

Lab RSMortgage Customer Account Service

**Spring Cloud RSMortgage Customer Account REST Service**

Udemy Exploring Spring Cloud Course

Presented By

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**Rolling Stone Technology**

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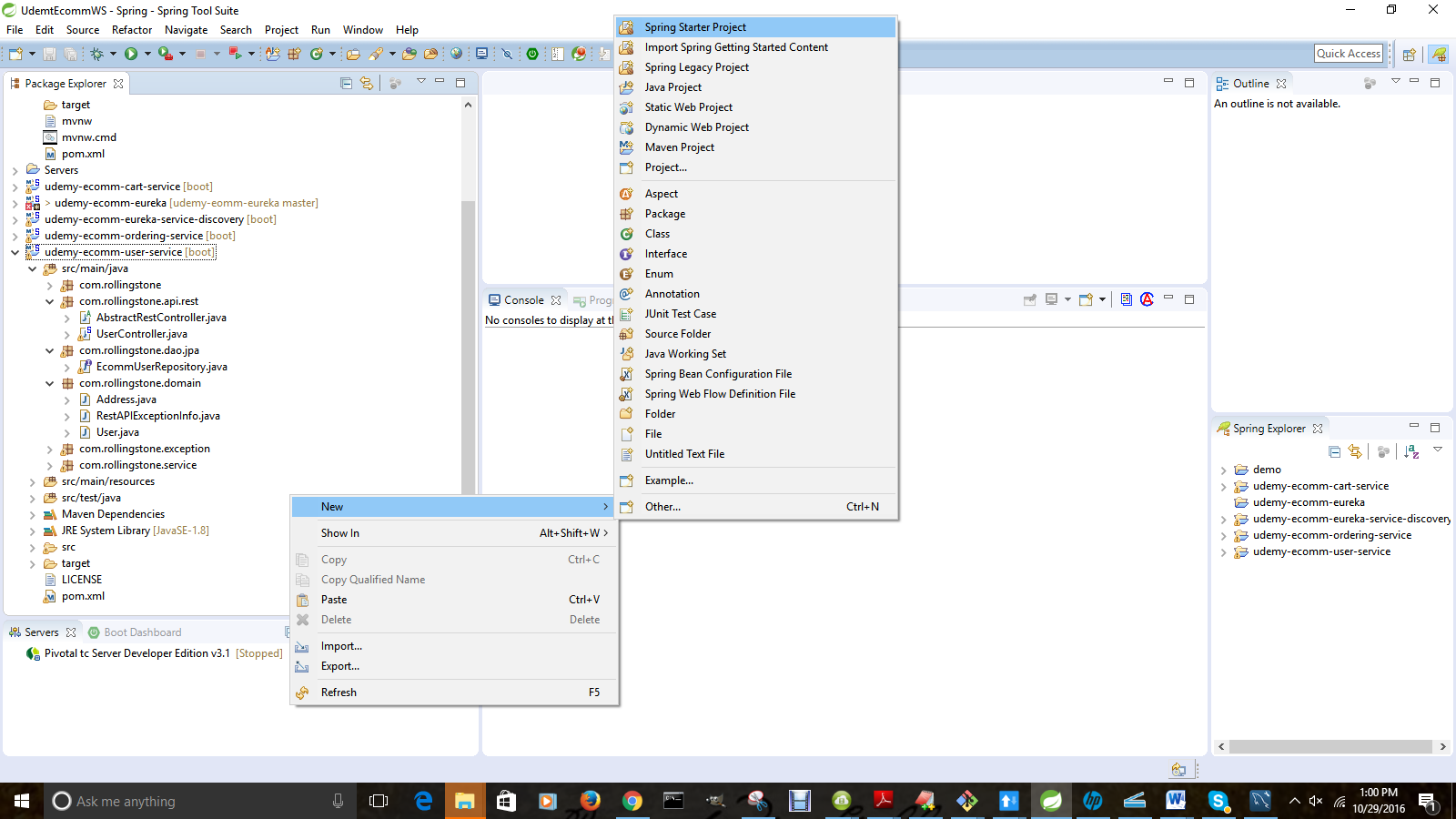
Chapter 1

*Spring Cloud Customer Account Service Project Creation*

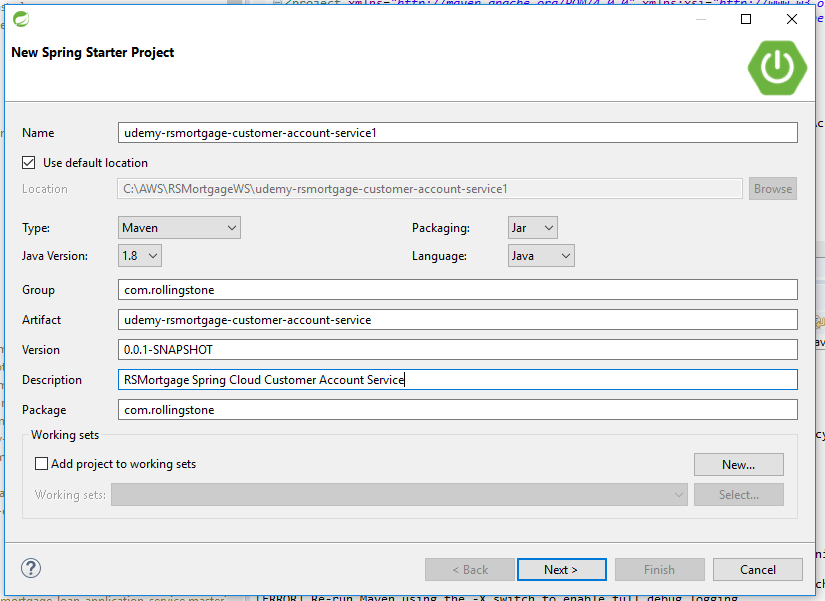
1.0 - Introduction

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

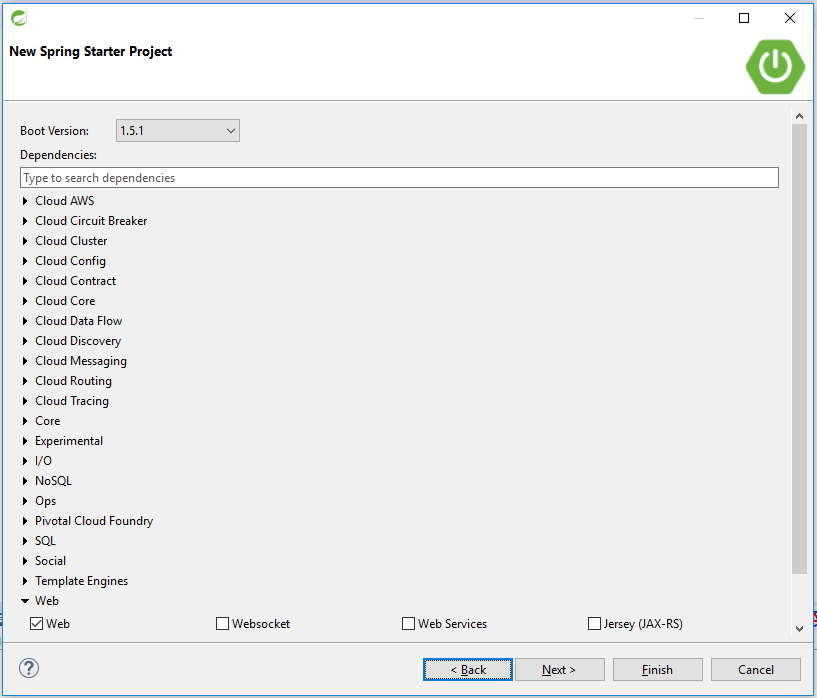
1.1 – Create a new Spring Starter Project



1.2 – Fill initial values

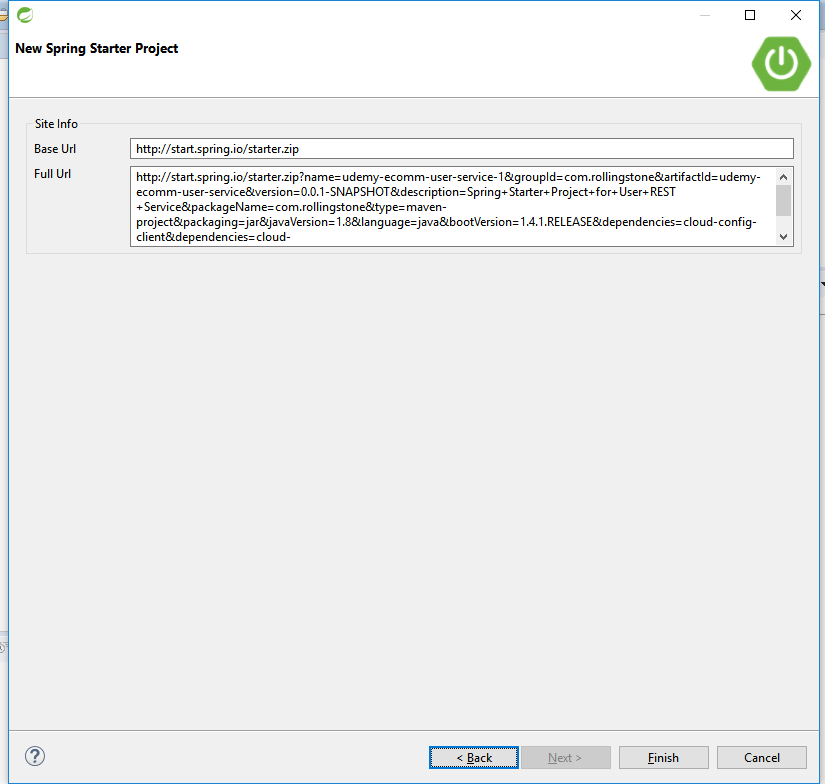


1.3 – Choose Eureka and Web as starter projects

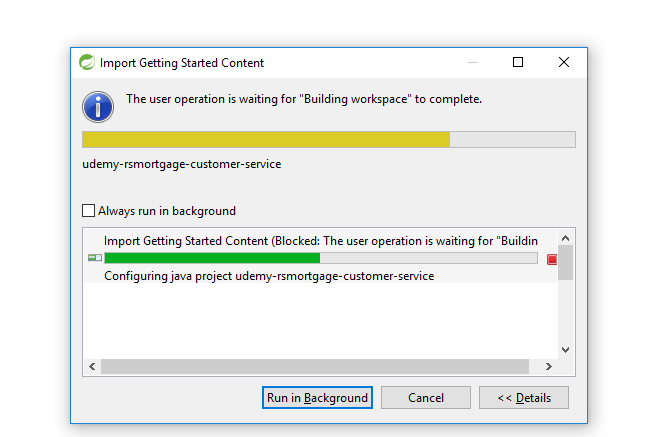


.

