day49-SpringBoot高级

学习目标

- [ ] 理解springboot自动配置原理
- [ ] 理解自动配置注解的原理解析
- [ ] 掌握自定义springboot的starter
- [ ] 了解springboot监听机制
- [ ] 了解springboot的启动流程
- [ ] 了解springboot监控
- [ ] 掌握springboot的部署

第一章-SpringBoot的自动配置原理

知识点-Condition接口及相关注解

1.目标

　在我们使用springboot的时候，能带来的方便性和便利性，不需要配置便可以实现相关的使用，开发效率极大的提升，那么实际上，springboot本身的基础依赖中封装了许许多多的配置帮我们自动完成了配置了。那么它是如何实现的呢？讲Springboot自动配置，逃不开ConditionalOnxxx等等注解，也逃不开Condition接口所定义的功能。

- [ ] 掌握Condition接口及相关注解

2.路径

1. Condition接口说明
2. Condition的应用案例
3. Condition的应用案例优化

3.讲解

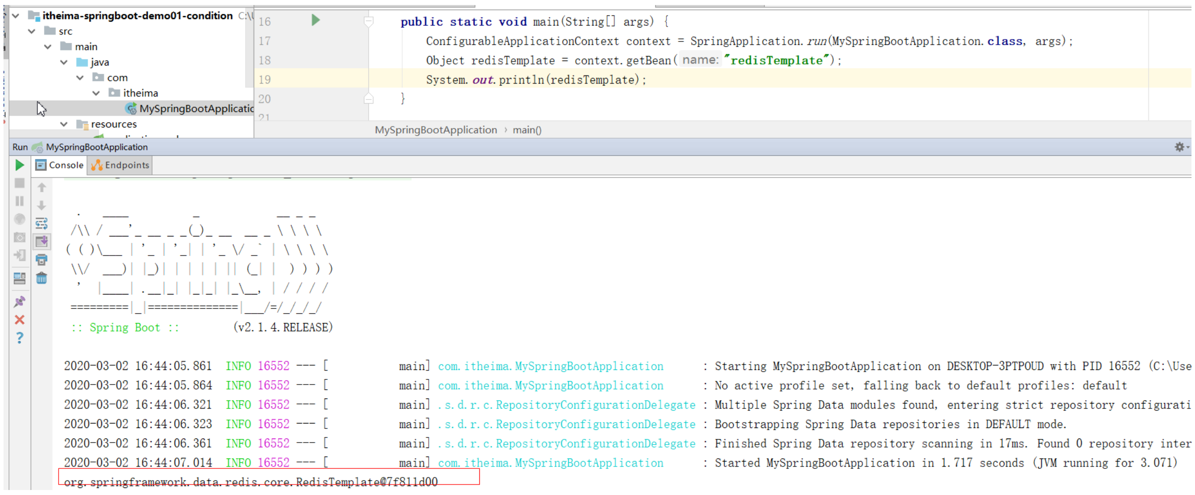
3.1Condition接口说明

　condition接口是spring4之后提供给了的接口，增加条件判断功能，用于选择性的创建Bean对象到spring容器中。

```java
@FunctionalInterface
public interface Condition {

    /**
     * Determine if the condition matches.
     * @param context the condition context
     * @param metadata metadata of the {@link org.springframework.core.type.AnnotationMetadata class}
     * or {@link org.springframework.core.type.MethodMetadata method} being checked
     * @return {@code true} if the condition matches and the component can be registered,
     * or {@code false} to veto the annotated component's registration
     */
    boolean matches(ConditionContext context, AnnotatedTypeMetadata metadata);

}
```

　我们之前用过springboot整合redis 实现的步骤：就是添加redis起步依赖之后，直接就可以使用从spring容器中获取注入RedisTemplate对象了，而不需要创建该对象放到spring容器中了.意味着Spring boot redis的起步依赖已经能自动的创建该redisTemplate对象加入到spring容器中了。这里应用的重要的一个点就是condition的应用。

我们来演示下，是否加入依赖就可以获取redisTemplate,不加依赖就不会获取到redisTemplate

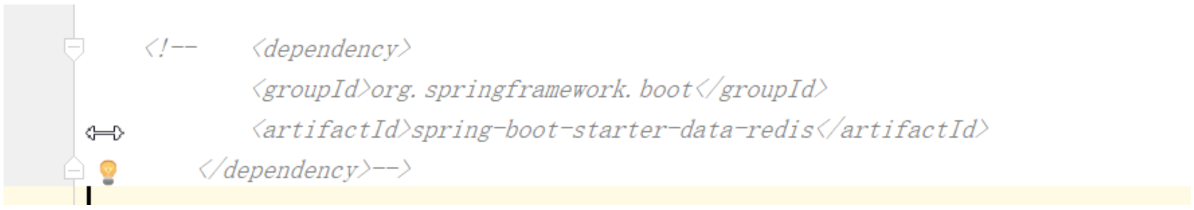


```
itheima-springboot-demo01-condition
  src
    main
      java
        com
          itheima
            MySpringBootApplicatio
      resources
```

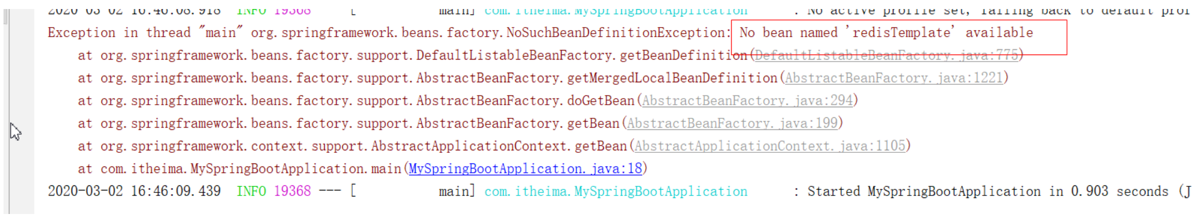
```java
    public static void main(String[] args) {
        ConfigurableApplicationContext context = SpringApplication.run(MySpringBootApplication.class, args);
        Object redisTemplate = context.getBean( name: "redisTemplate");
        System.out.println(redisTemplate);
    }
```

```
  .   ____          _            __ _ _
 /\\ / ___'_ __ _ _(_)_ __  __ _ \ \ \ \
( ( )\___ | '_ | '_| | '_ \/ _` | \ \ \ \
 \\/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_\__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v2.1.4.RELEASE)

2020-03-02 16:44:05.861  INFO 16552 --- [           main] com.itheima.MySpringBootApplication      : Starting MySpringBootApplication on DESKTOP-3PTPOUD with PID 16552 (C:\Use
2020-03-02 16:44:05.864  INFO 16552 --- [           main] com.itheima.MySpringBootApplication      : No active profile set, falling back to default profiles: default
2020-03-02 16:44:06.321  INFO 16552 --- [           main] .s.d.r.c.RepositoryConfigurationDelegate : Multiple Spring Data modules found, entering strict repository configurati
2020-03-02 16:44:06.323  INFO 16552 --- [           main] .s.d.r.c.RepositoryConfigurationDelegate : Bootstrapping Spring Data repositories in DEFAULT mode.
2020-03-02 16:44:06.361  INFO 16552 --- [           main] .s.d.r.c.RepositoryConfigurationDelegate : Finished Spring Data repository scanning in 17ms. Found 0 repository inter
2020-03-02 16:44:07.014  INFO 16552 --- [           main] com.itheima.MySpringBootApplication      : Started MySpringBootApplication in 1.717 seconds (JVM running for 3.071)
org.springframework.data.redis.core.RedisTemplate@7f811d00
```

- 注释依赖则报错：



```xml
<!--    <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-data-redis</artifactId>
        </dependency>-->
```



```
2020-03-02 16:46:08.918  INFO 19368 --- [           main] com.itheima.MySpringBootApplication      : No active profile set, falling back to default profi
Exception in thread "main" org.springframework.beans.factory.NoSuchBeanDefinitionException: No bean named 'redisTemplate' available
	at org.springframework.beans.factory.support.DefaultListableBeanFactory.getBeanDefinition(DefaultListableBeanFactory.java:775)
	at org.springframework.beans.factory.support.AbstractBeanFactory.getMergedLocalBeanDefinition(AbstractBeanFactory.java:1221)
	at org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:294)
	at org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:199)
	at org.springframework.context.support.AbstractApplicationContext.getBean(AbstractApplicationContext.java:1105)
	at com.itheima.MySpringBootApplication.main(MySpringBootApplication.java:18)
2020-03-02 16:46:09.439  INFO 19368 --- [           main] com.itheima.MySpringBootApplication      : Started MySpringBootApplication in 0.903 seconds (J
```

3.2Condition的应用

刚才看到的效果，那么它到底是如何实现的呢？我们现在给一个需求：

3.2.1需求

在Spring容器中有一个user的bean对象，如果导入了jedis的坐标则加载该bean，如果没有导入则不加载该bean。

3.2.2实现步骤

1. 定义一个User的pojo
2. 定义一个配置类用于创建user对象交给spring容器管理
3. 定义一个接口condition的实现类
    - 实现方法 判断是否有字节码对象，有则返回true 没有则返回false
4. 修改配置类上加入注解@Conditional(value=Condition)
5. 测试打印

3.2.3实现

1.环境的准备

- pom文件

```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
http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <groupId>com.itheima</groupId>
    <artifactId>02-condition</artifactId>
    <version>1.0-SNAPSHOT</version>

    <parent>
        <artifactId>spring-boot-starter-parent</artifactId>
        <groupId>org.springframework.boot</groupId>
        <version>2.1.0.RELEASE</version>
    </parent>

    <properties>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
        <maven.compiler.source>1.8</maven.compiler.source>
        <maven.compiler.target>1.8</maven.compiler.target>
    </properties>

    <dependencies>
        <!--spring-boot-starter-->
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter</artifactId>
        </dependency>
        <!--jedis-->
        <dependency>
            <groupId>redis.clients</groupId>
            <artifactId>jedis</artifactId>
            <version>3.2.0</version>
        </dependency>
    </dependencies>
</project>
```

- 启动类

```
package com.itheima.condition;

import com.itheima.condition.bean.User;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.context.ConfigurableApplicationContext;

/**
 * @Description:
 * @author: yp
 */
@SpringBootApplication
public class ConditionApplication {

    public static void main(String[] args) {
        //1. ConfigurableApplicationContext Spring容器
        ConfigurableApplicationContext context =
SpringApplication.run(ConditionApplication.class, args);
        User user = (User) context.getBean("user");
        System.out.println(user);
    }

}
```

2.实现

- 创建pojo

```
package com.itheima.condition.bean;

/**
 * @Description:
 * @author: yp
 */
public class User {
    private String username;
    public String getUsername() {
        return username;
    }
    public void setUsername(String username) {
        this.username = username;
    }

}
```

- 创建配置类

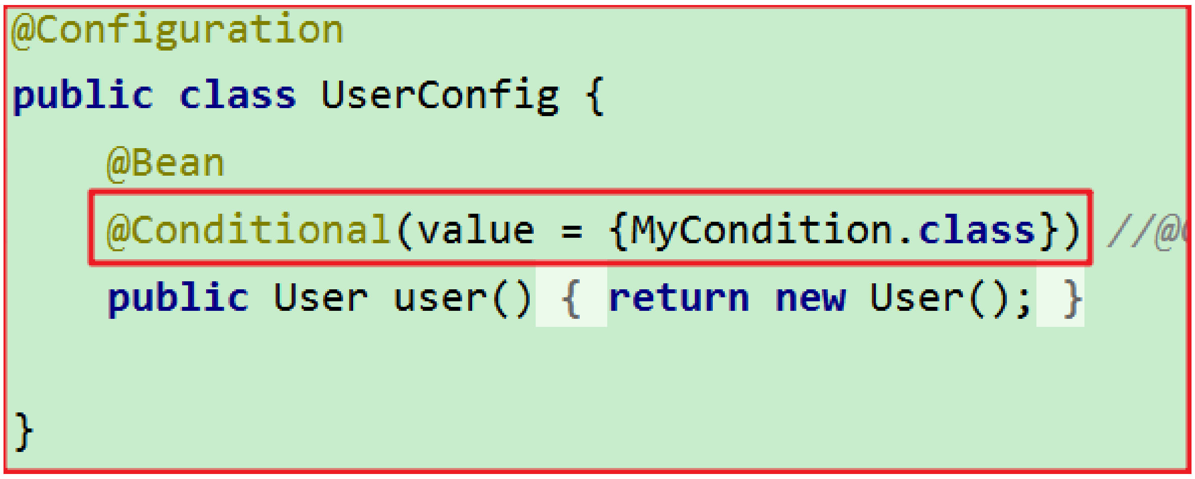
```
package com.itheima.condition.config;

import com.itheima.condition.bean.User;
import com.itheima.condition.condition.ConditionalOnClass;
```

```java
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;

/**
 * @Description:
 * @author: yp
 */
@Configuration
public class UserConfig {

    @Bean
    @ConditionalOnClass(name = {"redis.clients.jedis.Jedis"})
    @Conditional(value = {MyCondition.class})
    public User user(){
        return new User();
    }

}
```

- 创建Condition的实现类

```java
package com.itheima.condition.condition;

import org.springframework.context.annotation.Condition;
import org.springframework.context.annotation.ConditionContext;
import org.springframework.core.type.AnnotatedTypeMetadata;

import java.util.Map;

/**
 * @Description:
 * @author: yp
 */
public class MyCondition implements Condition {
    /**
     * 返回值: 返回true 代表满足条件; false:代表不满足条件
     * @param context Condition上下文对象  获得Spring容器,类加载器
     * @param metadata 注解原数据对象,  获得注解的属性
     * @return
     */
    @Override
    public boolean matches(ConditionContext context, AnnotatedTypeMetadata
metadata) {
        //在MyCondition里面获得@ConditionalOnClass(name =
{"redis.clients.jedis.Jedis"})的name的属性值
        try {
            //1.获得ConditionalOnClass注解的全部属性
            Map<String, Object> map =
metadata.getAnnotationAttributes(ConditionalOnClass.class.getName());
            //2.获得name的属性值
            String[] values = (String[]) map.get("name");
            for (String value : values) {
                //System.out.println("value="+value);
                Class.forName(value);
            }
            return true;
        } catch (Exception e) {
            e.printStackTrace();
            return false;
        }
    }
}
```

- 修改配置类上加入注解@Conditional(value=Condition)



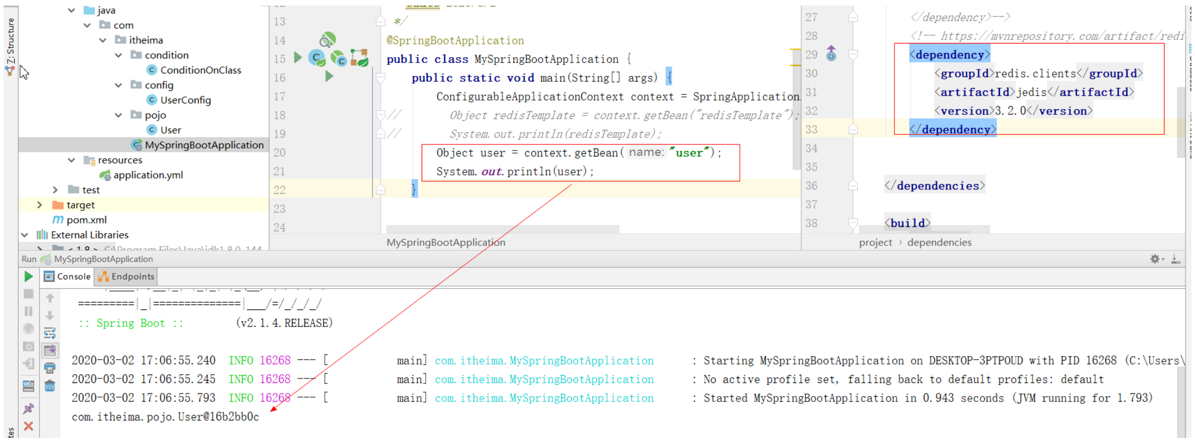
```java
@Configuration
public class UserConfig {
    @Bean
    @Conditional(value = {MyCondition.class}) //@
    public User user() { return new User(); }

}
```

@Conditional(value = MyCondition.class) 当符合指定类的条件返回true的时候则执行被修饰的方法，放入spring容器中。

- 测试：

  加入jedis的依赖时：

```xml
<dependency>
    <groupId>redis.clients</groupId>
    <artifactId>jedis</artifactId>
    <version>3.2.0</version>
</dependency>
```

