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02: Simple Spring Boot Restful Web Service Tutorial

Posted on November 21, 2015 by Arulkumaran Kumaraswamipillai

This tutorial extends Simple Spring Boot Tutorial in 8 steps.

Step 1: The **pom.xml** file that was created in the previous Spring boot tutorial needs to be changed from "spring-boot-starter-actuator" to "**spring-boot-starter-web**"

```

<project xmlns="http://maven.apache.org/POM/4.0.
    xsi:schemaLocation="http://maven.apache.org/
    <modelVersion>4.0.0</modelVersion>
    <groupId>com.mytutorial</groupId>
    <artifactId>simple-spring-boot</artifactId>
    <packaging>jar</packaging>
    <version>1.0-SNAPSHOT</version>
    <name>simple-spring-boot</name>
    <url>http://maven.apache.org</url>

    <parent>
        <groupId>org.springframework.boot</group
        <artifactId>spring-boot-starter-parent</
        <version>1.3.0.RELEASE</version>
    </parent>

    <dependencies>
        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <scope>test</scope>
```

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    ⊞ Spring JavaConf
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    03: ♥♦ Spring DI
    04 ♦ 17 Spring b

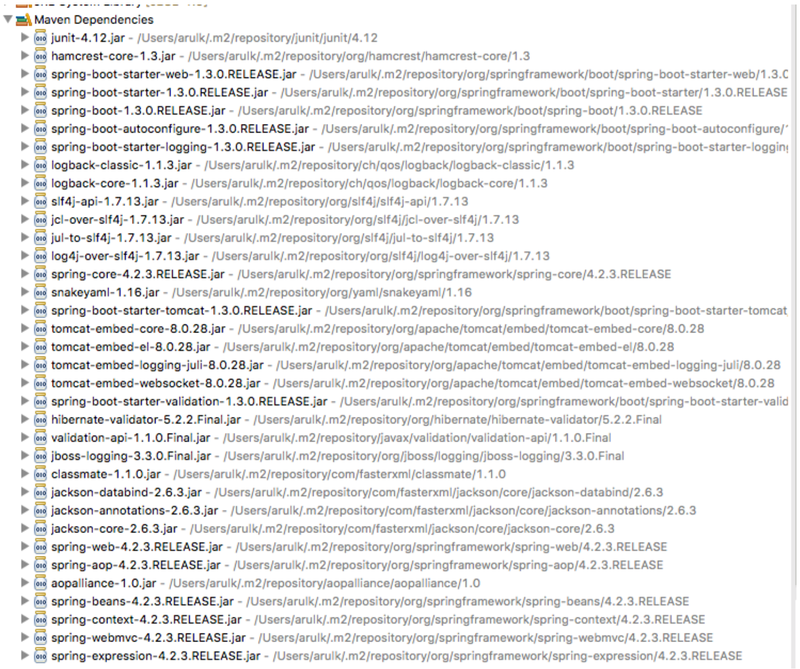
```
        </dependency>

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

    <build>
        <plugins>
            <plugin>
                <!-- Build an executable JAR -->
                <groupId>org.apache.maven.plugin
                <artifactId>maven-jar-plugin</ar
                <configuration>
                    <archive>
                        <manifest>
                            <addClasspath>true</
                            <classpathPrefix>lib
                            <mainClass>com.mytut
                        </manifest>
                    </archive>
                </configuration>
            </plugin>
            <plugin>
                <groupId>org.springframework.boo
                <artifactId>spring-boot-maven-pl
                </plugin>
        </plugins>
    </build>

</project>

