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时间	状态	作者	内容	版本	备注
2022-01-28	创建	jinshengyuan	Springboot整合cxf	v1.0	

SpringBoot整合CXF

> WebService技术实现
>
> - jdk自带的JAX-WS
> - Apache Axis1
> - Apache Axis2
> - Apache CXF

> Springboot官网：https://spring.io/projects/spring-boot
>
> CXF官网：http://cxf.apache.org/
>
> 官网文档： http://cxf.apache.org/docs/index.html

1. 服务提供(服务方)

1. pom.xml中引入cxf依赖

```
<!--WebService CXF依赖 begin-->
        <dependency>
            <groupId>org.apache.cxf</groupId>
            <artifactId>cxf-spring-boot-starter-jaxws</artifactId>
            <version>3.5.0</version>
        </dependency>

        <dependency>
            <groupId>org.apache.cxf</groupId>
            <artifactId>cxf-rt-frontend-jaxws</artifactId>
            <version>3.5.0</version>
        </dependency>

        <dependency>
            <groupId>org.apache.cxf</groupId>
            <artifactId>cxf-rt-transports-http</artifactId>
            <version>3.5.0</version>
        </dependency>
        <!--WebService CXF依赖 end-->
```

完整的pom.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
https://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>
    <parent>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-parent</artifactId>
        <version>2.6.3</version>
        <relativePath/> <!-- lookup parent from repository -->
    </parent>
    <groupId>com.yuan</groupId>
    <artifactId>yuan-demo</artifactId>
    <version>1.0.0</version>
    <name>yuan-boot-cxf</name>
    <description>Spring Boot Integrate Apache CXF</description>
    <properties>
        <java.version>1.8</java.version>
    </properties>
    <dependencies>

        <!--WebService CXF依赖 begin-->
        <dependency>
```

```
            <groupId>org.apache.cxf</groupId>
            <artifactId>cxf-spring-boot-starter-jaxws</artifactId>
            <version>3.5.0</version>
        </dependency>

        <dependency>
            <groupId>org.apache.cxf</groupId>
            <artifactId>cxf-rt-frontend-jaxws</artifactId>
            <version>3.5.0</version>
        </dependency>

        <dependency>
            <groupId>org.apache.cxf</groupId>
            <artifactId>cxf-rt-transports-http</artifactId>
            <version>3.5.0</version>
        </dependency>
        <!--WebService CXF依赖 end-->
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-thymeleaf</artifactId>
        </dependency>
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-web</artifactId>
        </dependency>

        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-devtools</artifactId>
            <scope>runtime</scope>
            <optional>true</optional>
        </dependency>
        <dependency>
            <groupId>mysql</groupId>
            <artifactId>mysql-connector-java</artifactId>
            <scope>runtime</scope>
        </dependency>
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-configuration-processor</artifactId>
            <optional>true</optional>
        </dependency>
        <dependency>
            <groupId>org.projectlombok</groupId>
            <artifactId>lombok</artifactId>
            <optional>true</optional>
        </dependency>
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-test</artifactId>
            <scope>test</scope>
        </dependency>
    </dependencies>

    <build>
        <plugins>
            <plugin>
                <groupId>org.springframework.boot</groupId>
```

```
                <artifactId>spring-boot-maven-plugin</artifactId>
                <configuration>
                    <excludes>
                        <exclude>
                            <groupId>org.projectlombok</groupId>
                            <artifactId>lombok</artifactId>
                        </exclude>
                    </excludes>
                </configuration>
            </plugin>
        </plugins>
    </build>

</project>
```

2. yaml配置

```yaml
server:
  port: 8101
spring:
  application:
    name: yuan-boot-cxf
  #遇到相同类名覆盖注册
  main:
    allow-bean-definition-overriding: true
# 集成cxf,默认：cxf.path=/services
cxf:
  path: /ws
```

3. 编写接口及实现类

3.1 编写接口

```java
package com.yuan.cxf.serivce;

/**
 * description: HelloService接口
 *
 * @author:jinshengyuan
 * @date: 2022-1-28
 */
public interface HelloService {
    String sayHello(String name);
}
```

3.2 接口的实现类

```java
package com.yuan.cxf.serivce.impl;

import com.yuan.cxf.serivce.HelloService;
import org.springframework.stereotype.Service;

import javax.jws.WebMethod;
```

```java
import javax.jws.WebParam;
import javax.jws.WebResult;
import javax.jws.WebService;

