

A Developer Diary

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April 4, 2016 By [Abhisek Jana](#)

How to Create Spring Boot Application Step by Step





Spring Boot had been built for Rapid Application Development. In this tutorial we will learn How to Create Spring Boot Application using some easy examples. We will also focus on How to deploy spring boot application in different application servers.

Here are the following topics that we will cover in this series:

1. Create Spring Boot Application using
 - start.spring.io
 - Eclipse STS
 - IntelliJ IDEA STS
2. Run Spring Boot Application using
 - Java CLI
 - Eclipse/IntelliJ IDEA
3. Create a Basic Spring Boot application using REST
4. How to use Spring Actuator
5. Deploy Spring Boot application in
 - IBM Liberty Profile
 - IBM Application Server 8.5

If you need an introduction of Spring Boot please find my previous post below.



INTRODUCTION

An Introduction to Spring Boot

Spring has been a great framework for years however it had few drawbacks. In this tutorial, An Introduction to Spring Boot we will see how Spring Boot has not only addressed the drawbacks but also supports modern software architecture. Spring Boot is around for sometime now, I had started working using spring boot 1.5 years ...
Continue reading



A Developer Diary

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Create Spring Boot Application using start.spring.io

The best way of bootstrapping Spring Boot application is by using Spring Initializr. Let's first start by opening <http://start.spring.io>. As you already know, you can use either Maven or Gradle to build, however we will use Maven in this tutorial. Click on **Switch to the full Version** and you will be able to see the below screen.

Software Needed

- JDK 1.8 (You can use 1.7 or 1.6)
- Maven 3.x

Steps :

- Select **Maven Project**
- If you want, change the Group/Package name. We will use **com.adeveloperdiary**
- Change the Artifact to **SpringBoot** , Name will automatically change to the same
- Leave the packaging to Jar, Java Version to 1.8 (Make sure you have JDK 1.8 in your local or use 1.7)
- Either type the Dependencies or select them below. We will add **web** and **Actuator** here
- Click on Generate Project button to download the zip file

SPRING INITIALIZR bootstrap your application now

Generate a Maven Project with Spring Boot 1.3.3

Project Metadata

Artifact coordinates

Group

Artifact

Name

Description

Package Name

Packaging

Java Version

Language

Too many options? [Switch back to the simple version.](#)

Dependencies

Add Spring Boot Starters and dependencies to your application

Search for dependencies

Selected Dependencies

Web Actuator

Generate Project

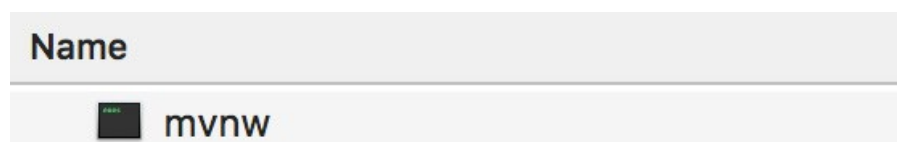
Core

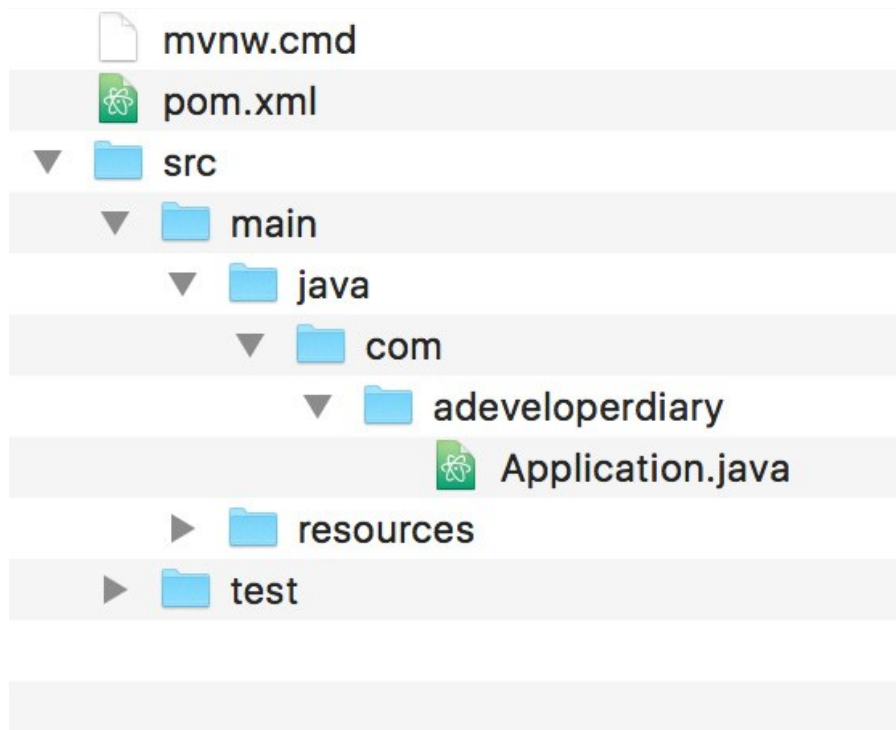
- ☐ Security
Secure your application via spring-security