```



```
▼ Maven Dependencies
  ▶ junit-4.12.jar - /Users/arulk/.m2/repository/junit/junit/4.12
  ▶ hamcrest-core-1.3.jar - /Users/arulk/.m2/repository/org/hamcrest/hamcrest-core/1.3
  ▶ spring-boot-starter-web-1.3.0.RELEASE.jar - /Users/arulk/.m2/repository/org/springframework/boot/spring-boot-starter-web/1.3.C
  ▶ spring-boot-starter-1.3.0.RELEASE.jar - /Users/arulk/.m2/repository/org/springframework/boot/spring-boot-starter/1.3.0.RELEASE
  ▶ spring-boot-1.3.0.RELEASE.jar - /Users/arulk/.m2/repository/org/springframework/boot/spring-boot/1.3.0.RELEASE
  ▶ spring-boot-autoconfigure-1.3.0.RELEASE.jar - /Users/arulk/.m2/repository/org/springframework/boot/spring-boot-autoconfigure/
  ▶ spring-boot-starter-logging-1.3.0.RELEASE.jar - /Users/arulk/.m2/repository/org/springframework/boot/spring-boot-starter-loggin
  ▶ logback-classic-1.1.3.jar - /Users/arulk/.m2/repository/ch/qos/logback/logback-classic/1.1.3
  ▶ logback-core-1.1.3.jar - /Users/arulk/.m2/repository/ch/qos/logback/logback-core/1.1.3
  ▶ slf4j-api-1.7.13.jar - /Users/arulk/.m2/repository/org/slf4j/slf4j-api/1.7.13
  ▶ jcl-over-slf4j-1.7.13.jar - /Users/arulk/.m2/repository/org/slf4j/jcl-over-slf4j/1.7.13
  ▶ jul-to-slf4j-1.7.13.jar - /Users/arulk/.m2/repository/org/slf4j/jul-to-slf4j/1.7.13
  ▶ log4j-over-slf4j-1.7.13.jar - /Users/arulk/.m2/repository/org/slf4j/log4j-over-slf4j/1.7.13
  ▶ spring-core-4.2.3.RELEASE.jar - /Users/arulk/.m2/repository/org/springframework/spring-core/4.2.3.RELEASE
  ▶ snakeyaml-1.16.jar - /Users/arulk/.m2/repository/org/yaml/snakeyaml/1.16
  ▶ spring-boot-starter-tomcat-1.3.0.RELEASE.jar - /Users/arulk/.m2/repository/org/springframework/boot/spring-boot-starter-tomcat
  ▶ tomcat-embed-core-8.0.28.jar - /Users/arulk/.m2/repository/org/apache/tomcat/embed/tomcat-embed-core/8.0.28
  ▶ tomcat-embed-el-8.0.28.jar - /Users/arulk/.m2/repository/org/apache/tomcat/embed/tomcat-embed-el/8.0.28
  ▶ tomcat-embed-logging-juli-8.0.28.jar - /Users/arulk/.m2/repository/org/apache/tomcat/embed/tomcat-embed-logging-juli/8.0.28
  ▶ tomcat-embed-websocket-8.0.28.jar - /Users/arulk/.m2/repository/org/apache/tomcat/embed/tomcat-embed-websocket/8.0.28
  ▶ spring-boot-starter-validation-1.3.0.RELEASE.jar - /Users/arulk/.m2/repository/org/springframework/boot/spring-boot-starter-valid
  ▶ hibernate-validator-5.2.2.Final.jar - /Users/arulk/.m2/repository/org/hibernate/hibernate-validator/5.2.2.Final
  ▶ validation-api-1.1.0.Final.jar - /Users/arulk/.m2/repository/javax/validation/validation-api/1.1.0.Final
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  ▶ classmate-1.1.0.jar - /Users/arulk/.m2/repository/com/fasterxml/classmate/1.1.0
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  ▶ spring-aop-4.2.3.RELEASE.jar - /Users/arulk/.m2/repository/org/springframework/spring-aop/4.2.3.RELEASE
  ▶ aopalliance-1.0.jar - /Users/arulk/.m2/repository/aopalliance/aopalliance/1.0
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  ▶ spring-context-4.2.3.RELEASE.jar - /Users/arulk/.m2/repository/org/springframework/spring-context/4.2.3.RELEASE
  ▶ spring-webmvc-4.2.3.RELEASE.jar - /Users/arulk/.m2/repository/org/springframework/spring-webmvc/4.2.3.RELEASE
  ▶ spring-expression-4.2.3.RELEASE.jar - /Users/arulk/.m2/repository/org/springframework/spring-expression/4.2.3.RELEASE
```

Spring-boot-starter-web brought in all these dependency jars

Step 2: Add additional logic to the “**App.java**” to turn it into a controller to be invoked as a RESTful web service.