/**
 * description:  HelloService的实现
 *
 * @author:jinshengyuan
 * @date: 2022-1-28
 */
@WebService
@Service
public class HelloServiceImpl implements HelloService {
    /**
     * description: sayHello方法
     *
     * @param name 姓名
     * @return String
     * @author:jinshengyuan
     * @date: 2022-1-28
     */
    @WebMethod
    @WebResult(name = "resultName")
    @Override
    public String sayHello(@WebParam(name = "name") String name) {
        return "Hello ," + name;
    }
}
```

4. CXF配置及服务发布

1. 使用JDK自带的 JAX-WS 发布WebService服务

1. WSPublish.java

```java
import serivce.impl.HelloServiceImpl;

import javax.xml.ws.Endpoint;
/**
 * description: JAX-WS发布WebService
 *
 * @author:jinshengyuan
 * @date: 2022-1-28
 */
public class WSPublish {
    public static void main(String[] args) {
        String address = "http://localhost:8888/ws";
        Endpoint.publish(address,new HelloServiceImpl());
        System.out.println("服务已发布");
    }
}
```

2. 打开浏览器输入 http://localhost:8888/ws?wsdl 如下:

2. 使用CXF发布WEbService服务

CxfConfig.java

```
package com.yuan.cxf.config;

import com.yuan.cxf.serivce.impl.HelloServiceImpl;
import org.apache.cxf.Bus;
import org.apache.cxf.jaxws.EndpointImpl;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;

import javax.xml.ws.Endpoint;

/**
 * description: CXF服务发布配置
 *
 * @author:jinshengyuan
 * @date: 2022-1-28
 */
@Configuration
public class CxfConfig {

    @Autowired
    private Bus bus;

    @Autowired
    private HelloServiceImpl helloService;

    /**
     * description: 发布服务
     *
     * @return Endpoint
     * @author:jinshengyuan
     * @date: 2022-1-28
     */
    @Bean
    public Endpoint helloServer() {
```

```
        EndpointImpl endpoint = new EndpointImpl(bus, helloService);
        endpoint.publish("/hello");
        return endpoint;
    }
}
```

5. 打开浏览器访问

访问地址：http://localhost:8101/ws/hello?wsdl

6. 动态发布多个WS服务

> 业务场景: 当要集成多方的WebService接口时，每次都要单独注册一个类似下面的Bean来发布WS接口,如果多了非常繁琐及代码冗余

```
@Bean
public Endpoint helloServer() {
 EndpointImpl endpoint = new EndpointImpl(bus, helloService);
 endpoint.publish("/hello");
 repackage com.yuan.cxf.config;

import com.yuan.cxf.service.impl.DeptInfoWSServiceImpl;
import com.yuan.cxf.service.impl.HelloServiceImpl;
import com.yuan.cxf.service.impl.UserInfoWSServiceImpl;
import org.apache.cxf.Bus;
import org.apache.cxf.jaxws.EndpointImpl;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;

import javax.xml.ws.Endpoint;

@Configuration
public class CxfConfig {
 @Autowired
 private Bus bus;
```

```
    @Autowired
    private HelloServiceImpl helloService;


    @Autowired
    private UserInfoWSServiceImpl userInfoWSService;


    @Autowired
    private DeptInfoWSServiceImpl deptInfoWSService;

    @Bean
    public Endpoint helloServer(){
        EndpointImpl endpoint = new EndpointImpl(bus,helloService);
        endpoint.publish("/hello");
        return endpoint;
    }

    @Bean
    public Endpoint userInfo(){
        EndpointImpl endpoint = new EndpointImpl(bus,userInfoWSService);
        endpoint.publish("/userInfo");
        return endpoint;
    }