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>

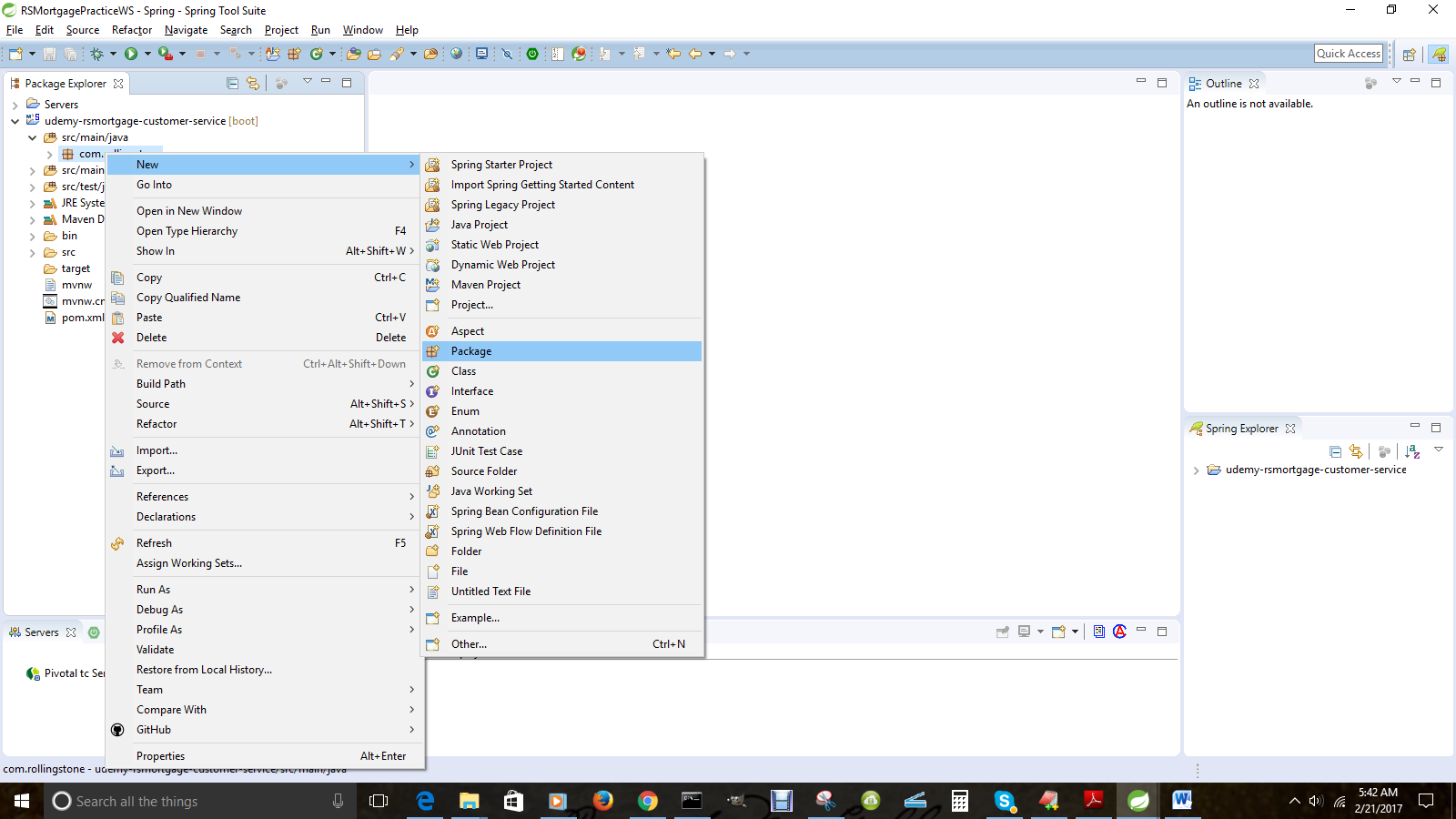
</configuration>

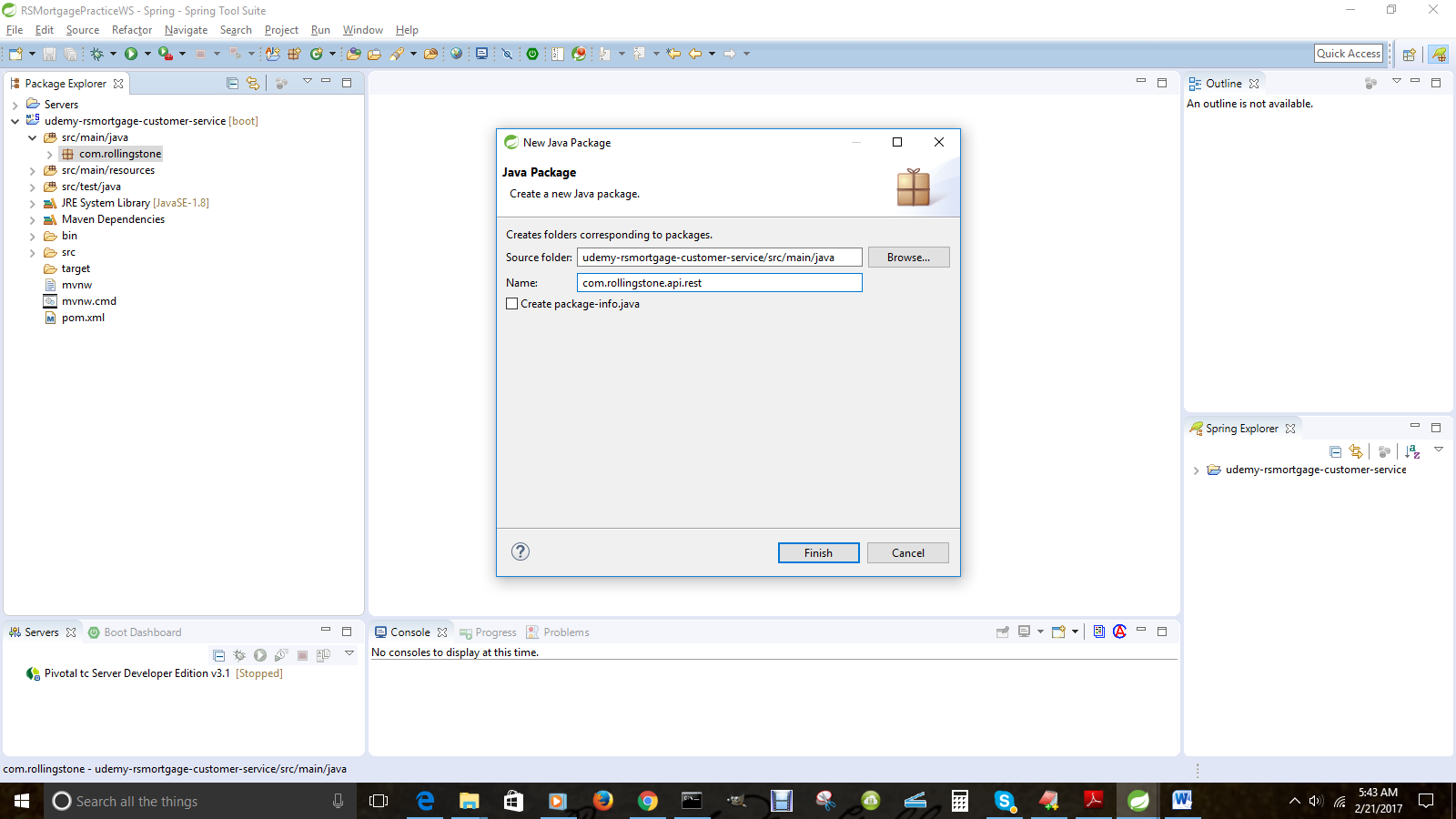
</plugin>

</plugins>

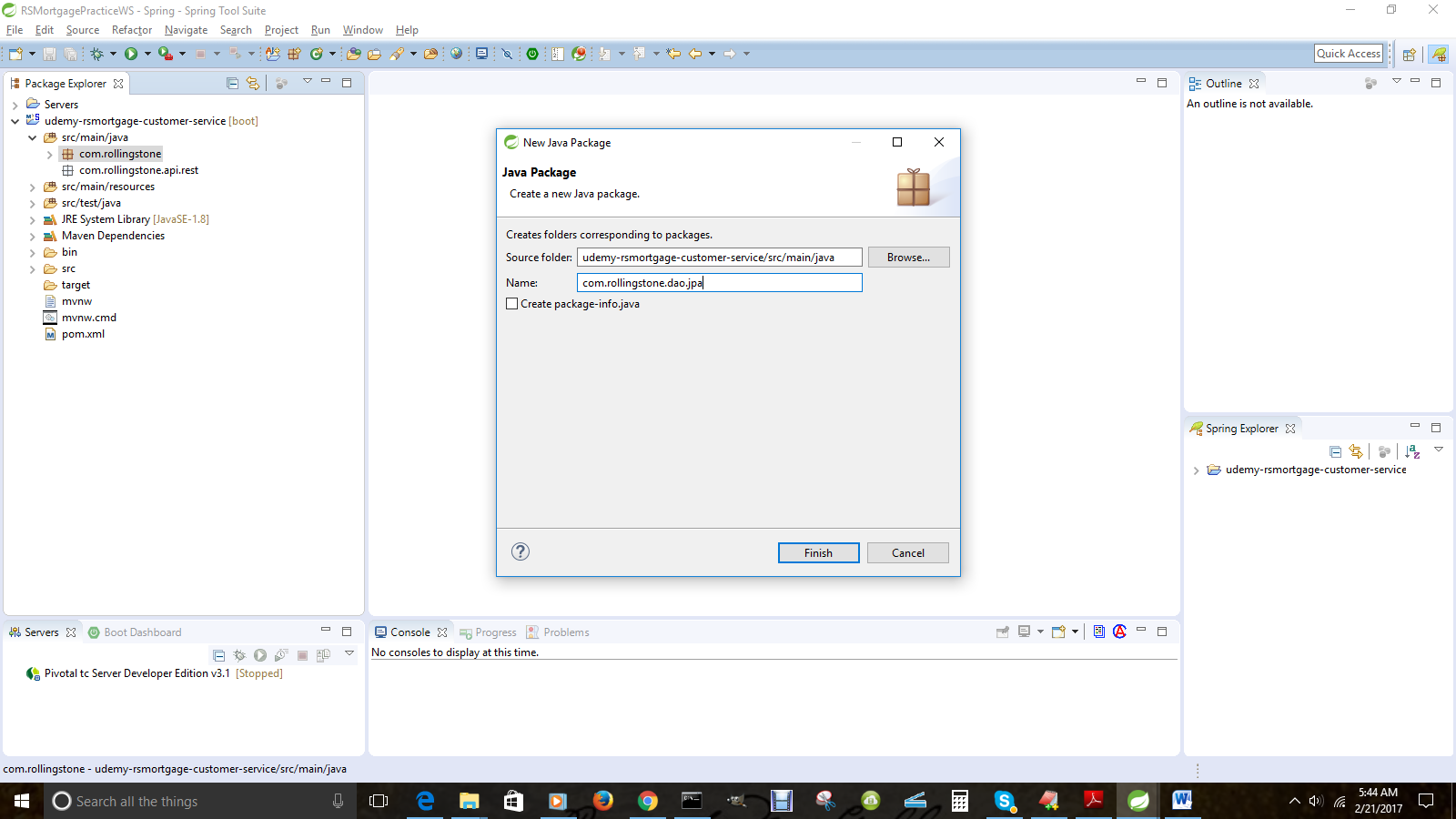
</build>

1.25 – Add api.rest package

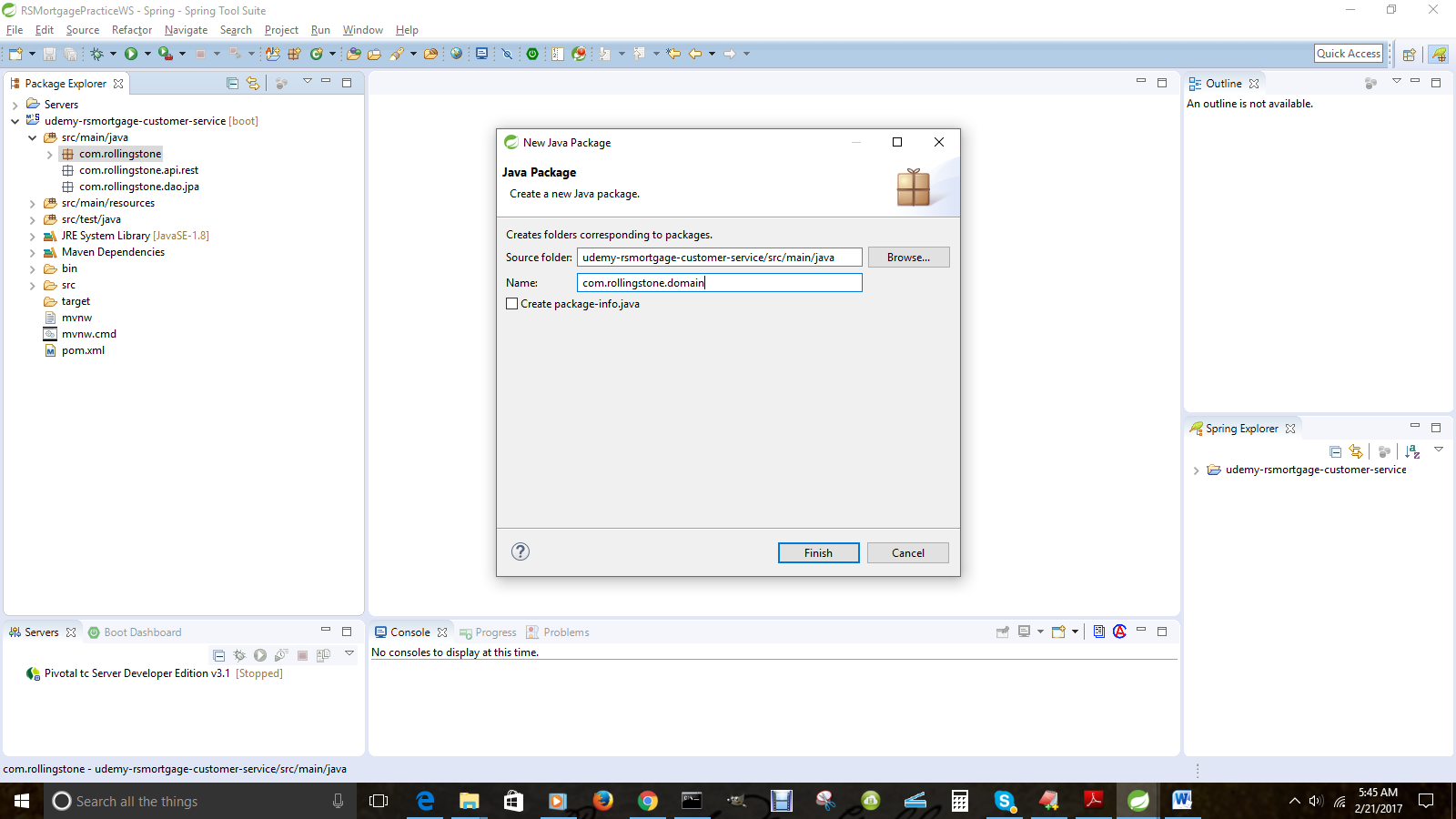




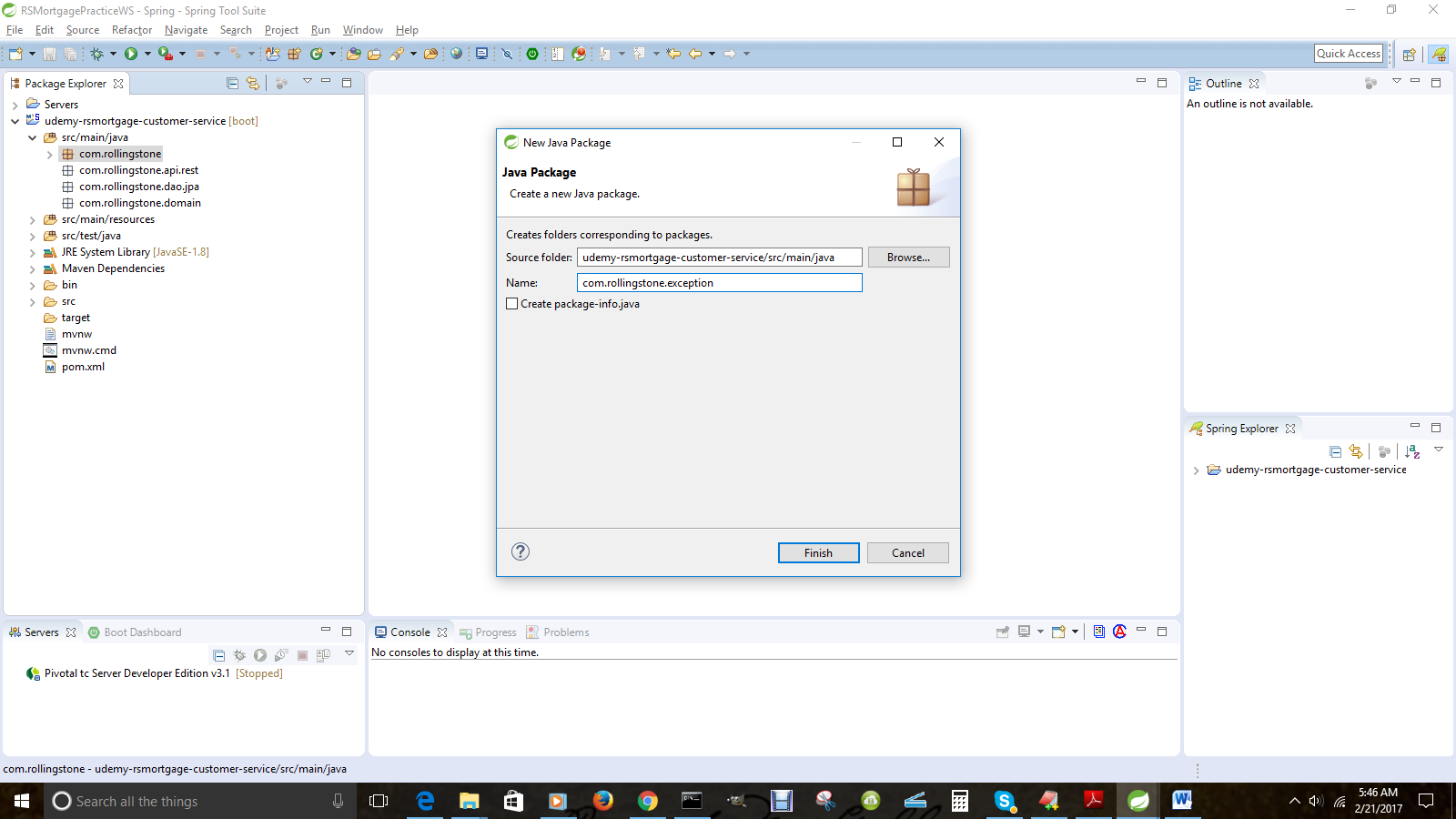
1.26– Add dao.jpa package



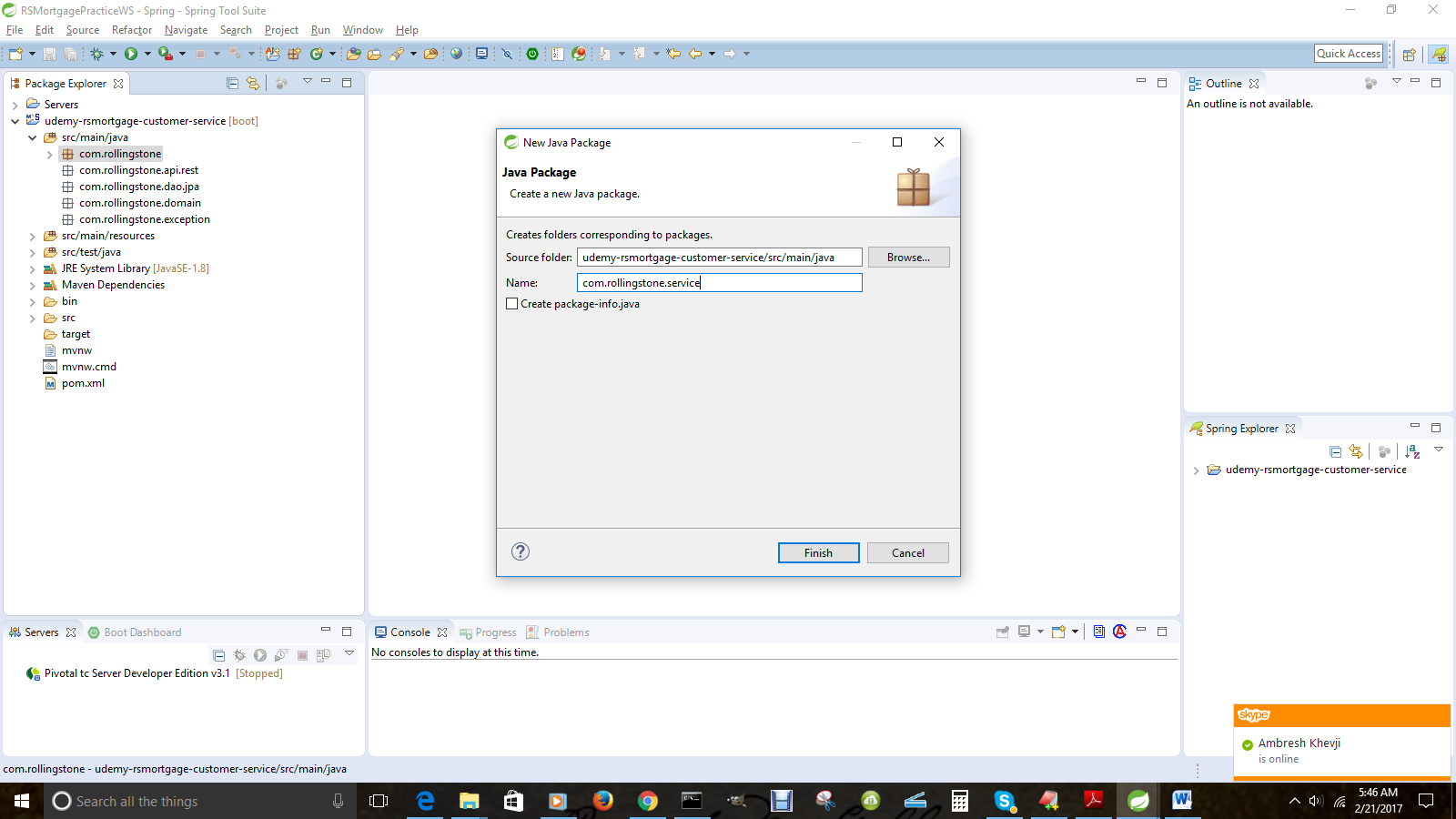
1.27– Add domain package



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.createCustomerAccount");

}

@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.getAllCustomerAccount");

}

