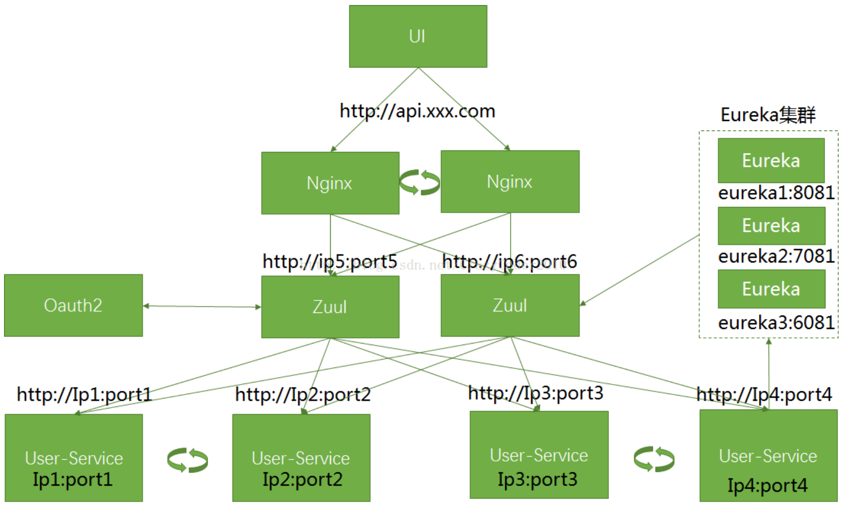
经过前几个章节的内容，我们的微服务项目架构逐渐完善了起来，这一章节的重点是通过给已有的微服务增加oauth2安全认证功能来保证服务调用的安全性，我们要实现的目标架构如下：

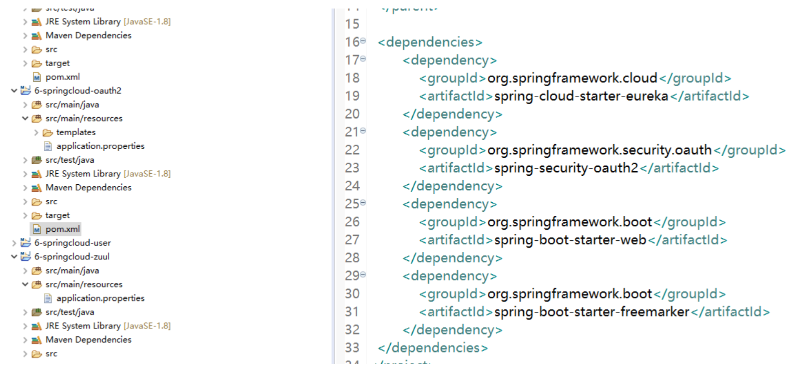


因为所有的外部请求都统一经过zuul网关，因此我们的Oauth2认证添加在Zuul这一层上，而每个微服务之间的调用则认为是项目内部模块之间的调用，不需要进行oauth2认证过程。

1. 项目增加springcloud-ouauth2模块

在我们的项目中增加一个新的模块springcloud-oauth2，并增加依赖

```
<dependency>
    <groupId>org.springframework.cloud</groupId>
    <artifactId>spring-cloud-starter-eureka</artifactId>
</dependency>
<dependency>
    <groupId>org.springframework.security.oauth</groupId>
    <artifactId>spring-security-oauth2</artifactId>
</dependency>
<dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-web</artifactId>
</dependency>
<dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-freemarker</artifactId>
</dependency>
```


```
JRE System Library [JavaSE-1.8]
Maven Dependencies
src
target
pom.xml
6-springcloud-oauth2
  src/main/java
  src/main/resources
    templates
    application.properties
  src/test/java
  JRE System Library [JavaSE-1.8]
  Maven Dependencies
  src
  target
  pom.xml
6-springcloud-user
6-springcloud-zuul
  src/main/java
  src/main/resources
    application.properties
  src/test/java
  JRE System Library [JavaSE-1.8]
  Maven Dependencies
  src
```

```
<dependencies>
    <dependency>
        <groupId>org.springframework.cloud</groupId>
        <artifactId>spring-cloud-starter-eureka</artifactId>
    </dependency>
    <dependency>
        <groupId>org.springframework.security.oauth</groupId>
        <artifactId>spring-security-oauth2</artifactId>
    </dependency>
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-web</artifactId>
    </dependency>
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-freemarker</artifactId>
    </dependency>
</dependencies>
```