Web

- ☒ Web
Full-stack web development with Tomcat and Spring MVC

Now Extract the zip and you will have the following files.





Open Terminal and navigate to the above folder. Type `mvn clean package` and press enter. The Build will start now.

```
SpringBoot
gframework.boot.actuate.endpoint.mvc.EndpointMvcAdapter.invoke()
2016-04-02 22:05:57.564 INFO 38542 --- [main] com.adeveloperdiary.ApplicationTests : Started A
pplicationTests in 2.13 seconds (JVM running for 2.575)
Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 2.217 sec - in com.adeveloperdiary.Application
Tests
2016-04-02 22:05:57.577 INFO 38542 --- [Thread-1] o.s.w.c.s.GenericWebApplicationContext : Closing o
rg.springframework.web.context.support.GenericWebApplicationContext@498d318c: startup date [Sat Apr 02 22:05:5
5 EDT 2016]; root of context hierarchy

Results :

Tests run: 1, Failures: 0, Errors: 0, Skipped: 0

[INFO] --- maven-jar-plugin:2.5:jar (default-jar) @ SpringBoot ---
[INFO] Building jar: /Users/abhisekjana/Documents/workspace/j2ee/GettingStartedWithSpringBoot/SpringBoot/targe
t/SpringBoot-0.0.1-SNAPSHOT.jar
[INFO] --- spring-boot-maven-plugin:1.3.3.RELEASE:repackage (default) @ SpringBoot ---
[INFO] BUILD SUCCESS
[INFO] Total time: 5.526 s
[INFO] Finished at: 2016-04-02T22:05:58-04:00
[INFO] Final Memory: 30M/318M
[INFO]
Abhiseks-MacBook-Pro:SpringBoot abhisekjana$
```

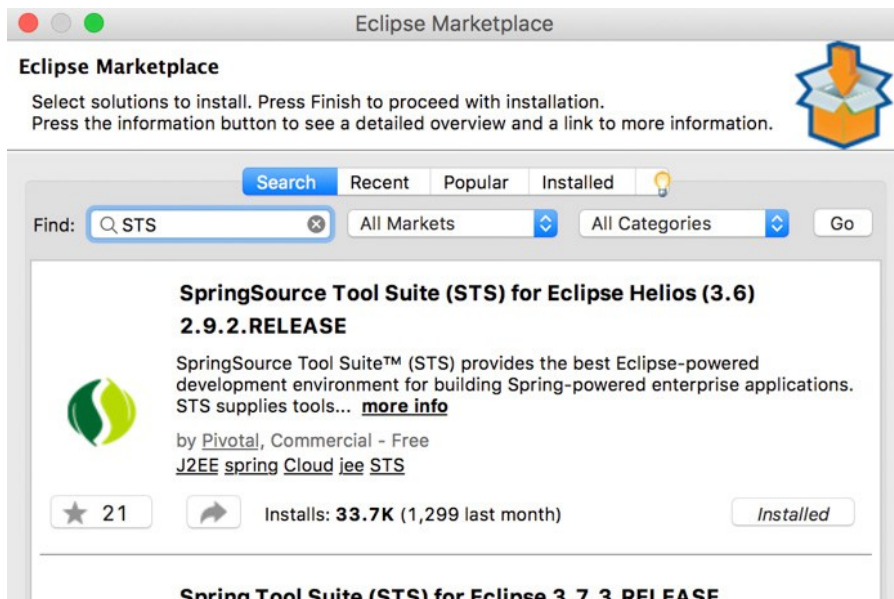
Once the build has been completed, you will have the `SpringBoot-0.0.1-SNAPSHOT.jar` created inside the `target` folder.

