new
Long(account.getCustomer().getId())));

          if (customer != null){
               createdAccount  = customerAccountRepository.save(account);
               log.info("Valid Customer Created Account.");
          }else {
               log.info("Invalid Customer");
               throw new Exception("Invalid Customer");
          }
     }
     else {
               throw new Exception("Invalid Customer");
     }
       return createdAccount;
   }

   public Account createAccountWithoutCustomerValidation(Account account) throws
Exception {
     Account createdAccount = null;

     log.info("Customer Validation Failed. Creating Customer Account without
validation.");

     createdAccount  = customerAccountRepository.save(account);

       return createdAccount;
   }

   public Account getAccount(long id) {
       return customerAccountRepository.findOne(id);
```

```
    }

    public void updateAccount(Account account) throws Exception {
      Account createdAccount = null;
      if (account != null && account.getCustomer() != null){

            log.info("In service account create"+ account.getCustomer().getId());
            if (customerClient == null){
                  log.info("In customerClient null got customer");
            }
            else {
                  log.info("In customerClient not null got customer");
            }

            Customer customer = customerClient.getCustomer((new
Long(account.getCustomer().getId())));

            if (customer != null){
                  createdAccount  = customerAccountRepository.save(account);
            }else {
                  log.info("Invalid Customer");
                  throw new Exception("Invalid Customer");
            }
      }
      else {
                  throw new Exception("Invalid Customer");
      }
    }

    public void deleteAccount(Long id) {
      customerAccountRepository.delete(id);
    }

    public Page<Account> getAllAccountsByPage(Integer page, Integer size) {
        Page pageOfAccounts = customerAccountRepository.findAll(new
PageRequest(page, size));

        // example of adding to the /metrics
        if (size > 50) {
            counterService.increment("com.rollingstone.getAll.largePayload");
        }
        return pageOfAccounts;
    }

    public List<Account> getAllAccounts() {
```

```
        Iterable<Account> pageOfAccounts = customerAccountRepository.findAll();

        List<Account> customerAccounts = new ArrayList<Account>();

        for (Account account : pageOfAccounts){
            customerAccounts.add(account);
        }
       log.info("In Real Service getAllAccounts  size :"+customerAccounts.size());


        return customerAccounts;
    }

    public List<Account> getAllAccountsForCustomer(Customer customer) {
        Iterable<Account> pageOfAccounts =
customerAccountRepository.findCustomerAccountsByCustomer(customer);

        List<Account> customerAccounts = new ArrayList<Account>();

        for (Account account : pageOfAccounts){
            customerAccounts.add(account);
        }
       log.info("In Real Service getAllAccounts  size :"+customerAccounts.size());


        return customerAccounts;
    }
}
```

1.61– Generate ServiceProperties class in the service package

```
package com.rollingstone.service;

import org.springframework.boot.context.properties.ConfigurationProperties;
import org.springframework.stereotype.Component;

import javax.validation.constraints.NotNull;

/*
 * demonstrates how service-specific properties can be injected
 */
@ConfigurationProperties(prefix = "customer.service", ignoreUnknownFields = false)
@Component
public class ServiceProperties {

   @NotNull // you can also create configurationPropertiesValidator
     private String name = "CustomerAccountService";

   @NotNull // you can also create configurationPropertiesValidator
     private String description = "Customer Account MicroService that helps maintain
the customer bank, credit card and other types of expense account";


     public String getName() {
          return this.name;
     }

     public void setName(String name) {
          this.name = name;
     }

     public String getDescription() {
          return description;
     }

     public void setDescription(String description) {
          this.description = description;
     }
}
```

1.62– Generate ServiceHealth class in the service package

```
package com.rollingstone.service;


import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.actuate.health.Health;
import org.springframework.boot.actuate.health.HealthIndicator;
import org.springframework.stereotype.Component;

/**
 * This is an optional class used to inject application specific health check
 * into the Spring Boot health management endpoint.
 */
@Component
public class CustomerAccountServiceHealth implements HealthIndicator {

    @Autowired
    private ServiceProperties configuration;

    // extend this to create an application-specific health check according to
http://goo.gl/vt8I7O
    @Override
    public Health health() {
        return Health.up().withDetail("details", "{ 'internals' : 'getting close to limit',
'profile' : '" + this.configuration.getName() + "' "
                + "'" + this.configuration.getDescription() + "' }").status("itsok!").build();
    }

}
```

1.63– Generate ServiceEvent class in the service package

```
package com.rollingstone.service;

import org.springframework.context.ApplicationEvent;

/**
 * This is an optional class used in publishing application events.
 * This can be used to inject events into the Spring Boot audit management endpoint.
 */
public class CustomerAccountServiceEvent extends ApplicationEvent {

    public CustomerAccountServiceEvent(Object source) {
        super(source);
    }

    public String toString() {
        return "My CustomerAccountService Event";
    }
}
```

1.64– Generate CustomerClient class in the rest.api package

```
package com.rollingstone.service;

import java.util.List;

import org.springframework.cloud.netflix.feign.FeignClient;
import org.springframework.web.bind.annotation.PathVariable;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RequestMethod;

import com.rollingstone.domain.Customer;


@FeignClient("rsmortgage-customer-service")
interface CustomerClient {


    @RequestMapping(method = RequestMethod.GET, value="/rsmortgage-
customerservice/v1/customer/all")
    List<Customer> getCustomers();

    @RequestMapping(method = RequestMethod.GET, value="/rsmortgage-
customerservice/v1/customer/simple/{id}")
    Customer getCustomer(@PathVariable("id") Long id);

}
```

1.65– Generate AbstractRestController class in the rest.api package

```
package com.rollingstone.api.rest;

/**
 * This class is meant to be the backbone of all other REst controllers. It contains
common functionality such as exception handling etc.
 */
//@ControllerAdvice?
public abstract class AbstractRestController implements
ApplicationEventPublisherAware {

    protected final Logger log = LoggerFactory.getLogger(this.getClass());
    protected ApplicationEventPublisher eventPublisher;

    protected static final String  DEFAULT_PAGE_SIZE = "30";
    protected static final String DEFAULT_PAGE_NUM = "0";

    @ResponseStatus(HttpStatus.BAD_REQUEST)
    @ExceptionHandler(HTTP400Exception.class)
    public
    @ResponseBody
    RestAPIExceptionInfo handleDataStoreException(HTTP400Exception ex,
WebRequest request, HttpServletResponse response) {
        log.info("Converting Data Store exception to RestResponse : " + ex.getMessage());

        return new RestAPIExceptionInfo(ex, "The Request did not have correct
parameters / body etc. Please check");
    }

    @ResponseStatus(HttpStatus.NOT_FOUND)
    @ExceptionHandler(HTTP404Exception.class)
    public
    @ResponseBody
    RestAPIExceptionInfo handleResourceNotFoundException(HTTP404Exception ex,
WebRequest request, HttpServletResponse response) {
        log.info("ResourceNotFoundException handler:" + ex.getMessage());

        return new RestAPIExceptionInfo(ex, "The Endpoint was not found.");
    }

    @Override
    public void setApplicationEventPublisher(ApplicationEventPublisher
applicationEventPublisher) {
        this.eventPublisher = applicationEventPublisher;
```

```
    }

    //todo: replace with exception mapping
    public static <T> T checkResourceFound(final T resource) {
        if (resource == null) {
            throw new HTTP404Exception("resource not found");
        }
        return resource;
    }

}
```

1.66– Generate CustomerControllerclass in the rest.api package

```
package com.rollingstone.api.rest;

import java.util.List;

import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.data.domain.Page;
import org.springframework.http.HttpStatus;
import org.springframework.web.bind.annotation.PathVariable;
import org.springframework.web.bind.annotation.RequestBody;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RequestMethod;
import org.springframework.web.bind.annotation.RequestParam;
import org.springframework.web.bind.annotation.ResponseBody;
import org.springframework.web.bind.annotation.ResponseStatus;
import org.springframework.web.bind.annotation.RestController;


import com.rollingstone.domain.Customer;
import com.rollingstone.domain.Account;
import com.rollingstone.exception.HTTP400Exception;
import com.rollingstone.service.RsMortgageCustomerAccountService;
/*
 * Demonstrates how to set up RESTful API endpoints using Spring MVC
 */

@RestController
@RequestMapping(value = "/rsmortgage-customer-account-service/v1/customer-
account")
public class CustomerAccountController extends AbstractRestController {

   @Autowired
   private RsMortgageCustomerAccountService customerAccountService;

   @RequestMapping(value = "",
         method = RequestMethod.POST,
         consumes = {"application/json", "application/xml"},
         produces = {"application/json", "application/xml"})
   @ResponseStatus(HttpStatus.CREATED)
   public void createCustomerAccount(@RequestBody Account account,
```