修改下工程占用的端口号

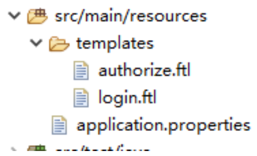
```
server.port=8888
eureka.instance.hostname=oauth2
eureka.client.serviceUrl.defaultZone=http://eureka1:8081/eureka/,http://eureka2:7081/eureka/,http://eureka3:6081/eureka/
```

2. 自定义登录页面和授权确认页面

创建Oauth2Application 类，所谓项目的主函数所在类，继承自WebMvcConfigurerAdapter，自定义登录页面和授权页面的地址

```
package lizzy.springcloud.oauth2;

import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.cloud.client.discovery.EnableDiscoveryClient;
import org.springframework.web.servlet.config.annotation.ViewControllerRegistry;
import org.springframework.web.servlet.config.annotation.WebMvcConfigurerAdapter;

@EnableDiscoveryClient
@SpringBootApplication
public class Oauth2Application extends WebMvcConfigurerAdapter{
    public static void main( String[] args ){
        SpringApplication.run(Oauth2Application.class, args);
    }
    @Override
    public void addViewControllers(ViewControllerRegistry registry) {
            registry.addViewController("/login").setViewName("login");
            registry.addViewController("/oauth/confirm_access").setViewName("authorize");
    }
}
```

同时在src/main/resources下建立templates目录，增加2个ftl文件



```
src/main/resources
    templates
        authorize.ftl
        login.ftl
    application.properties
```

authorize.ftl

```
<html>
<head>
        <script src="https://cdn.bootcss.com/bootstrap/3.3.7/js/bootstrap.js"></script>
        <link href="https://cdn.bootcss.com/bootstrap/3.3.7/css/bootstrap.css" rel="stylesheet">
</head>
<body>
        <div class="container">
                <h2>Please Confirm</h2>
                <p>
                        Do you authorize "${authorizationRequest.clientId}" at "${authorizationRequest.redirectUri}" to
access your protected resources with scope ${authorizationRequest.scope?join(", ")}.
                </p>
                <form id="confirmationForm" name="confirmationForm" action="../oauth/authorize" method="post">
                        <#list authorizationRequest.scope as scop>
                                <input type="hidden" name="scope.${scop}" value="true"/>
                        </#list>
                        <input name="user_oauth_approval" value="true" type="hidden"/>
                        <input type="hidden" id="csrf_token" name="${_csrf.parameterName}" value="${_csrf.token}"/>
                        <button class="btn btn-primary" type="submit">Approve</button>
                </form>
                <form id="denyForm" name="confirmationForm" action="../oauth/authorize" method="post">
                        <input name="user_oauth_approval" value="false" type="hidden"/>
                        <input type="hidden" id="csrf_token" name="${_csrf.parameterName}" value="${_csrf.token}"/>
                        <button class="btn btn-primary" type="submit">Deny</button>
                </form>
        </div>
</body>
</html>
```

login.ftl

```
<html>
        <head>
                <link rel="stylesheet" href="https://cdn.bootcss.com/bootstrap/3.3.7/css/bootstrap.min.css"
integrity="sha384-BVYiiSIFeK1dGmJRAkycuHAHRg32OmUcww7on3RYdg4Va+PmSTsz/K68vbdEjh4u" crossorigin="anonymous">
        </head>
        <body>
                <div class="container">
                <form role="form" action="login" method="post">
                        <div class="form-group">
                                <label for="username">Username:</label>
                        <input type="text" class="form-control" id="username" name="username"/>
                    </div>
                    <div class="form-group">
                        <label for="password">Password:</label>
                        <input type="password" class="form-control" id="password" name="password"/>
                    </div>
                    <input type="hidden" id="csrf_token" name="${_csrf.parameterName}" value="${_csrf.token}"/>
                    <button type="submit" class="btn btn-primary">Submit</button>
                </form>
                </div>
                <script src="https://cdn.bootcss.com/bootstrap/3.3.7/js/bootstrap.min.js" integrity="sha384-Tc5IQib027qvyjSMfHjOMaLkfuWVxZxUPnCJA7l2mCWNIpG9mGCD8wGNIcPD7Txa" crossorigin="anonymous"></script>
        </body>
</html>
```