The Size of the jar would be around **13MB** since it will have the embedded Tomcat server in it.

```
Abhiseks-MacBook-Pro:target abhisekjana$ ls -ll
total 27112
-rw-r--r--  1 abhisekjana  staff   13876787 Apr  2 22:05 SpringBoot-0.0.1-SNAPSHOT.jar
-rw-r--r--  1 abhisekjana  staff    2833 Apr  2 22:05 SpringBoot-0.0.1-SNAPSHOT.jar.original
drwxr-xr-x  4 abhisekjana  staff      136 Apr  2 22:05 classes
drwxr-xr-x  3 abhisekjana  staff     102 Apr  2 22:05 generated-sources
drwxr-xr-x  3 abhisekjana  staff     102 Apr  2 22:05 generated-test-sources
drwxr-xr-x  3 abhisekjana  staff     102 Apr  2 22:05 maven-archiver
drwxr-xr-x  3 abhisekjana  staff     102 Apr  2 22:05 maven-status
drwxr-xr-x  4 abhisekjana  staff     136 Apr  2 22:05 surefire-reports
drwxr-xr-x  3 abhisekjana  staff     102 Apr  2 22:05 test-classes
Abhiseks-MacBook-Pro:target abhisekjana$
```

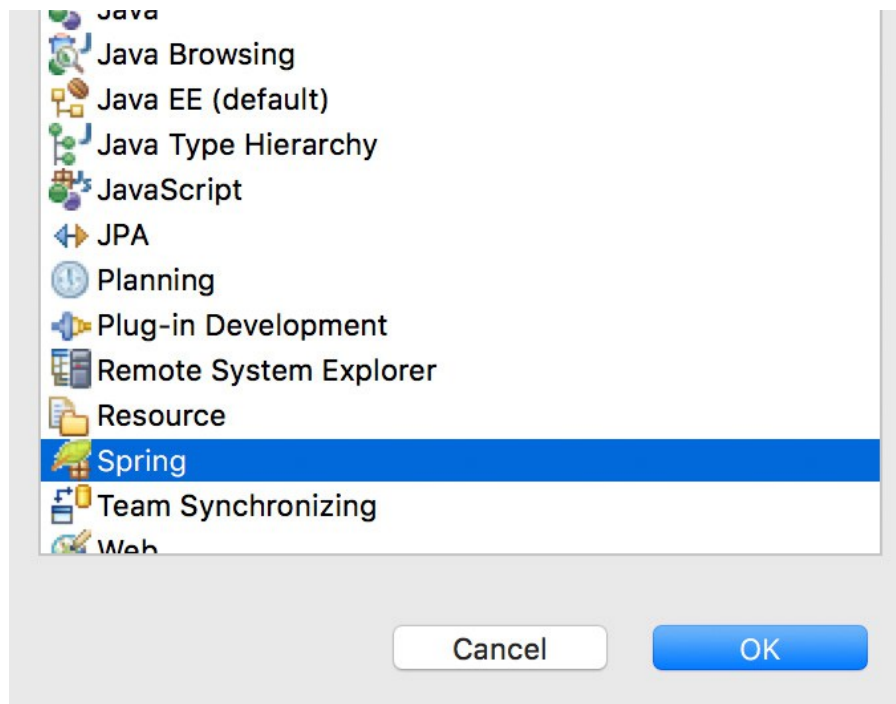
Create Spring Boot Application using Eclipse

We will use STS Toolkit to bootstrap when using eclipse. I am using eclipse MARS .1 version. We will first install the STS (SpringSource Tools Suite). Open Eclipse Marketplace, Type STS in Find and install the STS.