@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.getCustomerAccount");

}

@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.updateCustomerAccount");

}

@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:

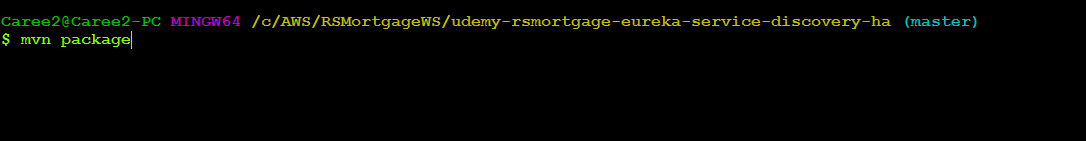
mysql

cloud:

config:

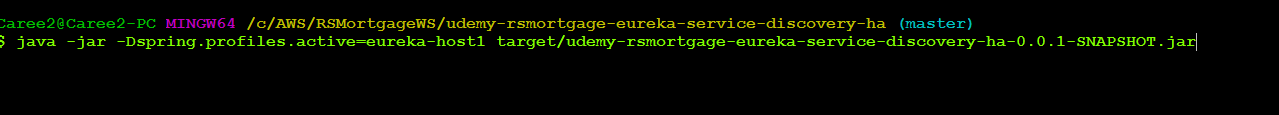
uri: http://localhost:9000

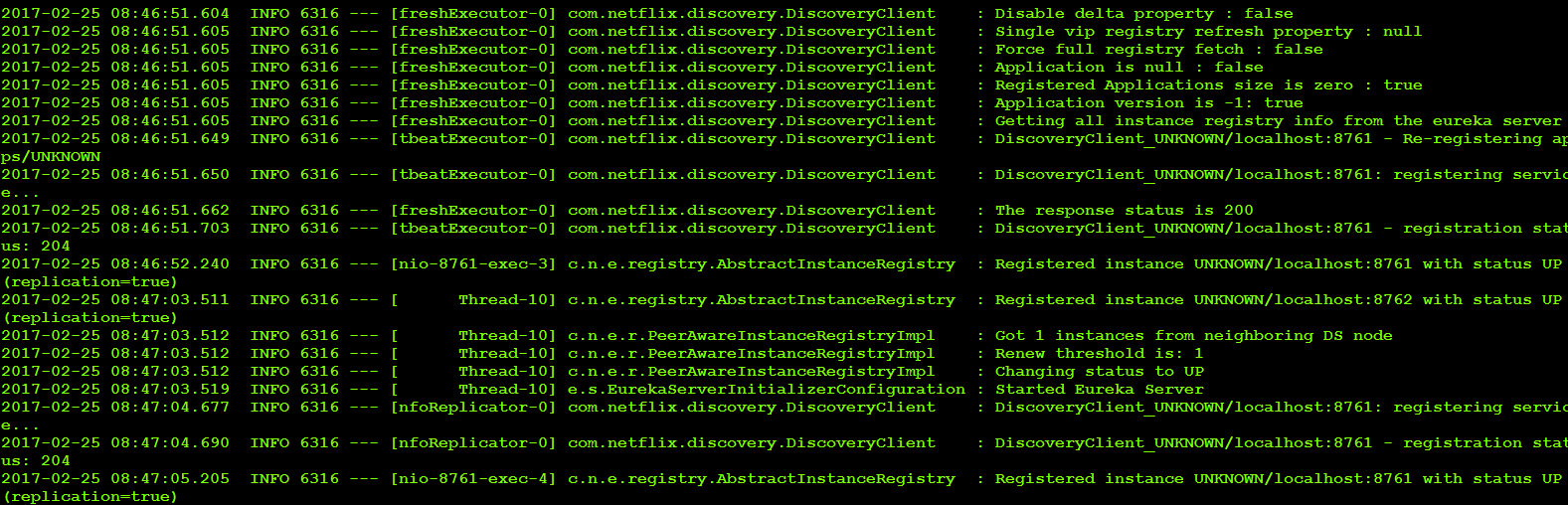
1.70 –Open Git Bash in project folder



1.71 –Run the first instance

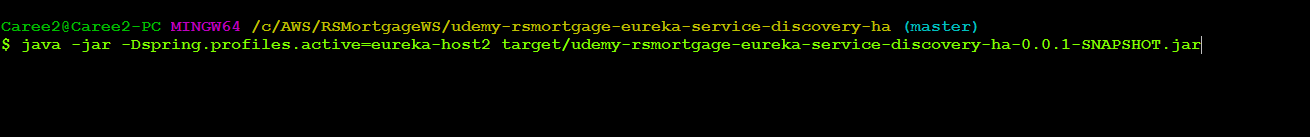
java -jar -Dspring.profiles.active=eureka-host1 target/udemy-rsmortgage-eureka-service-discovery-ha-0.0.1-SNAPSHOT.jar