    @Bean
    public Endpoint deptInfo(){
        EndpointImpl endpoint = new EndpointImpl(bus,deptInfoWSService);
        endpoint.publish("/deptInfo");
        return endpoint;
    }
}
turn endpoint;
}
```

1. 实现方式

> `ApplicationRunner`或`CommandLineRunner`使用场景：在Springboot容器启动完毕后要执行一些特定的业务代码，如读取Redis缓存数据、特定的配置文件、数据库等等相关数据
>
> - 可以同时配置多个`ApplicationRunner`或`CommandLineRunner`,如果配置了多个则启动的优先级可以通过`@Order(1)`来指定，值越小优先级越高
> - `ApplicationRunner`中的run方法接收一个`ApplicationArguments`类型的参数`run(ApplicationArguments args)`，如：当把应用打成一个jar包运行的时候，后面跟着的命令行参数可以通过ApplicationArguments拿到
> - `CommandLineRunner`中的run方法接收一个String类型的可变参数列表`run(String... args)`

1. 自定义动态发布接口的注解
2. 在业务类中标注自定义动态发布WebService接口的注解
3. 使用Springboot提供的`ApplicationRunner`或`CommandLineRunner`接口来实现当容器启动完毕后动态发布多个webService接口

2. 编码

1. 自定义动态发布WS的注解

AutoPublishWS.java

```
package com.yuan.cxf.annotation;

import java.lang.annotation.ElementType;
import java.lang.annotation.Retention;
import java.lang.annotation.RetentionPolicy;
import java.lang.annotation.Target;

/**
 * description: 动态发布WebService的自定义注解
 *
 * @author:jinshengyuan
 * @date: 2022-1-29
 */
@Retention(RetentionPolicy.RUNTIME)
@Target({ElementType.TYPE})
public @interface AutoPublishWS {
    /**
     * description: 定义WebService的发布路径属性
     *
     * @return String
     * @author:jinshengyuan
     * @date: 2022-1-29
     */
    String publishPath();
}
```

2. 在业务接口的实现类上标注动态发布WS的自定义注解
3. 定义自动发布WS的配置类

AutoPublishWSEndpoint.java

```
package com.yuan.cxf.config;

import com.yuan.cxf.annotation.AutoPublishWS;
import lombok.extern.slf4j.Slf4j;
import org.apache.cxf.Bus;
import org.apache.cxf.jaxws.EndpointImpl;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.beans.factory.annotation.Value;
import org.springframework.boot.ApplicationArguments;
import org.springframework.boot.ApplicationRunner;
import org.springframework.core.annotation.Order;
import org.springframework.core.env.Environment;
import org.springframework.stereotype.Component;
import org.springframework.web.context.WebApplicationContext;

import java.net.InetAddress;
import java.net.UnknownHostException;
import java.util.ArrayList;
import java.util.List;
```

```java
/**
 * description: 自动发布
 *
 * @author:jinshengyuan
 * @date: 2022-1-29
 */
@Slf4j
@Component
@Order(1)
public class AutoPublishWSEndpoint implements ApplicationRunner {
    //取出WS的根路径
    @Value("${cxf.path}")
    public String cxfPath;
    //取出AppName
    @Value("${spring.application.name}")
    public String appName;

    //注入CXF Bus
    @Autowired
    private Bus bus;
    //注入Spring Web中Servlet上下文Web容器
    @Autowired
    private WebApplicationContext webApplicationContext;

    @Override
    public void run(ApplicationArguments args) throws Exception {
        log.info("AutoPublishWSEndpoint===发布开始");
        //根据注解获取beanNames
        String[] beanNames =
webApplicationContext.getBeanNamesForAnnotation(AutoPublishWS.class);
        EndpointImpl endpoint;
        List<String> cxfPathList = new ArrayList<>();
        for (String beanName : beanNames) {
            //根据beanName获取属性名
            String publishPath =
webApplicationContext.getType(beanName).getAnnotation(AutoPublishWS.class).publi
shPath();
            //发布WebService接口
            endpoint = new EndpointImpl(bus,
webApplicationContext.getBean(beanName));
            endpoint.publish(publishPath);
            cxfPathList.add(publishPath);
            log.info(String.format("%s", publishPath));
        }
        log.info("AutoPublishWSEndpoint===发布结束");
        Environment environment = webApplicationContext.getEnvironment();
        address(environment, cxfPathList);
    }

    /**
     * description: 打印访问路径
     *
     * @param environment 运行环境
     * @param cxfPathList 发布的WS路径
     * @return String
     * @author:jinshengyuan
     * @date: 2022-1-29
     */
```