05: ♦ 9 Spring B
06: ♥ Debugging
07: Debugging S
Spring loading p
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⊞ Transaction Managen

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```java

package com.mytutorial;

import org.springframework.boot.SpringApplicatio
import org.springframework.boot.autoconfigure.En
import org.springframework.context.annotation.Co
import org.springframework.context.annotation.Co
import org.springframework.stereotype.Controller
import org.springframework.web.bind.annotation.R
import org.springframework.web.bind.annotation.R


@Configuration
@EnableAutoConfiguration
@ComponentScan
@Controller
public class App
{

    @ResponseBody
    @RequestMapping("/")
    public String hello() {
        return "Hello from RESTful Web Service";
    }

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

    }
}

```

Step 3: Ready to build the “jar” now.

```

c:/projects/simple-spring-boot> mvn package

```

The “target” directory will have the jar file “simple-spring-boot-1.0-SNAPSHOT.jar”

Step 4: Deploy the very simple Spring boot application & run as shown below

right-click on the jar, and then select “properties” to get the full file path of the jar file.

“c:/projects/simple-spring-boot/target/simple-spring-boot-1.0-SNAPSHOT.jar”

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⊞ Writing Code Home A
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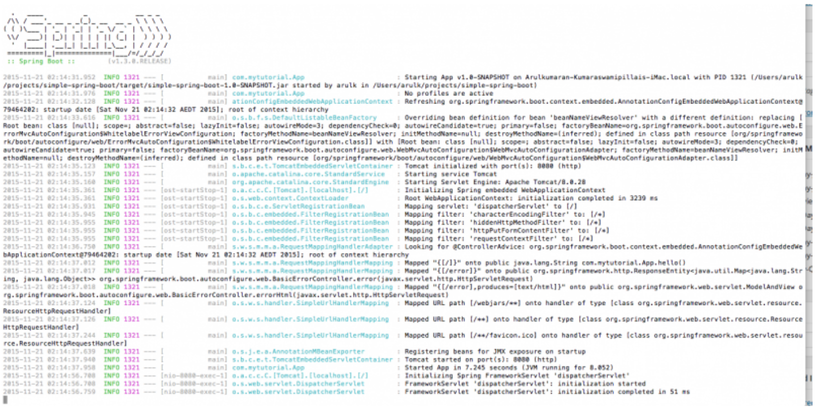
```
c:/projects/simple-spring-boot>java -jar c:/proje
```

This will deploy the “simple-spring-boot-1.0-SNAPSHOT.jar” to & start the Tomcat server. The default port is 8080.



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 :: Spring Boot ::        (v1.3.0.RELEASE)

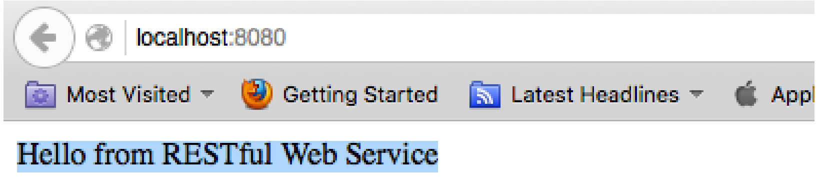
2015-11-21 02:14:31.952  INFO 1321 --- [           main] com.mytutorial.App                       : Starting App v1.0-SNAPSHOT on Arulkumaran-Kumaraswamipillais-iMac.local with PID 1321 (/Users/arulk
/projects/simple-spring-boot/target/simple-spring-boot-1.0-SNAPSHOT.jar started by arulk in /Users/arulk/projects/simple-spring-boot)
2015-11-21 02:14:31.976  INFO 1321 --- [           main] com.mytutorial.App                       : No profiles are active
2015-11-21 02:14:32.128  INFO 1321 --- [           main] ationConfigEmbeddedWebApplicationContext : Refreshing org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWebApplicationContext@
79464202: startup date [Sat Nov 21 02:14:32 AEDT 2015]; root of context hierarchy
2015-11-21 02:14:33.616  INFO 1321 --- [           main] o.s.b.f.s.DefaultListableBeanFactory     : Overriding bean definition for bean 'beanNameViewResolver' with a different definition: replacing [
Root bean: class [null]; scope=; abstract=false; lazyInit=false; autowireMode=3; dependencyCheck=0; autowireCandidate=true; primary=false; factoryBeanName=org.springframework.boot.autoconfigure.web.E
rrorMvcAutoConfiguration$WhitelabelErrorViewConfiguration; factoryMethodName=beanNameViewResolver; initMethodName=null; destroyMethodName=(inferred); defined in class path resource [org/springframewo
rk/boot/autoconfigure/web/ErrorMvcAutoConfiguration$WhitelabelErrorViewConfiguration.class]] with [Root bean: class [null]; scope=; abstract=false; lazyInit=false; autowireMode=3; dependencyCheck=0;
autowireCandidate=true; primary=false; factoryBeanName=org.springframework.boot.autoconfigure.web.WebMvcAutoConfiguration$WebMvcAutoConfigurationAdapter; factoryMethodName=beanNameViewResolver; initM
ethodName=null; destroyMethodName=(inferred); defined in class path resource [org/springframework/boot/autoconfigure/web/WebMvcAutoConfiguration$WebMvcAutoConfigurationAdapter.class]]
2015-11-21 02:14:35.123  INFO 1321 --- [           main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat initialized with port(s): 8080 (http)
2015-11-21 02:14:35.157  INFO 1321 --- [           main] o.apache.catalina.core.StandardService   : Starting service Tomcat