3.实现UserDetailsService

实际的项目中，我们的登录用户数据可能存在数据库中，也可能是存放在ladap或其他微服务接口中，springcloud oauth2给我们提供了一个UserDetailsService接口

```
UserDetails loadUserByUsername(String username) throws UsernameNotFoundException;
```

在项目中，我们需要自行实现这个接口来获取用户信息。在这个例子中，我们在接口中写死了一个用户名admin,并为其手动指定了一个角色admin

```
package lizzy.springcloud.oauth2.service;

import java.util.Collection;
import java.util.HashSet;
import org.springframework.security.core.GrantedAuthority;
import org.springframework.security.core.authority.SimpleGrantedAuthority;
import org.springframework.security.core.userdetails.User;
import org.springframework.security.core.userdetails.UserDetails;
import org.springframework.security.core.userdetails.UserDetailsService;
import org.springframework.security.core.userdetails.UsernameNotFoundException;
import org.springframework.stereotype.Service;

@Service
public class MyUserDetailsService  implements UserDetailsService {
        @Override
        public UserDetails loadUserByUsername(String username) throws UsernameNotFoundException {
                if ("admin".equalsIgnoreCase(username)) {
                        User user = mockUser();
                        return user;
                        }
                        return null;
        }
        private User mockUser() {
                Collection<GrantedAuthority> authorities = new HashSet<>();
                authorities.add(new SimpleGrantedAuthority("admin"));//用户所拥有的角色信息
                User user = new User("admin","123456",authorities);
                return user;
        }
}
```

4.配置Oauth2Server和SecurityConfig

WebSecurityConfig.java

```
package lizzy.springcloud.oauth2.config;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;
import org.springframework.core.annotation.Order;
import org.springframework.security.authentication.AuthenticationManager;
import org.springframework.security.config.annotation.authentication.builders.AuthenticationManagerBuilder;
import org.springframework.security.config.annotation.web.builders.HttpSecurity;
import org.springframework.security.config.annotation.web.configuration.WebSecurityConfigurerAdapter;

import lizzy.springcloud.oauth2.service.MyUserDetailsService;

@Order(10)
@Configuration
public class WebSecurityConfig extends WebSecurityConfigurerAdapter {
        //注入Service
        @Autowired
    //注意，这个MyUserDetailsService就是上个步骤中定义的bean
    private MyUserDetailsService userDetailsFitService;
        @Override
        @Bean
        public AuthenticationManager authenticationManagerBean() throws Exception {
                return super.authenticationManagerBean();
        }

        @Override
        protected void configure(HttpSecurity http) throws Exception {
                http.formLogin()
                        .loginPage("/login").permitAll().and().authorizeRequests().antMatchers("/health", "/css/**")
                        .anonymous().and().authorizeRequests().anyRequest().authenticated();
        }

        @Override
        protected void configure(AuthenticationManagerBuilder auth) throws Exception {
                auth.userDetailsService(userDetailsFitService);
                //auth.parentAuthenticationManager(authenticationManagerBean());
        }
}
```
在这个例子中，我们把client的信息保存在内存中

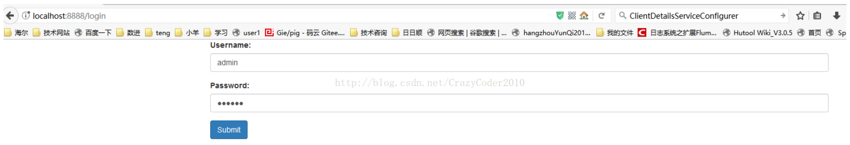
AuthorizationServerConfiguration.java

```
package lizzy.springcloud.oauth2.config;

@Configuration
@EnableAuthorizationServer
public class AuthorizationServerConfiguration extends AuthorizationServerConfigurerAdapter {
        @Autowired
        private AuthenticationManager authenticationManager;
        @Autowired
        private MyUserDetailsService userDetailsService;

        @Override
        public void configure(final AuthorizationServerSecurityConfigurer oauthServer) throws Exception {
        oauthServer.tokenKeyAccess("permitAll()").checkTokenAccess("isAuthenticated()");
        }
        @Override
        public void configure(ClientDetailsServiceConfigurer clients) throws Exception {
                //把client的信息保存在内存中
                clients.inMemory()
                        .withClient("client") // client_id
                        .secret("secret") // client_secret
                        .authorizedGrantTypes("authorization_code") // 该client允许的授权类型
                        .scopes("app"); // 允许的授权范围
        }
        @Override
        public void configure(final AuthorizationServerEndpointsConfigurer endpoints) throws Exception {
                // @formatter:off
                endpoints.authenticationManager(authenticationManager)
                        .userDetailsService(userDetailsService);
        }
}
```