```
    public void address(Environment environment, List<String> cxfPathList) {
        try {
            String ip = InetAddress.getLocalHost().getHostAddress();
            String port = environment.getProperty("server.port");
            String path = environment.getProperty("server.servlet.context-
path");
            if (path == null) {
                path = "";
            }
            log.info("\n----------------------------------------------------------
--\n\t" +
                    "Application " + appName + " is running! Access URLs:\n\t" +
                    "Local: \t\thttp://localhost:" + port + path + "/\n\t" +
                    "External: \thttp://" + ip + ":" + port + path + "/" +
                    "\n----------------------------------------------------------
");
            if (cxfPathList.size() > 0) {
                StringBuilder logStr = new StringBuilder();
                logStr.append("\n\tWSDL URLS:\n\t");
                String finalPath = path;
                cxfPathList.forEach(s -> {
                    logStr.append("\t\thttp://localhost:" + port + finalPath +
cxfPath + "/" + s + "?wsdl\n\t");
                    logStr.append("\t\thttp://" + ip + ":" + port + finalPath +
cxfPath + "/" + s + "?wsdl\n\t");
                });
                log.info(logStr.toString());
            }
        } catch (UnknownHostException e) {
            e.printStackTrace();
        }
    }
}
```

2. 服务消费(客户端)

WSDL文档

- 直接通过http请求获取wsdl文档
- 将请求后的wsdl另存为本地文件

```
wsimport -keep -encoding utf-8 -verbose    http://localhost:8101/ws/hello?wsdl

wsimport -p com.test -keep -encoding utf-8 -verbose
http://localhost:8101/ws/autoUserInfo?wsdl
```

1.生成代码调用(jdk)

1. wsimport命令使用
2. 解析WSDL文档

```
wsdl2java -keep -encoding utf-8 -verbose  http://localhost:8101/ws/hello?wsdl

wsdl2java -p com.test -keep -encoding utf-8 -verbose
http://localhost:8101/ws/autoDeptInfo?wsdl
```

2. 生成代码调用(cxf)

1. 下载cxf二进制包
2. 快速下载地址：https://www.apache.org/dyn/closer.lua/cxf/3.5.0/apache-cxf-3.5.0.zip
3. wsdl2java命令使用
4. 生成java代码解析WSDL文档

3. CXF动态调用WS服务(不生成Java代码)

> 注意：仅限第三方用java语言发布的WebService接口动态调用，不支持用.net发布的WebService接口

1. 添加frontend调用依赖

```
<!-- https://mvnrepository.com/artifact/org.apache.cxf/cxf-rt-frontend-jaxws -->
<dependency>
    <groupId>org.apache.cxf</groupId>
    <artifactId>cxf-rt-frontend-jaxws</artifactId>
    <version>3.5.0</version>
</dependency>
```

4. 生成代码调用WS常见问题分析

> 注意：不管是JDK自带的wsmport命令还是cxf的wsdl2java生成`非java语言(如.net)`开发的WebService接口调用代码时，都会出现`解析组件 's:schema' 时出错。`的错误，比如以生成接口`http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl`代码为例
>
> 1. wsimport命令生成代码时提示错误：`无法将名称 's:schema' 解析为 'element declaration' 组件。`
> 2. cxf的wsdl2java命令生成代码时提示错误：`undefined element declaration 's:schema'`

1. jdk生成WS调用代码时错误

```
wsimport -keep -verbose -encoding utf-8 WeatherWebService.wsdl

wsimport -keep -verbose -encoding utf-8
http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl
```

1. 生成源代码问题：`无法将名称 's:schema' 解析为 'element declaration' 组件。`

```
I:\yuan-boot-integrate\yuan-ws-jdk\src\main\java>wsimport -keep -verbose -
encoding utf-8 http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl

正在解析 WSDL...
```

```
[WARNING] src-resolve.4.2: 解析组件 's:schema' 时出错。在该组件中检测到 's:schema' 位于名称空间 'http://www.w3.org/2001/XMLSchema' 中，但无法从方案文档 'http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl#types?schema1' 引用此名称空间的组件。如果这是不正确的名称空间，则很可能需要更改 's:schema' 的前缀。如果这是正确的名称空间，则应将适当的 'import' 标记添加到 'http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl#types?schema1'。
  http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl#types?schema1 的第 44 行

[WARNING] src-resolve: 无法将名称 's:schema' 解析为 'element declaration' 组件。
  http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl#types?schema1 的第 44 行

[ERROR] undefined element declaration 's:schema'
  http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl的第 44 行

[ERROR] undefined element declaration 's:schema'
  http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl的第 85 行