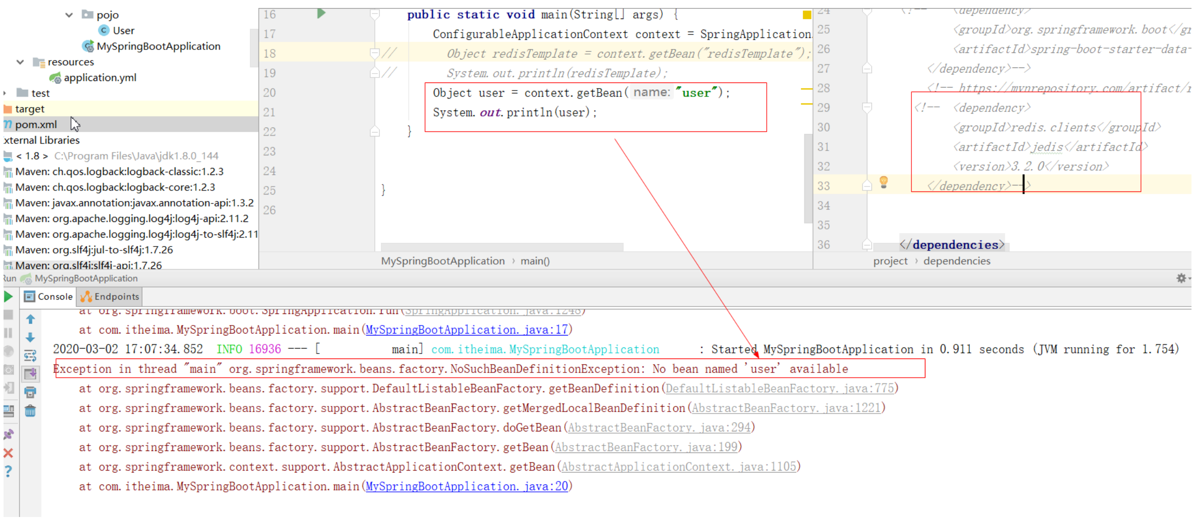


```java
 */
@SpringBootApplication
public class MySpringBootApplication {
    public static void main(String[] args) {
        ConfigurableApplicationContext context = SpringApplication
//      Object redisTemplate = context.getBean("redisTemplate");
//      System.out.println(redisTemplate);
        Object user = context.getBean( name: "user");
        System.out.println(user);
    }
```

```xml
    </dependency>-->
    <!-- https://mvnrepository.com/artifact/redi
    <dependency>
        <groupId>redis.clients</groupId>
        <artifactId>jedis</artifactId>
        <version>3.2.0</version>
    </dependency>

</dependencies>

<build>
```

```
=========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v2.1.4.RELEASE)

2020-03-02 17:06:55.240  INFO 16268 --- [           main] com.itheima.MySpringBootApplication      : Starting MySpringBootApplication on DESKTOP-3PTPOUD with PID 16268 (C:\Users\
2020-03-02 17:06:55.245  INFO 16268 --- [           main] com.itheima.MySpringBootApplication      : No active profile set, falling back to default profiles: default
2020-03-02 17:06:55.793  INFO 16268 --- [           main] com.itheima.MySpringBootApplication      : Started MySpringBootApplication in 0.943 seconds (JVM running for 1.793)
com.itheima.pojo.User@16b2bb0c
```

不加入jedis的依赖时：


pojo
User
MySpringBootApplication
resources
application.yml
test
target
pom.xml
External Libraries
< 1.8 > C:\Program Files\Java\jdk1.8.0_144
Maven: ch.qos.logback:logback-classic:1.2.3
Maven: ch.qos.logback:logback-core:1.2.3
Maven: javax.annotation:javax.annotation-api:1.3.2
Maven: org.apache.logging.log4j:log4j-api:2.11.2
Maven: org.apache.logging.log4j:log4j-to-slf4j:2.11
Maven: org.slf4j:jul-to-slf4j:1.7.26
Maven: org.slf4j:slf4j-api:1.7.26
MySpringBootApplication › main()
project › dependencies
Run MySpringBootApplication
Console
Endpoints

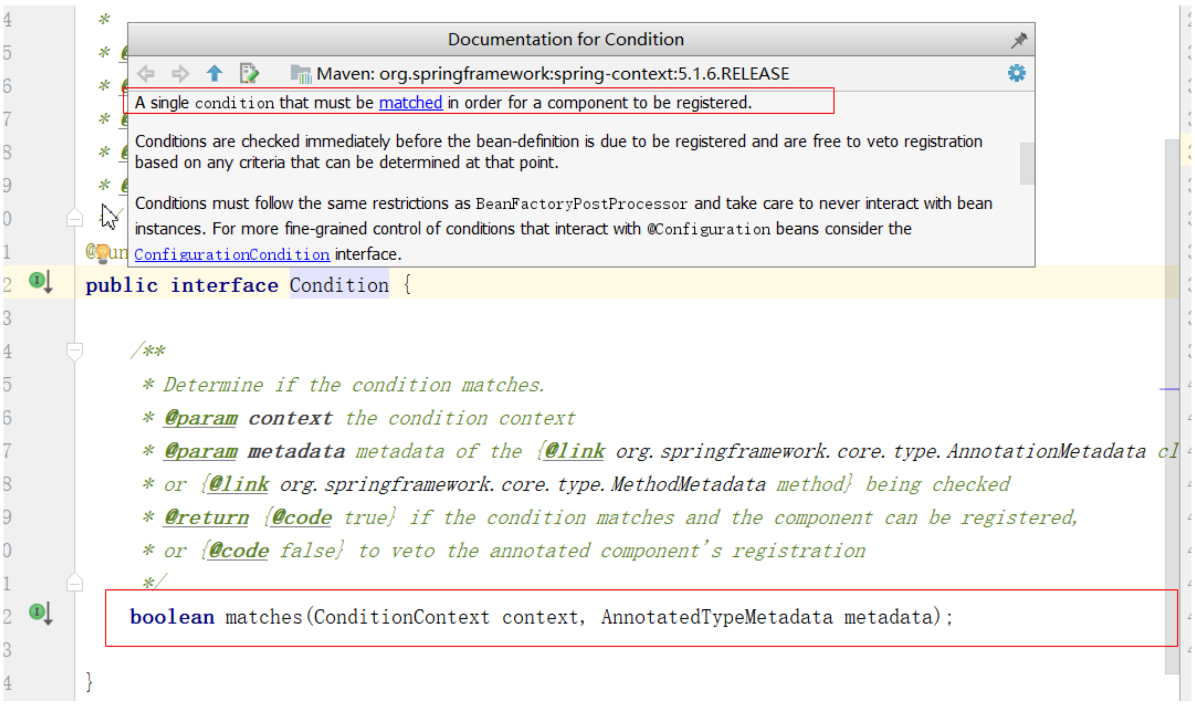
```java
    public static void main(String[] args) {
        ConfigurableApplicationContext context = SpringApplication
//        Object redisTemplate = context.getBean("redisTemplate");
//        System.out.println(redisTemplate);
        Object user = context.getBean( name: "user");
        System.out.println(user);
    }

}
```

```xml
        <!--    <dependency>
            <groupId>org.springframework.boot</gr
            <artifactId>spring-boot-starter-data-
        </dependency>-->
        <!-- https://mvnrepository.com/artifact/r
<!--    <dependency>
            <groupId>redis.clients</groupId>
            <artifactId>jedis</artifactId>
            <version>3.2.0</version>
        </dependency>-->

    </dependencies>
```

```
    at org.springframework.boot.SpringApplication.run(SpringApplication.java:1248)
    at com.itheima.MySpringBootApplication.main(MySpringBootApplication.java:17)
2020-03-02 17:07:34.852  INFO 16936 --- [           main] com.itheima.MySpringBootApplication      : Started MySpringBootApplication in 0.911 seconds (JVM running for 1.754)
Exception in thread "main" org.springframework.beans.factory.NoSuchBeanDefinitionException: No bean named 'user' available
    at org.springframework.beans.factory.support.DefaultListableBeanFactory.getBeanDefinition(DefaultListableBeanFactory.java:775)
    at org.springframework.beans.factory.support.AbstractBeanFactory.getMergedLocalBeanDefinition(AbstractBeanFactory.java:1221)
    at org.springframework.beans.factory.support.AbstractBeanFactory.doGetBean(AbstractBeanFactory.java:294)
    at org.springframework.beans.factory.support.AbstractBeanFactory.getBean(AbstractBeanFactory.java:199)
    at org.springframework.context.support.AbstractApplicationContext.getBean(AbstractApplicationContext.java:1105)
    at com.itheima.MySpringBootApplication.main(MySpringBootApplication.java:20)
```

3.2.4 小结

我们由上边的看出。由于有了条件接口，那么我们可以选择性的在某种条件小才进行bean的注册和初始化等操作。他的接口的说明也描述了这有点；


Documentation for Condition
Maven: org.springframework:spring-context:5.1.6.RELEASE

A single condition that must be matched in order for a component to be registered.

Conditions are checked immediately before the bean-definition is due to be registered and are free to veto registration based on any criteria that can be determined at that point.

Conditions must follow the same restrictions as BeanFactoryPostProcessor and take care to never interact with bean instances. For more fine-grained control of conditions that interact with @Configuration beans consider the ConfigurationCondition interface.

```java
public interface Condition {

    /**
     * Determine if the condition matches.
     * @param context the condition context
     * @param metadata metadata of the {@link org.springframework.core.type.AnnotationMetadata cl
     * or {@link org.springframework.core.type.MethodMetadata method} being checked
     * @return {@code true} if the condition matches and the component can be registered,
     * or {@code false} to veto the annotated component's registration
     */
    boolean matches(ConditionContext context, AnnotatedTypeMetadata metadata);

}
```

3.3Condition的应用需求优化

我们希望这个类注解可以进行动态的加载某一个类的全路径，不能写死为redis.将来可以进行重用。

3.3.1需求

- [ ] 将类的判断定义为动态的. 判断哪个字节码文件存在可以动态指定

3.3.2实现步骤

1. 自定义MyConditionalOnClass注解(需要加@Conditional注解), 定义name属性用于指定具体的类全路径
2. 配置类使用这个注解, 动态的指定类路径
3. 在MyCondition中修改方法实现,在条件的实现类中进行动态的获取并加载类

3.3.3实现

- 自定义MyConditionalOnClass注解, 定义name属性用于指定具体的类全路径

```
package com.itheima.condition.condition;

import org.springframework.context.annotation.Conditional;

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

/**
 * @Description:
 * @author: yp
 */
@Retention(RetentionPolicy.RUNTIME)  //在运行阶段还有效
@Conditional(value = {MyCondition.class}) //Conditiond的子类: MyCondition里面的matches方法返回true, @Conditional控制加载当前的bean;返回false, @Conditional控制不加载当前的bean
public @interface ConditionalOnClass {
    String[] name();

}
```

- 配置类使用这个注解, 动态的指定类路径

```
package com.itheima.condition.config;

import com.itheima.condition.bean.User;
import com.itheima.condition.condition.ConditionalOnClass;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;

/**
 * @Description:
 * @author: yp
 */
@Configuration
public class UserConfig {

    @Bean
    @ConditionalOnClass(name = {"redis.clients.jedis.Jedis"})
    public User user(){
        return new User();
    }

}
```

- 在MyCondition中修改方法实现,在条件的实现类中进行动态的获取并加载类

```
package com.itheima.condition.condition;
```

```
import org.springframework.context.annotation.Condition;
import org.springframework.context.annotation.ConditionContext;
import org.springframework.core.type.AnnotatedTypeMetadata;

import java.util.Map;

/**
 * @Description:
 * @author: yp
 */
public class MyCondition implements Condition {
    /**
     * 返回值: 返回true 代表满足条件; false:代表不满足条件
     * @param context Condition上下文对象  获得Spring容器,类加载器
     * @param metadata 注解原数据对象,  获得注解的属性
     * @return
     */
    @Override
    public boolean matches(ConditionContext context, AnnotatedTypeMetadata
metadata) {
        //在MyCondition里面获得@ConditionalOnClass(name =
{"redis.clients.jedis.Jedis"})的name的属性值
        try {
            //1.获得ConditionalOnClass注解的全部属性
            Map<String, Object> map =
metadata.getAnnotationAttributes(ConditionalOnClass.class.getName());
            //2.获得name的属性值
            String[] values = (String[]) map.get("name");
            for (String value : values) {
                //System.out.println("value="+value);
                Class.forName(value);
            }
            return true;
        } catch (Exception e) {
            e.printStackTrace();
            return false;
        }
    }
}
```

4.小结

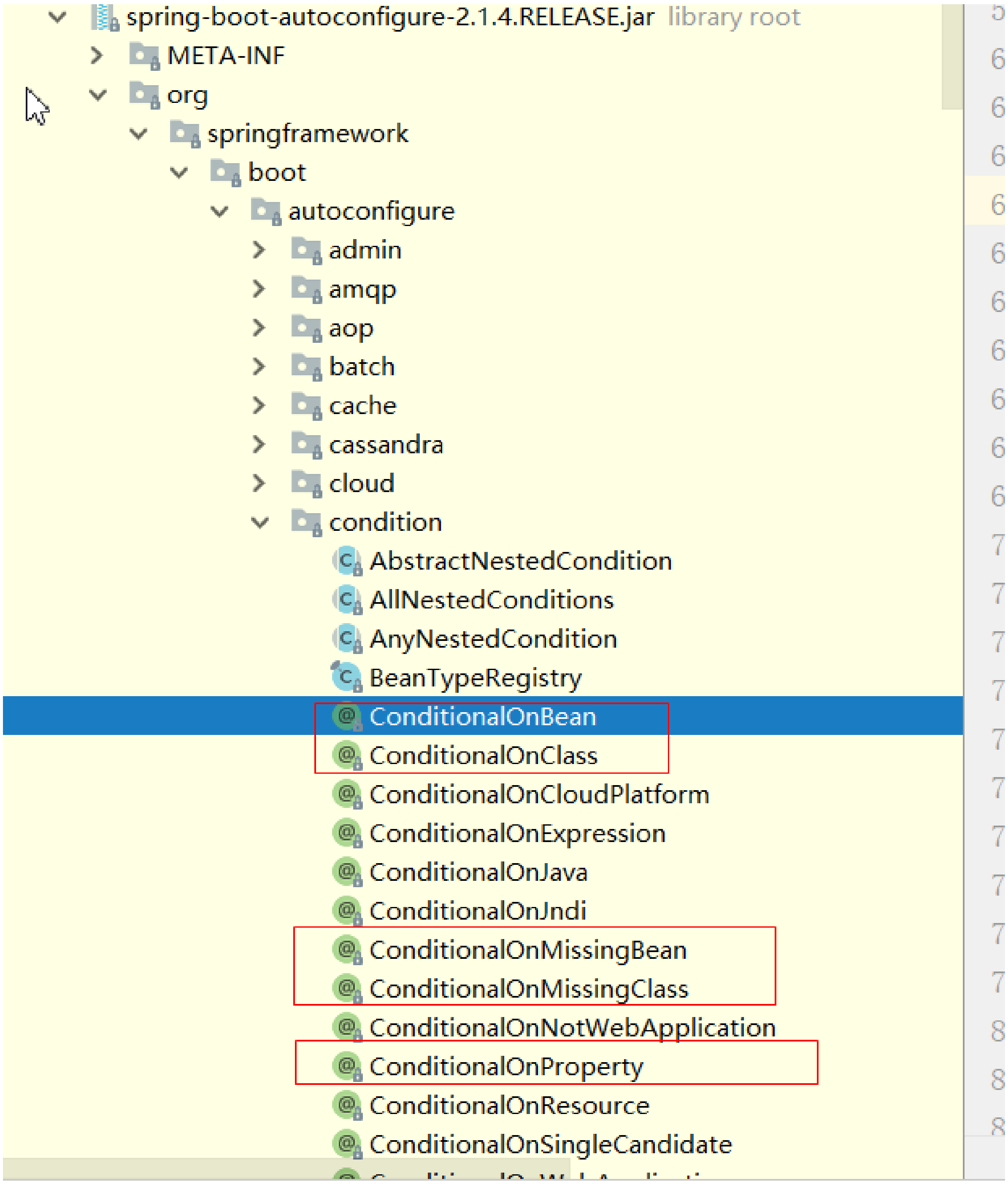
4.1案例小结

- 定义条件类：自定义类实现Condition接口，重写 matches 方法，在 matches 方法中进行逻辑判断，返回
  boolean值 。 matches 方法两个参数：
  - context：上下文对象，可以获取属性值，获取类加载器，获取BeanFactory等。
  - metadata：元数据对象，用于获取注解属性。
- 判断条件： 在初始化Bean时，使用 @Conditional(条件类.class)注解

4.2Conditional相关的注解

- ConditionalOnBean 当spring容器中有某一个bean时使用
- ConditionalOnClass 当判断当前类路径下有某一个类时使用
- ConditionalOnMissingBean 当spring容器中没有某一个bean时才使用
- ConditionalOnMissingClass 当当前类路径下没有某一个类的时候才使用
- ConditionalOnProperty 当配置文件中有某一个key value的时候才使用