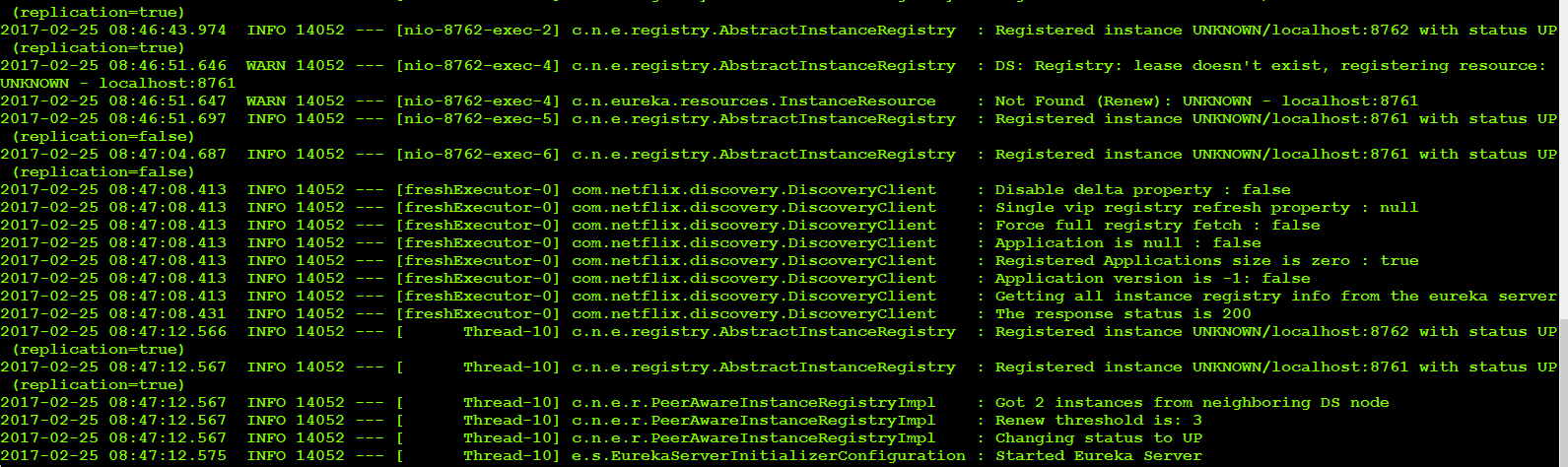




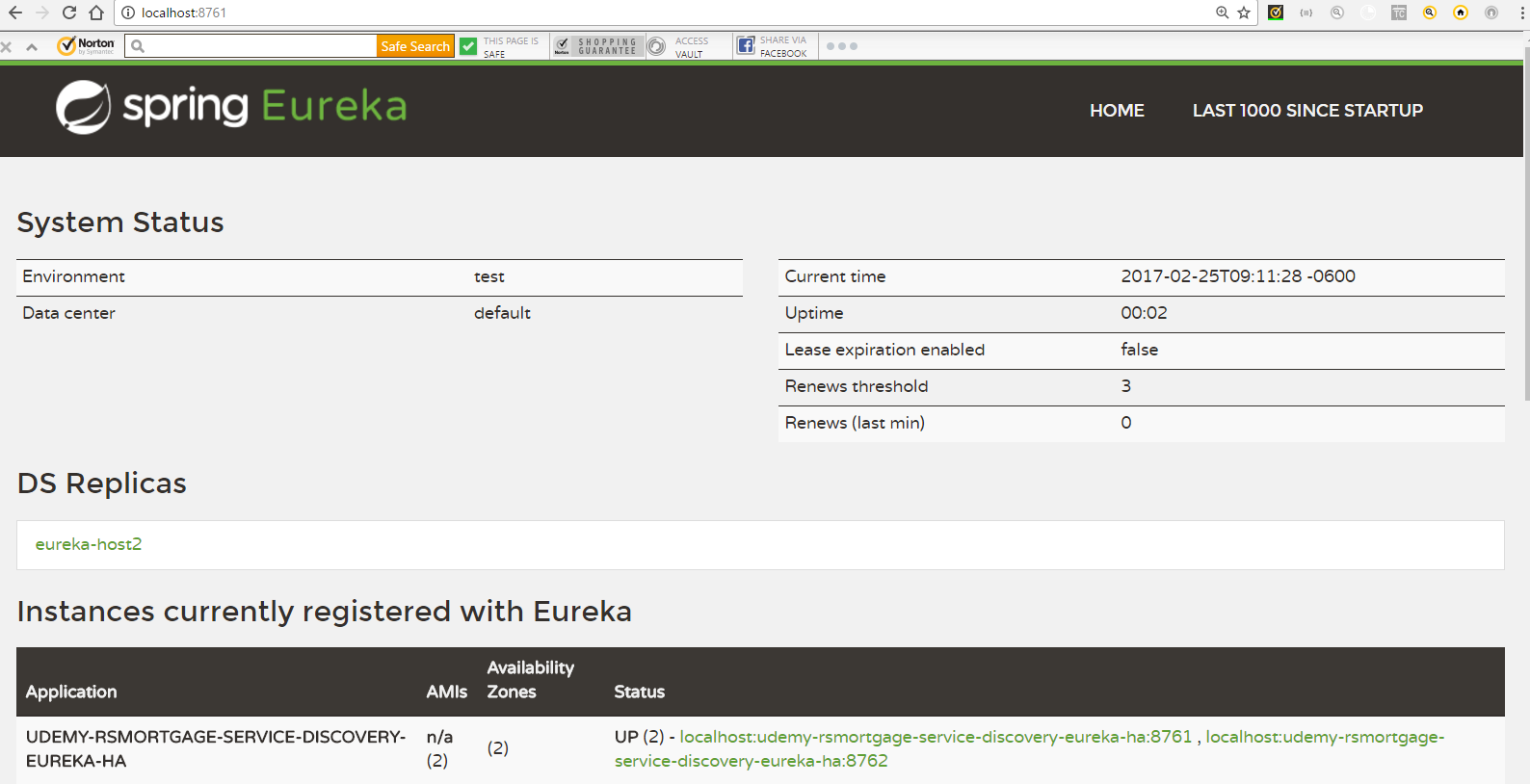
1.72 –Run the second instance

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

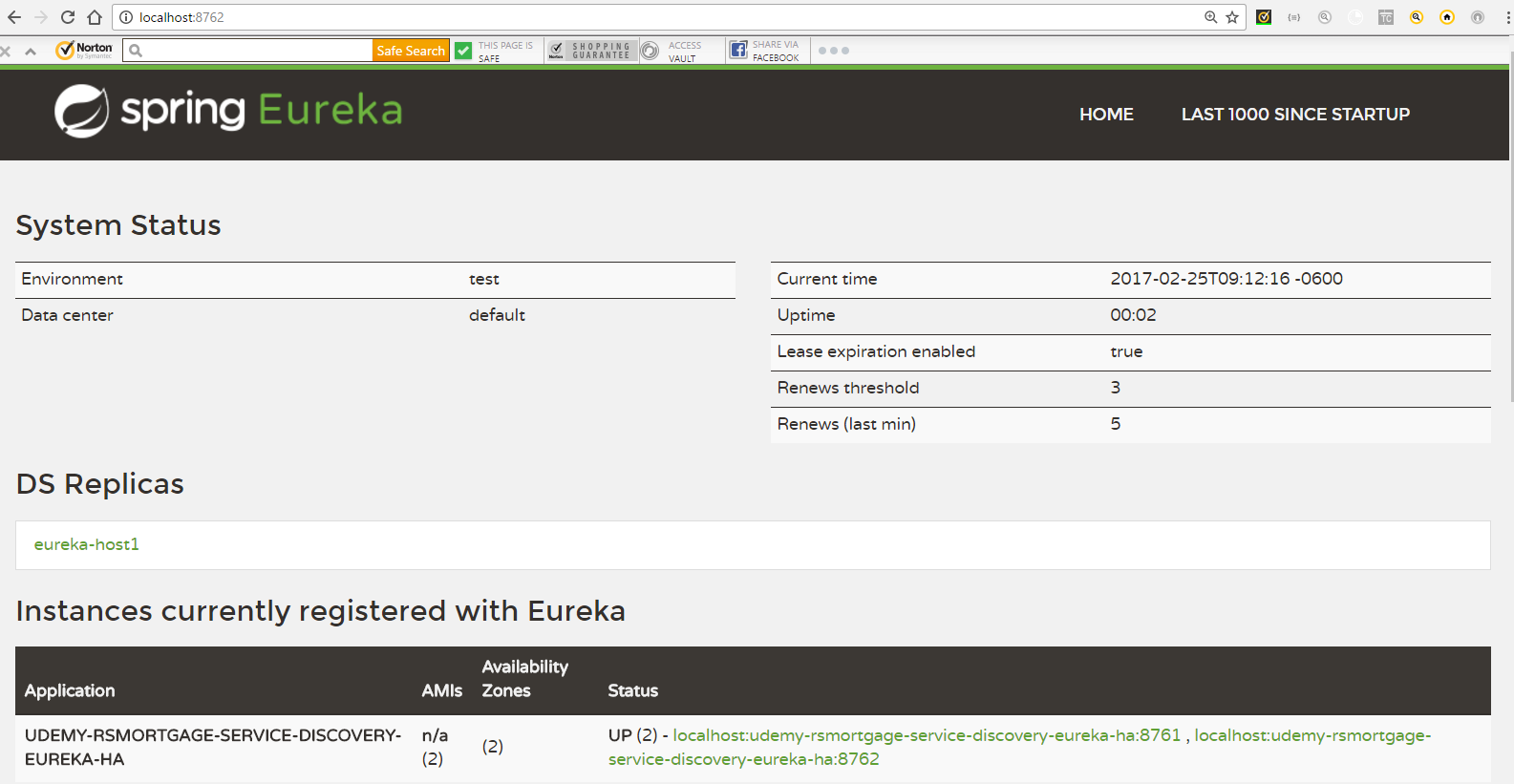




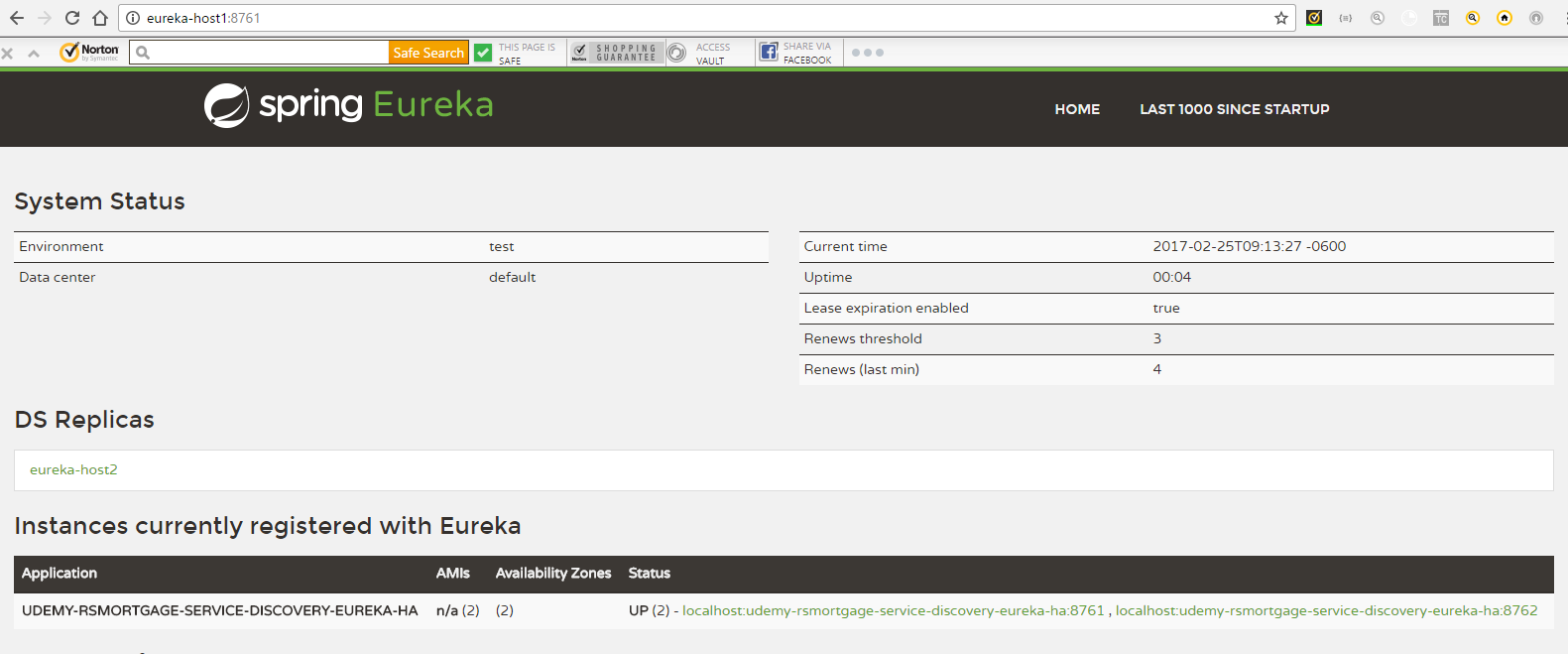
1.73 – Navigate to <http://localhost:8761>



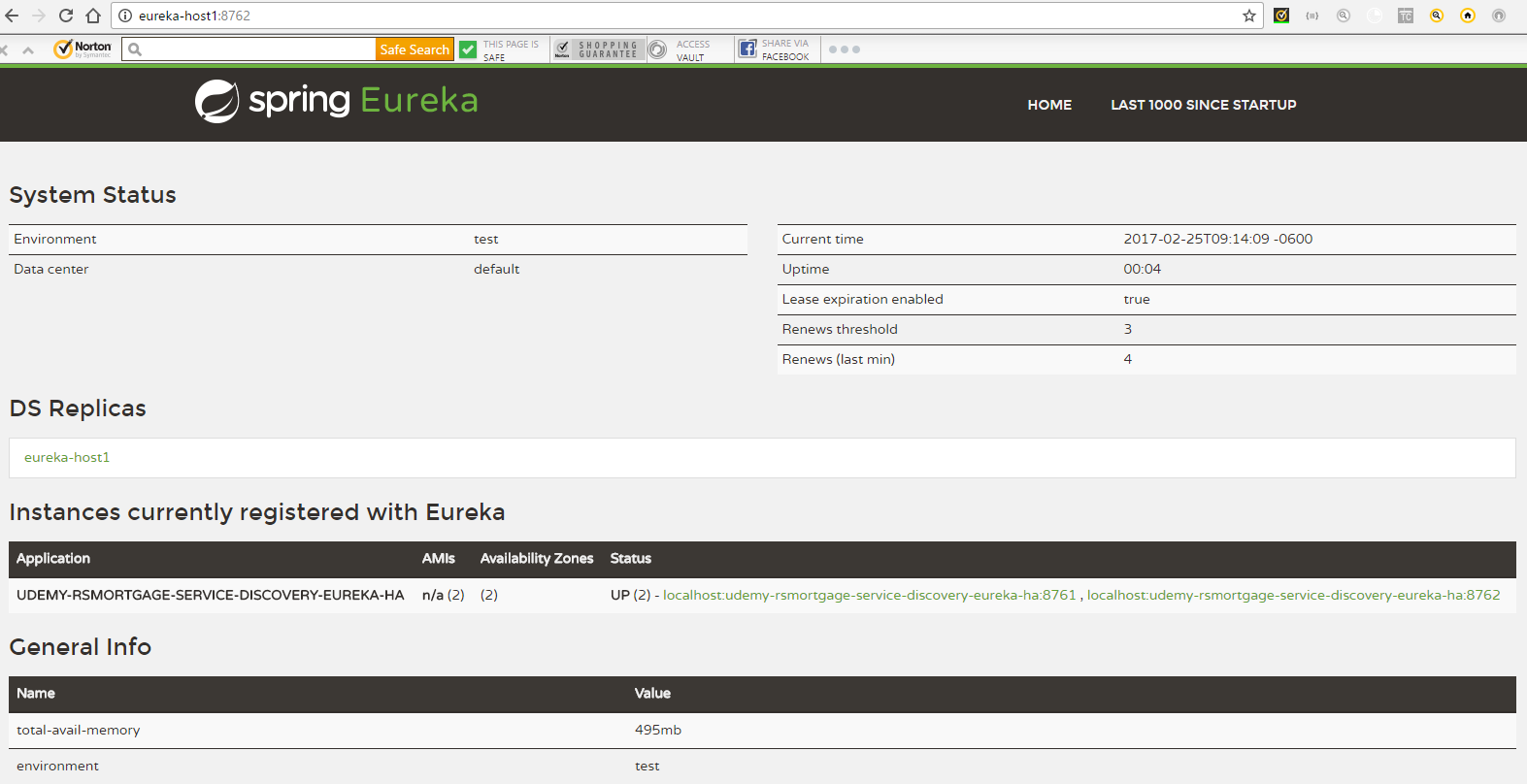