Exception in thread "main" com.sun.tools.internal.ws.wscompile.AbortException
        at com.sun.tools.internal.ws.processor.modeler.wsdl.JAXBModelBuilder.bind(JAXBModelBuilder.java:129)
        at com.sun.tools.internal.ws.processor.modeler.wsdl.WSDLModeler.buildJAXBModel(WSDLModeler.java:2283)
        at com.sun.tools.internal.ws.processor.modeler.wsdl.WSDLModeler.internalBuildModel(WSDLModeler.java:183)
        at com.sun.tools.internal.ws.processor.modeler.wsdl.WSDLModeler.buildModel(WSDLModeler.java:126)
        at com.sun.tools.internal.ws.wscompile.WsimportTool.buildWsdlModel(WsimportTool.java:429)
        at com.sun.tools.internal.ws.wscompile.WsimportTool.run(WsimportTool.java:190)
        at com.sun.tools.internal.ws.wscompile.WsimportTool.run(WsimportTool.java:168)
        at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
        at sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:62)
        at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
        at java.lang.reflect.Method.invoke(Method.java:498)
        at com.sun.tools.internal.ws.Invoker.invoke(Invoker.java:159)
        at com.sun.tools.internal.ws.WsImport.main(WsImport.java:42)
```

2. CXF生成WS调用代码时错误

```
wsdl2java -keep -verbose -encoding utf-8
http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl
wsdl2java -keep -verbose -encoding utf-8 WeatherWebService.wsdl
```

1. 生成源代码的问题: `undefined element declaration 's:schema'`

```
I:\yuan-boot-integrate\yuan-ws-jdk\src\main\java>wsdl2java -keep -verbose -
encoding utf-8 http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl
Loading FrontEnd jaxws ...
Loading DataBinding jaxb ...
wsdl2java -keep -verbose -encoding utf-8
http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl
wsdl2java - Apache CXF 3.5.0

二月 02, 2022 10:04:35 上午 org.apache.cxf.wsdl11.WSDLServiceBuilder
checkForWrapped
信息: Operation {http://WebXml.com.cn/}getSupportCity cannot be unwrapped, input
message must reference global element declaration with same localname as
operation
.....
WSDLToJava Error: http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?
wsdl [44,19]: undefined element declaration 's:schema'
http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl [85,13]:
undefined element declaration 's:schema'

org.apache.cxf.tools.common.ToolException:
http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl [44,19]:
undefined element declaration 's:schema'
http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl [85,13]:
undefined element declaration 's:schema'
        at
org.apache.cxf.tools.common.ToolErrorListener.throwToolException(ToolErrorListen
er.java:87)
        at
org.apache.cxf.tools.wsdlto.WSDLToJavaContainer.execute(WSDLToJavaContainer.java
:158)
        at
org.apache.cxf.tools.wsdlto.WSDLToJavaContainer.execute(WSDLToJavaContainer.java
:402)
        at
org.apache.cxf.tools.common.toolspec.ToolRunner.runTool(ToolRunner.java:105)
        at org.apache.cxf.tools.wsdlto.WSDLToJava.run(WSDLToJava.java:113)
        at org.apache.cxf.tools.wsdlto.WSDLToJava.run(WSDLToJava.java:86)
        at org.apache.cxf.tools.wsdlto.WSDLToJava.main(WSDLToJava.java:184)
        Suppressed: org.apache.cxf.tools.common.ToolException:
http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl [44,19]:
undefined element declaration 's:schema'
                ... 7 more
        Caused by: org.xml.sax.SAXParseExceptionpublicId:
http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl; systemId:
http://www.webxml.com.cn/WebServices/WeatherWebService.asm
x?wsdl; lineNumber: 44; columnNumber: 19; undefined element declaration
's:schema'
```