  ...


```
spring-boot-autoconfigure-2.1.4.RELEASE.jar library root
  META-INF
  org
    springframework
      boot
        autoconfigure
          admin
          amqp
          aop
          batch
          cache
          cassandra
          cloud
          condition
            AbstractNestedCondition
            AllNestedConditions
            AnyNestedCondition
            BeanTypeRegistry
            ConditionalOnBean
            ConditionalOnClass
            ConditionalOnCloudPlatform
            ConditionalOnExpression
            ConditionalOnJava
            ConditionalOnJndi
            ConditionalOnMissingBean
            ConditionalOnMissingClass
            ConditionalOnNotWebApplication
            ConditionalOnProperty
            ConditionalOnResource
            ConditionalOnSingleCandidate
```

知识点-@SpringBootApplication源码

1.目标

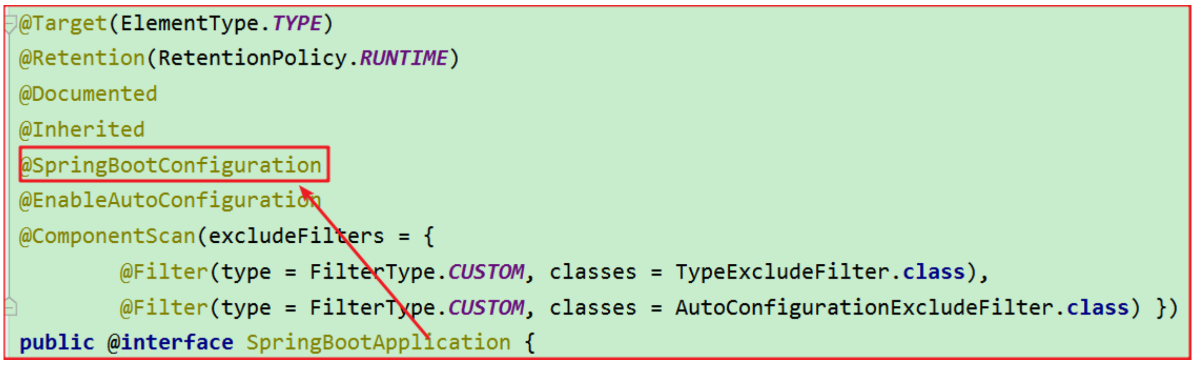
- [ ] 掌握@SpringBootApplication源码

2.路径

1. @SpringbootConfiguration
2. @EnableAutoConfiguration
3. @ComponentScan注解

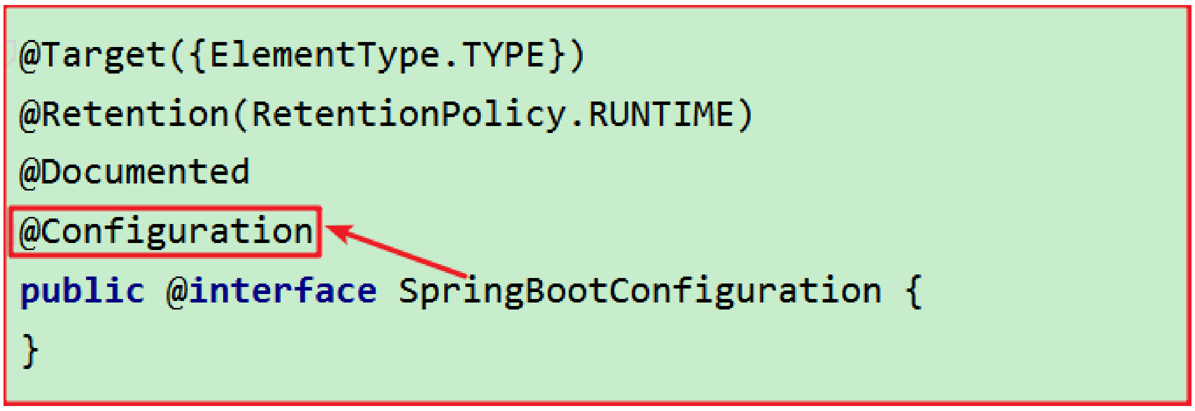
3.讲解

3.1@SpringbootConfiguration



```java
@Target(ElementType.TYPE)
@Retention(RetentionPolicy.RUNTIME)
@Documented
@Inherited
@SpringBootConfiguration
@EnableAutoConfiguration
@ComponentScan(excludeFilters = {
        @Filter(type = FilterType.CUSTOM, classes = TypeExcludeFilter.class),
        @Filter(type = FilterType.CUSTOM, classes = AutoConfigurationExcludeFilter.class) })
public @interface SpringBootApplication {
```

如上图所示，就是该注解实际上是在启动类上的注解中的一个注解，我们再点击进去：



```java
@Target({ElementType.TYPE})
@Retention(RetentionPolicy.RUNTIME)
@Documented
@Configuration
public @interface SpringBootConfiguration {
}
```

　我们发现其实该注解就是一个@Configuration注解，那么意味着我们的==启动类被注解修饰后，意味着它本身也是一个配置类==,该配置类就可以当做spring中的applicationContext.xml的文件，用于加载配置使用。

自己话总结@SpringbootConfiguration：

　1.先看字面意思，字面意思就是---springboot配置注解

　2.打开启动类上面的@SpringbootConfiguration注解，看到该注解上有元注解@SpringbootConfiguration和@EnableAutoConfiguration

　3.再打开@SpringbootConfiguration，看到该注解上面有@Configuration注解，所以理解为@SpringbootConfiguration将启动类修饰成一个配置类，这时启动类就等价于spring中的applicationContext.xml文件，用启动类来加载配置使用。**

3.2@EnableAutoConfiguration【重点】

自己话总结@EnableAutoConfiguration:

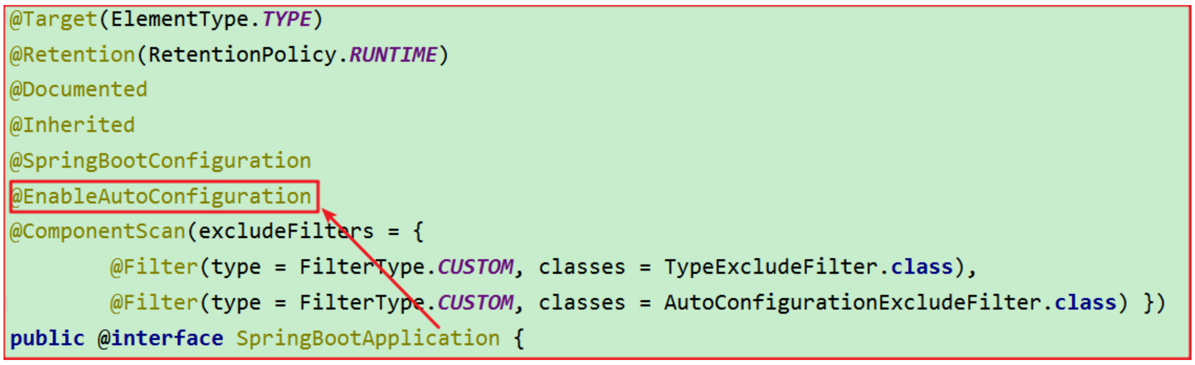
1.字面意思是---允许自动配置，这个注解就是起自动装配的作用；

2.打开注解SpringbootConfiguration上面的元注解@EnableAutoConfiguration，看到该注解上导入了一个类，@Import(AutoConfigurationImportSelector.class)，在自动配置导入选择器这个类中，有一个方法selectImports()方法**

```
@Override
public Iterable<Entry> selectImports() {
   /*在该方法中实现自动配置，进入该方法后先判断这个启动类的自动配置进入有没有配置，如果没有配置，则调用Collections类中的emptyList()方法，这个方法会返回一个可序列化的空列表，*/
   if (this.autoConfigurationEntries.isEmpty()) {
      return Collections.emptyList();
   }
   Set<String> allExclusions = this.autoConfigurationEntries.stream()
         .map(AutoConfigurationEntry::getExclusions)
         .flatMap(Collection::stream).collect(Collectors.toSet());
   Set<String> processedConfigurations = this.autoConfigurationEntries.stream()
         .map(AutoConfigurationEntry::getConfigurations)
         .flatMap(Collection::stream)
         .collect(Collectors.toCollection(LinkedHashSet::new));
   processedConfigurations.removeAll(allExclusions);

   return sortAutoConfigurations(processedConfigurations,
         getAutoConfigurationMetadata())
               .stream()
               .map((importClassName) -> new Entry(
                     this.entries.get(importClassName), importClassName))
               .collect(Collectors.toList());
}
```

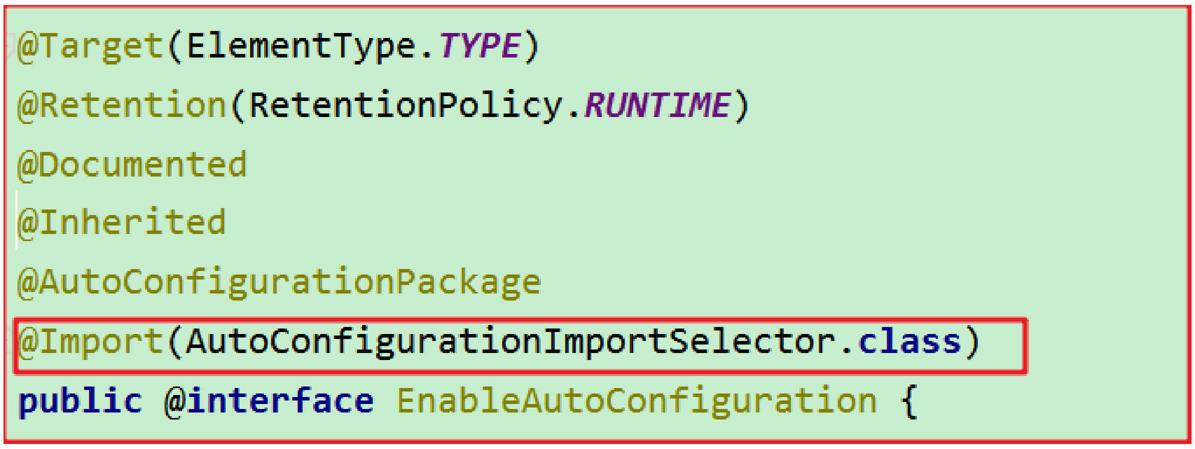
3.2.1源码分析

- 注解SpringBootApplication上有一个元注解@EnableAutoConfiguration,这就是起自动装配的作用



```
@Target(ElementType.TYPE)
@Retention(RetentionPolicy.RUNTIME)
@Documented
@Inherited
@SpringBootConfiguration
@EnableAutoConfiguration
@ComponentScan(excludeFilters = {
      @Filter(type = FilterType.CUSTOM, classes = TypeExcludeFilter.class),
      @Filter(type = FilterType.CUSTOM, classes = AutoConfigurationExcludeFilter.class) })
public @interface SpringBootApplication {
```

- 注解@EnableAutoConfiguration上导入了一个类
  @Import(AutoConfigurationImportSelector.class)

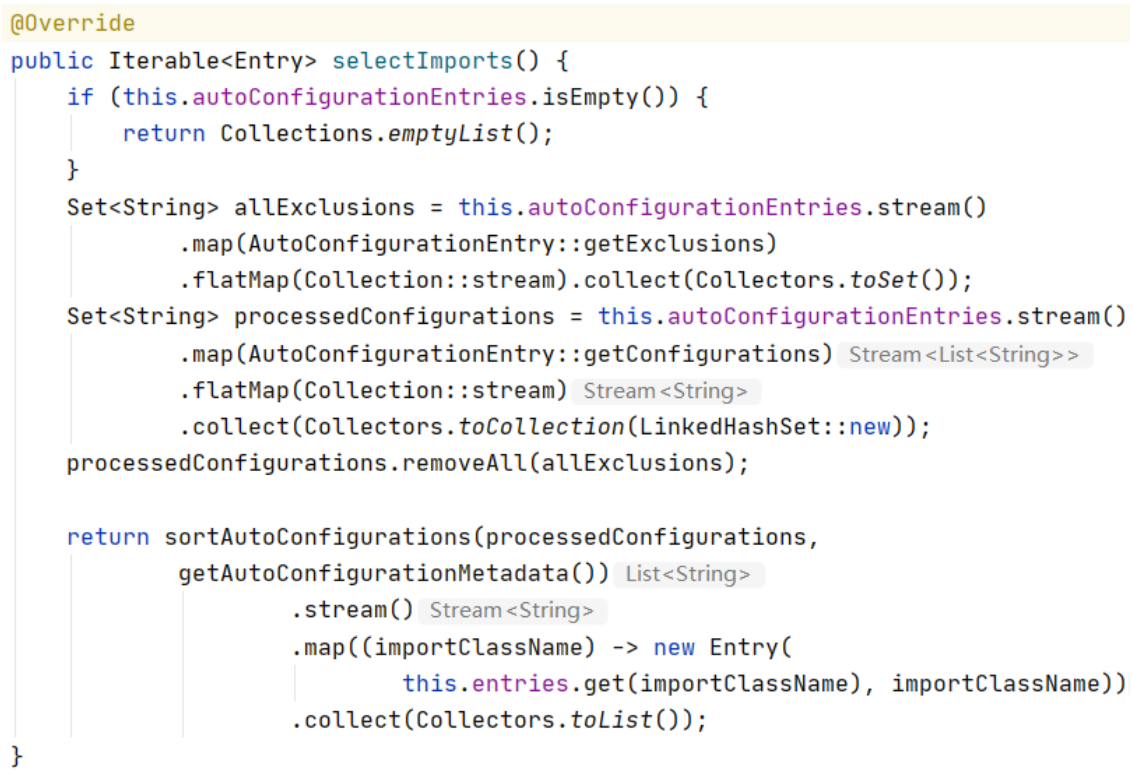


```java
@Target(ElementType.TYPE)
@Retention(RetentionPolicy.RUNTIME)
@Documented
@Inherited
@AutoConfigurationPackage
@Import(AutoConfigurationImportSelector.class)
public @interface EnableAutoConfiguration {
```

- AutoConfigurationImportSelector里面有一个process() 方法

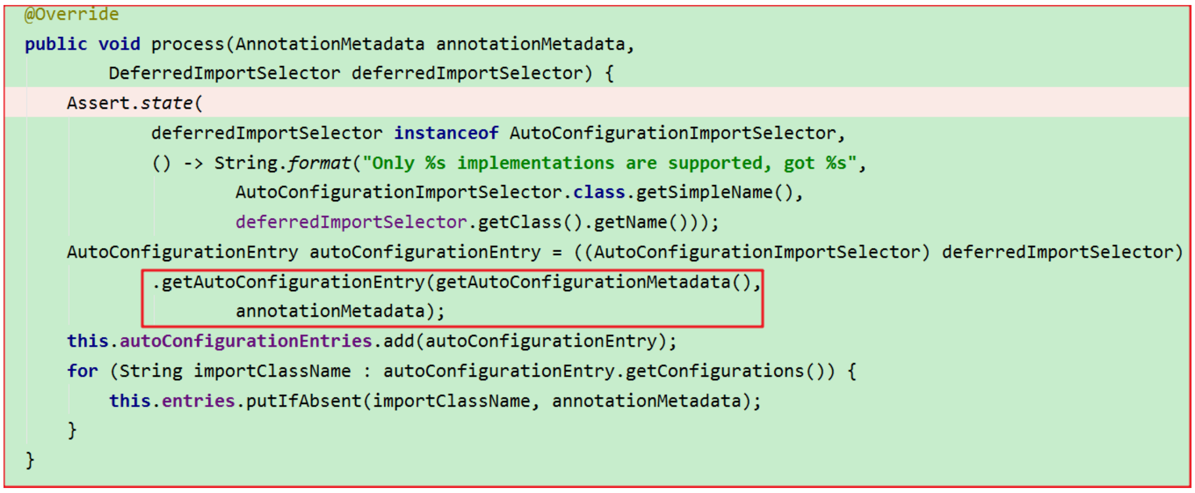
  注:老版本里面是执行selectImports()方法

  老版本中:

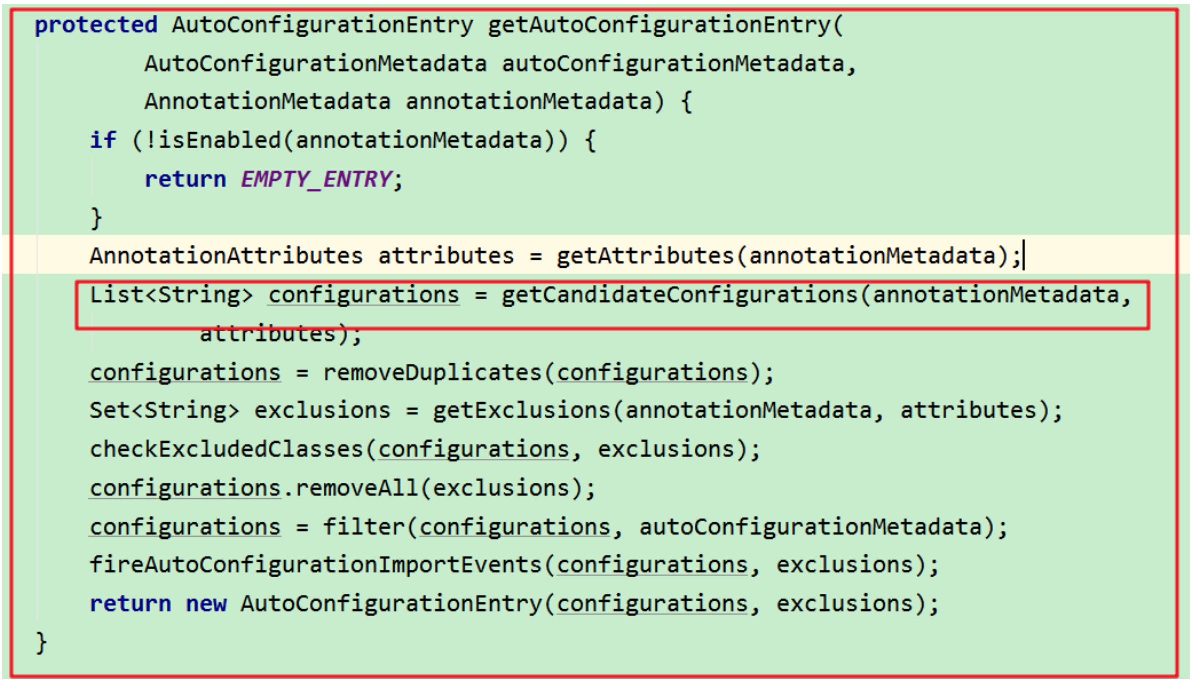


```java
@Override
public Iterable<Entry> selectImports() {
    if (this.autoConfigurationEntries.isEmpty()) {
        return Collections.emptyList();
    }
    Set<String> allExclusions = this.autoConfigurationEntries.stream()
            .map(AutoConfigurationEntry::getExclusions)
            .flatMap(Collection::stream).collect(Collectors.toSet());
    Set<String> processedConfigurations = this.autoConfigurationEntries.stream()
            .map(AutoConfigurationEntry::getConfigurations) Stream<List<String>>
            .flatMap(Collection::stream) Stream<String>
            .collect(Collectors.toCollection(LinkedHashSet::new));
    processedConfigurations.removeAll(allExclusions);

    return sortAutoConfigurations(processedConfigurations,
            getAutoConfigurationMetadata()) List<String>
                    .stream() Stream<String>
                    .map((importClassName) -> new Entry(
                            this.entries.get(importClassName), importClassName))
                    .collect(Collectors.toList());
}
```

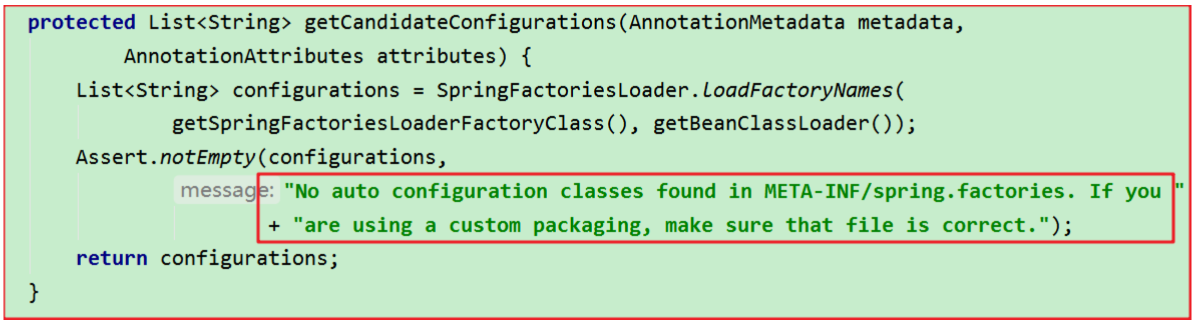
- 新版本中



```java
@Override
public void process(AnnotationMetadata annotationMetadata,
        DeferredImportSelector deferredImportSelector) {
    Assert.state(
            deferredImportSelector instanceof AutoConfigurationImportSelector,
            () -> String.format("Only %s implementations are supported, got %s",
                    AutoConfigurationImportSelector.class.getSimpleName(),
                    deferredImportSelector.getClass().getName()));
    AutoConfigurationEntry autoConfigurationEntry = ((AutoConfigurationImportSelector) deferredImportSelector)
            .getAutoConfigurationEntry(getAutoConfigurationMetadata(),
                    annotationMetadata);
    this.autoConfigurationEntries.add(autoConfigurationEntry);
    for (String importClassName : autoConfigurationEntry.getConfigurations()) {
        this.entries.putIfAbsent(importClassName, annotationMetadata);
    }
}
```

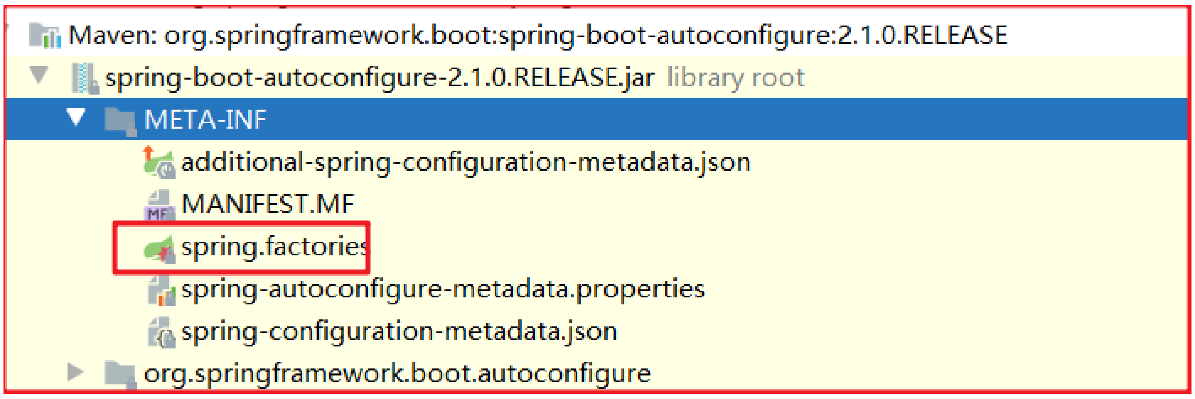


```java
protected AutoConfigurationEntry getAutoConfigurationEntry(
        AutoConfigurationMetadata autoConfigurationMetadata,
        AnnotationMetadata annotationMetadata) {
    if (!isEnabled(annotationMetadata)) {
        return EMPTY_ENTRY;
    }
    AnnotationAttributes attributes = getAttributes(annotationMetadata);
    List<String> configurations = getCandidateConfigurations(annotationMetadata,
            attributes);
    configurations = removeDuplicates(configurations);
    Set<String> exclusions = getExclusions(annotationMetadata, attributes);
    checkExcludedClasses(configurations, exclusions);
    configurations.removeAll(exclusions);
    configurations = filter(configurations, autoConfigurationMetadata);
    fireAutoConfigurationImportEvents(configurations, exclusions);
    return new AutoConfigurationEntry(configurations, exclusions);
}
```



```java
protected List<String> getCandidateConfigurations(AnnotationMetadata metadata,
        AnnotationAttributes attributes) {
    List<String> configurations = SpringFactoriesLoader.loadFactoryNames(
            getSpringFactoriesLoaderFactoryClass(), getBeanClassLoader());
    Assert.notEmpty(configurations,
            message: "No auto configuration classes found in META-INF/spring.factories. If you "
            + "are using a custom packaging, make sure that file is correct.");
    return configurations;
}
```

- 其中，SpringFactoriesLoader.loadFactoryNames 方法的作用就是从META-INF/spring.factories文件中读取指定类对应的类名称列表

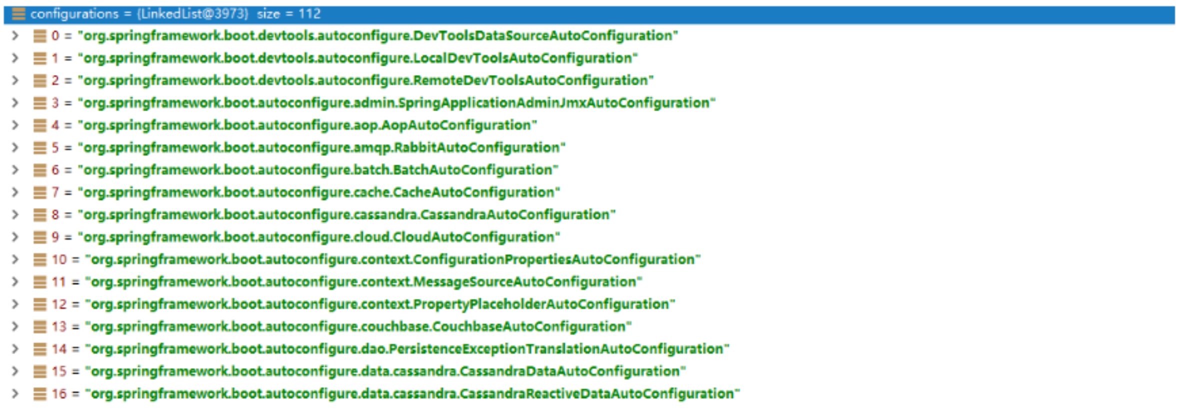


```
Maven: org.springframework.boot:spring-boot-autoconfigure:2.1.0.RELEASE
  spring-boot-autoconfigure-2.1.0.RELEASE.jar library root
    META-INF
      additional-spring-configuration-metadata.json
      MANIFEST.MF
      spring.factories
      spring-autoconfigure-metadata.properties
      spring-configuration-metadata.json
    org.springframework.boot.autoconfigure
```

META-INF/spring.factories的配置文件

```
# AutoConfigureWebMvc auto-configuration imports
org.springframework.boot.test.autoconfigure.web.servlet.AutoConfigureWebMvc=\
org.springframework.boot.autoconfigure.context.MessageSourceAutoConfiguration,\
org.springframework.boot.autoconfigure.freemarker.FreeMarkerAutoConfiguration,\
org.springframework.boot.autoconfigure.groovy.template.GroovyTemplateAutoConfigu
ration,\
org.springframework.boot.autoconfigure.gson.GsonAutoConfiguration,\
org.springframework.boot.autoconfigure.hateoas.HypermediaAutoConfiguration,\
org.springframework.boot.autoconfigure.http.HttpMessageConvertersAutoConfigurati
on,\
org.springframework.boot.autoconfigure.jackson.JacksonAutoConfiguration,\
org.springframework.boot.autoconfigure.jsonb.JsonbAutoConfiguration,\
org.springframework.boot.autoconfigure.mustache.MustacheAutoConfiguration,\
org.springframework.boot.autoconfigure.thymeleaf.ThymeleafAutoConfiguration,\
org.springframework.boot.autoconfigure.validation.ValidationAutoConfiguration,\
org.springframework.boot.autoconfigure.web.servlet.error.ErrorMvcAutoConfigurati
on,\
org.springframework.boot.autoconfigure.web.servlet.WebMvcAutoConfiguration
```

加载META-INF/spring.factories之后, 加断点解析获得 List configurations的值:

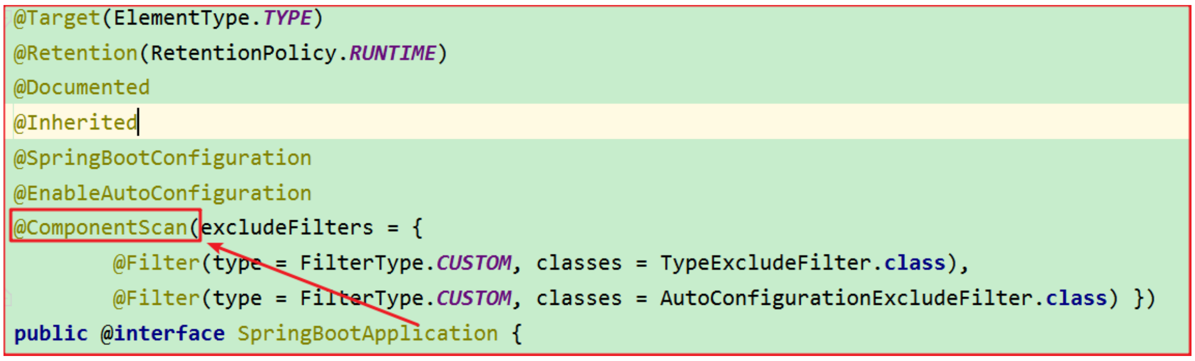


```
configurations = {LinkedList@3973}  size = 112
> 0 = "org.springframework.boot.devtools.autoconfigure.DevToolsDataSourceAutoConfiguration"
> 1 = "org.springframework.boot.devtools.autoconfigure.LocalDevToolsAutoConfiguration"
> 2 = "org.springframework.boot.devtools.autoconfigure.RemoteDevToolsAutoConfiguration"
> 3 = "org.springframework.boot.autoconfigure.admin.SpringApplicationAdminJmxAutoConfiguration"
> 4 = "org.springframework.boot.autoconfigure.aop.AopAutoConfiguration"
> 5 = "org.springframework.boot.autoconfigure.amqp.RabbitAutoConfiguration"
> 6 = "org.springframework.boot.autoconfigure.batch.BatchAutoConfiguration"
> 7 = "org.springframework.boot.autoconfigure.cache.CacheAutoConfiguration"
> 8 = "org.springframework.boot.autoconfigure.cassandra.CassandraAutoConfiguration"
> 9 = "org.springframework.boot.autoconfigure.cloud.CloudAutoConfiguration"
> 10 = "org.springframework.boot.autoconfigure.context.ConfigurationPropertiesAutoConfiguration"
> 11 = "org.springframework.boot.autoconfigure.context.MessageSourceAutoConfiguration"
> 12 = "org.springframework.boot.autoconfigure.context.PropertyPlaceholderAutoConfiguration"
> 13 = "org.springframework.boot.autoconfigure.couchbase.CouchbaseAutoConfiguration"
> 14 = "org.springframework.boot.autoconfigure.dao.PersistenceExceptionTranslationAutoConfiguration"
> 15 = "org.springframework.boot.autoconfigure.data.cassandra.CassandraDataAutoConfiguration"
> 16 = "org.springframework.boot.autoconfigure.data.cassandra.CassandraReactiveDataAutoConfiguration"
```

3.2.2结论

- @EnableAutoConfiguration 注解内部使用 @Import(AutoConfigurationImportSelector.class)来加载配置类。
- 配置文件位置：META-INF/spring.factories，该配置文件中定义了大量的配置类，当 SpringBoot 应用启动时，AutoConfigurationImportSelector内部会自动加载这些配置类，初始化Bean
- 并不是所有的Bean都会被初始化，在配置类中使用Condition来加载满足条件的Bean

3.3@ComponentScan



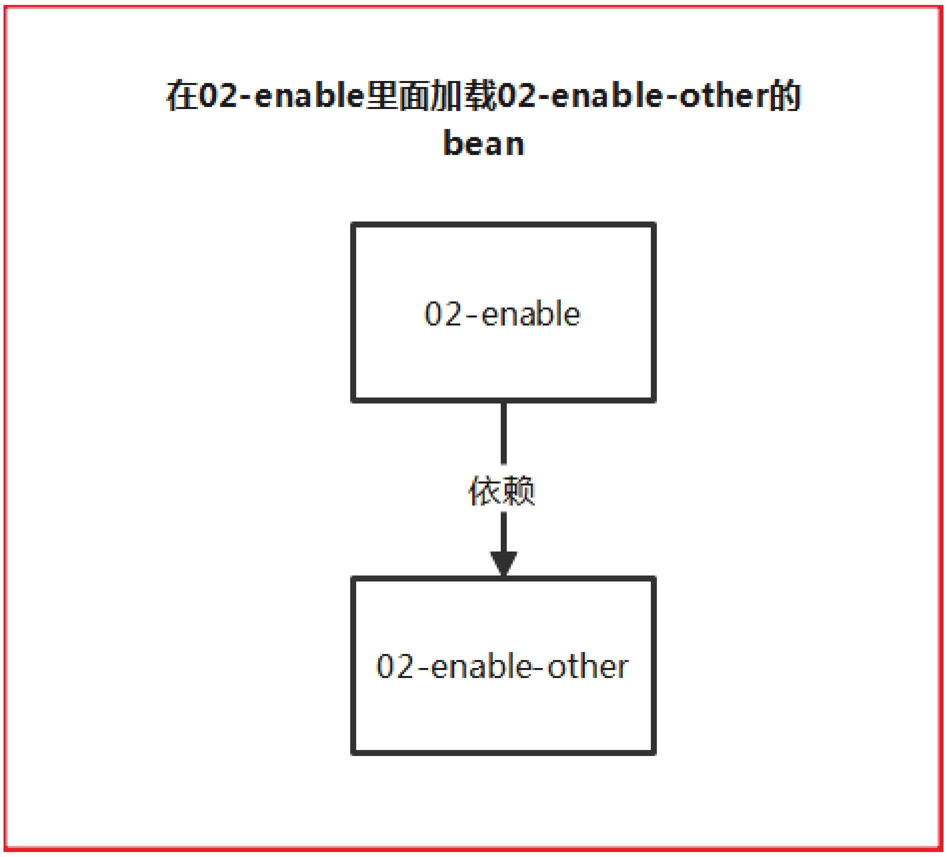
```
@Target(ElementType.TYPE)
@Retention(RetentionPolicy.RUNTIME)
@Documented
@Inherited
@SpringBootConfiguration
@EnableAutoConfiguration
@ComponentScan(excludeFilters = {
        @Filter(type = FilterType.CUSTOM, classes = TypeExcludeFilter.class),
        @Filter(type = FilterType.CUSTOM, classes = AutoConfigurationExcludeFilter.class) })
public @interface SpringBootApplication {
```