```
                        HttpServletRequest request, HttpServletResponse response)
throws Exception {
     Account createdAccount = this.customerAccountService.createAccount(account);
      response.setHeader("Location",
request.getRequestURL().append("/").append(createdAccount.getId()).toString());
   }

   @RequestMapping(value = "",
         method = RequestMethod.GET,
         produces = {"application/json", "application/xml"})
   @ResponseStatus(HttpStatus.OK)
   public
   @ResponseBody
   Page<Account> getAllCustomersAccountByPage(@RequestParam(value = "page",
required = true, defaultValue = DEFAULT_PAGE_NUM) Integer page,
                           @RequestParam(value = "size", required = true, defaultValue =
DEFAULT_PAGE_SIZE) Integer size,
                           HttpServletRequest request, HttpServletResponse response) {
      return this.customerAccountService.getAllAccountsByPage(page, size);
   }

   @RequestMapping(value = "/all",
         method = RequestMethod.GET,
         produces = {"application/json", "application/xml"})
   @ResponseStatus(HttpStatus.OK)
   public
   @ResponseBody
   List<Account> getAllCustomerAccounts(@RequestParam(value = "page", required =
true, defaultValue = DEFAULT_PAGE_NUM) Integer page,
                           @RequestParam(value = "size", required = true, defaultValue =
DEFAULT_PAGE_SIZE) Integer size,
                           HttpServletRequest request, HttpServletResponse response) {
      return this.customerAccountService.getAllAccounts();
   }

   @RequestMapping(value = "/all/{customerId}",
         method = RequestMethod.GET,
         produces = {"application/json", "application/xml"})
   @ResponseStatus(HttpStatus.OK)
   public
   @ResponseBody
   List<Account> getAllCustomerAccountsForSingleCustomer(@RequestParam(value
= "page", required = true, defaultValue = DEFAULT_PAGE_NUM) Integer page,
                           @RequestParam(value = "size", required = true, defaultValue =
DEFAULT_PAGE_SIZE) Integer size,
```

```
                                @PathVariable("id") Long id,
                                HttpServletRequest request, HttpServletResponse response) {
        return this.customerAccountService.getAllAccountsForCustomer(new
Customer());
    }


    @RequestMapping("/simple/{id}")
      public Account getSimpleCustomerAccount(@PathVariable("id") Long id) {
      Account account = this.customerAccountService.getAccount(id);
        checkResourceFound(account);
        return account;
      }

    @RequestMapping(value = "/{id}",
            method = RequestMethod.GET,
            produces = {"application/json", "application/xml"})
    @ResponseStatus(HttpStatus.OK)
    public
    @ResponseBody
    Account getAccount(@PathVariable("id") Long id,
                        HttpServletRequest request, HttpServletResponse response) throws
Exception {
      Account account = this.customerAccountService.getAccount(id);
        checkResourceFound(account);
        return account;
    }

    @RequestMapping(value = "/{id}",
            method = RequestMethod.PUT,
            consumes = {"application/json", "application/xml"},
            produces = {"application/json", "application/xml"})
    @ResponseStatus(HttpStatus.NO_CONTENT)
    public void updateCustomerAccount(@PathVariable("id") Long id, @RequestBody
Account account,
                          HttpServletRequest request, HttpServletResponse response)
throws Exception {
        checkResourceFound(this.customerAccountService.getAccount(id));
        if (id != account.getId()) throw new HTTP400Exception("ID doesn't match!");
        this.customerAccountService.updateAccount(account);
    }

    @RequestMapping(value = "/{id}",
            method = RequestMethod.DELETE,
            produces = {"application/json", "application/xml"})
```

```
    @ResponseStatus(HttpStatus.NO_CONTENT)
    public void deleteCustomerAccount(@PathVariable("id") Long id,
HttpServletRequest request,
                                HttpServletResponse response) {
        checkResourceFound(this.customerAccountService.getAccount(id));
        this.customerAccountService.deleteAccount(id);
    }
}
```

1.66– Generate RestControllerAspect in the rest.api package

```
package com.rollingstone;

import java.util.NoSuchElementException;

import org.aspectj.lang.JoinPoint;
import org.aspectj.lang.annotation.AfterReturning;
import org.aspectj.lang.annotation.AfterThrowing;
import org.aspectj.lang.annotation.Aspect;
import org.aspectj.lang.annotation.Before;
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.actuate.metrics.CounterService;
import org.springframework.stereotype.Component;

@Aspect
@Component
public class RestControllerAspect {

	private final Logger logger = LoggerFactory.getLogger(this.getClass());

	@Autowired
	CounterService counterService;

	@Before("execution(public * com.rollingstone.api.rest.*Controller.*(..))")
	public void logBeforeRestCall(JoinPoint pjp) throws Throwable {
		logger.info(":::::AOP Before REST call:::::" + pjp);
	}

	@AfterReturning("execution(public *
com.rollingstone.api.rest.*Controller.createCustomerAccount*(..))")
	public void afterCallingCreateCustomerAccount(JoinPoint pjp) {
		logger.info(":::::AOP @AfterReturning Create REST call:::::" + pjp);

counterService.increment("com.rollingstone.api.rest.CustomerAccountController.creat
eCustomerAccount");
	}

	@AfterReturning("execution(public *
com.rollingstone.api.rest.*Controller.getAllCustomersAccountByPage*(..))")
	public void afterCallinggetAllCustomerAccount(JoinPoint pjp) {
		logger.info(":::::AOP @AfterReturning getAllCustomerAccount REST call:::::" +
pjp);
```

```
counterService.increment("com.rollingstone.api.rest.CustomerAccountController.getAl
lCustomerAccount");
    }


      @AfterReturning("execution(public *
com.rollingstone.api.rest.*Controller.getAllCustomerAccounts*(..))")
    public void afterCallinggetCustomerAccount(JoinPoint pjp) {
            logger.info(":::::AOP @AfterReturning getCustomerAccount REST call::::: " +
pjp);

counterService.increment("com.rollingstone.api.rest.CustomerAccountController.getC
ustomerAccount");
    }

      @AfterReturning("execution(public *
com.rollingstone.api.rest.*Controller.updateCustomerAccount*(..))")
    public void afterCallingUpdateCustomerAccount(JoinPoint pjp) {
            logger.info(":::::AOP @AfterReturning updateCustomerAccount REST call::::: "
+ pjp);

counterService.increment("com.rollingstone.api.rest.CustomerAccountController.upda
teCustomerAccount");
    }


    @AfterThrowing(pointcut = "execution(public *
com.rollingstone.api.rest.*Controller.*(..))", throwing = "e")
    public void afterGetGreetingThrowsException(NoSuchElementException e) {
        counterService.increment("counter.errors.CustomerAccount.controller");
    }
}
```

1.67– Generate RsMortgageCustomerRestAPIApplication in the rest.api package

```
package com.rollingstone;

import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.EnableAutoConfiguration;
import org.springframework.boot.builder.SpringApplicationBuilder;
import org.springframework.boot.context.web.SpringBootServletInitializer;
import org.springframework.cloud.client.circuitbreaker.EnableCircuitBreaker;
import org.springframework.cloud.client.discovery.EnableDiscoveryClient;
import org.springframework.cloud.netflix.feign.EnableFeignClients;
import org.springframework.context.annotation.ComponentScan;
import org.springframework.data.jpa.repository.config.EnableJpaRepositories;

import springfox.documentation.swagger2.annotations.EnableSwagger2;

/*
 * This is the primary Spring Boot application class. It configures Spring Boot, JPA,
Swagger and
 * other dependent Spring modules.
 */

@SuppressWarnings("deprecation")
@EnableAutoConfiguration  // Sprint Boot Automatic Configuration
@ComponentScan(basePackages = "com.rollingstone")
@EnableJpaRepositories("com.rollingstone.dao.jpa") // To segregate MongoDB and JPA
repositories. Otherwise not needed.
@EnableSwagger2
@EnableDiscoveryClient
@EnableFeignClients
@EnableCircuitBreaker
public class RsMortgageCustomerAccountRestAPIApplication extends
SpringBootServletInitializer {

   private static final Class<RsMortgageCustomerAccountRestAPIApplication>
applicationClass = RsMortgageCustomerAccountRestAPIApplication.class;
   private static final Logger log = LoggerFactory.getLogger(applicationClass);

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

```
    @Override
    protected SpringApplicationBuilder configure(SpringApplicationBuilder application)
{
        return application.sources(applicationClass);
    }

}
```