```
                at
com.sun.xml.xsom.impl.parser.ParserContext$1.reportError(ParserContext.java:150)
                at
com.sun.xml.xsom.impl.parser.NGCCRuntimeEx.reportError(NGCCRuntimeEx.java:149)
                at
com.sun.xml.xsom.impl.parser.DelayedRef.resolve(DelayedRef.java:80)
                at
com.sun.xml.xsom.impl.parser.DelayedRef.run(DelayedRef.java:55)
                at
com.sun.xml.xsom.impl.parser.ParserContext.getResult(ParserContext.java:105)
                at
com.sun.xml.xsom.parser.XSOMParser.getResult(XSOMParser.java:184)
                at
com.sun.tools.xjc.ModelLoader.createXSOM(ModelLoader.java:479)
                at
com.sun.tools.xjc.api.impl.s2j.SchemaCompilerImpl.bind(SchemaCompilerImpl.java:2
40)
                at
com.sun.tools.xjc.api.impl.s2j.SchemaCompilerImpl.bind(SchemaCompilerImpl.java:6
7)
                at
org.apache.cxf.tools.wsdlto.databinding.jaxb.JAXBDataBinding.initialize(JAXBData
Binding.java:445)
                at
org.apache.cxf.tools.wsdlto.WSDLToJavaContainer.generateTypes(WSDLToJavaContaine
r.java:711)
                at
org.apache.cxf.tools.wsdlto.WSDLToJavaContainer.processWsdl(WSDLToJavaContainer.
java:259)
                at
org.apache.cxf.tools.wsdlto.WSDLToJavaContainer.execute(WSDLToJavaContainer.java
:156)
                ... 5 more
        Suppressed: org.apache.cxf.tools.common.ToolException:
http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl [85,13]:
undefined element declaration 's:schema'
                ... 7 more
        Caused by: org.xml.sax.SAXParseExceptionpublicId:
http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl; systemId:
http://www.webxml.com.cn/WebServices/WeatherWebService.asm
x?wsdl; lineNumber: 85; columnNumber: 13; undefined element declaration
's:schema'
                at
com.sun.xml.xsom.impl.parser.ParserContext$1.reportError(ParserContext.java:150)
                at
com.sun.xml.xsom.impl.parser.NGCCRuntimeEx.reportError(NGCCRuntimeEx.java:149)
                at
com.sun.xml.xsom.impl.parser.DelayedRef.resolve(DelayedRef.java:80)
                at
com.sun.xml.xsom.impl.parser.DelayedRef.run(DelayedRef.java:55)
                at
com.sun.xml.xsom.impl.parser.ParserContext.getResult(ParserContext.java:105)
                at
com.sun.xml.xsom.parser.XSOMParser.getResult(XSOMParser.java:184)
                at
com.sun.tools.xjc.ModelLoader.createXSOM(ModelLoader.java:479)
```

```
                at
com.sun.tools.xjc.api.impl.s2j.SchemaCompilerImpl.bind(SchemaCompilerImpl.java:2
40)
                at
com.sun.tools.xjc.api.impl.s2j.SchemaCompilerImpl.bind(SchemaCompilerImpl.java:6
7)
                at
org.apache.cxf.tools.wsdlto.databinding.jaxb.JAXBDataBinding.initialize(JAXBData
Binding.java:445)
                at
org.apache.cxf.tools.wsdlto.WSDLToJavaContainer.generateTypes(WSDLToJavaContaine
r.java:711)
                at
org.apache.cxf.tools.wsdlto.WSDLToJavaContainer.processWsdl(WSDLToJavaContainer.
java:259)
                at
org.apache.cxf.tools.wsdlto.WSDLToJavaContainer.execute(WSDLToJavaContainer.java
:156)
                ... 5 more