1.74 – Navigate to <http://localhost:8762>

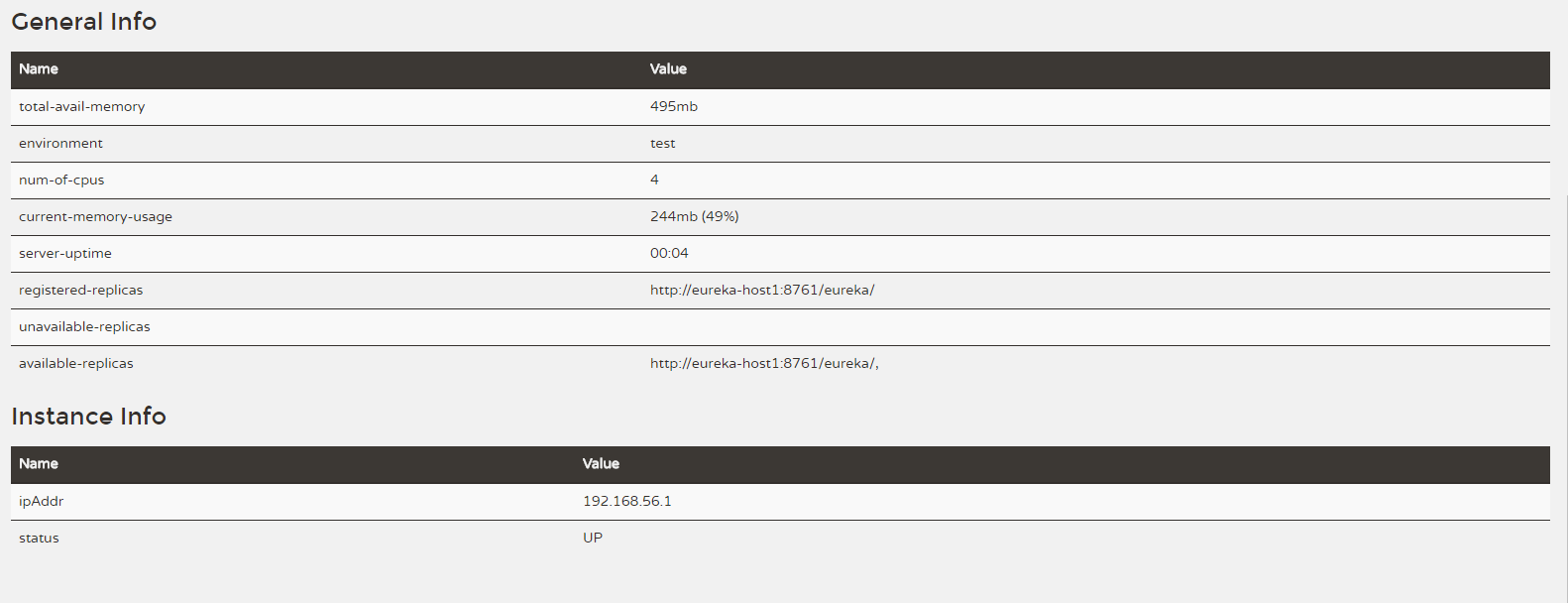


1.75 – Navigate to <http://eureka-host1:8761/>

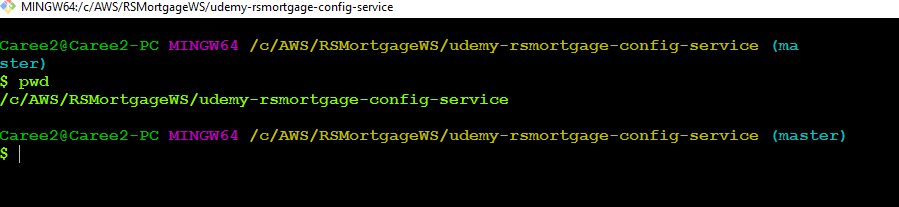


1.76 – Navigate to <http://eureka-host2:8762/>





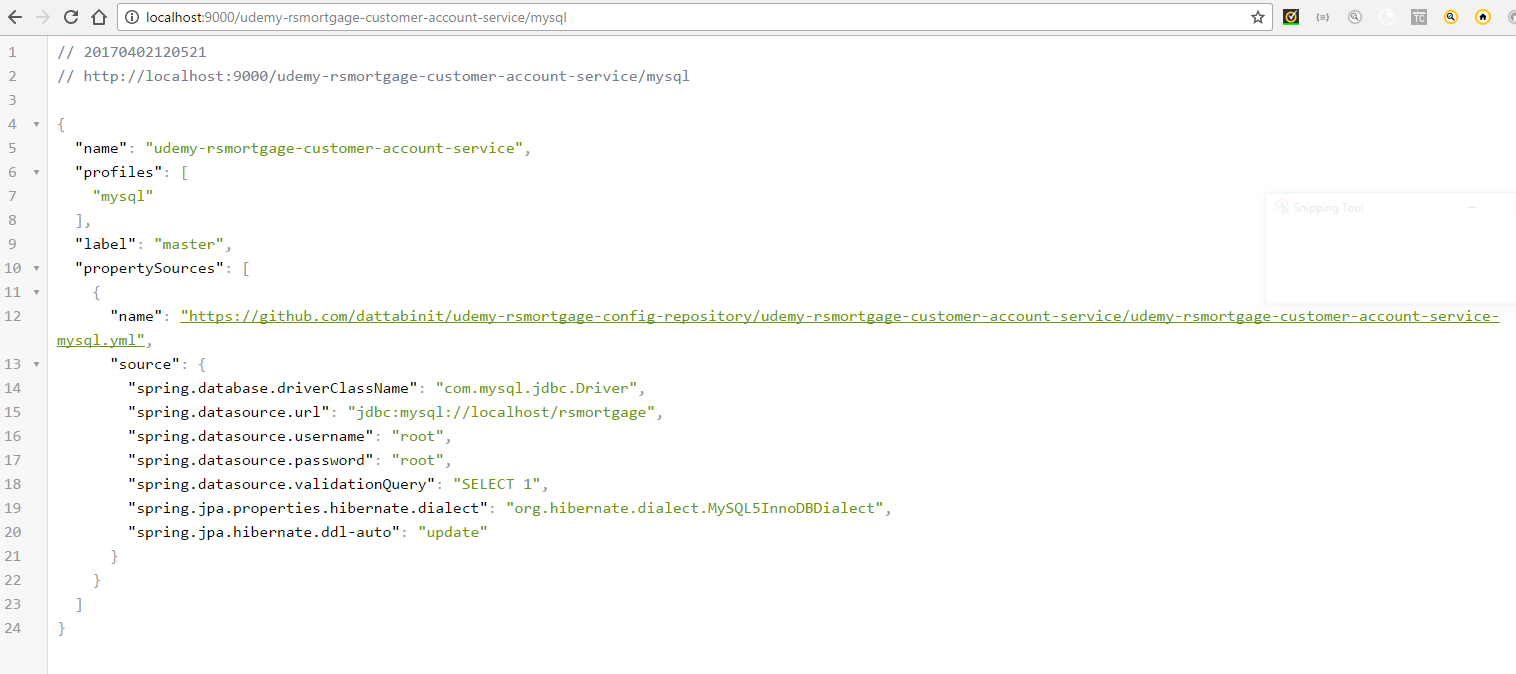
1.77– Open Git bash in the config project directory