1.68– Create application.yml file under resources

```
### This is the main way to configure the application (other than annotations).
### This fils is in Yaml format but you can also do this using the traditional
### Java properties file.
spring:
  profiles:
    active:
      mysql
  cloud:
    config:
      uri: http://localhost:9000
server:
  port: 9002

eureka:
  client:
    serviceUrl:
      defaultZone: http://eureka-host1:8761/eureka/,http://eureka-host2:8762/eureka/

spring.jmx:
   enabled: false

spring.datasource:
    driverClassName: com.mysql.jdbc.Driver
    url: jdbc:mysql://localhost/rsmortgage;MODE=MySQL


#todo: make sure to always enable security in production
security:
  basic:
    enabled: false

#management endpoints on a separate port
management:
  port: 9003
  security:
```

```
    enabled: false # management port is internal only. no need to secure it.

#default project info followed by actual injected pom-specified values.
project:
  name: customer-account-service
  version: 0.1
  description: customer-account-service
info:
  build:
    artifact: ${project.artifactId}
    name: ${project.name}
    description: ${project.description}
    version: ${project.version}
```

1.69– Add bootstrap.yml file in the resources folder

```
spring:
  application:
    name: udemy-rsmortgage-customer-account-service
  profiles:
    active:
      mysql
  cloud:
    config:
      uri: http://localhost:9000
```

1.70 –Open Git Bash in project folder

```
Caree2@Caree2-PC MINGW64 /c/AWS/RSMortgageWS/udemy-rsmortgage-eureka-service-discovery-ha (master)
$ mvn package
```

1.71 –Run the first instance

java -jar -Dspring.profiles.active=eureka-host1 target/udemy-rsmortgage-eureka-service-discovery-ha-0.0.1-SNAPSHOT.jar

```
Caree2@Caree2-PC MINGW64 /c/AWS/RSMortgageWS/udemy-rsmortgage-eureka-service-discovery-ha (master)
$ java -jar -Dspring.profiles.active=eureka-host1 target/udemy-rsmortgage-eureka-service-discovery-ha-0.0.1-SNAPSHOT.jar
```

```
2017-02-25 08:46:51.604  INFO 6316 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Disable delta property : false
2017-02-25 08:46:51.605  INFO 6316 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Single vip registry refresh property : null
2017-02-25 08:46:51.605  INFO 6316 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Force full registry fetch : false
2017-02-25 08:46:51.605  INFO 6316 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Application is null : false
2017-02-25 08:46:51.605  INFO 6316 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Registered Applications size is zero : true
2017-02-25 08:46:51.605  INFO 6316 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Application version is -1: true
2017-02-25 08:46:51.605  INFO 6316 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Getting all instance registry info from the eureka server
2017-02-25 08:46:51.649  INFO 6316 --- [tbeatExecutor-0] com.netflix.discovery.DiscoveryClient    : DiscoveryClient_UNKNOWN/localhost:8761 - Re-registering ap
ps/UNKNOWN
2017-02-25 08:46:51.650  INFO 6316 --- [tbeatExecutor-0] com.netflix.discovery.DiscoveryClient    : DiscoveryClient_UNKNOWN/localhost:8761: registering servic
e...
2017-02-25 08:46:51.662  INFO 6316 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : The response status is 200
2017-02-25 08:46:51.703  INFO 6316 --- [tbeatExecutor-0] com.netflix.discovery.DiscoveryClient    : DiscoveryClient_UNKNOWN/localhost:8761 - registration stat
us: 204
2017-02-25 08:46:52.240  INFO 6316 --- [nio-8761-exec-3] c.n.e.registry.AbstractInstanceRegistry  : Registered instance UNKNOWN/localhost:8761 with status UP
(replication=true)
2017-02-25 08:47:03.511  INFO 6316 --- [      Thread-10] c.n.e.registry.AbstractInstanceRegistry  : Registered instance UNKNOWN/localhost:8762 with status UP
(replication=true)
2017-02-25 08:47:03.512  INFO 6316 --- [      Thread-10] c.n.e.r.PeerAwareInstanceRegistryImpl    : Got 1 instances from neighboring DS node
2017-02-25 08:47:03.512  INFO 6316 --- [      Thread-10] c.n.e.r.PeerAwareInstanceRegistryImpl    : Renew threshold is: 1
2017-02-25 08:47:03.512  INFO 6316 --- [      Thread-10] c.n.e.r.PeerAwareInstanceRegistryImpl    : Changing status to UP
2017-02-25 08:47:03.519  INFO 6316 --- [      Thread-10] e.s.EurekaServerInitializerConfiguration : Started Eureka Server
2017-02-25 08:47:04.677  INFO 6316 --- [nfoReplicator-0] com.netflix.discovery.DiscoveryClient    : DiscoveryClient_UNKNOWN/localhost:8761: registering servic
e...
2017-02-25 08:47:04.690  INFO 6316 --- [nfoReplicator-0] com.netflix.discovery.DiscoveryClient    : DiscoveryClient_UNKNOWN/localhost:8761 - registration stat
us: 204
2017-02-25 08:47:05.205  INFO 6316 --- [nio-8761-exec-4] c.n.e.registry.AbstractInstanceRegistry  : Registered instance UNKNOWN/localhost:8761 with status UP
(replication=true)
```

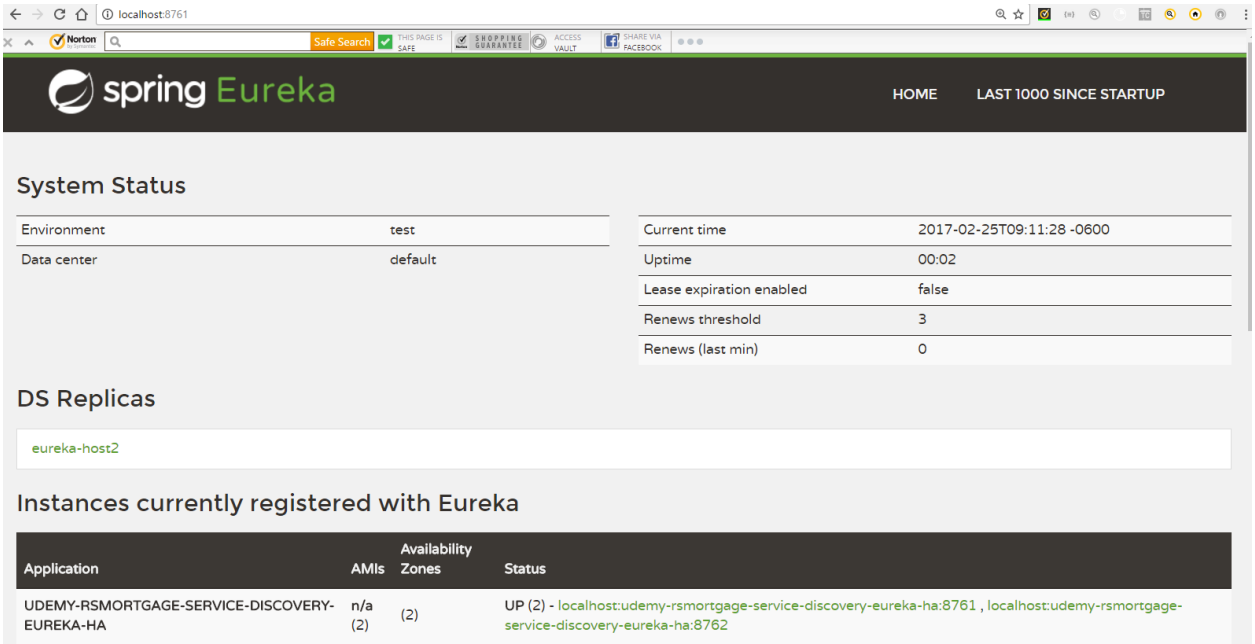
1.72 –Run the second instance

java -jar -Dspring.profiles.active=eureka-host2 target/udemy-rsmortgage-eureka-service-discovery-ha-0.0.1-SNAPSHOT.jar