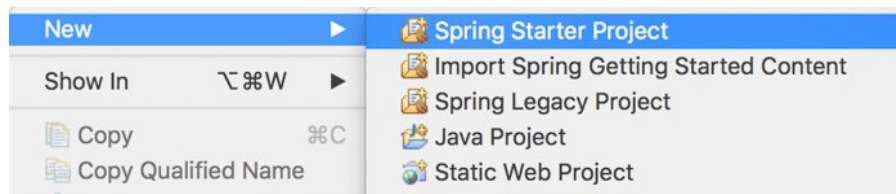


Then open Spring perspective.





Create a New -> Spring Starter Project.



Enter the following details. Click Next.

New Spring Starter Project

Name: SpringBoot

☒ Use default location

Location: /Users/abhisekjana/Documents/workspace/j2se/boot/SpringBoot [Browse]

Type: Maven [v] Packaging: Jar [v]

Java Version: 1.8 [v] Language: Java [v]

Group: com.adeveloperdiry

Artifact: SpringBoot

Version: 1.0



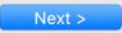


Description: SpringBoot

Package: com.adeveloperdiry


Working sets:

Working sets


☐ Add project to working sets

Select **Web** and **Actuator**. Click on Next.




New Spring Starter Project

Boot Version: 


Dependencies:

- Frequently Used
-
- ▼ Ops
 - ☒ Actuator
- ▼ Web
 - ☒ Web

Click on Finish.




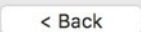
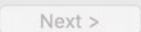
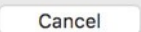
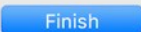
New Spring Starter Project



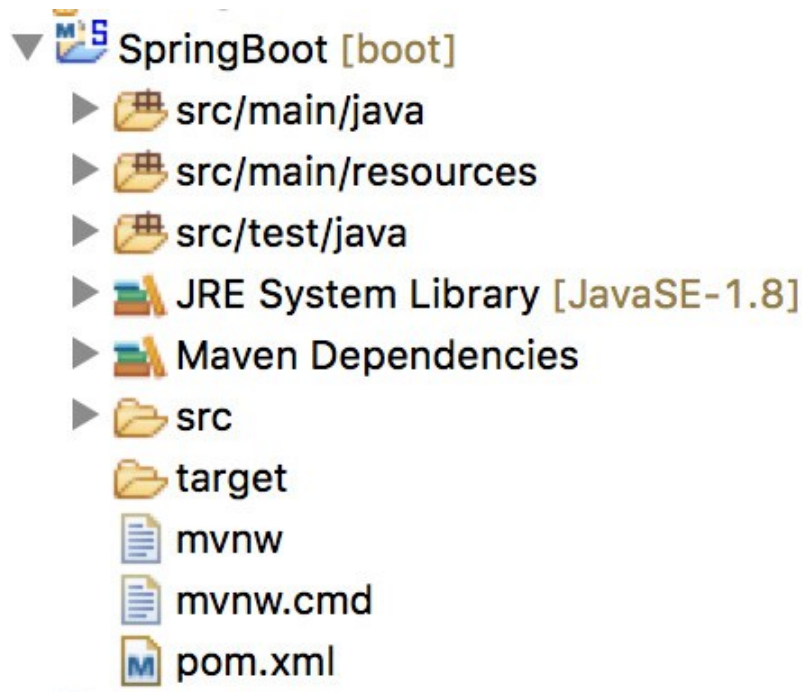
Site Info

Base Url

Full Url

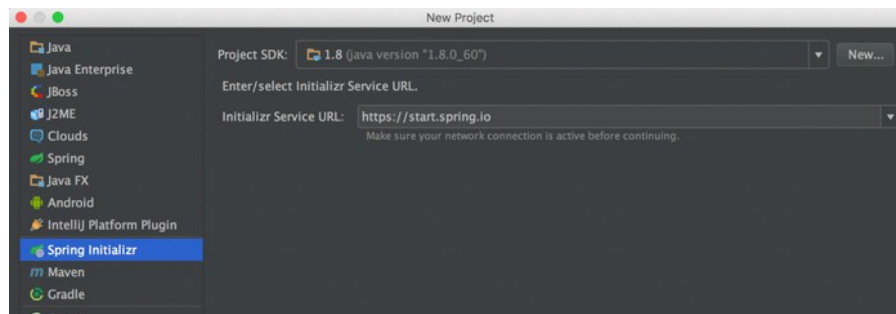
    

This should create the Spring Boot Project in Eclipse.