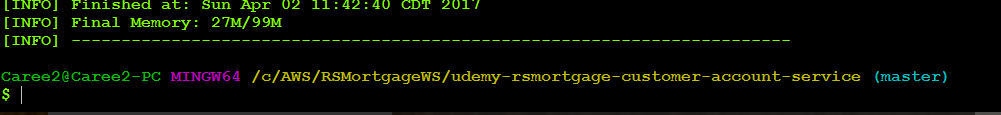
1.78– Run the config service project

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

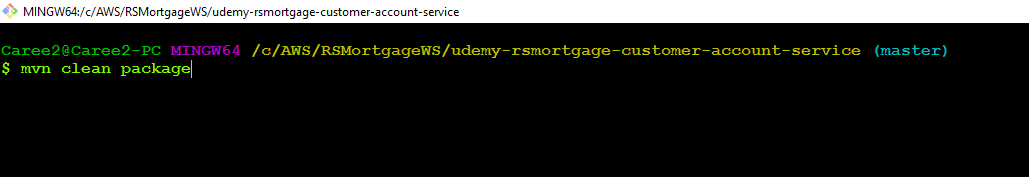
1.79– Verify Customer Account Project mysql properties

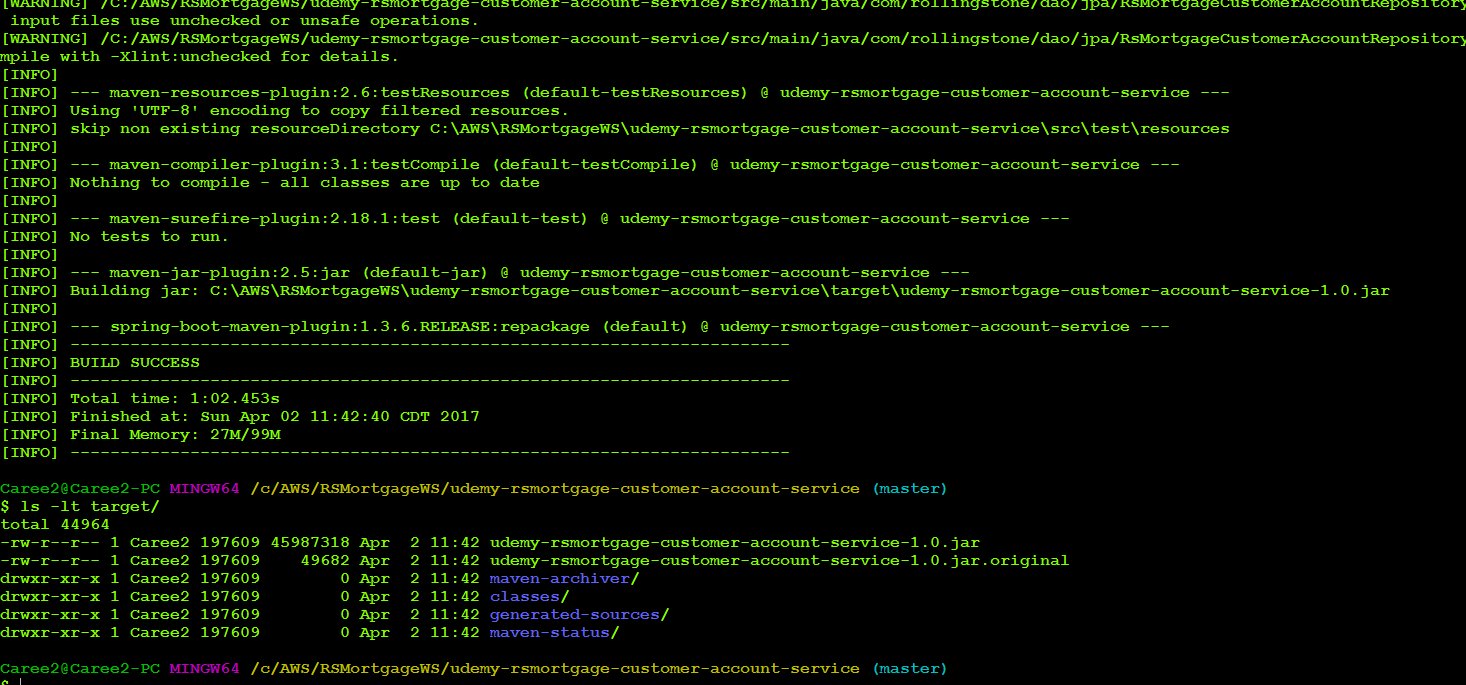


1.80– Open Git bash in the project directory



1.81– Build the project

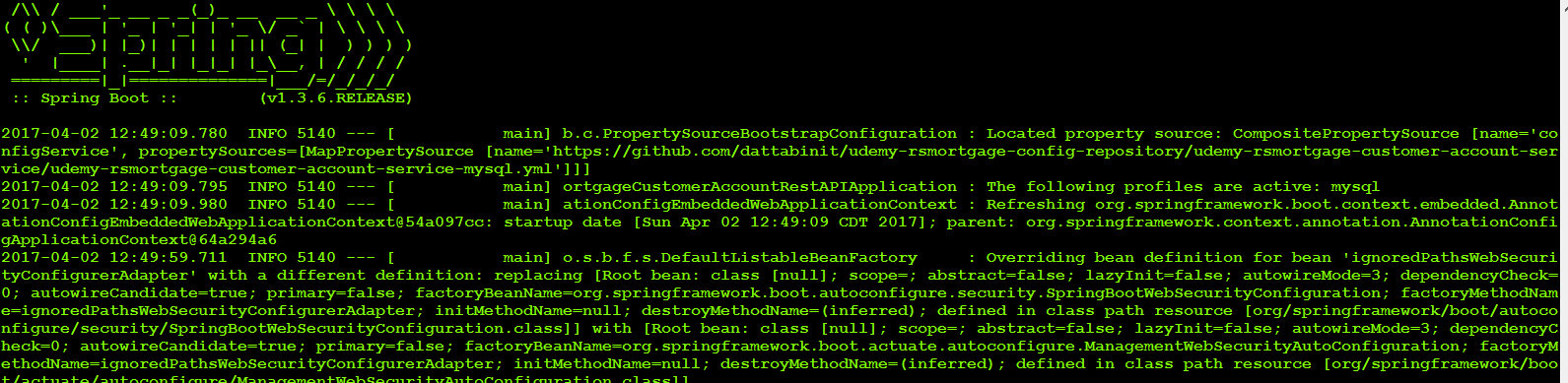




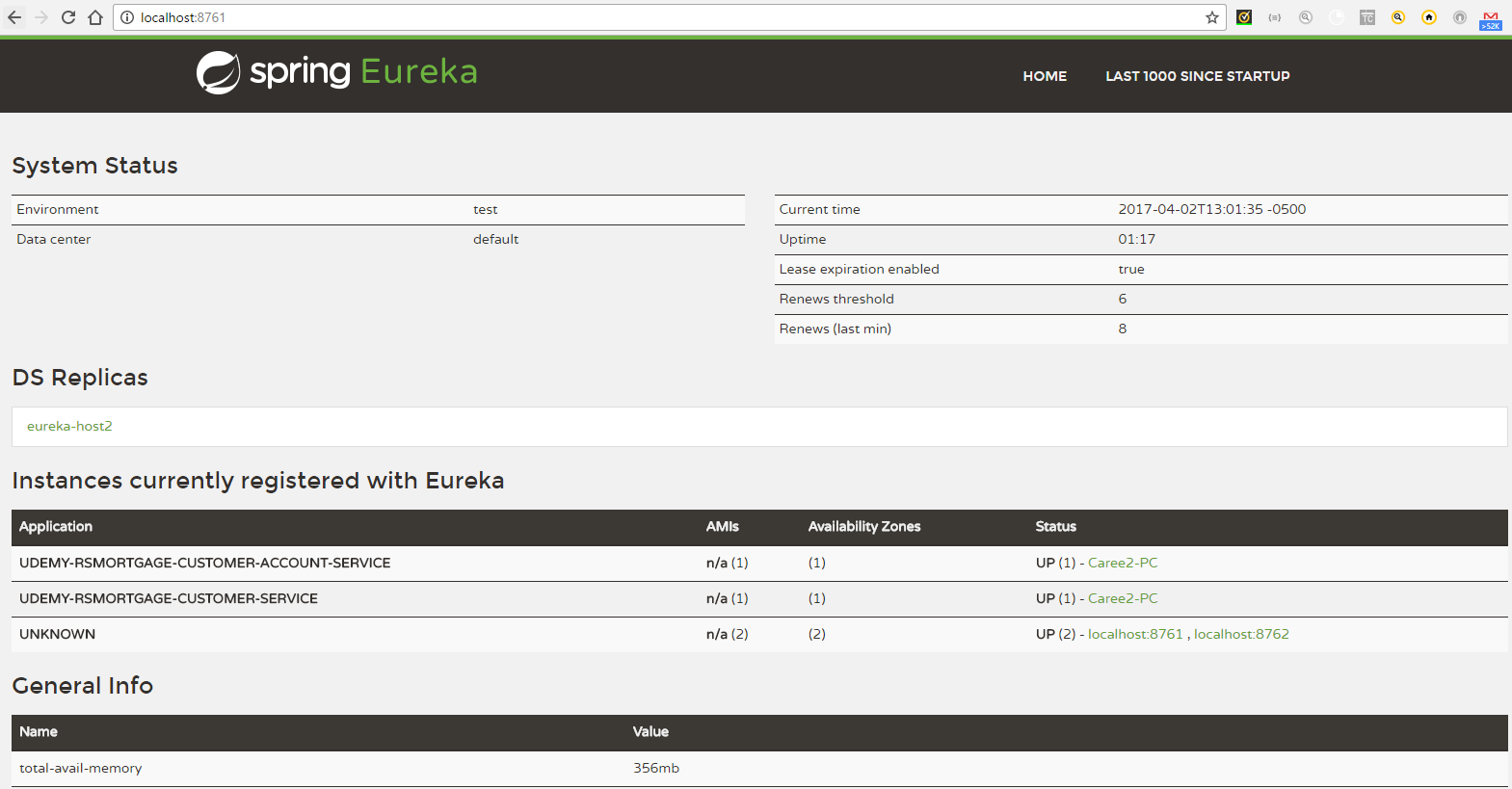
1.82 –Run the Project

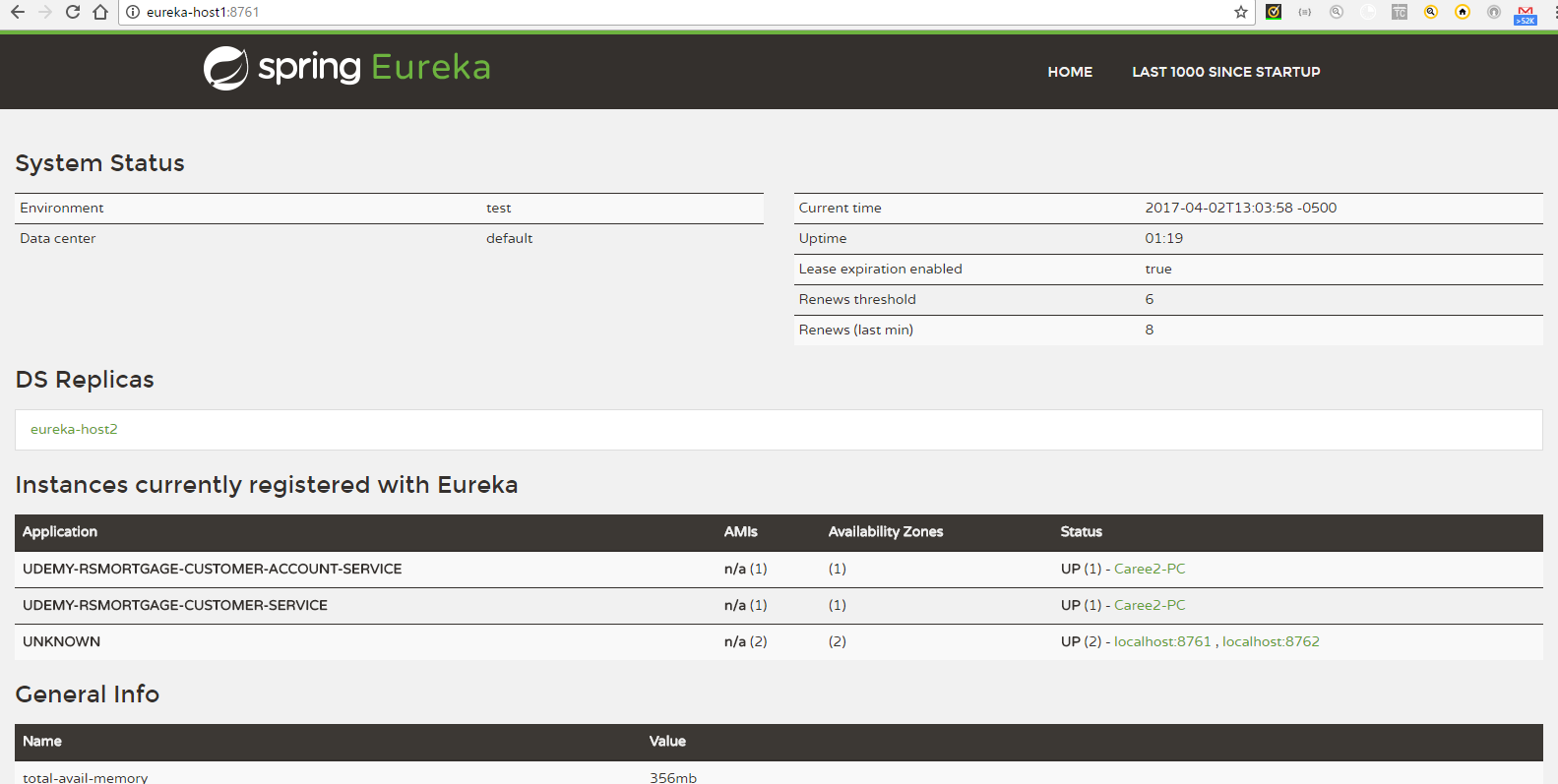
java -jar -Dspring.profiles.active=mysql target/udemy-rsmortgage-customer-account-service-1.0.jar

1.83 –Verify Config Property is read and used



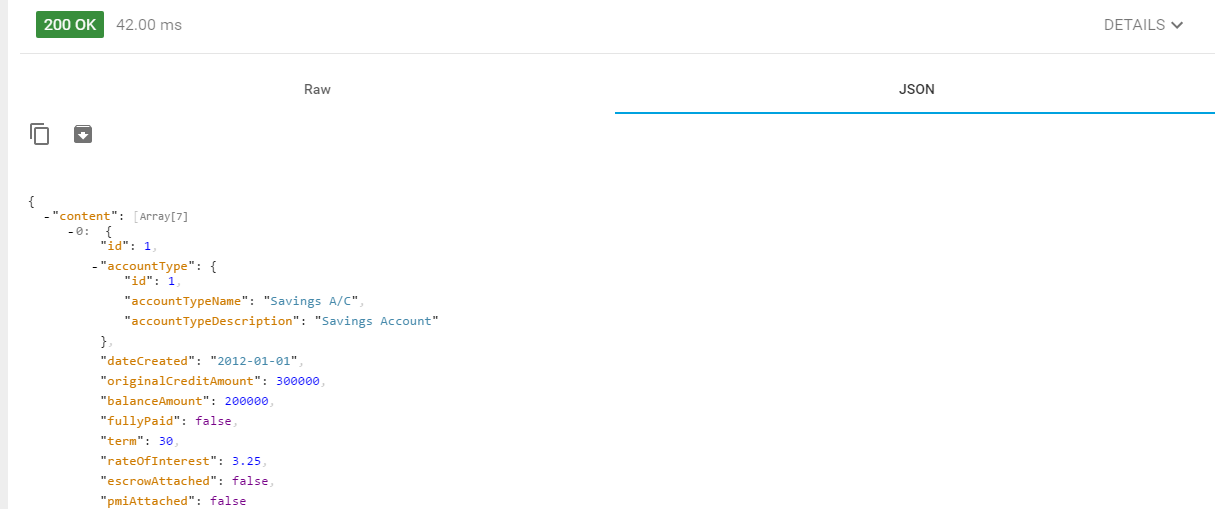
1.84 – Navigate to <http://localhost:8761>