如上图，在启动类的注解@SpringBootApplication注解里面又修饰了@CompnetScan注解，该注解的作用用于组件扫描包类似于xml中的`context-componet-scan`，如果不指定扫描路径，那么就扫描该注解修饰的启动类所在的包以及子包。这就是为什么我们在第一天的时候写了controller 并没有扫描也能使用的原因。

知识点-加载第三方的Bean

1.目标

- [ ] 掌握加载第三方的Bean, 在02-enable工程里面获得02-enable-other里面的bean



2.路径

1. 使用@ComponentScan扫描
2. 使用@Import注解
3. 使用@EnableXXX

   一,引入第三方bean的三种方式

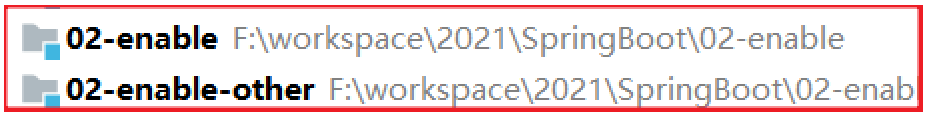
   1.使用@ComponentScan扫描 eg:@ComponentScan(value ={"@ComponentScan(value = {"com.itheima.enableother.bean"})"})

   2.可以使用@Import注解，加载类。这些类都会被Spring创建，并放入IOC容器 eg: @Import(value = {User.class}) 创建bean的名字是类的全限定名

   3.可以对Import注解进行封装 eg: @EnableUser

3.讲解

3.0环境的准备



02-enable F:\workspace\2021\SpringBoot\02-enable
02-enable-other F:\workspace\2021\SpringBoot\02-enab

注意，在enable中添加enableother的依赖

3.1@ComponentScan扫描

- 02-enable-other的User.class

```
package com.itheima.enableother.bean;


import org.springframework.stereotype.Component;

/**
 * @Description:
 * @author: yp
 */
@Component("user")
public class User {

}
```

- 02-enable的启动类

```
@SpringBootApplication
@ComponentScan(value ={"com.itheima.enableother.bean"})
public class EnableApplication {
    public static void main(String[] args) {
        ConfigurableApplicationContext context =
SpringApplication.run(EnableApplication.class, args);
        User user = (User) context.getBean("user");

    }
}
```

3.2使用@Import注解

3.2.1导入bean

- 02-enable-other的User

```
package com.itheima.enableother.bean;


import org.springframework.stereotype.Component;

/**
 * @Description:
 * @author: yp
 */
@Component("user")
public class User {

}
```

- 02-enable-other的Role

```java
package com.itheima.enableother.bean;

/**
 * @Description:
 * @author: yp
 */
public class Role {

}
```

- 02-enable的启动类

```java
@SpringBootApplication
@Import(value = {User.class,Role.class})
public class EnableApplication {
    public static void main(String[] args) {
        ConfigurableApplicationContext context =
SpringApplication.run(EnableApplication.class, args);
        User user = (User) context.getBean("user");
        System.out.println(user);


        Role role = (Role) context.getBean("com.itheima.enableother.bean.Role");
        System.out.println(role);
    }
}
```

3.2.2导入配置类

- 02-enable-other的UserConfig

-
  ```java
  package com.itheima.enableother.pojo;
  public class User {
      private String name="张三";
  }
  ```

```java
package com.itheima.enableother.config;

import com.itheima.enableother.bean.User;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;

/**
 * @Description:
 * @author: yp
 */
@Configuration
public class UserConfig {
    @Bean
    public User user(){
        return new User();
    }
}
```

- 02-enable的启动类

```
@SpringBootApplication
@Import(value = {UserConfig.class})
public class EnableApplication {
    public static void main(String[] args) {
        ConfigurableApplicationContext context =
SpringApplication.run(EnableApplication.class, args);
        User user = (User) context.getBean("user");
        System.out.println(user);
}
```

3.2.3导入ImportSelector的实现类

- 02-enable-other的MyImportSelector

```
public class MyImportSelector implements ImportSelector {
    @Override
    public String[] selectImports(AnnotationMetadata importingClassMetadata) {
        //返回要注册到spring容器中的Bean的全路径
        return new String[]
{"com.itheima.enableother.bean.Role","com.itheima.enableother.bean.User"};
    }
}
```

- 02-enable的启动类

```
@SpringBootApplication
@Import(value = {MyImportSelector.class})
public class EnableApplication {
    public static void main(String[] args) {
        ConfigurableApplicationContext context =
SpringApplication.run(EnableApplication.class, args);
        User user = context.getBean(User.class);
        System.out.println(user);

        Role role = context.getBean(Role.class);
        System.out.println(role);
    }
}
```

3.2.4导入ImportBeanDefinitionRegistrar实现类

- 02-enable-other的MyImportBeanDefinitionRegistrar

```
package com.itheima.enableother.config;

import com.itheima.enableother.bean.User;
import javafx.beans.property.adapter.JavaBeanBooleanProperty;
import org.springframework.beans.factory.config.BeanDefinition;
```

```java
import org.springframework.beans.factory.support.AbstractBeanDefinition;
import org.springframework.beans.factory.support.BeanDefinitionBuilder;
import org.springframework.beans.factory.support.BeanDefinitionRegistry;
import org.springframework.context.annotation.ImportBeanDefinitionRegistrar;
import org.springframework.core.type.AnnotationMetadata;

/**
 * @Description:
 * @author: yp
 */
public class MyImportBeanDefinitionRegistrar implements
ImportBeanDefinitionRegistrar {

    @Override
    public void registerBeanDefinitions(AnnotationMetadata
importingClassMetadata, BeanDefinitionRegistry registry) {
        //1.构建Bean的定义对象
        BeanDefinition beanDefinition =
BeanDefinitionBuilder.rootBeanDefinition(User.class).getBeanDefinition();
        //2.进行注册
        registry.registerBeanDefinition("u1", beanDefinition);
    }
}
```

- 02-enable的启动类

```java
@SpringBootApplication
@Import(value = {MyImportBeanDefinitionRegistrar.class})
public class EnableApplication {
    public static void main(String[] args) {
        ConfigurableApplicationContext context =
SpringApplication.run(EnableApplication.class, args);
        User user = (User) context.getBean("u1");
        System.out.println(user);
    }
}
```

3.3使用@EnableXXX

- 在02-enable-other中定义EnableUser

```java
@Target(ElementType.TYPE)
@Retention(RetentionPolicy.RUNTIME)
@Documented
@Import(UserConfig.class)
public @interface EnableUser {
}
```

- 02-enable的启动类

```
@SpringBootApplication
@EnableUser
public class EnableApplication {
    public static void main(String[] args) {
        ConfigurableApplicationContext context =
SpringApplication.run(EnableApplication.class, args);
        User user = (User) context.getBean("user");
        System.out.println(user);
    }
}
```

如上一目了然，当然这里面用的功能点不在于自定义的注解，而在于import的注解。

4.小结

1.3.3.2. 包扫描路径放大

方式一：第一种使用组件扫描 包扫描路径放大

在demo2启动类上修改

```
@ComponentScan(basePackages = "")


打印所有spring容器bean对象
String[] beanDefinitionNames = context.getBeanDefinitionNames();
 for (String beanDefinitionName : beanDefinitionNames) {
     System.out.println(beanDefinitionName);
 }
```

1.3.3.3. import注解

方式二：第二种使用import注解进行导入配置类的方式即可

- 直接导入Bean
- 导入配置类
- 导入ImportSelector的实现类，通常用于加载配置文件中的Bean
- 导入ImportBeanDefinitionRegistrar实现类

知识点-切换内置的web服务器【了解】

1.目标

　我们知道在springboot启动的时候如果我们使用web起步依赖，那么我们默认就加载了tomcat的类嵌入了tomcat了，不需要额外再找tomcat。

- [ ] 掌握切换内置的web服务器

2.路径

1. spring-boot-starter-web起步依赖的原理
2. 修改配置切换

3.讲解

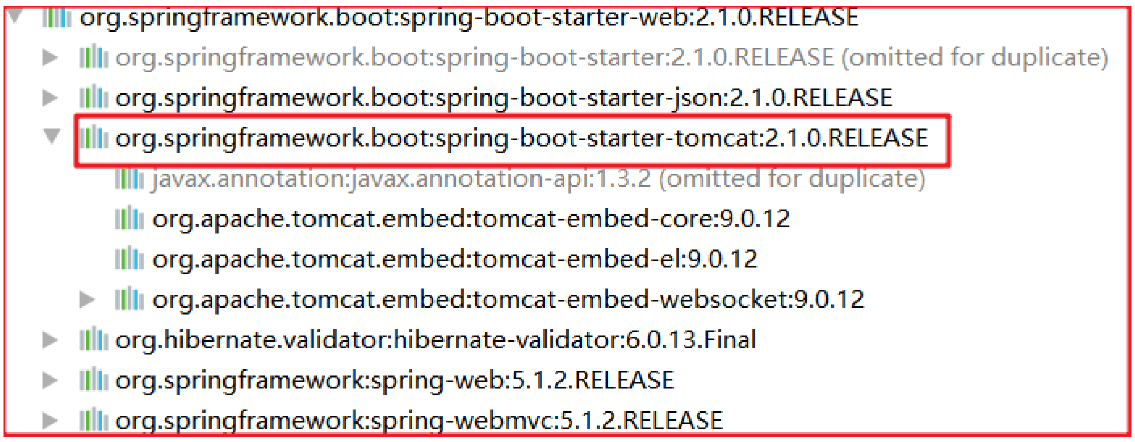
3.1spring-boot-starter-web起步依赖的原理

1. 加入pom.xml中起步依赖

```xml
<dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-web</artifactId>
</dependency>
```

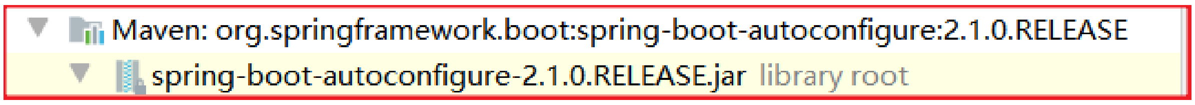
2. 查看依赖图

   web起步依赖依赖于spring-boot-starter-tomcat，这个为嵌入式的tomcat的包。

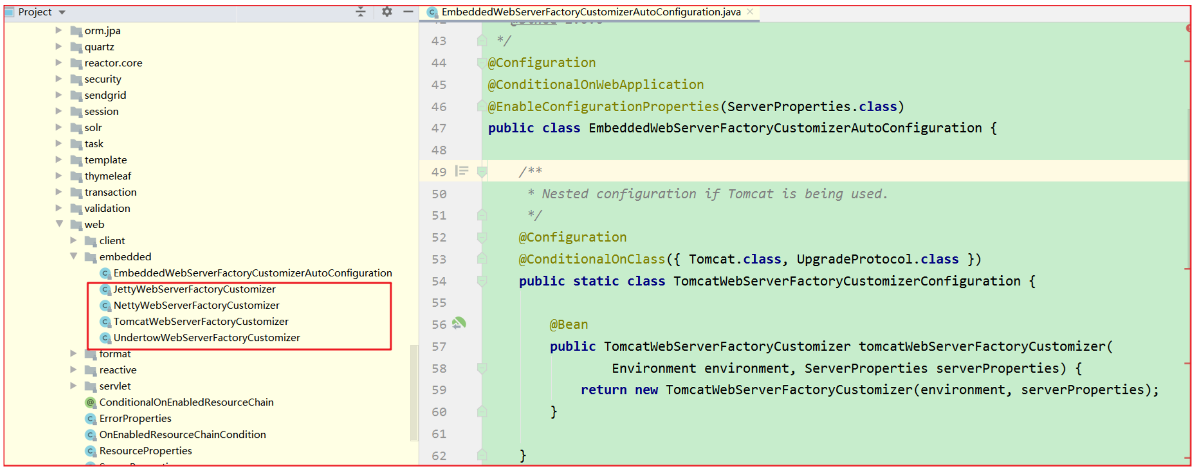


```
▼ org.springframework.boot:spring-boot-starter-web:2.1.0.RELEASE
    ▶ org.springframework.boot:spring-boot-starter:2.1.0.RELEASE (omitted for duplicate)
    ▶ org.springframework.boot:spring-boot-starter-json:2.1.0.RELEASE
    ▼ org.springframework.boot:spring-boot-starter-tomcat:2.1.0.RELEASE
          javax.annotation:javax.annotation-api:1.3.2 (omitted for duplicate)
          org.apache.tomcat.embed:tomcat-embed-core:9.0.12
          org.apache.tomcat.embed:tomcat-embed-el:9.0.12
        ▶ org.apache.tomcat.embed:tomcat-embed-websocket:9.0.12
    ▶ org.hibernate.validator:hibernate-validator:6.0.13.Final
    ▶ org.springframework:spring-web:5.1.2.RELEASE
    ▶ org.springframework:spring-webmvc:5.1.2.RELEASE
```

3. 自动配置类说明



```
▼ Maven: org.springframework.boot:spring-boot-autoconfigure:2.1.0.RELEASE
    ▼ spring-boot-autoconfigure-2.1.0.RELEASE.jar library root
```



```
▶ orm.jpa
▶ quartz
▶ reactor.core
▶ security
▶ sendgrid
▶ session
▶ solr
▶ task
▶ template
▶ thymeleaf
▶ transaction
▶ validation
▼ web
    ▶ client
    ▼ embedded
        EmbeddedWebServerFactoryCustomizerAutoConfiguration
        JettyWebServerFactoryCustomizer
        NettyWebServerFactoryCustomizer
        TomcatWebServerFactoryCustomizer
        UndertowWebServerFactoryCustomizer
    ▶ format
    ▶ reactive
    ▶ servlet
    ConditionalOnEnabledResourceChain
    ErrorProperties
    OnEnabledResourceChainCondition
    ResourceProperties
```

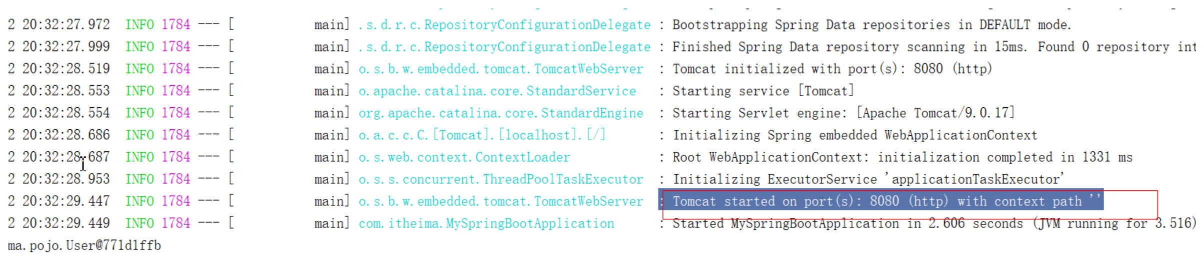
EmbeddedWebServerFactoryCustomizerAutoConfiguration.java

```java
 */
@Configuration
@ConditionalOnWebApplication
@EnableConfigurationProperties(ServerProperties.class)
public class EmbeddedWebServerFactoryCustomizerAutoConfiguration {

    /**
     * Nested configuration if Tomcat is being used.
     */
    @Configuration
    @ConditionalOnClass({ Tomcat.class, UpgradeProtocol.class })
    public static class TomcatWebServerFactoryCustomizerConfiguration {

        @Bean
        public TomcatWebServerFactoryCustomizer tomcatWebServerFactoryCustomizer(
                Environment environment, ServerProperties serverProperties) {
            return new TomcatWebServerFactoryCustomizer(environment, serverProperties);
        }

    }
```

4. 以上如图所,web容器有4种类型

   - tomcat容器(默认spring-boot-starter-web加入的是tomcat ,所以根据上图配置，会配置tomcat作为web容器)
   - jetty