Create Spring Boot Application using IntelliJ IDEA

We will now use IntelliJ IDEA to create our Spring Boot Application. I recommend to use the latest version of IntelliJ. Create a New Project. Select **Spring Initializr**. Click on Next.



Enter the following details. Click Next.



Name:

Type:

Packaging:

Java Version:

Language:

Group:

Artifact:

Version:

Description:

Package:

Select **Web** and **Actuator** . Click Next.

Spring Boot Version:

Dependencies

► Core

▼ Web

☒ Web ☐ Websocket ☐ WS

☐ Ratpack ☐ Vaadin ☐ Rest Repositories

☐ Rest Repositories HAL Browser ☐ Mobile ☐ REST Docs

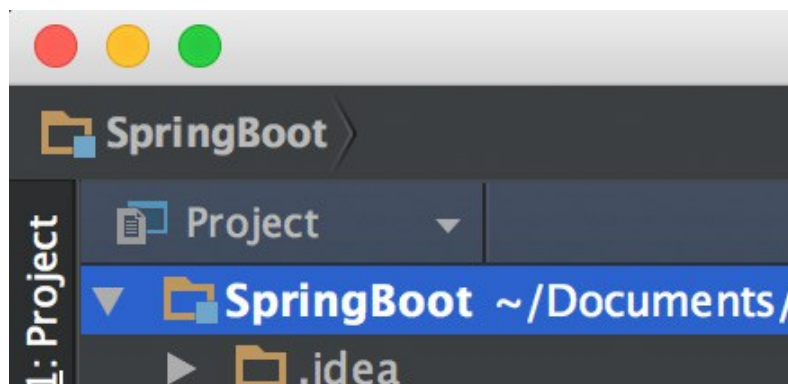
► Template Engines

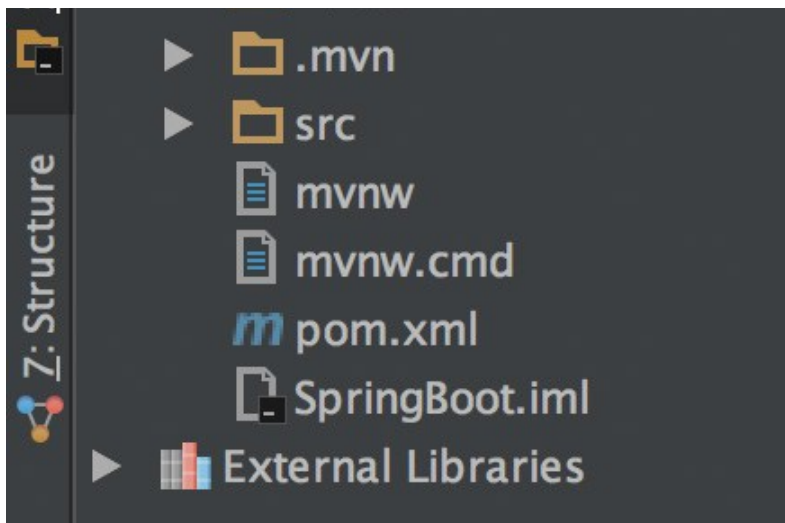
Enter the project Name and click Finish.

Project name:

Project location:

Your Spring Boot Project has been created now.