I:\yuan-boot-integrate\yuan-ws-jdk\src\main\java>
```

3. 原因分析

> 不管是wsimport还是wsdl2java解析WSDL文档是，都是通过`JAXB`将xml文件转换到java类的，而.net发布的wsdl文档里面的复合类型中会包含`<s:element ref="s:schema" /><s:any />`的元素，而JAXB似乎不支持ref这种引用类型的属性,所以会导致生成文档是出现错误

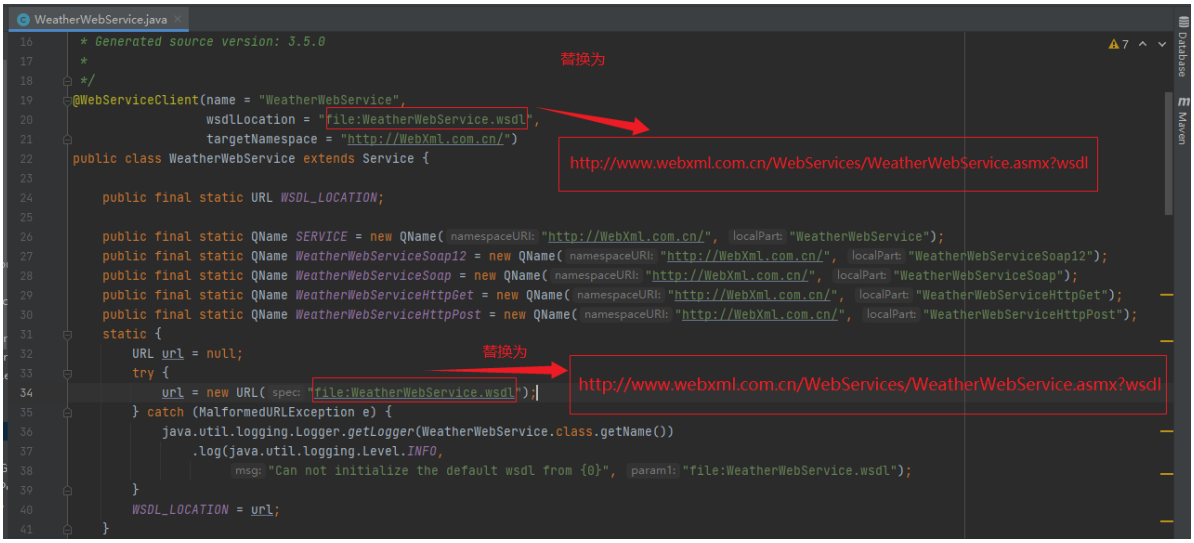
4. 解决方法

以获取天气预报的免费WebService接口
`http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl`为例

1. 先访问上面接口，并在浏览器中另存为本地xml文件`WeatherWebService.xml`
2. 打开`WeatherWebService.xml`文件,查找所有的`<s:element ref="s:schema" /><s:any />`并替换为`<s:any minOccurs="2"  maxOccurs="2"/>`，一般都会查找到两处
3. 将`WeatherWebService.xml`重命名为`WeatherWebService.wsdl`
4. 将`WeatherWebService.wsdl`拷贝到指定的位置，如`D:\WeatherWebService.wsdl`
5. 生成java代码

```
wsimport -keep -verbose -encoding utf-8 D:\WeatherWebService.wsdl
# 或
wsdl2java -keep -verbose -encoding utf-8 D:\WeatherWebService.wsdl
```

6. 生成java代码后，将`WeatherWebService.java`中的`file:WeatherWebService.wsdl`替换为`http://www.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl`,如下图



7. 编写服务调用代码

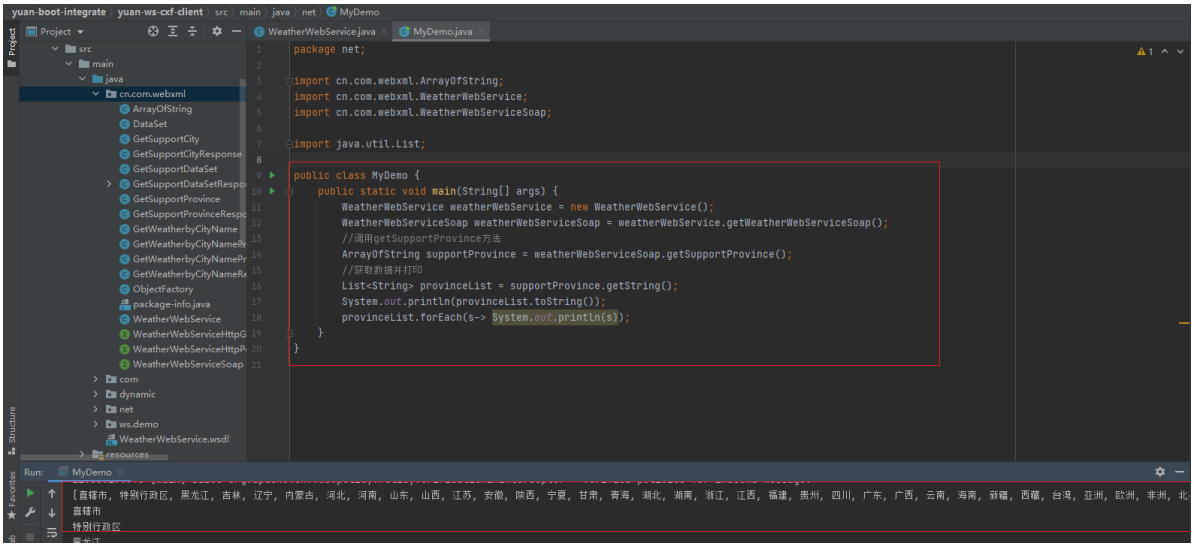
```
package net;