    - netty
    - undertow
5. 启动时如下：



```
2 20:32:27.972  INFO 1784 --- [           main] .s.d.r.c.RepositoryConfigurationDelegate : Bootstrapping Spring Data repositories in DEFAULT mode.
2 20:32:27.999  INFO 1784 --- [           main] .s.d.r.c.RepositoryConfigurationDelegate : Finished Spring Data repository scanning in 15ms. Found 0 repository int
2 20:32:28.519  INFO 1784 --- [           main] o.s.b.w.embedded.tomcat.TomcatWebServer  : Tomcat initialized with port(s): 8080 (http)
2 20:32:28.553  INFO 1784 --- [           main] o.apache.catalina.core.StandardService   : Starting service [Tomcat]
2 20:32:28.554  INFO 1784 --- [           main] org.apache.catalina.core.StandardEngine  : Starting Servlet engine: [Apache Tomcat/9.0.17]
2 20:32:28.686  INFO 1784 --- [           main] o.a.c.c.C.[Tomcat].[localhost].[/]       : Initializing Spring embedded WebApplicationContext
2 20:32:28.687  INFO 1784 --- [           main] o.s.web.context.ContextLoader            : Root WebApplicationContext: initialization completed in 1331 ms
2 20:32:28.953  INFO 1784 --- [           main] o.s.s.concurrent.ThreadPoolTaskExecutor  : Initializing ExecutorService 'applicationTaskExecutor'
2 20:32:29.447  INFO 1784 --- [           main] o.s.b.w.embedded.tomcat.TomcatWebServer  : Tomcat started on port(s): 8080 (http) with context path ''
2 20:32:29.449  INFO 1784 --- [           main] com.itheima.MySpringBootApplication      : Started MySpringBootApplication in 2.606 seconds (JVM running for 3.516)
ma.pojo.User@771d1ffb
```

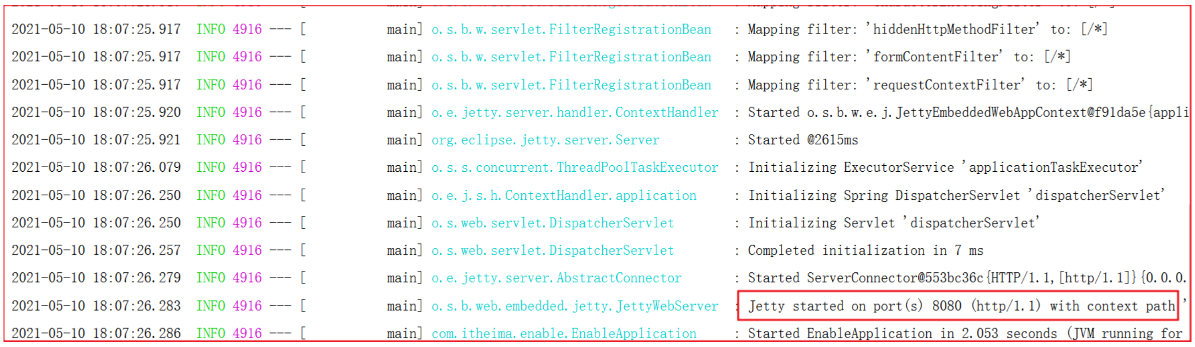
3.2修改配置切换

如上，我们可以通过修改web容器，根据业务需求使用性能更优越的等等其他的web容器。这里我们演示使用jetty作为web容器。

在pom.xml中排出tomcat依赖，添加jetty依赖即可：

```xml
<dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-web</artifactId>
    <exclusions>
        <exclusion>
            <artifactId>spring-boot-starter-tomcat</artifactId>
            <groupId>org.springframework.boot</groupId>
        </exclusion>
    </exclusions>
</dependency>

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

再次启动如下图所示：



```
2021-05-10 18:07:25.917  INFO 4916 --- [           main] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'hiddenHttpMethodFilter' to: [/*]
2021-05-10 18:07:25.917  INFO 4916 --- [           main] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'formContentFilter' to: [/*]
2021-05-10 18:07:25.917  INFO 4916 --- [           main] o.s.b.w.servlet.FilterRegistrationBean   : Mapping filter: 'requestContextFilter' to: [/*]
2021-05-10 18:07:25.920  INFO 4916 --- [           main] o.e.jetty.server.handler.ContextHandler  : Started o.s.b.w.e.j.JettyEmbeddedWebAppContext@f91da5e{appli
2021-05-10 18:07:25.921  INFO 4916 --- [           main] org.eclipse.jetty.server.Server          : Started @2615ms
2021-05-10 18:07:26.079  INFO 4916 --- [           main] o.s.s.concurrent.ThreadPoolTaskExecutor  : Initializing ExecutorService 'applicationTaskExecutor'
2021-05-10 18:07:26.250  INFO 4916 --- [           main] o.e.j.s.h.ContextHandler.application     : Initializing Spring DispatcherServlet 'dispatcherServlet'
2021-05-10 18:07:26.250  INFO 4916 --- [           main] o.s.web.servlet.DispatcherServlet        : Initializing Servlet 'dispatcherServlet'
2021-05-10 18:07:26.257  INFO 4916 --- [           main] o.s.web.servlet.DispatcherServlet        : Completed initialization in 7 ms
2021-05-10 18:07:26.279  INFO 4916 --- [           main] o.e.jetty.server.AbstractConnector       : Started ServerConnector@553bc36c{HTTP/1.1,[http/1.1]}{0.0.0.
2021-05-10 18:07:26.283  INFO 4916 --- [           main] o.s.b.web.embedded.jetty.JettyWebServer  : Jetty started on port(s) 8080 (http/1.1) with context path '
2021-05-10 18:07:26.286  INFO 4916 --- [           main] com.itheima.enable.EnableApplication     : Started EnableApplication in 2.053 seconds (JVM running for
```

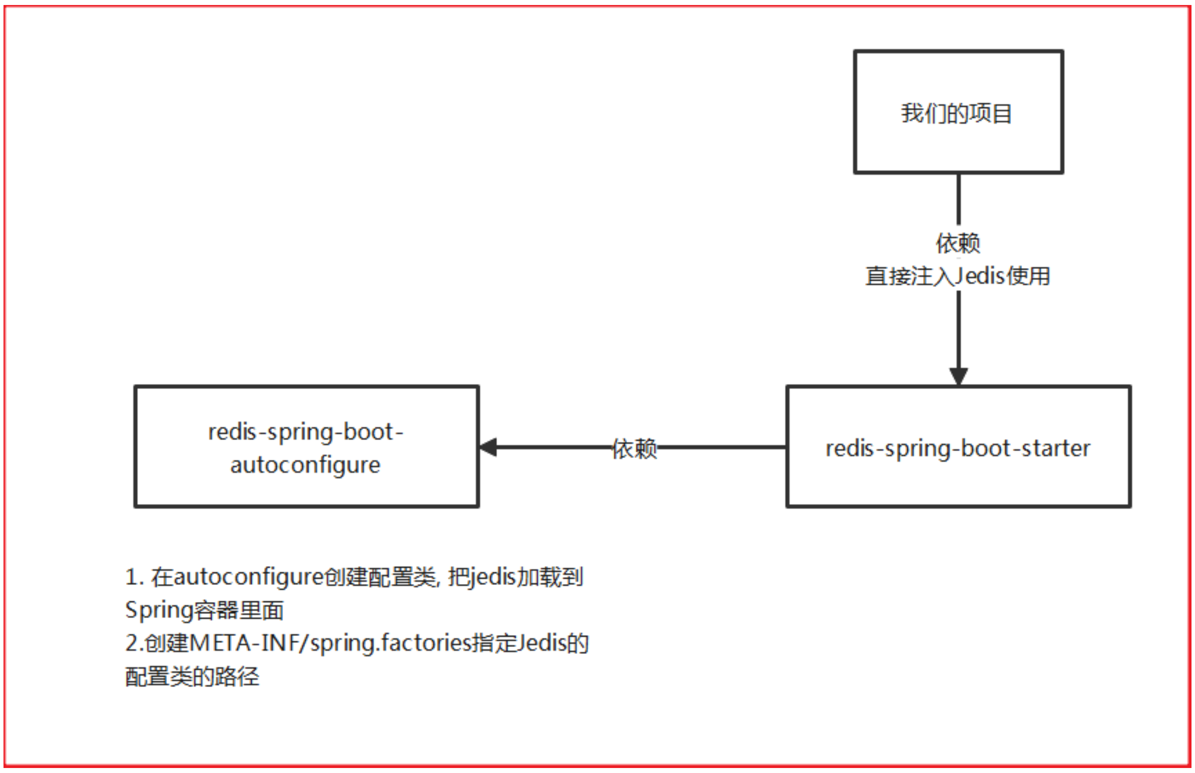
第二章-自定义starter

案例-自定义redis-starter

1.需求

- [ ] 自定义redis-starter。要求当导入redis坐标时，SpringBoot自动创建Jedis的Bean。

2.分析


我们的项目
依赖
直接注入Jedis使用
redis-spring-boot-starter
依赖
redis-spring-boot-autoconfigure
1. 在autoconfigure创建配置类, 把jedis加载到Spring容器里面
2.创建META-INF/spring.factories指定Jedis的配置类的路径

1. 创建 redis-spring-boot-autoconfigure 模块
2. 创建 redis-spring-boot-starter 模块,依赖 redis-spring-boot-autoconfigure的模块
3. 在 redis-spring-boot-autoconfigure 模块中初始化 Jedis 的Bean。并定义META-INF/spring.factories 文件
4. 在测试模块中引入自定义的 redis-starter 依赖，测试获取
   Jedis 的Bean，操作 redis。

==参考mybatis-spring-boot-starter==

3.实现

- 创建 redis-spring-boot-autoconfigure 模块

```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
http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <groupId>com.itheima</groupId>
    <artifactId>redis-spring-boot-autoconfigure</artifactId>
    <version>1.0-SNAPSHOT</version>

    <parent>
        <artifactId>spring-boot-starter-parent</artifactId>
        <groupId>org.springframework.boot</groupId>
        <version>2.1.0.RELEASE</version>
    </parent>
    <properties>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
        <maven.compiler.source>1.8</maven.compiler.source>
        <maven.compiler.target>1.8</maven.compiler.target>
    </properties>

    <dependencies>
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter</artifactId>
        </dependency>
        <dependency>
            <groupId>redis.clients</groupId>
            <artifactId>jedis</artifactId>
        </dependency>
    </dependencies>

</project>
```

- 创建 redis-spring-boot-starter 模块,依赖 redis-spring- boot-autoconfigure的模块

```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
http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <groupId>com.itheima</groupId>
    <artifactId>redis-spring-boot-starter</artifactId>
    <version>1.0-SNAPSHOT</version>

    <parent>
        <artifactId>spring-boot-starter-parent</artifactId>
        <groupId>org.springframework.boot</groupId>
        <version>2.1.0.RELEASE</version>
    </parent>

    <properties>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
        <maven.compiler.source>1.8</maven.compiler.source>
        <maven.compiler.target>1.8</maven.compiler.target>
    </properties>

    <dependencies>
        <dependency>
            <groupId>com.itheima</groupId>
            <artifactId>redis-spring-boot-autoconfigure</artifactId>
            <version>1.0-SNAPSHOT</version>
        </dependency>
    </dependencies>


</project>
```

- 在 redis-spring-boot-autoconfigure 模块中初始化 Jedis 的Bean。并定义META-INF/spring.factories 文件
  - RedisAutoConfiguration

```java
package com.itheima.redis.autoconfigure;

import org.springframework.beans.factory.annotation.Autowired;
import
org.springframework.boot.context.properties.EnableConfigurationProperties;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;
import redis.clients.jedis.Jedis;

/**
 * @Description: Redis配置类
 * @author: yp
 */
@Configuration
@EnableConfigurationProperties(value = {RedisProperties.class}) //在
spring.factories只配置了RedisAutoConfiguration, 需要把RedisProperties一起给加载
public class RedisAutoConfiguration {


    // 把jedis加载到Spring容器里面
    /**
     * @Bean
     * 1.把方法的返回值注册到Spring容器里面
     * 2.自动的从Spring容器里面找到对应的类型给方法的参数进行注入
     */
    @Bean
    public Jedis jedis(RedisProperties redisProperties){
        return new
Jedis(redisProperties.getHost(),redisProperties.getPort());
    }



}
```

  - RedisProperties

```java
package com.itheima.redis.autoconfigure;

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

/**
 * @Description:
 * @author: yp
 */
@Component
@ConfigurationProperties(prefix = "redis")
public class RedisProperties {

    private  String host;
    private  int port;
    public String getHost() {
        return host;
    }

    public void setHost(String host) {
        this.host = host;
    }

    public int getPort() {
        return port;
    }

    public void setPort(int port) {
        this.port = port;
    }
}
```

- 创建META-INF/spring.factories

```
# Auto Configure
org.springframework.boot.autoconfigure.EnableAutoConfiguration=\
com.itheima.redis.autoconfigure.RedisAutoConfiguration
```

- 在测试模块中引入自定义的 redis-starter 依赖，测试获取Jedis 的Bean，操作 redis
  - pom

```xml
<dependency>
    <groupId>com.itheima</groupId>
    <artifactId>redis-spring-boot-starter</artifactId>
    <version>1.0-SNAPSHOT</version>
</dependency>
```

  - 配置文件

```yaml
redis:
  host: 127.0.0.1
  port: 6379
```

  - Java代码

```java
@EnableUser
public class EnableApplication {

    public static void main(String[] args) {
        ConfigurableApplicationContext context =
SpringApplication.run(EnableApplication.class, args);

        Jedis jedis = (Jedis) context.getBean("jedis");
        System.out.println(jedis);


    }
}
```

4.小结

第三章-SpringBoot的监控【了解】

知识点-Actuator【了解】

1.目标

　我们在使用的项目的时候，想知道相关项目的一些参数和调用状态，而SpringBoot自带监控功能Actuator，可以帮助实现对程序内部运行情况监控，比如监控状况、Bean加载情况、配置属性、日志信息等。

- [ ] 了解Actuator的使用

2.路径

1. 什么是Actuator
2. Actuator的使用
3. 监控路径列表说明

3.讲解

3.1 什么是Actuator

　Actuator是springboot自带的组件可以用来进行监控，Bean加载情况、环境变量、日志信息、线程信息等等，使用简单。

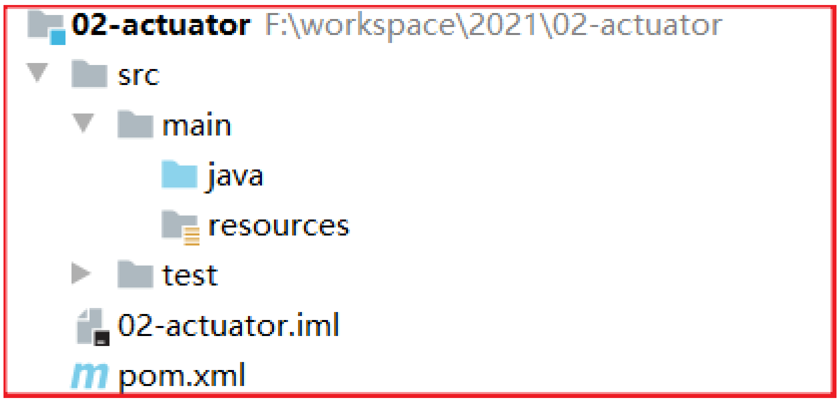
3.2Actuator的使用

3.2.1步骤

1. 创建springboot工程
2. 添加Actuator的起步依赖
3. 配置开启端点和相关配置项
4. 创建启动类
5. 通过端口路径查看信息 http://localhost:端口/路径

3.2.2实现

- 创建springboot工程



```
02-actuator F:\workspace\2021\02-actuator
  src
    main
      java
      resources
    test
  02-actuator.iml
  pom.xml
```

- 添加Actuator的起步依赖

```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
http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <groupId>com.itheima</groupId>
    <artifactId>02-actuator</artifactId>
    <version>1.0-SNAPSHOT</version>

    <parent>
        <artifactId>spring-boot-starter-parent</artifactId>
        <groupId>org.springframework.boot</groupId>
        <version>2.1.0.RELEASE</version>
    </parent>

    <properties>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
        <maven.compiler.source>1.8</maven.compiler.source>
        <maven.compiler.target>1.8</maven.compiler.target>
    </properties>

    <dependencies>
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-web</artifactId>
        </dependency>

        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-test</artifactId>
            <scope>test</scope>
        </dependency>

        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-actuator</artifactId>
        </dependency>
    </dependencies>
    <build>
        <plugins>
            <plugin>
                <groupId>org.springframework.boot</groupId>
                <artifactId>spring-boot-maven-plugin</artifactId>
            </plugin>
        </plugins>
    </build>