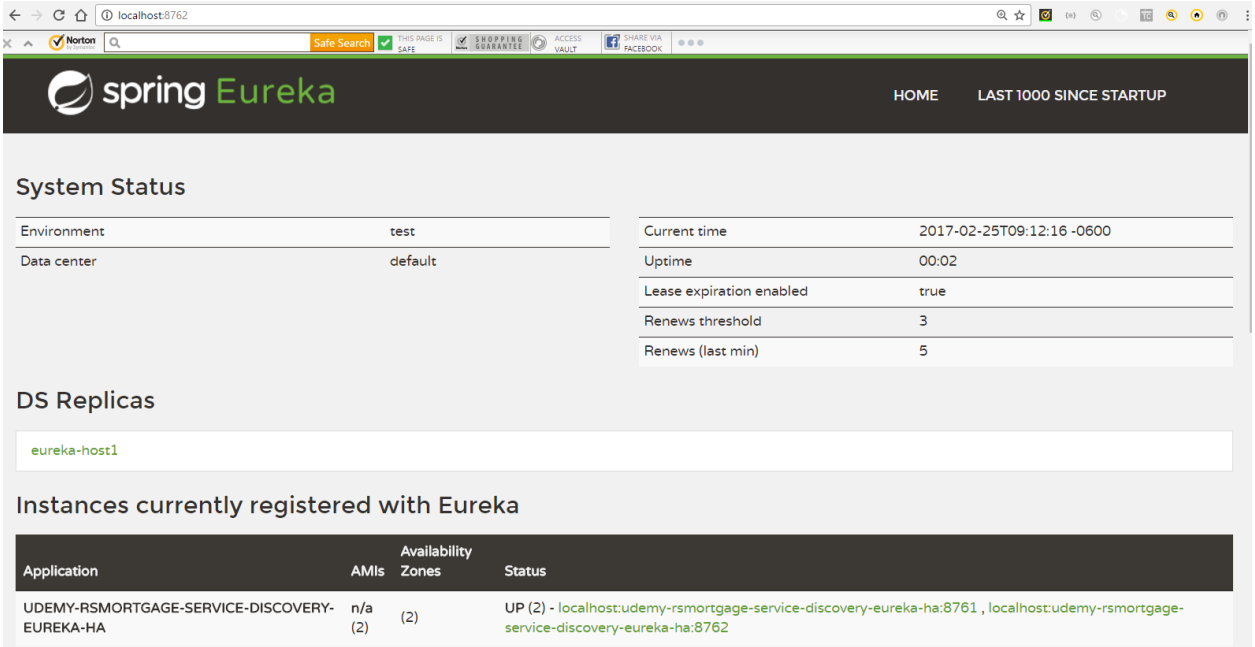
```
Caree2@Caree2-PC MINGW64 /c/AWS/RSMortgageWS/udemy-rsmortgage-eureka-service-discovery-ha (master)
$ java -jar -Dspring.profiles.active=eureka-host2 target/udemy-rsmortgage-eureka-service-discovery-ha-0.0.1-SNAPSHOT.jar
```

```
 (replication=true)
2017-02-25 08:46:43.974  INFO 14052 --- [nio-8762-exec-2] c.n.e.registry.AbstractInstanceRegistry  : Registered instance UNKNOWN/localhost:8762 with status UP
 (replication=true)
2017-02-25 08:46:51.646  WARN 14052 --- [nio-8762-exec-4] c.n.e.registry.AbstractInstanceRegistry  : DS: Registry: lease doesn't exist, registering resource:
UNKNOWN - localhost:8761
2017-02-25 08:46:51.647  WARN 14052 --- [nio-8762-exec-4] c.n.eureka.resources.InstanceResource    : Not Found (Renew): UNKNOWN - localhost:8761
2017-02-25 08:46:51.697  INFO 14052 --- [nio-8762-exec-5] c.n.e.registry.AbstractInstanceRegistry  : Registered instance UNKNOWN/localhost:8761 with status UP
 (replication=false)
2017-02-25 08:47:04.687  INFO 14052 --- [nio-8762-exec-6] c.n.e.registry.AbstractInstanceRegistry  : Registered instance UNKNOWN/localhost:8761 with status UP
 (replication=false)
2017-02-25 08:47:08.413  INFO 14052 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Disable delta property : false
2017-02-25 08:47:08.413  INFO 14052 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Single vip registry refresh property : null
2017-02-25 08:47:08.413  INFO 14052 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Force full registry fetch : false
2017-02-25 08:47:08.413  INFO 14052 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Application is null : false
2017-02-25 08:47:08.413  INFO 14052 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Registered Applications size is zero : true
2017-02-25 08:47:08.413  INFO 14052 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Application version is -1: false
2017-02-25 08:47:08.413  INFO 14052 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : Getting all instance registry info from the eureka server
2017-02-25 08:47:08.431  INFO 14052 --- [freshExecutor-0] com.netflix.discovery.DiscoveryClient    : The response status is 200
2017-02-25 08:47:12.566  INFO 14052 --- [      Thread-10] c.n.e.registry.AbstractInstanceRegistry  : Registered instance UNKNOWN/localhost:8762 with status UP
 (replication=true)
2017-02-25 08:47:12.567  INFO 14052 --- [      Thread-10] c.n.e.registry.AbstractInstanceRegistry  : Registered instance UNKNOWN/localhost:8761 with status UP
 (replication=true)
2017-02-25 08:47:12.567  INFO 14052 --- [      Thread-10] c.n.e.r.PeerAwareInstanceRegistryImpl    : Got 2 instances from neighboring DS node
2017-02-25 08:47:12.567  INFO 14052 --- [      Thread-10] c.n.e.r.PeerAwareInstanceRegistryImpl    : Renew threshold is: 3
2017-02-25 08:47:12.567  INFO 14052 --- [      Thread-10] c.n.e.r.PeerAwareInstanceRegistryImpl    : Changing status to UP
2017-02-25 08:47:12.575  INFO 14052 --- [      Thread-10] e.s.EurekaServerInitializerConfiguration : Started Eureka Server
```

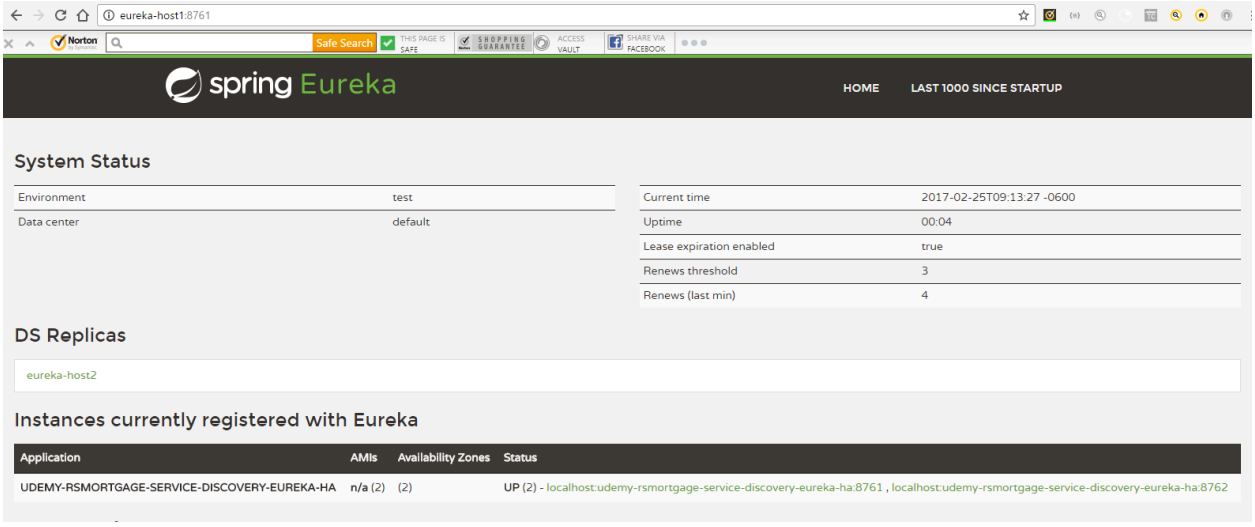
1.73 – Navigate to http://localhost:8761