1.85—Get an existing Customer Account

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



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,

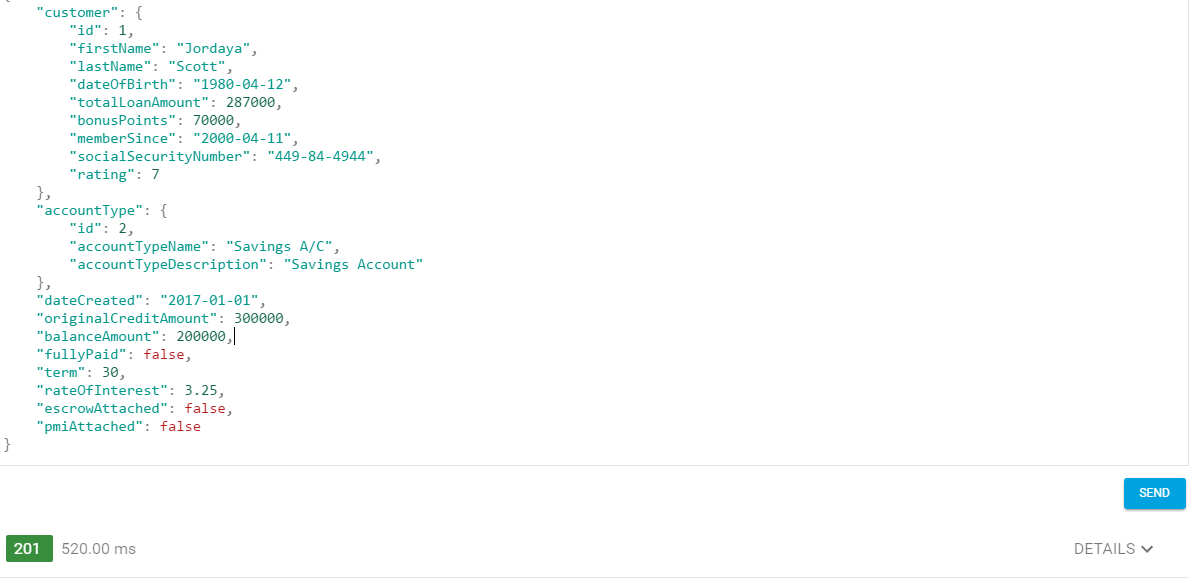
"term": 30,

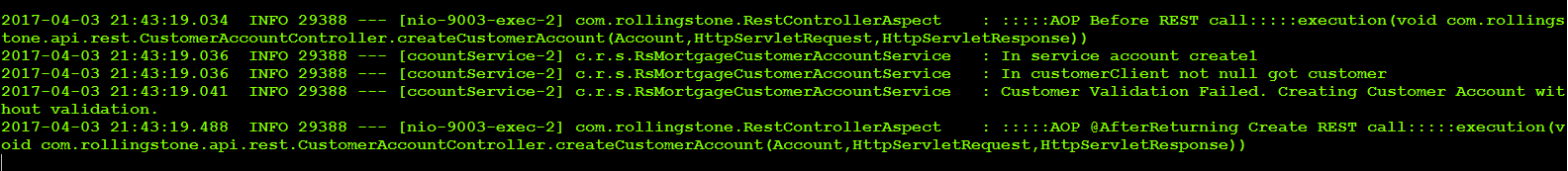
"rateOfInterest": 3.25,

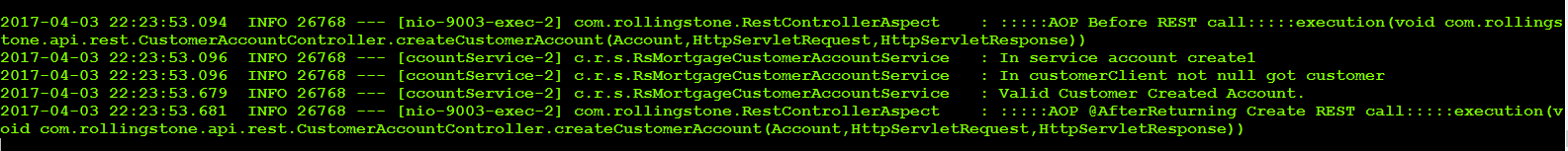
"escrowAttached": false,

"pmiAttached": false

}







1.87– Verify the Database



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,

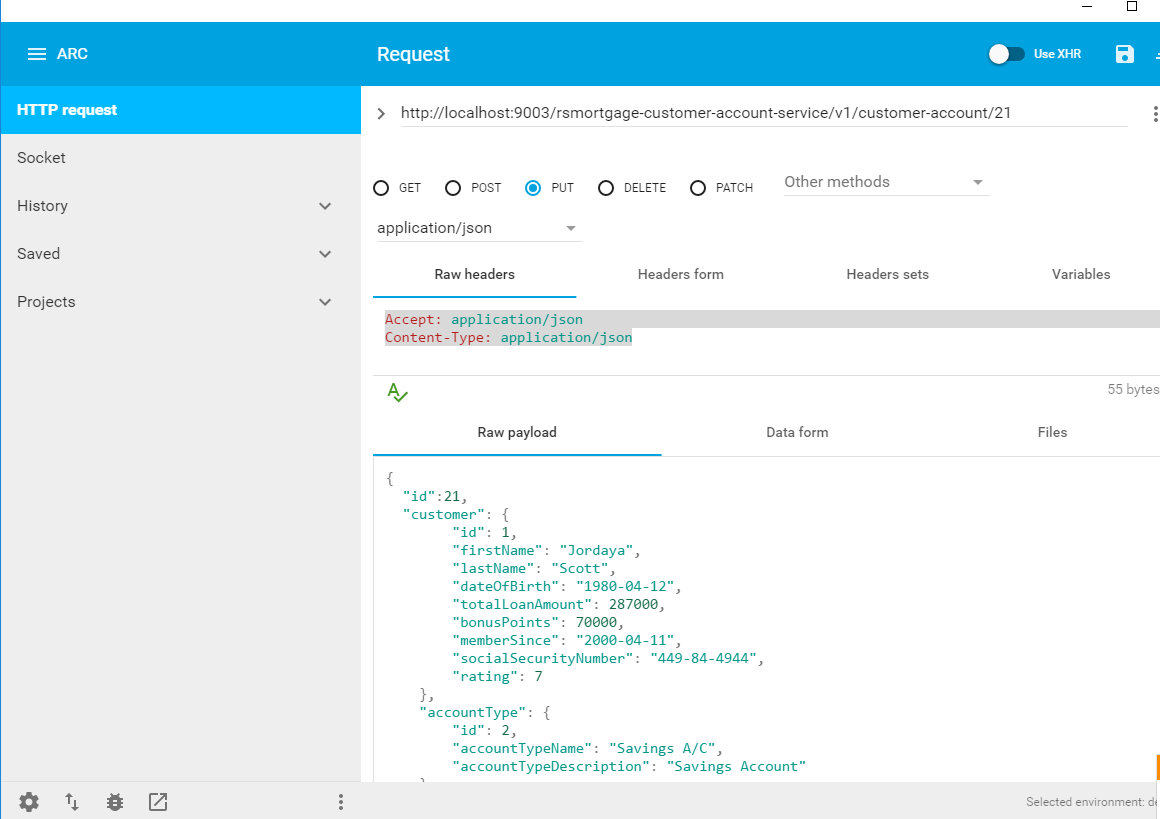
"escrowAttached": false,

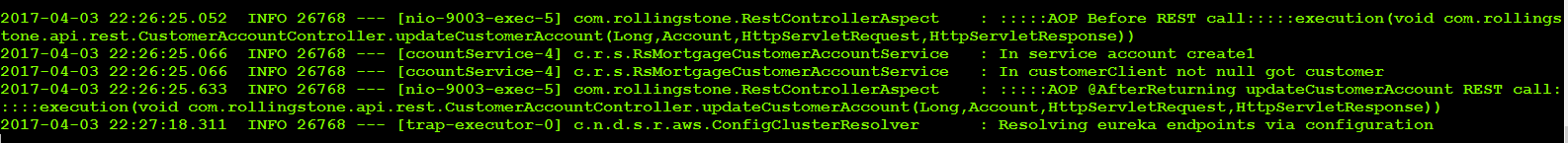
"pmiAttached": false

}