</project>
```

- 配置开启端点和相关配置项application.properties

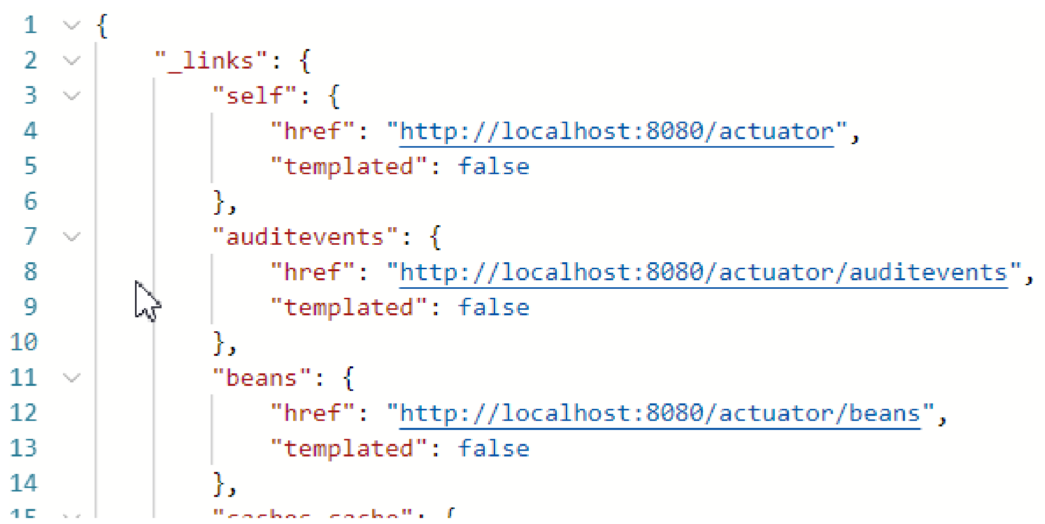
```
server.port=8080
# 配置健康端点开启所有详情信息
management.endpoint.health.show-details=always
# 设置开放所有web相关的端点信息
management.endpoints.web.exposure.include=*
```

- 创建启动类

```
package com.itheima.actuator;

import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;

/**
 * @Description:
 * @author: yp
 */
@SpringBootApplication
public class ActuatorApplication {

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

}
```

- 通过端口路径查看信息 http://localhost:端口/路径

在浏览器输入 地址：`http://localhost:8080/actuator`



```
{
    "_links": {
        "self": {
            "href": "http://localhost:8080/actuator",
            "templated": false
        },
        "auditevents": {
            "href": "http://localhost:8080/actuator/auditevents",
            "templated": false
        },
        "beans": {
            "href": "http://localhost:8080/actuator/beans",
            "templated": false
        },
        "caches-cache": {
```

显示如上的信息，就可以看到相关的路径，这些路径分表代表不同的信息的含义。

3.3 监控路径列表说明

以下展示部分列表

路径	**描述**
/beans	描述应用程序上下文里全部的Bean，以及它们的关系
/env	获取全部环境属性
/env/{name}	根据名称获取特定的环境属性值
/health	报告应用程序的健康指标，这些值由HealthIndicator的实现类提供
/info	获取应用程序的定制信息，这些信息由info打头的属性提供
/mappings	描述全部的URI路径，以及它们和控制器(包含Actuator端点)的映射关系
/metrics	报告各种应用程序度量信息，比如内存用量和HTTP请求计数
/metrics/{name}	报告指定名称的应用程序度量值
/trace	提供基本的HTTP请求跟踪信息(时间戳、HTTP头等)

知识点-SpringBoot admin【了解】

1.目标

使用actuator使用起来比较费劲，没有数据直观感受。我们可以使用SpringBoot admin。

- [ ] 了解SpringBoot admin的使用

2.路径

1. SpringBoot admin的介绍
2. SpringBoot admin角色说明
3. SpringBoot admin的使用
4. 测试

3.讲解

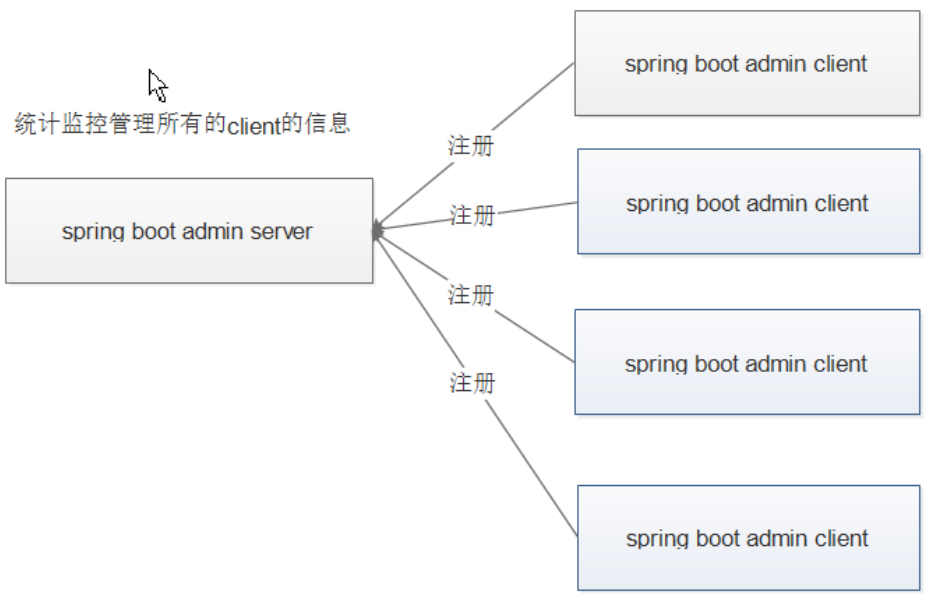
3.1 介绍

- Spring Boot Admin是一个开源社区项目，用于管理和监控SpringBoot应用程序。
- Spring Boot Admin 有两个角色，客户端(Client)和服务端(Server)。
- 应用程序作为Spring Boot Admin Client向为Spring Boot Admin Server注册
- Spring Boot Admin Server 通过图形化界面方式展示Spring Boot Admin Client的监控信息。

3.2角色说明

spring boot admin的架构角色

- admin server 用于收集统计所有相关client的注册过来的信息进行汇总展示
- admin client 每一个springboot工程都是一个client 相关的功能展示需要汇总到注册汇总到server



3.3使用

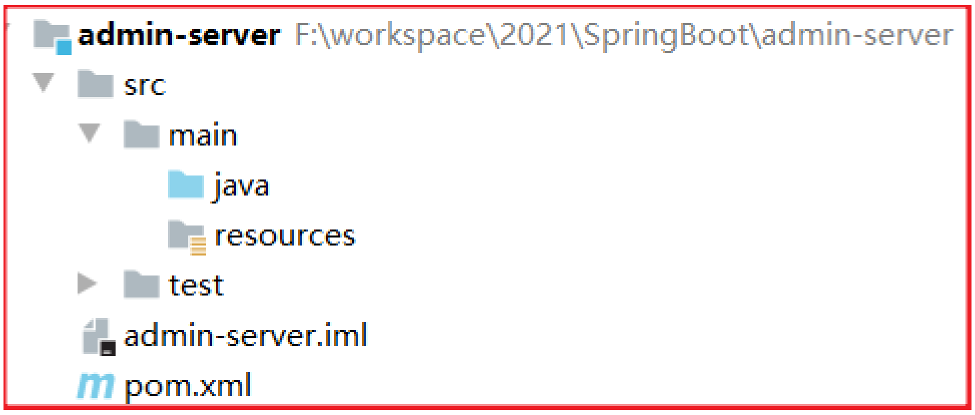
3.3.1admin-server

步骤

1. 创建SpringBoot工程admin-server
2. 添加spring-boot-admin-starter-server依赖
3. 创建启动类, 开启@EnableAdminServer

实现

- 创建SpringBoot工程admin-server



- 添加spring-boot-admin-starter-server依赖

```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
http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <groupId>com.itheima</groupId>
    <artifactId>admin-server</artifactId>
    <version>1.0-SNAPSHOT</version>

    <parent>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-parent</artifactId>
        <version>2.1.0.RELEASE</version>
    </parent>

    <properties>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
        <maven.compiler.source>1.8</maven.compiler.source>
        <maven.compiler.target>1.8</maven.compiler.target>
        <spring-boot-admin.version>2.1.0</spring-boot-admin.version>
    </properties>

    <dependencies>
        <dependency>
            <groupId>de.codecentric</groupId>
            <artifactId>spring-boot-admin-starter-server</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-test</artifactId>
            <scope>test</scope>
        </dependency>
    </dependencies>
    <dependencyManagement>
        <dependencies>
            <dependency>
                <groupId>de.codecentric</groupId>
                <artifactId>spring-boot-admin-dependencies</artifactId>
                <version>${spring-boot-admin.version}</version>
                <type>pom</type>
                <scope>import</scope>
            </dependency>
        </dependencies>
    </dependencyManagement>
    <build>
        <plugins>
            <plugin>
                <groupId>org.springframework.boot</groupId>
                <artifactId>spring-boot-maven-plugin</artifactId>
            </plugin>
        </plugins>
    </build>
</project>
```

- 创建启动类, 开启@EnableAdminServer

```java
package com.itheima.adminserver;

import de.codecentric.boot.admin.server.config.EnableAdminServer;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;

/**
 * @Description:
 * @author: yp
 */
@SpringBootApplication
@EnableAdminServer
public class AdminServerApplication {

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

}
```

注意: 避免端口冲突, 在 `application.properties` 修改port为9000

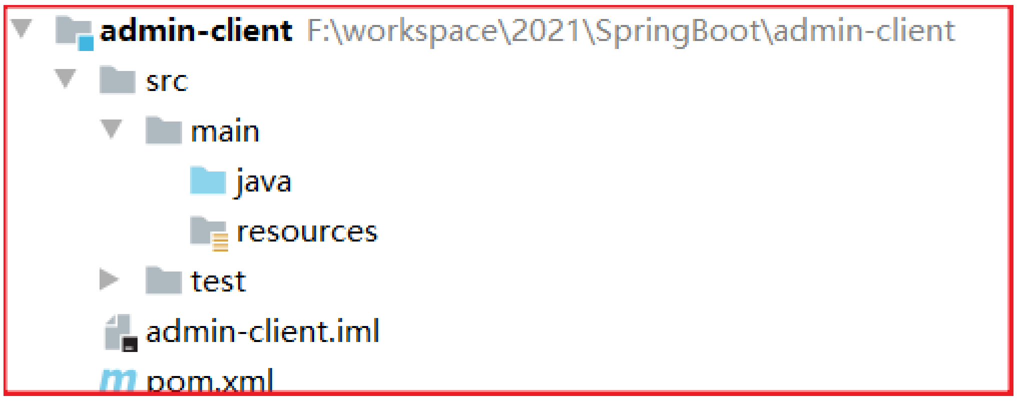
3.3.2admin client

步骤

1. 创建SpringBoot工程admin-client
2. 添加spring-boot-admin-starter-client依赖
3. 在application.properties配置admin-server
4. 创建启动类

实现

- 创建SpringBoot工程admin-client


admin-client F:\workspace\2021\SpringBoot\admin-client
src
main
java
resources
test
admin-client.iml
pom.xml

- 添加spring-boot-admin-starter-client依赖

```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
http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <groupId>com.itheima</groupId>
    <artifactId>admin-client</artifactId>
    <version>1.0-SNAPSHOT</version>

    <parent>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-parent</artifactId>
        <version>2.1.0.RELEASE</version>

    </parent>

    <properties>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
        <maven.compiler.source>1.8</maven.compiler.source>
        <maven.compiler.target>1.8</maven.compiler.target>
        <spring-boot-admin.version>2.1.0</spring-boot-admin.version>
    </properties>

    <dependencies>
        <dependency>
            <groupId>de.codecentric</groupId>
            <artifactId>spring-boot-admin-starter-client</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-test</artifactId>
            <scope>test</scope>
        </dependency>
    </dependencies>
    <dependencyManagement>
        <dependencies>
            <dependency>
                <groupId>de.codecentric</groupId>
                <artifactId>spring-boot-admin-dependencies</artifactId>
                <version>${spring-boot-admin.version}</version>
                <type>pom</type>
                <scope>import</scope>
            </dependency>
        </dependencies>
    </dependencyManagement>

    <build>
        <plugins>
            <plugin>
                <groupId>org.springframework.boot</groupId>
                <artifactId>spring-boot-maven-plugin</artifactId>
            </plugin>
        </plugins>
    </build>

</project>
```

- 在application.properties配置admin-server

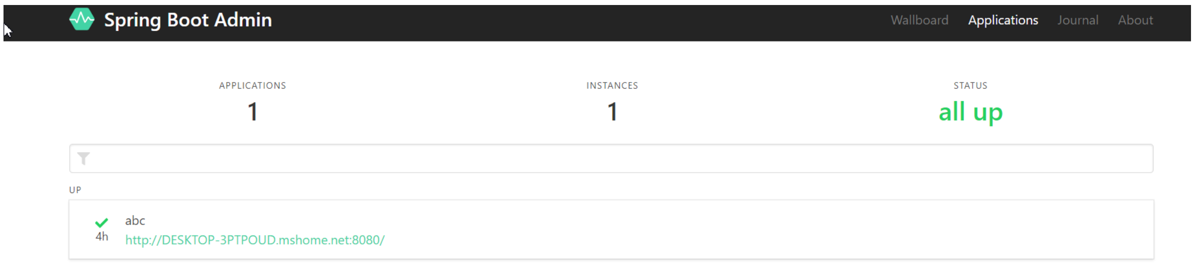
```
# 执行admin.server地址
spring.boot.admin.client.url=http://localhost:9000

management.endpoint.health.show-details=always
management.endpoints.web.exposure.include=*
```

- 创建启动类

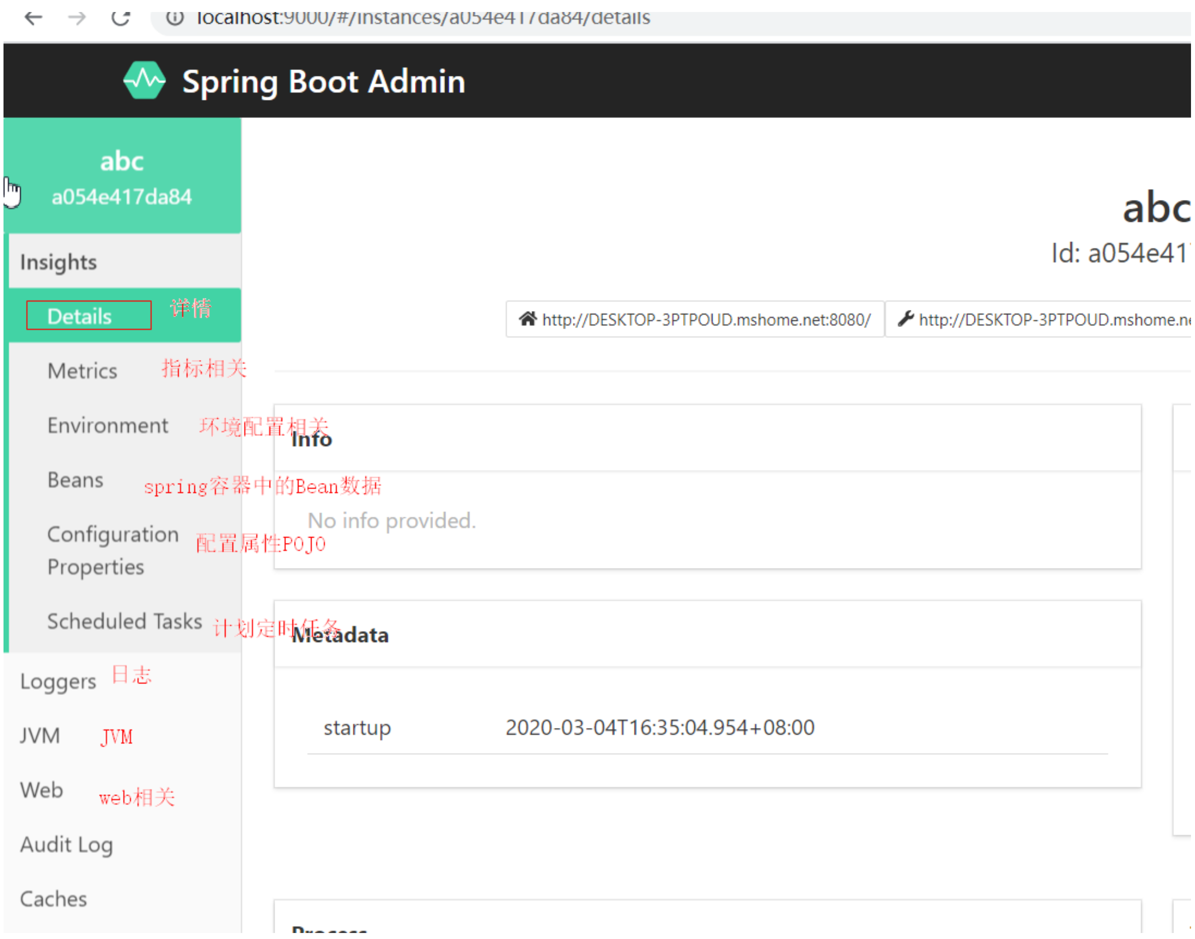
```
package com.itheima.adminclient;

import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;

/**
 * @Description:
 * @author: yp
 */
@SpringBootApplication
public class AdminClientApplication {