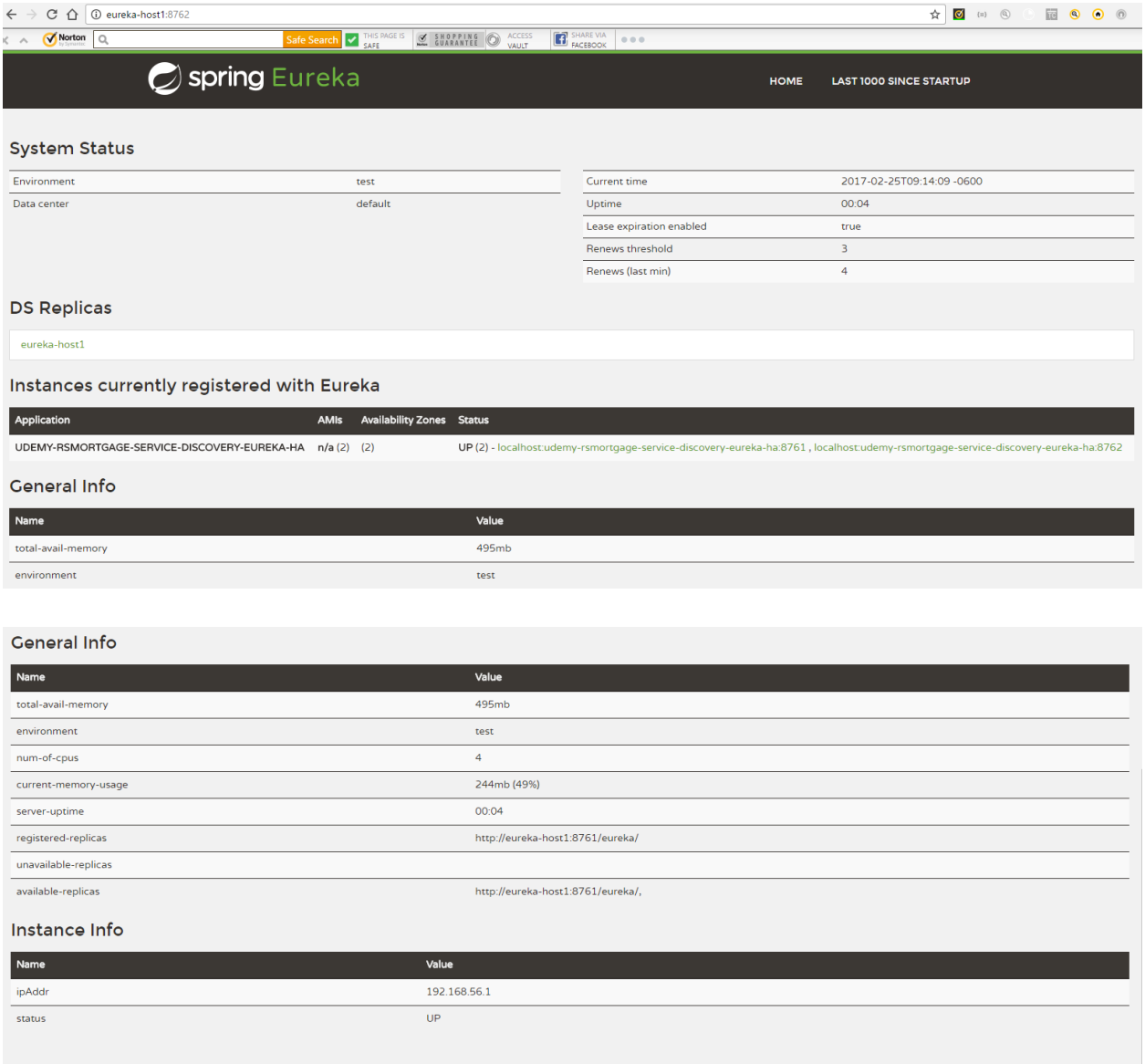
1.74 – Navigate to http://localhost:8762



1.75 – Navigate to http://eureka-host1:8761/



1.76 – Navigate to http://eureka-host2:8762/



1.77– Open Git bash in the config project directory

MINGW64:/c/AWS/RSMortgageWS/udemy-rsmortgage-config-service

```
Caree2@Caree2-PC MINGW64 /c/AWS/RSMortgageWS/udemy-rsmortgage-config-service (ma
ster)
$ pwd
/c/AWS/RSMortgageWS/udemy-rsmortgage-config-service

Caree2@Caree2-PC MINGW64 /c/AWS/RSMortgageWS/udemy-rsmortgage-config-service (master)
$ |
```

1.78– Run the config service project

java -jar target/udemy-rsmortgage-config-service-0.0.1-SNAPSHOT.jar

1.79– Verify Customer Account Project mysql properties

localhost:9000/udemy-rsmortgage-customer-account-service/mysql


```
// 20170402120521
// http://localhost:9000/udemy-rsmortgage-customer-account-service/mysql

{
  "name": "udemy-rsmortgage-customer-account-service",
  "profiles": [
    "mysql"
  ],
  "label": "master",
  "propertySources": [
    {
      "name": "https://github.com/dattabinit/udemy-rsmortgage-config-repository/udemy-rsmortgage-customer-account-service/udemy-rsmortgage-customer-account-service-mysql.yml",
      "source": {
        "spring.database.driverClassName": "com.mysql.jdbc.Driver",
        "spring.datasource.url": "jdbc:mysql://localhost/rsmortgage",
        "spring.datasource.username": "root",
        "spring.datasource.password": "root",
        "spring.datasource.validationQuery": "SELECT 1",
        "spring.jpa.properties.hibernate.dialect": "org.hibernate.dialect.MySQL5InnoDBDialect",
        "spring.jpa.hibernate.ddl-auto": "update"
      }
    }
  ]
}
```

1.80– Open Git bash in the project directory

```
[INFO] Finished at: Sun Apr 02 11:42:40 CDT 2017
[INFO] Final Memory: 27M/99M
[INFO] ------------------------------------------------------------------------

Caree2@Caree2-PC MINGW64 /c/AWS/RSMortgageWS/udemy-rsmortgage-customer-account-service (master)
$ |
```

1.81– Build the project

MINGW64:/c/AWS/RSMortgageWS/udemy-rsmortgage-customer-account-service

```
Caree2@Caree2-PC MINGW64 /c/AWS/RSMortgageWS/udemy-rsmortgage-customer-account-service (master)
$ mvn clean package
```

```
[WARNING] /C:/AWS/RSMortgageWS/udemy-rsmortgage-customer-account-service/src/main/java/com/rollingstone/dao/jpa/RsMortgageCustomerAccountRepository
 input files use unchecked or unsafe operations.
[WARNING] /C:/AWS/RSMortgageWS/udemy-rsmortgage-customer-account-service/src/main/java/com/rollingstone/dao/jpa/RsMortgageCustomerAccountRepository
mpile with -Xlint:unchecked for details.
[INFO]
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ udemy-rsmortgage-customer-account-service ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory C:\AWS\RSMortgageWS\udemy-rsmortgage-customer-account-service\src\test\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:testCompile (default-testCompile) @ udemy-rsmortgage-customer-account-service ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- maven-surefire-plugin:2.18.1:test (default-test) @ udemy-rsmortgage-customer-account-service ---
[INFO] No tests to run.
[INFO]
[INFO] --- maven-jar-plugin:2.5:jar (default-jar) @ udemy-rsmortgage-customer-account-service ---
[INFO] Building jar: C:\AWS\RSMortgageWS\udemy-rsmortgage-customer-account-service\target\udemy-rsmortgage-customer-account-service-1.0.jar
[INFO]
[INFO] --- spring-boot-maven-plugin:1.3.6.RELEASE:repackage (default) @ udemy-rsmortgage-customer-account-service ---
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time: 1:02.453s
[INFO] Finished at: Sun Apr 02 11:42:40 CDT 2017
[INFO] Final Memory: 27M/99M
[INFO] ------------------------------------------------------------------------

Caree2@Caree2-PC MINGW64 /c/AWS/RSMortgageWS/udemy-rsmortgage-customer-account-service (master)
$ ls -lt target/
total 44964
-rw-r--r-- 1 Caree2 197609 45987318 Apr  2 11:42 udemy-rsmortgage-customer-account-service-1.0.jar
-rw-r--r-- 1 Caree2 197609    49682 Apr  2 11:42 udemy-rsmortgage-customer-account-service-1.0.jar.original
drwxr-xr-x 1 Caree2 197609        0 Apr  2 11:42 maven-archiver/
drwxr-xr-x 1 Caree2 197609        0 Apr  2 11:42 classes/
drwxr-xr-x 1 Caree2 197609        0 Apr  2 11:42 generated-sources/
drwxr-xr-x 1 Caree2 197609        0 Apr  2 11:42 maven-status/

Caree2@Caree2-PC MINGW64 /c/AWS/RSMortgageWS/udemy-rsmortgage-customer-account-service (master)
```