Run Spring Boot Application using CLI

We had created the jar file, now we will run it from Command Line by executing this line

```
1 java -jar target/SpringBoot-0.0.1-SNAPSHOT.jar
```

You should be able to see Spring Boot in the Command Line.

```
Abhiseks-MacBook-Pro:SpringBoot abhisekjana$ java -jar target/SpringBoot-0.0.1-SNAPSHOT.jar

  ____ _
 / ___| | | |
| |___| | | |
 \___|_|_|_|_|

:: Spring Boot :: (v1.3.3.RELEASE)

2016-04-02 22:42:15.906 INFO 62672 --- [main] com.adeveloperdiary.Application :
Starting Application v0.0.1-SNAPSHOT on Abhiseks-MacBook-Pro.local with PID 62672 (/Users/abhisekjana/Documents/workspace/j2ee/GettingStartedWithSpringBoot/SpringBoot/target/SpringBoot-0.0.1-SNAPSHOT.jar started by abhisekjana in /Users/abhisekjana/Documents/workspace/j2ee/GettingStartedWithSpringBoot/SpringBoot)
2016-04-02 22:42:15.909 INFO 62672 --- [main] com.adeveloperdiary.Application :
No active profile set, falling back to default profiles: default
2016-04-02 22:42:15.952 INFO 62672 --- [main] ationConfigEmbeddedWebApplicationContext :
Refreshing org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWebApplicationContext@28bbd79c: startup date [Sat Apr 02 22:42:15 EDT 2016]; root of context hierarchy
2016-04-02 22:42:16.430 INFO 62672 --- [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.En
```

The server should have started and the default port number will also be displayed as below.

```
main o.s.i.e.a.AnnotationMBeanExporter : Registering beans for JMX exposure on startup
```

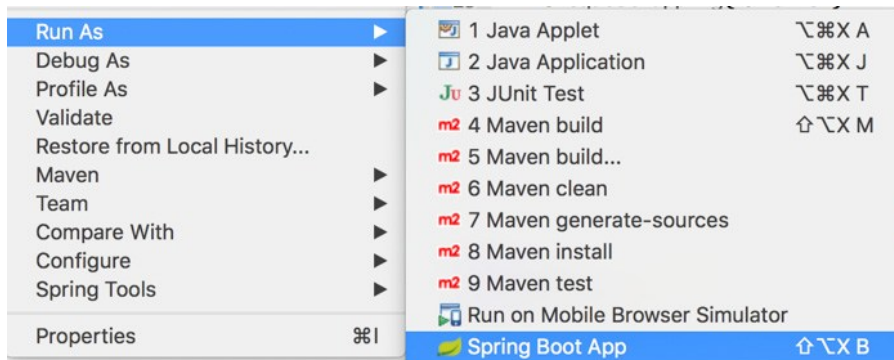
```

main] o.s.j.r.v.a.n.m.o.c.e.s.i.o.n.m.o.c.e.s.i.o.n.e.x.p.o.r.t.e.r : Registering beans for SNA exposure on startup
main] o.s.c.support.DefaultLifecycleProcessor : Starting beans in phase 0
main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat started on port(s): 8080 (http)
main] com.adeveloperdiary.Application : Started Application in 2.97 seconds (JVM run

```

Run Spring Boot Application in Eclipse

Its much easier to run the Spring Boot app in eclipse. Select the project, Right Click and, move to **Run As** and click on **Spring Boot App**. Again, remember you need to select the project to get this option, not the pom file.