2015-11-21 02:14:35.160  INFO 1321 --- [           main] org.apache.catalina.core.StandardEngine  : Starting Servlet Engine: Apache Tomcat/8.0.28
2015-11-21 02:14:35.361  INFO 1321 --- [ost-startStop-1] o.a.c.c.C.[Tomcat].[localhost].[/]       : Initializing Spring embedded WebApplicationContext
2015-11-21 02:14:35.361  INFO 1321 --- [ost-startStop-1] o.s.web.context.ContextLoader            : Root WebApplicationContext: initialization completed in 3239 ms
2015-11-21 02:14:35.931  INFO 1321 --- [ost-startStop-1] o.s.b.c.e.ServletRegistrationBean        : Mapping servlet: 'dispatcherServlet' to [/]
2015-11-21 02:14:35.945  INFO 1321 --- [ost-startStop-1] o.s.b.c.embedded.FilterRegistrationBean  : Mapping filter: 'characterEncodingFilter' to: [/*]
2015-11-21 02:14:35.955  INFO 1321 --- [ost-startStop-1] o.s.b.c.embedded.FilterRegistrationBean  : Mapping filter: 'hiddenHttpMethodFilter' to: [/*]
2015-11-21 02:14:35.955  INFO 1321 --- [ost-startStop-1] o.s.b.c.embedded.FilterRegistrationBean  : Mapping filter: 'httpPutFormContentFilter' to: [/*]
2015-11-21 02:14:35.955  INFO 1321 --- [ost-startStop-1] o.s.b.c.embedded.FilterRegistrationBean  : Mapping filter: 'requestContextFilter' to: [/*]
2015-11-21 02:14:36.750  INFO 1321 --- [           main] s.w.s.m.m.a.RequestMappingHandlerAdapter : Looking for @ControllerAdvice: org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWe
bApplicationContext@79464202: startup date [Sat Nov 21 02:14:32 AEDT 2015]; root of context hierarchy
2015-11-21 02:14:37.012  INFO 1321 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/]}" onto public java.lang.String com.mytutorial.App.hello()
2015-11-21 02:14:37.017  INFO 1321 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error]}" onto public org.springframework.http.ResponseEntity<java.util.Map<java.lang.Str
ing, java.lang.Object>> org.springframework.boot.autoconfigure.web.BasicErrorController.error(javax.servlet.http.HttpServletRequest)
2015-11-21 02:14:37.018  INFO 1321 --- [           main] s.w.s.m.m.a.RequestMappingHandlerMapping : Mapped "{[/error],produces=[text/html]}" onto public org.springframework.web.servlet.ModelAndView o
rg.springframework.boot.autoconfigure.web.BasicErrorController.errorHtml(javax.servlet.http.HttpServletRequest)
2015-11-21 02:14:37.124  INFO 1321 --- [           main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/webjars/**] onto handler of type [class org.springframework.web.servlet.resource.
ResourceHttpRequestHandler]
2015-11-21 02:14:37.126  INFO 1321 --- [           main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/**] onto handler of type [class org.springframework.web.servlet.resource.Resource
HttpRequestHandler]
2015-11-21 02:14:37.244  INFO 1321 --- [           main] o.s.w.s.handler.SimpleUrlHandlerMapping  : Mapped URL path [/**/favicon.ico] onto handler of type [class org.springframework.web.servlet.resou
rce.ResourceHttpRequestHandler]
2015-11-21 02:14:37.639  INFO 1321 --- [           main] o.s.j.e.a.AnnotationMBeanExporter        : Registering beans for JMX exposure on startup
2015-11-21 02:14:37.940  INFO 1321 --- [           main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat started on port(s): 8080 (http)
2015-11-21 02:14:37.958  INFO 1321 --- [           main] com.mytutorial.App                       : Started App in 7.245 seconds (JVM running for 8.052)
2015-11-21 02:14:56.708  INFO 1321 --- [nio-8080-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]       : Initializing Spring FrameworkServlet 'dispatcherServlet'
2015-11-21 02:14:56.708  INFO 1321 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet        : FrameworkServlet 'dispatcherServlet': initialization started
2015-11-21 02:14:56.759  INFO 1321 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet        : FrameworkServlet 'dispatcherServlet': initialization completed in 51 ms
```