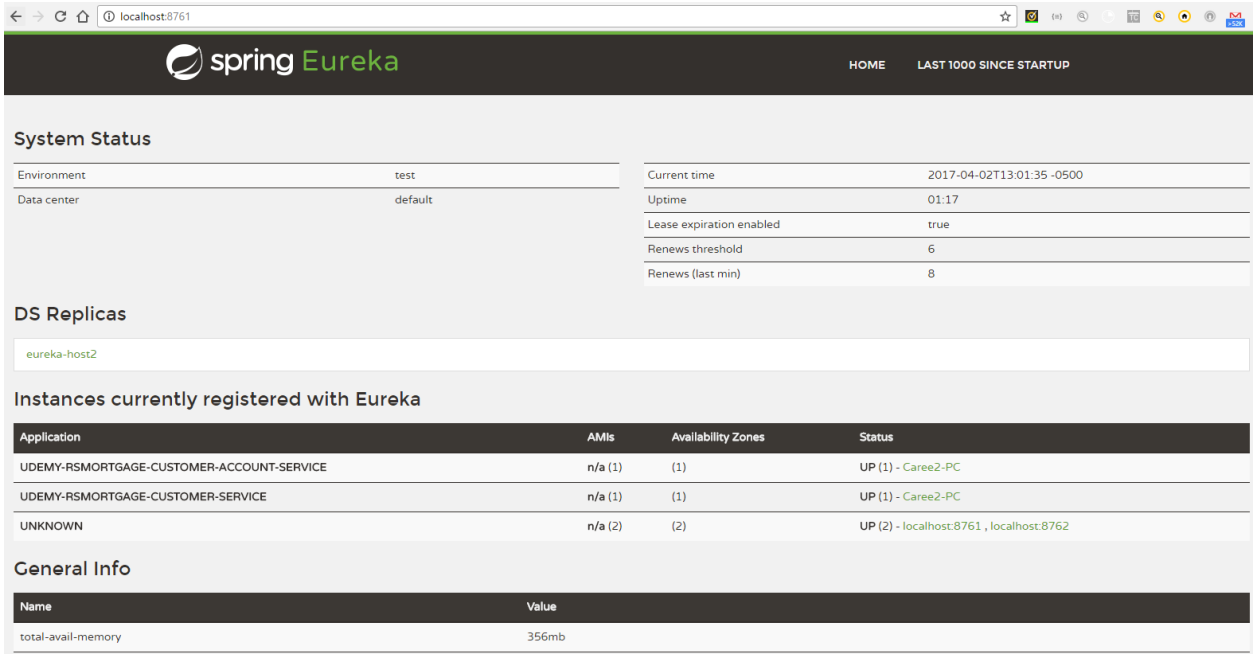
1.82 –Run the Project

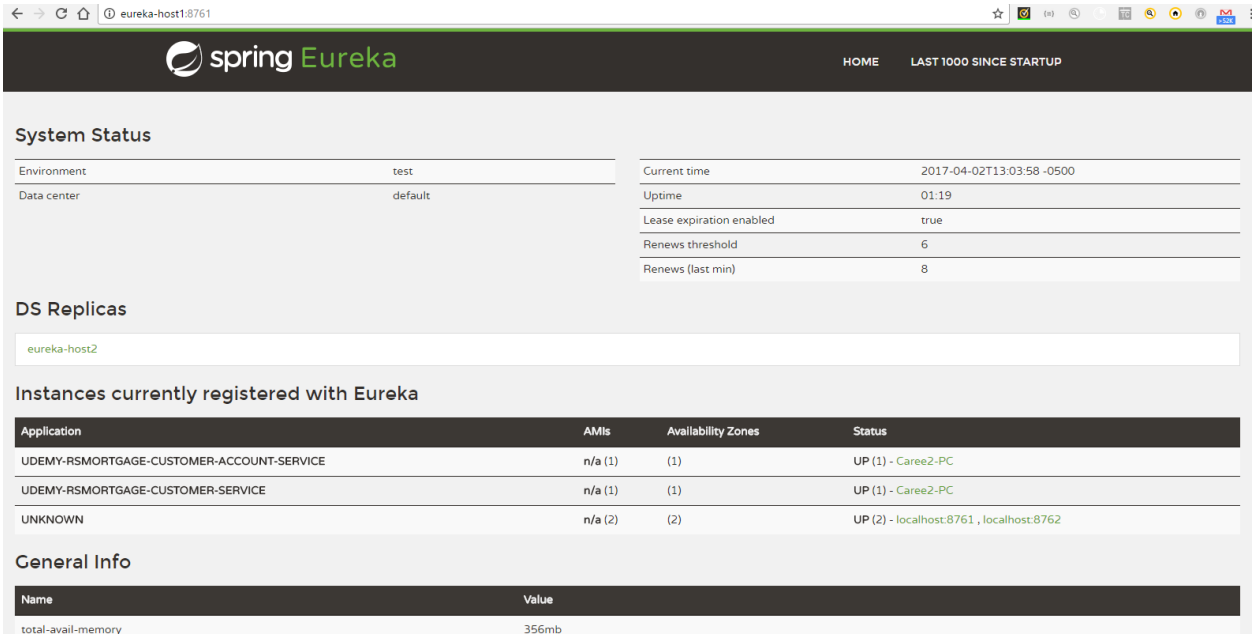
java -jar -Dspring.profiles.active=mysql target/udemy-rsmortgage-customer-account-service-1.0.jar

1.83 –Verify Config Property is read and used

```
  /\\ / ___'_ __ _ _(_)_ __  __ _ \ \ \ \
 ( ( )\___ | '_ | '_| | '_ \/ _` | \ \ \ \
  \\/  ___)| |_)| | | | | || (_| |  ) ) ) )
   '  |____| .__|_| |_|_| |_\__, | / / / /
  =========|_|==============|___/=/_/_/_/
  :: Spring Boot ::        (v1.3.6.RELEASE)

2017-04-02 12:49:09.780  INFO 5140 --- [           main] b.c.PropertySourceBootstrapConfiguration : Located property source: CompositePropertySource [name='co
nfigService', propertySources=[MapPropertySource [name='https://github.com/dattabinit/udemy-rsmortgage-config-repository/udemy-rsmortgage-customer-account-ser
vice/udemy-rsmortgage-customer-account-service-mysql.yml']]]
2017-04-02 12:49:09.795  INFO 5140 --- [           main] ortgageCustomerAccountRestAPIApplication : The following profiles are active: mysql
2017-04-02 12:49:09.980  INFO 5140 --- [           main] ationConfigEmbeddedWebApplicationContext : Refreshing org.springframework.boot.context.embedded.Annot
ationConfigEmbeddedWebApplicationContext@54a097cc: startup date [Sun Apr 02 12:49:09 CDT 2017]; parent: org.springframework.context.annotation.AnnotationConfi
gApplicationContext@64a294a6
2017-04-02 12:49:59.711  INFO 5140 --- [           main] o.s.b.f.s.DefaultListableBeanFactory     : Overriding bean definition for bean 'ignoredPathsWebSecuri
tyConfigurerAdapter' with a different definition: replacing [Root bean: class [null]; scope=; abstract=false; lazyInit=false; autowireMode=3; dependencyCheck=
0; autowireCandidate=true; primary=false; factoryBeanName=org.springframework.boot.autoconfigure.security.SpringBootWebSecurityConfiguration; factoryMethodNam
e=ignoredPathsWebSecurityConfigurerAdapter; initMethodName=null; destroyMethodName=(inferred); defined in class path resource [org/springframework/boot/autoco
nfigure/security/SpringBootWebSecurityConfiguration.class]] with [Root bean: class [null]; scope=; abstract=false; lazyInit=false; autowireMode=3; dependencyC
heck=0; autowireCandidate=true; primary=false; factoryBeanName=org.springframework.boot.actuate.autoconfigure.ManagementWebSecurityAutoConfiguration; factoryM
ethodName=ignoredPathsWebSecurityConfigurerAdapter; initMethodName=null; destroyMethodName=(inferred); defined in class path resource [org/springframework/boo
t/actuate/autoconfigure/ManagementWebSecurityAutoConfiguration.class]]
```

1.84 – Navigate to http://localhost:8761





1.85—Get an existing Customer Account

http://localhost:9003/rsmortgage-customer-account-service/v1/customer-account

200 OK 42.00 ms DETAILS

Raw JSON


```
{
  - "content": [Array[7]
    - 0: {
        "id": 1,
      - "accountType": {
          "id": 1,
          "accountTypeName": "Savings A/C",
          "accountTypeDescription": "Savings Account"
        },
        "dateCreated": "2012-01-01",
        "originalCreditAmount": 300000,
        "balanceAmount": 200000,
        "fullyPaid": false,
        "term": 30,
        "rateOfInterest": 3.25,
        "escrowAttached": false,
        "pmiAttached": false
```

1.86– Create a Customer Account

http://localhost:9003/rsmortgage-customer-account-service/v1/customer-account

Headers

Accept: application/json
Content-Type: application/json

Payload


```
{
   "customer": {
      "id": 1,
      "firstName": "Jordaya",
      "lastName": "Scott",
      "dateOfBirth": "1980-04-12",
      "totalLoanAmount": 287000,
      "bonusPoints": 70000,
      "memberSince": "2000-04-11",
      "socialSecurityNumber": "449-84-4944",
      "rating": 7
   },
   "accountType": {
      "id": 2,
      "accountTypeName": "Savings A/C",
      "accountTypeDescription": "Savings Account"
   },
   "dateCreated": "2017-01-01",
   "originalCreditAmount": 300000,
   "balanceAmount": 200000,
   "fullyPaid": false,
   "term": 30,
   "rateOfInterest": 3.25,
   "escrowAttached": false,
   "pmiAttached": false
}
```

```
    "customer": {
        "id": 1,
        "firstName": "Jordaya",
        "lastName": "Scott",
        "dateOfBirth": "1980-04-12",
        "totalLoanAmount": 287000,
        "bonusPoints": 70000,
        "memberSince": "2000-04-11",
        "socialSecurityNumber": "449-84-4944",
        "rating": 7
    },
    "accountType": {
        "id": 2,
        "accountTypeName": "Savings A/C",
        "accountTypeDescription": "Savings Account"
    },
    "dateCreated": "2017-01-01",
    "originalCreditAmount": 300000,
    "balanceAmount": 200000,
    "fullyPaid": false,
    "term": 30,
    "rateOfInterest": 3.25,
    "escrowAttached": false,
    "pmiAttached": false
}
```