5.访问oauth2服务

http://localhost:8888/oauth/authorize?response_type=code&client_id=client&redirect_uri=http://baidu.com&state=123

出现登录页面，输入用户名：admin 密码：123456



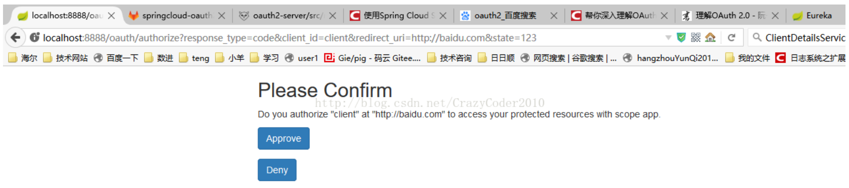
localhost:8888/login

Username:
admin

Password:
••••••

Submit

点击Submit按钮，进入用户授权确认页面



localhost:8888/oauth/authorize?response_type=code&client_id=client&redirect_uri=http://baidu.com&state=123

Please Confirm

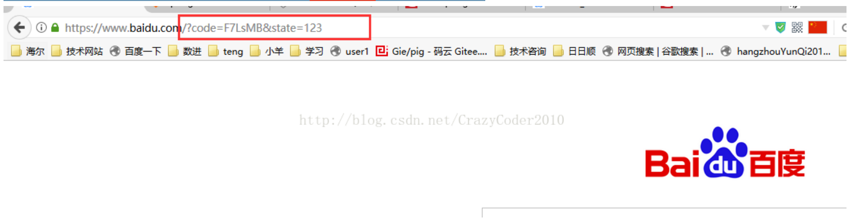
Do you authorize "client" at "http://baidu.com" to access your protected resources with scope app.

Approve

Deny

点击Approve,跳转到baidu页面，后面携带了code和state参数

https://www.baidu.com/?code=F7LsMB&state=123

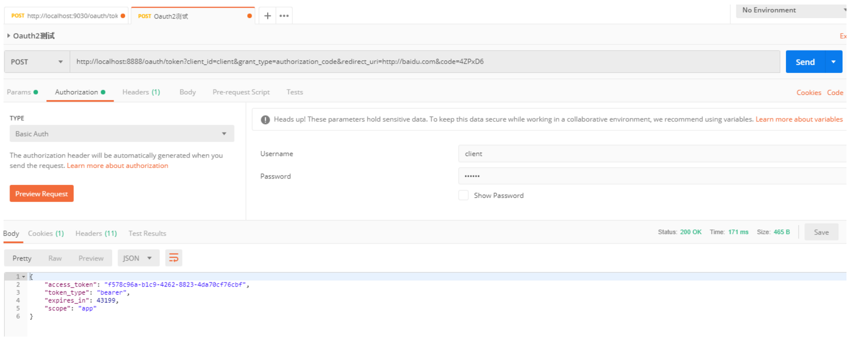


https://www.baidu.com/?code=F7LsMB&state=123

根据code换取access_code，注意使用post方法

http://localhost:8888/oauth/token?client_id=client&grant_type=authorization_code&redirect_uri=http://baidu.com&code=F7LsMB

注意这个code要和上个步骤中获得的code保持一致 用户名输入client，密码是secret,点击确定



POST http://localhost:8888/oauth/token?client_id=client&grant_type=authorization_code&redirect_uri=http://baidu.com&code=4ZPxD6

Authorization
TYPE: Basic Auth
Username: client
Password: ••••••

Status: 200 OK Time: 171 ms Size: 465 B

```
{
    "access_token": "f578c96a-b1c9-4262-8823-4da70cf76cbf",
    "token_type": "bearer",
    "expires_in": 43199,
    "scope": "app"
}
```

```
{
    "access_token": "38ef0fec-1b9f-4ee9-8c1a-95c03f6347a1",
    "token_type": "bearer",
    "expires_in": 42902,
    "scope": "app"
}
```