import cn.com.webxml.ArrayOfString;
import cn.com.webxml.WeatherWebService;
import cn.com.webxml.WeatherWebServiceSoap;

import java.util.List;

public class MyDemo {
    public static void main(String[] args) {
        WeatherWebService weatherWebService = new WeatherWebService();
        WeatherWebServiceSoap weatherWebServiceSoap =
weatherWebService.getWeatherWebServiceSoap();
        //调用getSupportProvince方法
        ArrayOfString supportProvince =
weatherWebServiceSoap.getSupportProvince();
        //获取数据并打印
        List<String> provinceList = supportProvince.getString();
        System.out.println(provinceList.toString());
        provinceList.forEach(s-> System.out.println(s));
    }
}
```

执行结果如下：



4. 接口与接口的实现类中标注javax.jws注解的区别

1. 接口上标注jws注解

1. 接口类

在接口及接口方法上标注@WebService、 @WebMethod、 @WebResult等注解

- HelloService.java

```
package com.yuan.cxf.serivce;

import javax.jws.WebMethod;
import javax.jws.WebParam;
import javax.jws.WebResult;
import javax.jws.WebService;

/**
 * description:
 *
 * @author:jinshengyuan
 * @date: 2022-1-28
```

```
 */
@WebService
public interface HelloService {

    /**
     * description:
     *
     * @param name 用户名
     * @return
     * @author:jinshengyuan
     * @date: 2022-1-28
     * @since v1.0.0
     */
    @WebMethod
    @WebResult(name = "resultName")
    String sayHello(@WebParam(name = "name") String name);
}
```

2. 接口的实现类

- HelloServiceImpl.java

```
package com.yuan.cxf.serivce.impl;

import com.yuan.cxf.serivce.HelloService;
import org.springframework.stereotype.Service;

import javax.jws.WebParam;

/**
 * description:  HelloService的实现
 *
 * @author:jinshengyuan
 * @date: 2022-1-28
 */
@Service
public class HelloServiceImpl implements HelloService {
    /**
     * description: sayHello方法
     *
     * @param name 姓名
     * @return String
     * @author:jinshengyuan
     * @date: 2022-1-28
     */
    @Override
    public String sayHello(@WebParam(name = "name") String name) {
        System.out.println("服务被调用了ss," + System.currentTimeMillis());
        return "Hello ," + name;
    }
}
```

3. 发布后访问效果

访问地址：http://localhost:8101/ws/hello?wsdl

1. 访问后如下图

2. 再次访问 location中的地址 http://localhost:8101/ws/hello?wsdl=HelloService.wsdl ,如下图

2. 接口的实现类标jws注解

1. 接口

HelloService.java中未标注jws的相关注解

```
package com.yuan.ws.service;

/**
 * description: Helloservice接口
 *
 * @author:jinshengyuan
 * @date: 2022-1-28
 */
```

```java
public interface HelloService {
    /**
     * description:
     *
     * @param name 用户名
     * @return
     * @author:jinshengyuan
     * @date: 2022-1-28
     * @since v1.0.0
     */
    String sayHello(String name);
}
```

2. 接口的实现类

```java
package com.yuan.ws.service.impl;

import com.yuan.ws.service.HelloService;
import org.springframework.stereotype.Service;

import javax.jws.WebMethod;
import javax.jws.WebParam;
import javax.jws.WebResult;
import javax.jws.WebService;

/**
 * description: HelloService的实现
 *
 * @author:jinshengyuan
 * @date: 2022-1-28
 */
@WebService
@Service
public class HelloServiceImpl implements HelloService {
    @WebMethod
    @WebResult(name = "resultName")
    @Override
    public String sayHello(@WebParam(name = "name") String name) {
        return "hello," + name;
    }
}
```

3. 发布后访问效果

访问地址：http://localhost:8101/ws/hello?wsdl

3. 接口及接口实现类上都标注jws注解

> 结论：以接口标注的注解为主，即有两层wsdl地址，与**1. 接口上标注jws注解**显示效一致

4. 结论

1. 如果jws注解标注在接口上，则会出现两层wsdl文档
2. 如果jws注解标注在接口的实现类上，则只有一层wsdl文档
3. 如果接口及接口的实现类中都标注的jws注解，则以接口上标注的为主，也即会出现两层wsdl地址
4. 建议还是将jws注解标注在接口的实现类上，这样一次性看全所有的wsdl文档