SEND

201 520.00 ms DETAILS

```
2017-04-03 21:43:19.034  INFO 29388 --- [nio-9003-exec-2] com.rollingstone.RestControllerAspect    : :::::AOP Before REST call::::execution(void com.rollings
tone.api.rest.CustomerAccountController.createCustomerAccount(Account,HttpServletRequest,HttpServletResponse))
2017-04-03 21:43:19.036  INFO 29388 --- [ccountService-2] c.r.s.RsMortgageCustomerAccountService   : In service account create1
2017-04-03 21:43:19.036  INFO 29388 --- [ccountService-2] c.r.s.RsMortgageCustomerAccountService   : In customerClient not null got customer
2017-04-03 21:43:19.041  INFO 29388 --- [ccountService-2] c.r.s.RsMortgageCustomerAccountService   : Customer Validation Failed. Creating Customer Account wit
hout validation.
2017-04-03 21:43:19.488  INFO 29388 --- [nio-9003-exec-2] com.rollingstone.RestControllerAspect    : :::::AOP @AfterReturning Create REST call::::execution(v
oid com.rollingstone.api.rest.CustomerAccountController.createCustomerAccount(Account,HttpServletRequest,HttpServletResponse))
```

```
2017-04-03 22:23:53.094  INFO 26768 --- [nio-9003-exec-2] com.rollingstone.RestControllerAspect    : :::::AOP Before REST call::::execution(void com.rollings
tone.api.rest.CustomerAccountController.createCustomerAccount(Account,HttpServletRequest,HttpServletResponse))
2017-04-03 22:23:53.096  INFO 26768 --- [ccountService-2] c.r.s.RsMortgageCustomerAccountService   : In service account create1
2017-04-03 22:23:53.096  INFO 26768 --- [ccountService-2] c.r.s.RsMortgageCustomerAccountService   : In customerClient not null got customer
2017-04-03 22:23:53.679  INFO 26768 --- [ccountService-2] c.r.s.RsMortgageCustomerAccountService   : Valid Customer Created Account.
2017-04-03 22:23:53.681  INFO 26768 --- [nio-9003-exec-2] com.rollingstone.RestControllerAspect    : :::::AOP @AfterReturning Create REST call::::execution(v
oid com.rollingstone.api.rest.CustomerAccountController.createCustomerAccount(Account,HttpServletRequest,HttpServletResponse))
```

1.87– Verify the Database

	21	200000	2016-12-31	0	0	300000	0	3.25	30	1
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

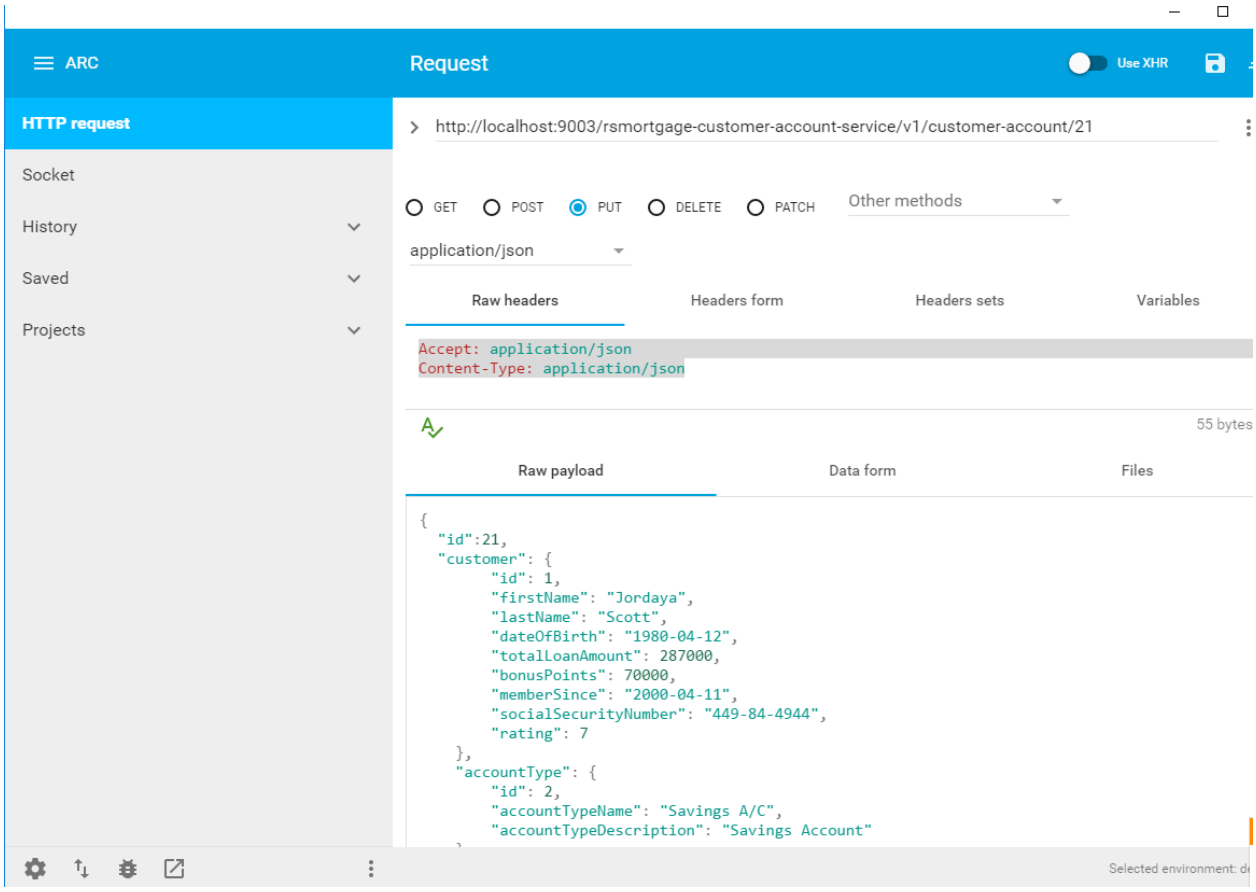
1.88—Try to Update a Record

http://localhost:9003/rsmortgage-customer-account-service/v1/customer-account/21

payload


```
{
  "id":21,
  "customer": {
        "id": 1,
        "firstName": "Jordaya",
        "lastName": "Scott",
        "dateOfBirth": "1980-04-12",
        "totalLoanAmount": 287000,
        "bonusPoints": 70000,
        "memberSince": "2000-04-11",
        "socialSecurityNumber": "449-84-4944",
        "rating": 7
    },
    "accountType": {
        "id": 2,
        "accountTypeName": "Savings A/C",
        "accountTypeDescription": "Savings Account"
    },
    "dateCreated": "2017-01-01",
    "originalCreditAmount": 500000,
    "balanceAmount": 345670,
    "fullyPaid": false,
    "term": 60,
    "rateOfInterest": 2.25,
    "escrowAttached": false,
    "pmiAttached": false
}
```


Accept: application/json
Content-Type: application/json




```
2017-04-03 22:26:25.052  INFO 26768 --- [nio-9003-exec-5] com.rollingstone.RestControllerAspect    : :::::AOP Before REST call::::::execution(void com.rollings
tone.api.rest.CustomerAccountController.updateCustomerAccount(Long,Account,HttpServletRequest,HttpServletResponse))
2017-04-03 22:26:25.066  INFO 26768 --- [ccountService-4] c.r.s.RsMortgageCustomerAccountService   : In service account create1
2017-04-03 22:26:25.066  INFO 26768 --- [ccountService-4] c.r.s.RsMortgageCustomerAccountService   : In customerClient not null got customer
2017-04-03 22:26:25.633  INFO 26768 --- [nio-9003-exec-5] com.rollingstone.RestControllerAspect    : :::::AOP @AfterReturning updateCustomerAccount REST call:
::::execution(void com.rollingstone.api.rest.CustomerAccountController.updateCustomerAccount(Long,Account,HttpServletRequest,HttpServletResponse))
2017-04-03 22:27:18.311  INFO 26768 --- [trap-executor-0] c.n.d.s.r.aws.ConfigClusterResolver      : Resolving eureka endpoints via configuration
```