Spring boot embedded Tomcat server log

Now, open a browser and type “**http://localhost/8080**”

Output:

Hello from RESTful Web Service



Hello from RESTful Web Service

Invoke the RESTful service from a browser

What if you want to deploy as a war file?

NOTE: The packaging is “war”. Also, the “spring-boot-starter-tomcat” is added as “provided”.

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```
<project xmlns="http://maven.apache.org/POM/4.0.
    xsi:schemaLocation="http://maven.apache.org/
    <modelVersion>4.0.0</modelVersion>
    <groupId>com.mytutorial</groupId>
    <artifactId>simple-spring-boot</artifactId>
    <packaging>war</packaging>
    <version>1.0-SNAPSHOT</version>
    <name>simple-spring-boot</name>
    <url>http://maven.apache.org</url>

    <parent>
        <groupId>org.springframework.boot</group
        <artifactId>spring-boot-starter-parent</
        <version>1.3.0.RELEASE</version>
    </parent>

    <dependencies>
        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <scope>test</scope>
        </dependency>

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

        <dependency>
            <groupId>org.springframework.boot</g
            <artifactId>spring-boot-starter-tomc
            <scope>provided</scope>
        </dependency>
    </dependencies>

    <build>
        <plugins>
            <plugin>
                <!-- Build an executable jar -->
                <groupId>org.apache.maven.plugin
                <artifactId>maven-jar-plugin</ar
                <configuration>
                    <archive>
                        <manifest>
                            <addClasspath>true</
                            <classpathPrefix>lib
                            <mainClass>com.mytut
                        </manifest>
                    </archive>
                </configuration>
            </plugin>
            <plugin>
                <groupId>org.springframework.boo
                <artifactId>spring-boot-maven-pl
            </plugin>
        </plugins>
    </build>
</project>


```

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