Accept: application/json

Content-Type: application/json



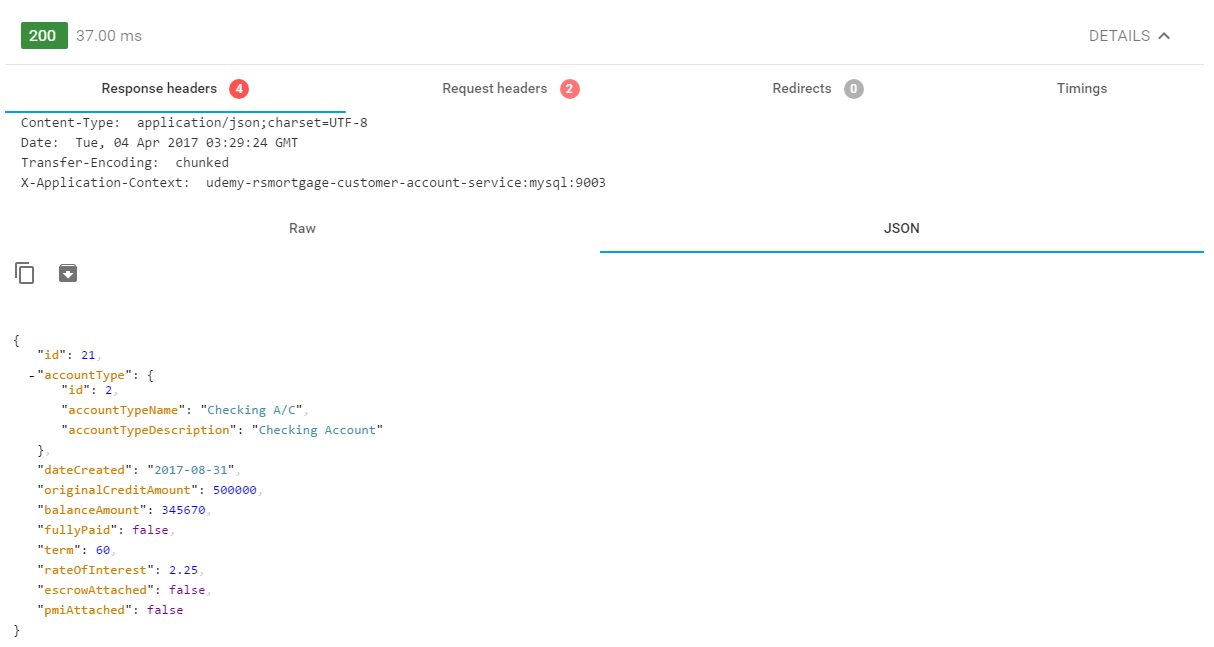


1.89—Verify the Database



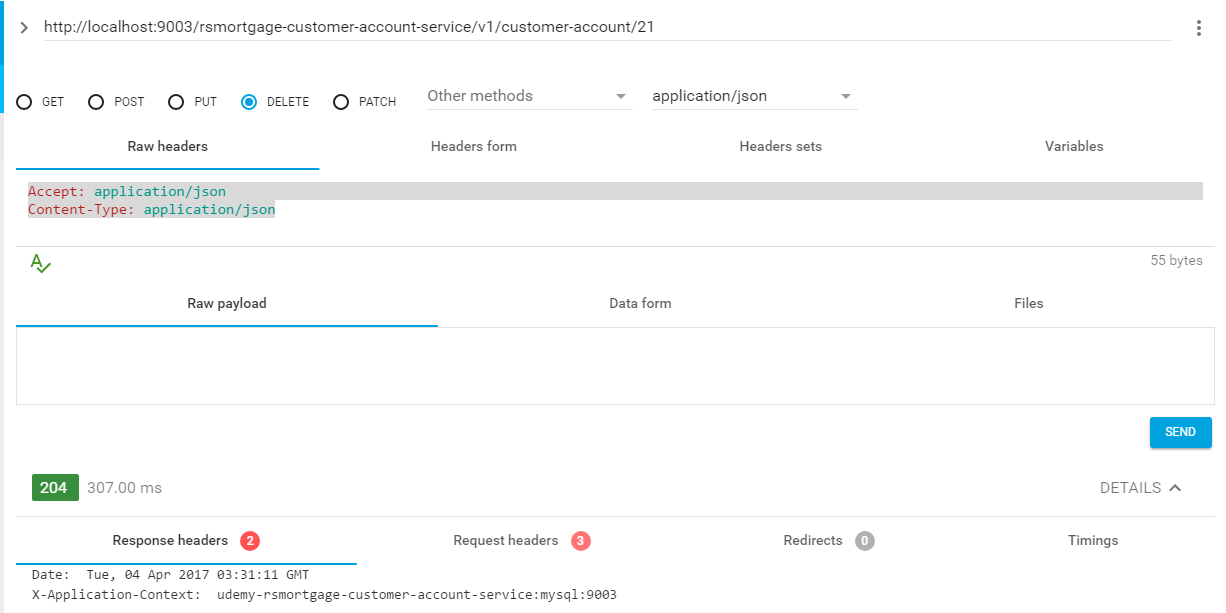
1.90 – Try to get a single customer

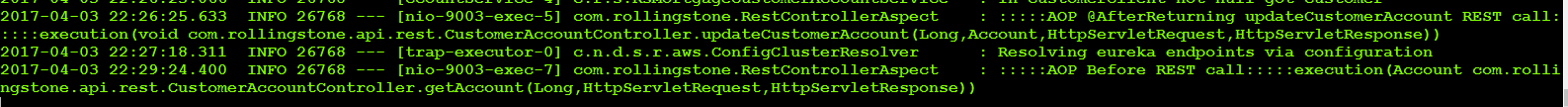
http://localhost:9003/rsmortgage-customer-account-service/v1/customer-account/21



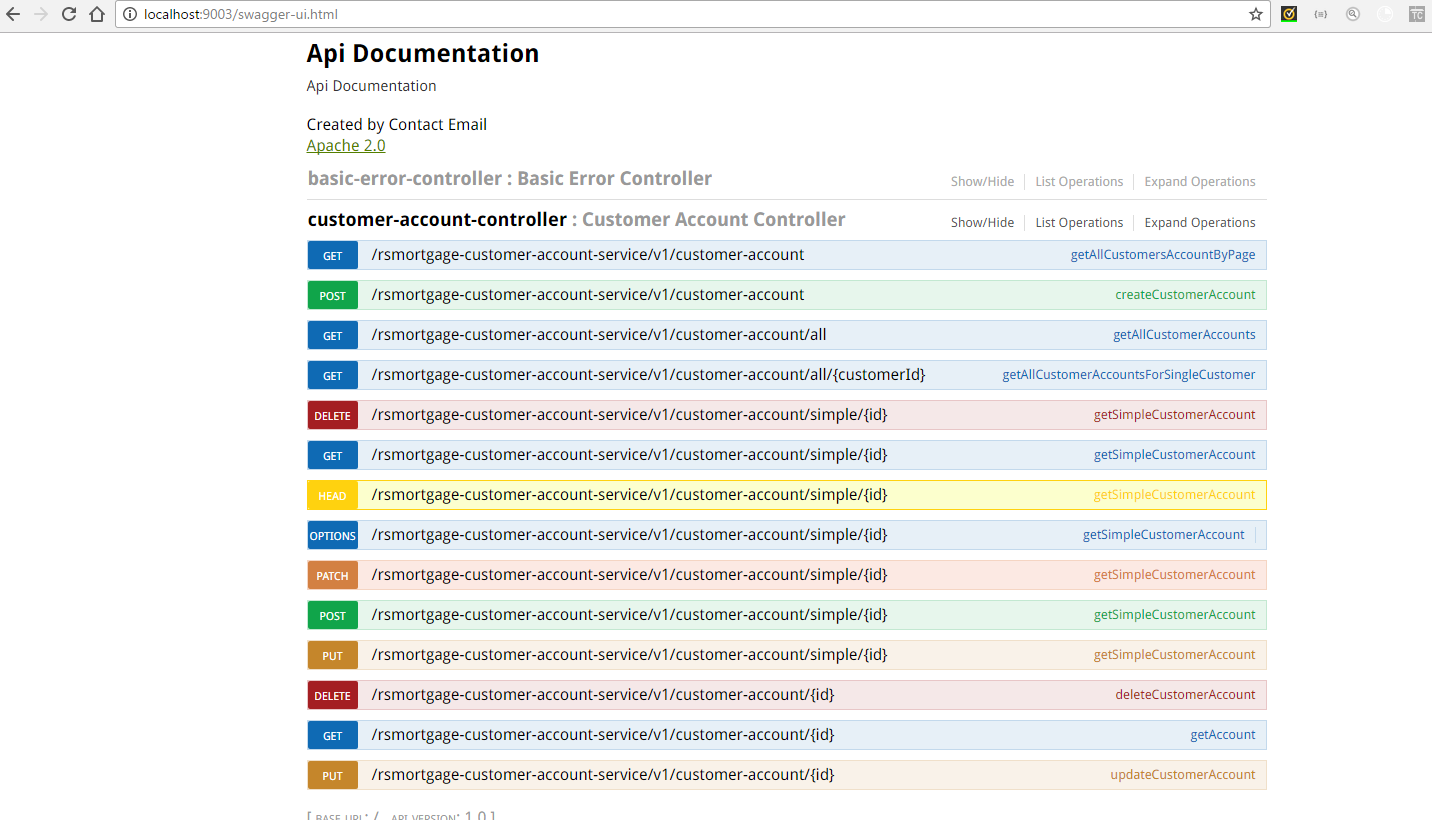
1.91 – Try to delete a single customer

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

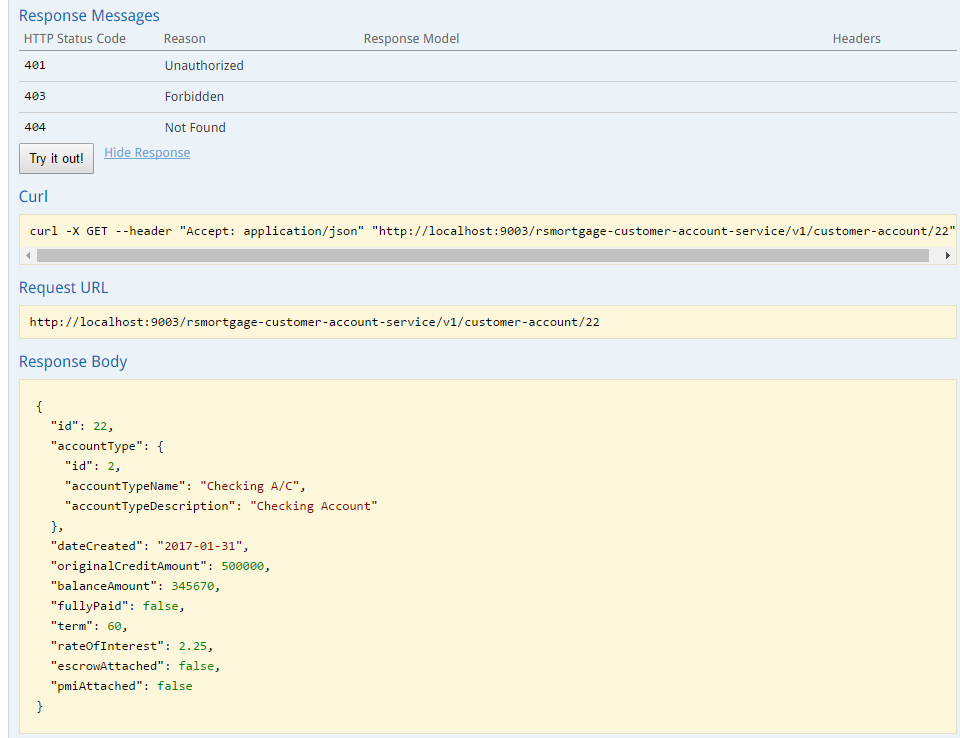




1.92 – Swagger UI







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.