1.89—Verify the Database

21	345670	2017-08-31	0	0	500000	0	2.25	60	1

1.90 – Try to get a single customer

http://localhost:9003/rsmortgage-customer-account-service/v1/customer-account/21

200 37.00 ms DETAILS

Response headers 4 | Request headers 2 | Redirects 0 | Timings

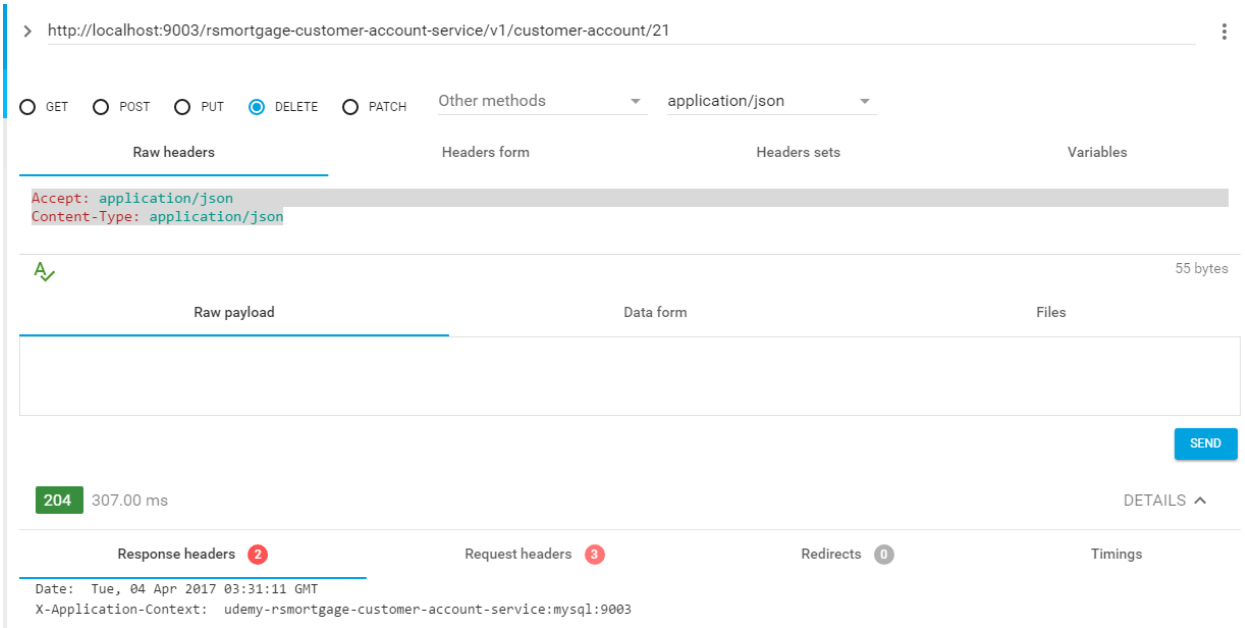
```
Content-Type:  application/json;charset=UTF-8
Date:  Tue, 04 Apr 2017 03:29:24 GMT
Transfer-Encoding:  chunked
X-Application-Context:  udemy-rsmortgage-customer-account-service:mysql:9003
```

Raw | JSON


```
{
  "id": 21,
 -"accountType": {
     "id": 2,
     "accountTypeName": "Checking A/C",
     "accountTypeDescription": "Checking Account"
  },
  "dateCreated": "2017-08-31",
  "originalCreditAmount": 500000,
  "balanceAmount": 345670,
  "fullyPaid": false,
  "term": 60,
  "rateOfInterest": 2.25,
  "escrowAttached": false,
  "pmiAttached": false
}
```

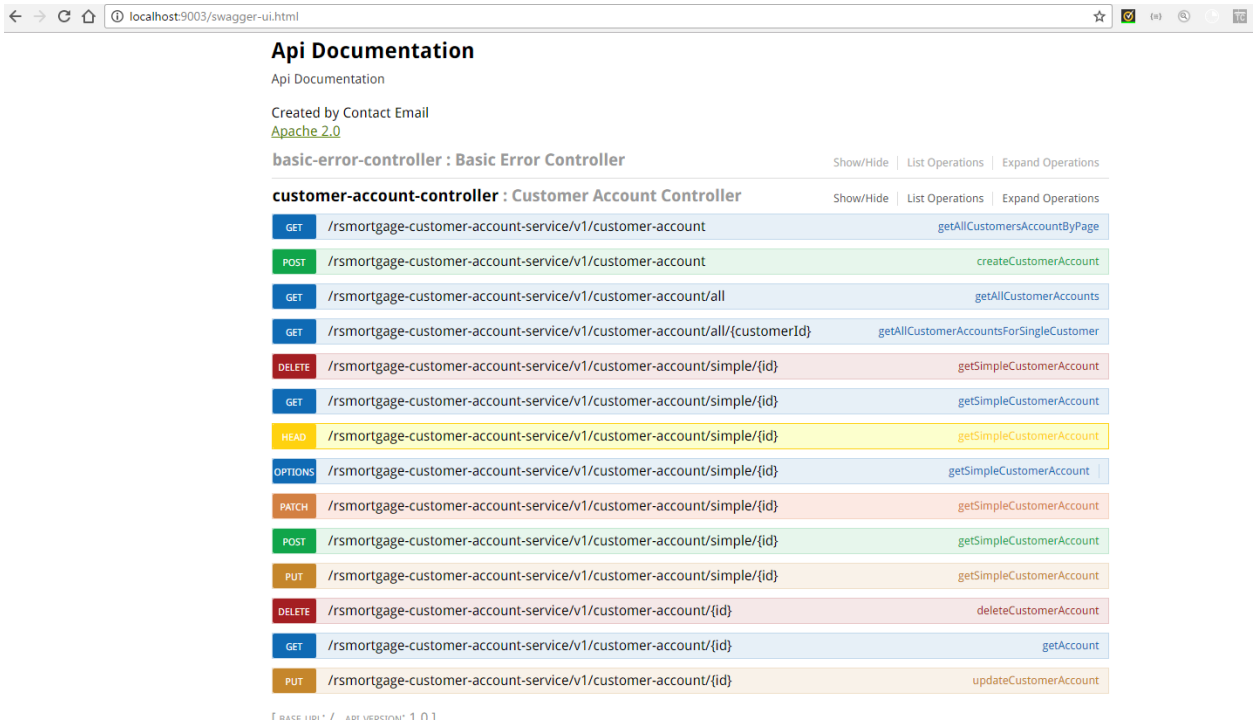
1.91 – Try to delete a single customer

http://localhost:9003/rsmortgage-customer-account-service/v1/customer-account/21




```
2017-04-03 22:26:25.633  INFO 26768 --- [nio-9003-exec-5] com.rollingstone.RestControllerAspect    : :::::AOP @AfterReturning updateCustomerAccount REST call:
::::execution(void com.rollingstone.api.rest.CustomerAccountController.updateCustomerAccount(Long,Account,HttpServletRequest,HttpServletResponse))
2017-04-03 22:27:18.311  INFO 26768 --- [trap-executor-0] c.n.d.s.r.aws.ConfigClusterResolver      : Resolving eureka endpoints via configuration
2017-04-03 22:29:24.400  INFO 26768 --- [nio-9003-exec-7] com.rollingstone.RestControllerAspect    : :::::AOP Before REST call::::execution(Account com.rolli
ngstone.api.rest.CustomerAccountController.getAccount(Long,HttpServletRequest,HttpServletResponse))
```

1.92 – Swagger UI



```
curl -X GET --header "Accept: application/json" "http://localhost:9003/rsmortgage-customer-account-service/v1/customer-account"
```

Request URL

```
http://localhost:9003/rsmortgage-customer-account-service/v1/customer-account
```

Response Body


```
{
  "content": [
    {
      "id": 1,
      "accountType": {
        "id": 1,
        "accountTypeName": "Savings A/C",
        "accountTypeDescription": "Savings Account"
      },
      "dateCreated": "2012-01-01",
      "originalCreditAmount": 300000,
      "balanceAmount": 200000,
      "fullyPaid": false,
      "term": 30,
      "rateOfInterest": 3.25,
      "escrowAttached": false,
      "pmiAttached": false
    },
    {
      "id": 2,
```


Response Code

```
200
```

Response Messages

HTTP Status Code	Reason	Response Model	Headers
401	Unauthorized		
403	Forbidden		
404	Not Found		

Try it out! Hide Response

Curl

```
curl -X GET --header "Accept: application/json" "http://localhost:9003/rsmortgage-customer-account-service/v1/customer-account/22"
```

Request URL

```
http://localhost:9003/rsmortgage-customer-account-service/v1/customer-account/22
```

Response Body


```
{
  "id": 22,
  "accountType": {
    "id": 2,
    "accountTypeName": "Checking A/C",
    "accountTypeDescription": "Checking Account"
  },
  "dateCreated": "2017-01-31",
  "originalCreditAmount": 500000,
  "balanceAmount": 345670,
  "fullyPaid": false,
  "term": 60,
  "rateOfInterest": 2.25,
  "escrowAttached": false,
  "pmiAttached": false
}
```

1.93 – Conclusion

This document listed the steps as well as provided the explanation of creating a Spring Boot **Customer Account Service Microservice** application based on Spring Cloud Service Discovery, Spring Cloud Config Client, Spring Cloud Feign, Spring Cloud Hystrix as well as JPA.