Here is the output.

```

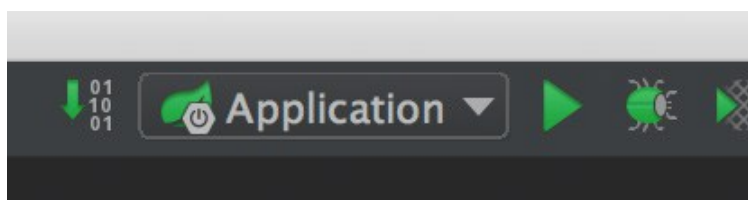
:: Spring Boot :: (v1.3.3.RELEASE)

2016-04-02 22:51:05.742 INFO 68557 --- [main] com.adeveloperdiary.Application : Starting Applic
2016-04-02 22:51:05.745 INFO 68557 --- [main] com.adeveloperdiary.Application : No active profil
2016-04-02 22:51:05.779 INFO 68557 --- [main] ationConfigEmbeddedWebApplicationContext : Refreshing org.:
2016-04-02 22:51:06.254 INFO 68557 --- [main] o.s.b.f.s.DefaultListableBeanFactory : Overriding bean
2016-04-02 22:51:06.732 INFO 68557 --- [main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat initiali
2016-04-02 22:51:06.741 INFO 68557 --- [main] o.apache.catalina.core.StandardService : Starting service
2016-04-02 22:51:06.742 INFO 68557 --- [main] org.apache.catalina.core.StandardEngine : Starting Service
2016-04-02 22:51:06.804 INFO 68557 --- [ost-startStop-1] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spi
2016-04-02 22:51:06.804 INFO 68557 --- [ost-startStop-1] o.s.web.context.ContextLoader : Root WebApplicar
2016-04-02 22:51:07.042 INFO 68557 --- [ost-startStop-1] o.s.b.c.e.ServletRegistrationBean : Mapping servlet:
2016-04-02 22:51:07.046 INFO 68557 --- [ost-startStop-1] o.s.b.c.embedded.FilterRegistrationBean : Mapping filter:
2016-04-02 22:51:07.046 INFO 68557 --- [ost-startStop-1] o.s.b.c.embedded.FilterRegistrationBean : Mapping filter:
2016-04-02 22:51:07.046 INFO 68557 --- [ost-startStop-1] o.s.b.c.embedded.FilterRegistrationBean : Mapping filter:

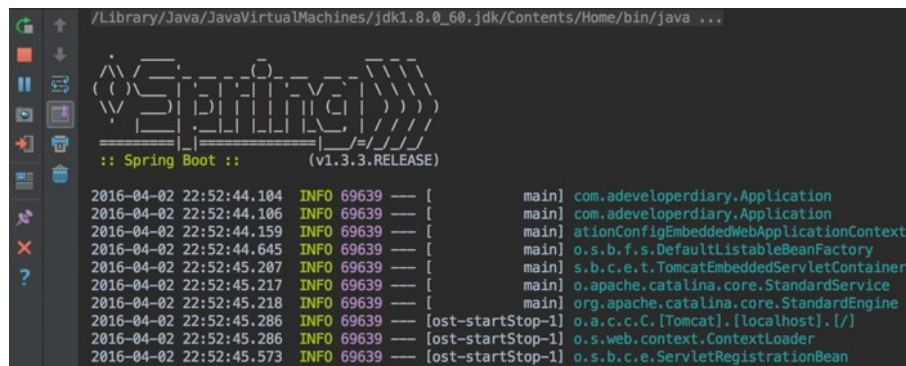
```

Run Spring Boot Application in IntelliJ IDEA

Its probably most easy, click on the run icon.



You should be able to see the logs that the application has started.



```
/Library/Java/JavaVirtualMachines/jdk1.8.0_60.jdk/Contents/Home/bin/java ...

Spring Boot
v1.3.3.RELEASE

2016-04-02 22:52:44.104 INFO 69639 --- [main] com.adeveloperdiary.Application
2016-04-02 22:52:44.106 INFO 69639 --- [main] com.adeveloperdiary.Application
2016-04-02 22:52:44.159 INFO 69639 --- [main] ationConfigEmbeddedWebApplicationContext
2016-04-02 22:52:44.645 INFO 69639 --- [main] o.s.b.f.s.DefaultListableBeanFactory
2016-04-02 22:52:45.207 INFO 69639 --- [main] s.b.c.e.t.TomcatEmbeddedServletContainer
2016-04-02 22:52:45.217 INFO 69639 --- [main] o.apache.catalina.core.StandardService
2016-04-02 22:52:45.218 INFO 69639 --- [main] org.apache.catalina.core.StandardEngine
2016-04-02 22:52:45.286 INFO 69639 --- [ost-startStop-1] o.a.c.c.C.[Tomcat].[localhost].[/]
2016-04-02 22:52:45.286 INFO 69639 --- [ost-startStop-1] o.s.web.context.ContextLoader
2016-04-02 22:52:45.573 INFO 69639 --- [ost-startStop-1] o.s.b.c.e.ServletRegistrationBean
```

Conclusion

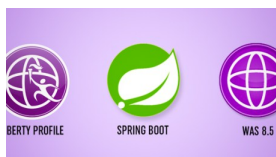
Hope this Step by Step approach will help you. Next we will learn how to create RESTServices and use Actuator in Spring Boot. Later we will also learn how to deploy Spring Boot Application in IBM Liberty Profile and IBM WAS 8.5 Server.