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

}
```

3.4 测试

启动两个系统。访问路径`<http://localhost:9000/>`



我们简单认识下：并点击相关界面链接就能看到相关的图形化展示了。



第四章-SpringBoot部署项目【掌握】

实操-springboot部署项目

1.目标

在springboot项目中，我们部署项目有两种方式：jar包直接通过java命令运行执行和war包存储在tomcat等servlet容器中执行

- [ ] 掌握SpringBoot项目打包

2.路径

1. Jar包部署
2. war包部署【了解】

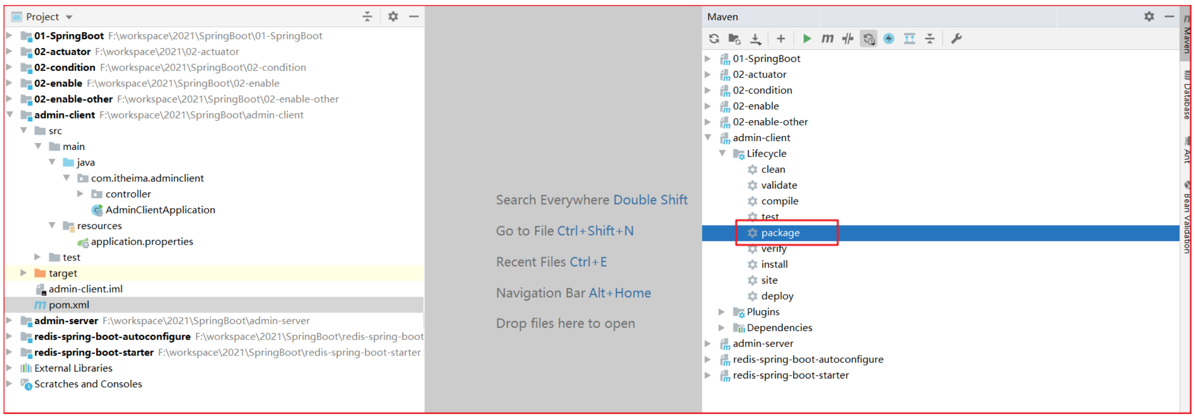
3.讲解

3.1Jar包部署

- 创建项目
- pom

```
 <build>
        <plugins>
            <plugin>
                <groupId>org.springframework.boot</groupId>
                <artifactId>spring-boot-maven-plugin</artifactId>
            </plugin>
        </plugins>
   </build>
```

- 打包

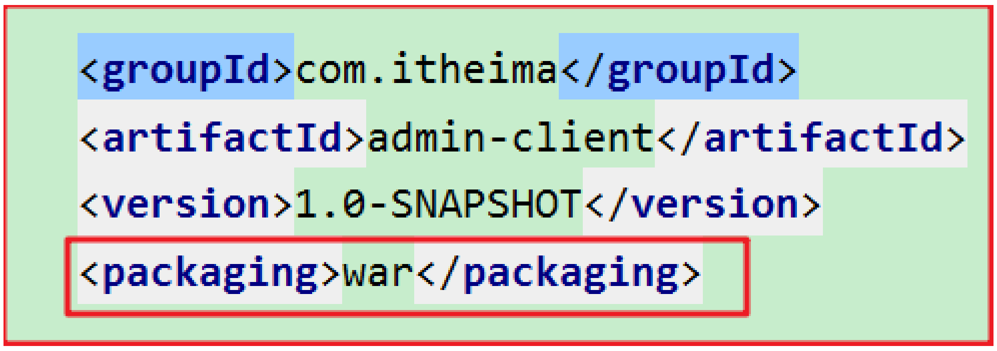

Project
01-SpringBoot F:\workspace\2021\SpringBoot\01-SpringBoot
02-actuator F:\workspace\2021\02-actuator
02-condition F:\workspace\2021\SpringBoot\02-condition
02-enable F:\workspace\2021\SpringBoot\02-enable
02-enable-other F:\workspace\2021\SpringBoot\02-enable-other
admin-client F:\workspace\2021\SpringBoot\admin-client
src
main
java
com.itheima.adminclient
controller
AdminClientApplication
resources
application.properties
test
target
admin-client.iml
pom.xml
admin-server F:\workspace\2021\SpringBoot\admin-server
redis-spring-boot-autoconfigure F:\workspace\2021\SpringBoot\redis-spring-boot
redis-spring-boot-starter F:\workspace\2021\SpringBoot\redis-spring-boot-starter
External Libraries
Scratches and Consoles
Search Everywhere Double Shift
Go to File Ctrl+Shift+N
Recent Files Ctrl+E
Navigation Bar Alt+Home
Drop files here to open
Maven
01-SpringBoot
02-actuator
02-condition
02-enable
02-enable-other
admin-client
Lifecycle
clean
validate
compile
test
package
verify
install
site
deploy
Plugins
Dependencies
admin-server
redis-spring-boot-autoconfigure
redis-spring-boot-starter
Maven
Database
Ant
Bean Validation

- 运行

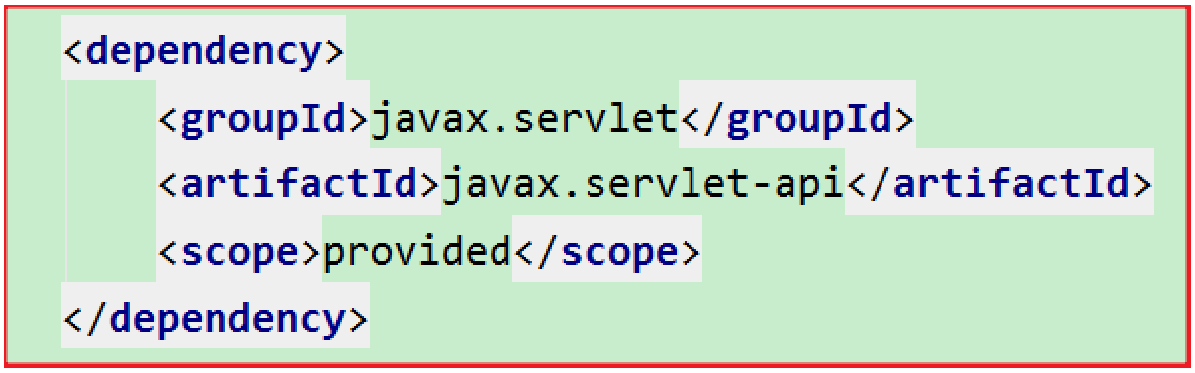
```
jar -jar xxx.jar
```

3.2war包部署【了解】

- 创建项目
- pom



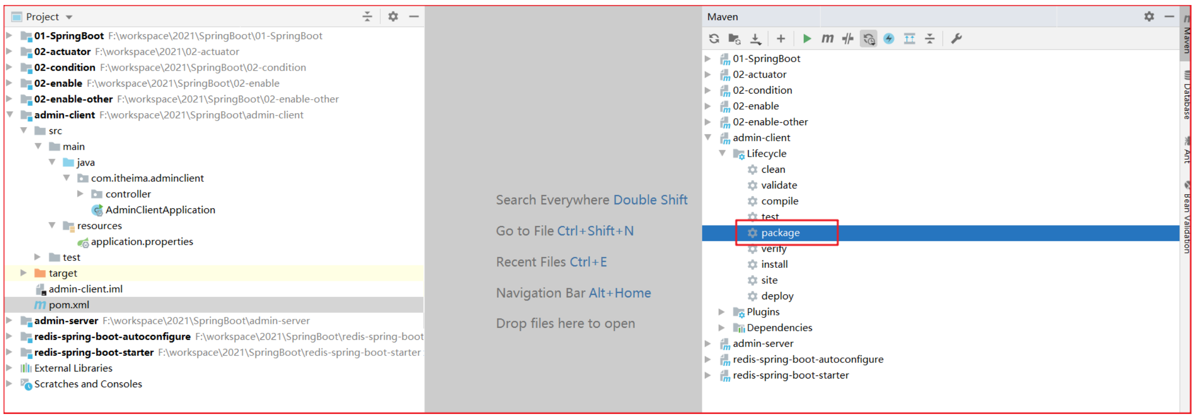
```
<groupId>com.itheima</groupId>
<artifactId>admin-client</artifactId>
<version>1.0-SNAPSHOT</version>
<packaging>war</packaging>
```



```xml
<dependency>
    <groupId>javax.servlet</groupId>
    <artifactId>javax.servlet-api</artifactId>
    <scope>provided</scope>
</dependency>
```

```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
http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <groupId>com.itheima</groupId>
    <artifactId>admin-client</artifactId>
    <version>1.0-SNAPSHOT</version>
    <packaging>war</packaging>

    <parent>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-parent</artifactId>
        <version>2.1.0.RELEASE</version>

    </parent>

    <properties>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
        <maven.compiler.source>1.8</maven.compiler.source>
        <maven.compiler.target>1.8</maven.compiler.target>
        <spring-boot-admin.version>2.1.0</spring-boot-admin.version>
    </properties>

    <dependencies>
        <dependency>
            <groupId>de.codecentric</groupId>
            <artifactId>spring-boot-admin-starter-client</artifactId>
        </dependency>

        <dependency>
            <groupId>javax.servlet</groupId>
            <artifactId>javax.servlet-api</artifactId>
            <scope>provided</scope>
        </dependency>

        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-web</artifactId>
            <exclusions>
                <exclusion>
                    <groupId>org.springframework.boot</groupId>
                    <artifactId>spring-boot-starter-tomcat</artifactId>
                </exclusion>
            </exclusions>
        </dependency>

    </dependencies>

    <dependencyManagement>
        <dependencies>
            <dependency>
                <groupId>de.codecentric</groupId>
                <artifactId>spring-boot-admin-dependencies</artifactId>
                <version>${spring-boot-admin.version}</version>
                <type>pom</type>
                <scope>import</scope>
            </dependency>
        </dependencies>
    </dependencyManagement>

    <build>
        <finalName>demo</finalName>
        <plugins>
            <plugin>
                <groupId>org.springframework.boot</groupId>
                <artifactId>spring-boot-maven-plugin</artifactId>
            </plugin>
        </plugins>
    </build>

</project>
```

- 打包


Project
01-SpringBoot F:\workspace\2021\SpringBoot\01-SpringBoot
02-actuator F:\workspace\2021\02-actuator
02-condition F:\workspace\2021\SpringBoot\02-condition
02-enable F:\workspace\2021\SpringBoot\02-enable
02-enable-other F:\workspace\2021\SpringBoot\02-enable-other
admin-client F:\workspace\2021\SpringBoot\admin-client
src
main
java
com.itheima.adminclient
controller
AdminClientApplication
resources
application.properties
test
target
admin-client.iml
pom.xml
admin-server F:\workspace\2021\SpringBoot\admin-server
redis-spring-boot-autoconfigure F:\workspace\2021\SpringBoot\redis-spring-boot
redis-spring-boot-starter F:\workspace\2021\SpringBoot\redis-spring-boot-starter
External Libraries
Scratches and Consoles
Search Everywhere Double Shift
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02-enable-other
admin-client
Lifecycle
clean
validate
compile
test
package
verify
install
site
deploy
Plugins
Dependencies
admin-server
redis-spring-boot-autoconfigure
redis-spring-boot-starter

- 运行 发布到tomcat

4.小结

工作里面项目做完,打包,上线。打包的方式:

1. 非SpringBoot项目， 打war包 把war发布到tomcat里面
2. SpringBoot项目，打jar包， 把jar上传到服务器（Linux， 装jdk）， 直接运行jar包
3. SpringBoot项目，打jar包， 把jar包打成docker镜像， 直接通过docker镜像创建容器运行（docker课程， Jenkins课程）

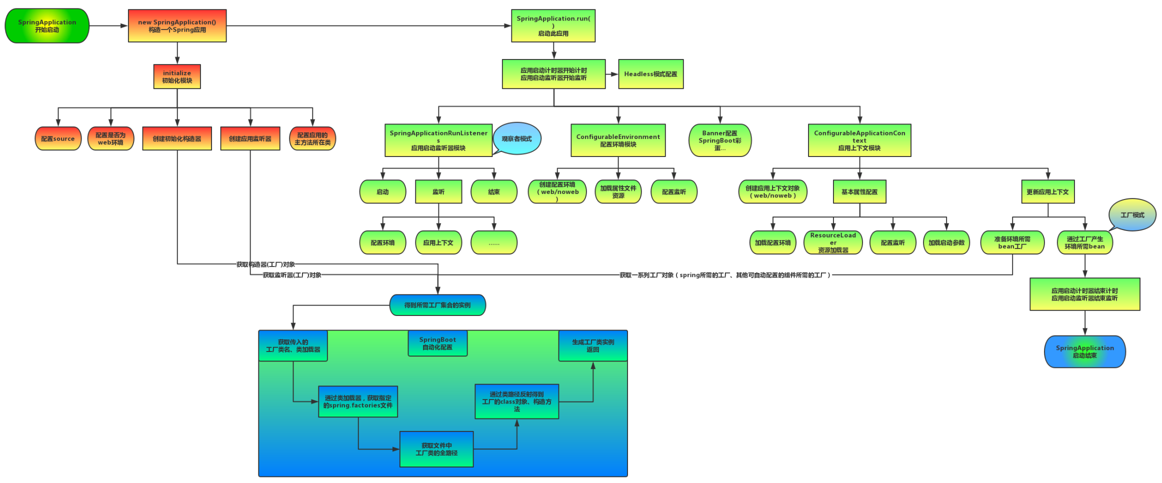
扩展-Run流程

1.看源码

- 凭感觉
    - 方法名
    - 找入口
- 不要全部看
- 方式
    - 加断点
    - 不加断点， 直接进去

- springboot初始化的Run流程的链接地址：

https://www.processon.com/view/link/59812124e4b0de2518b32b6e



SpringApplication 开始启动
new SpringApplication() 构造一个Spring应用
initialize 初始化模块
配置source
配置是否为web环境
创建初始化构造器
创建应用监听器
配置应用的主方法所在类
SpringApplication.run( ) 启动此应用
应用启动计时器开始计时 应用启动监听器开始监听
Headless模式配置
SpringApplicationRunListeners 应用启动监听器模块
观察者模式
启动
监听
结束
配置环境
应用上下文
……
ConfigurableEnvironment 配置环境模块
创建配置环境 (web/noweb)
加载属性文件资源
配置监听
Banner配置 SpringBoot彩蛋...
ConfigurableApplicationContext 应用上下文模块
创建应用上下文对象 (web/noweb)
基本属性配置
加载配置环境
ResourceLoader 资源加载器
配置监听
加载启动参数
更新应用上下文
准备环境所需bean工厂
通过工厂产生环境所需bean
工厂模式
应用启动计时器结束计时 应用启动监听器结束监听
SpringApplication 启动结束
获取构造器(工厂)对象
获取监听器(工厂)对象
获取一系列工厂对象（spring所需的工厂、其他可自动配置的组件所需的工厂）
得到所需工厂集合的实例
获取传入的 工厂类名、类加载器
SpringBoot 自动化配置
生成工厂类实例 返回
通过类加载器，获取指定的spring.factories文件
获取文件中 工厂类的全路径
通过类路径反射得到 工厂的class对象、构造方法

> 明天的演讲内容: @EnableAutoConfiguration 加载过程

顺序

1.@EnableAutoConfiguration

- 结合笔记总结出自己的话语

2.加载第三方的Bean

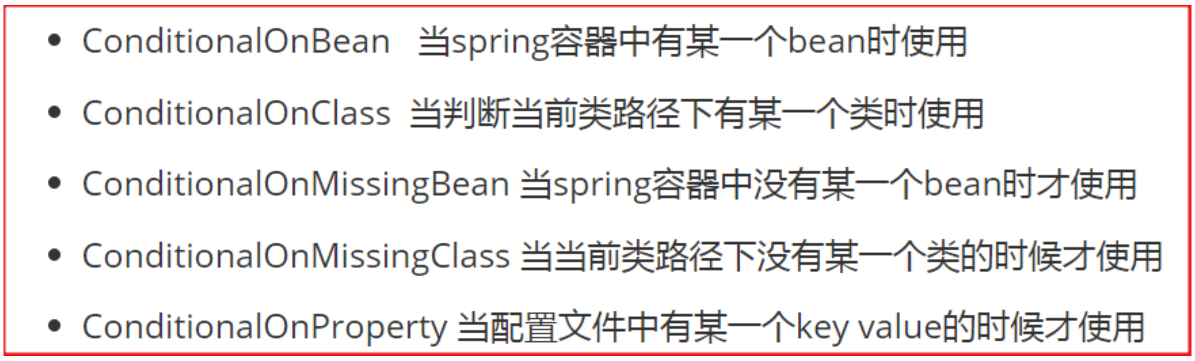
- 重点掌握@Import （配置类），其它的也要练习
- 包扫描

3.昨天东西没有掌握好，敲昨天

4.建议敲自定义starter

5.知道Condition相关注解作用

- 代码还好, 不是重点



- ConditionalOnBean 当spring容器中有某一个bean时使用
- ConditionalOnClass 当判断当前类路径下有某一个类时使用
- ConditionalOnMissingBean 当spring容器中没有某一个bean时才使用
- ConditionalOnMissingClass 当当前类路径下没有某一个类的时候才使用
- ConditionalOnProperty 当配置文件中有某一个key value的时候才使用

6.预习