This is the 2nd part of Getting Started with Spring Boot Series. Find all the parts here.

1. [An Introduction to Spring Boot](#)
2. [How to Create Spring Boot Application Step by Step](#)
3. [How to create RESTful Webservices using Spring Boot](#)
4. [How to deploy Spring Boot application in IBM Liberty and WAS 8.5](#)

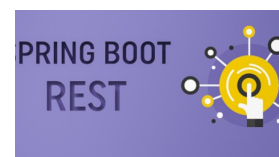


Related



[An Introduction to Spring Boot](#)

March 27, 2016



How to deploy Spring Boot application in IBM Liberty and WAS 8.5

April 4, 2016

In "Spring Boot"

In "Spring Boot"

How to create RESTful Webservices using Spring Boot

April 4, 2016

In "Spring Boot"

Filed Under: [Spring Boot](#) | Tagged With: [Java](#), [Microservices](#), [Spring](#), [Spring Boot](#), [step by step](#), [tutorial](#)

Comments



Naseem Ahamed says

October 16, 2016 at 2:29 pm

If I run a project more than once on the same port with STS, it gives me an error that the port is already in use. If I change the port again, it is working for the first time only. Can you please help me on this? Should I stop and start the server again and again for every code change?

Error:

java.net.BindException: Address already in use: bind

application.properties entry:

server.port=8080



[adeveloperdiary](#) says

October 16, 2016 at 3:03 pm

The application is still running at the background. You can restart the server, that should resolve the problem. If you are running it as standalone jar make sure that its stopped while you try to run it again.

In case this does not help, pleas let me know what type of server you are using and how you are running it (IDE, Server Name, Steps etc).



Vivek Agarwal says
December 1, 2016 at 4:16 am

The application is still running in the background. you ca restart the server, which might solve the problem .



Raj B says
May 8, 2017 at 2:54 am

stop server by clicking the red the square button which you can find on console tab..

restart the server is also another solution but i think its is not good solution.



muff says
November 25, 2016 at 8:28 am

hi ... i have installed STS from eclipse market place..i am using Eclipse Luna.

When i create a new project-> spring starter project
It is giving me error that M2e connector is not installed. before Installing
STS , maven was there, but after installing it just vanished frm my system..
I hv even downloaded m2e connectors from market place.. stl no success.
please help



Kate says

December 7, 2016 at 12:29 pm

I am attempting to mvn clean package.

However, it keeps displaying BUILD FAILURE

Total time: 0.059 s

[INFO] Finished at: 2016-12-07T11:26:14-05:00

[INFO] Final Memory: 6M/310M

[INFO] -----

[ERROR] The goal you specified requires a project to execute but there is no
POM in this directory

(C:\Downloads\SpringBoot\src\main\java\com\adeveloperdiary). Please
verify you invoked Maven from the correct directory.

this is my mvn -version

Apache Maven 3.3.9 (bb52d8502b132ec0a5a3f4c09453c07478323dc5;
2015-11-10T11:41:47-05:00)

Maven home: C:\Users\kbultman\Downloads\apache-maven-3.3.9
\apache-maven-3.3.9

Java version: 1.7.0_79, vendor: Oracle Corporation

Java home: C:\Program Files\Java\jdk1.7.0_79\jre

Default locale: en_US, platform encoding: Cp1252

OS name: "windows 8.1", version: "6.3", arch: "amd64", family: "windows"



JReis says

February 3, 2017 at 2:28 pm

had the same issue. Run the command from
"C:\Downloads\SpringBoot\". Its not super clear from the tutorial but
you are not supposed to go to the adeveloperdiary folder.

Basically run it from the pom.xml folder 😊



Richard says

June 4, 2017 at 3:54 pm

I have created a Spring boot with Web and Actuator and it works fine. Now,
I want to add Config Server. How do I do that?



Mach Speed says

June 14, 2017 at 3:41 pm

This is very nice. Earlier I was creating the spring boot project from the
starter/spring.io website. Now I know how to directly create it in eclipse

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