Spring Boot

Philosophy

- Opinionated

- Productive

- Sensible defaults

- Convention over configuration

Boot Plugin

```
1  buildscript {
2    ext {
3      springBootVersion = '1.5.6.RELEASE'
4    }
5    repositories {
6      mavenCentral()
7    }
8    dependencies {
9      classpath("org.springframework.boot:spring-boot-gradle-plugin:${springBootVersion}")
10   }
11 }
12
13 apply plugin: 'java'
14 apply plugin: 'org.springframework.boot'
```

```
Application tasks
----------------
bootRun - Run the project with support for auto-detecting main class and reloading static resources
```

Starter Dependencies

Table 13.1. Spring Boot application starters

Name	Description
`spring-boot-starter`	Core starter, including auto-configuration support, logging and YAML
`spring-boot-starter-activemq`	Starter for JMS messaging using Apache ActiveMQ
`spring-boot-starter-amqp`	Starter for using Spring AMQP and Rabbit MQ
`spring-boot-starter-aop`	Starter for aspect-oriented programming with Spring AOP and AspectJ
`spring-boot-starter-artemis`	Starter for JMS messaging using Apache Artemis
`spring-boot-starter-batch`	Starter for using Spring Batch
`spring-boot-starter-cache`	Starter for using Spring Framework's caching support
`spring-boot-starter-cloud-connectors`	Starter for using Spring Cloud Connectors which simplifies connecting to services in cloud platforms like Cloud Foundry and Heroku
`spring-boot-starter-data-cassandra`	Starter for using Cassandra distributed database and Spring Data Cassandra
`spring-boot-starter-data-couchbase`	Starter for using Couchbase document-oriented database and Spring Data Couchbase
`spring-boot-starter-data-elasticsearch`	Starter for using Elasticsearch search and analytics engine and Spring Data Elasticsearch
`spring-boot-starter-data-gemfire`	Starter for using GemFire distributed data store and Spring Data GemFire
`spring-boot-starter-data-jpa`	Starter for using Spring Data JPA with Hibernate

Entry Point

```java
package io.pivotal.training;

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

@SpringBootApplication
public class GreetingApplication {

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

}
```

Auto Configuration, Component Scanning..

```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 {
```

Configuration

Supports .properties, .yml and environment variables

```yaml
spring:
  application:
    name: greeting

management:
  security:
    enabled: false

greeting:
  displayFortune: true
```

```
➜  greeting-app git:(master) ✗ SERVER_PORT=8100 gradle bootRun

> Task :bootRun
17:01:41.405 [main] DEBUG org.springframework.boot.devtools.settings.DevToolsSettings - Included patterns for restart : []
17:01:41.407 [main] DEBUG org.springframework.boot.devtools.settings.DevToolsSettings - Excluded patterns for restart : [/spring-boot-starter/target/clas
/, /spring-boot/target/classes/, /spring-boot-actuator/target/classes/, /spring-boot-devtools/target/classes/]
17:01:41.407 [main] DEBUG org.springframework.boot.devtools.restart.ChangeableUrls - Matching URLs for reloading : [file:/Users/esuez/work/new_course_dev
w_course_dev/springcloud/greeting-app/build/resources/main/]


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 :: Spring Boot ::        (v1.5.6.RELEASE)


2017-11-20 17:01:41.674  INFO 71777 --- [  restartedMain] io.pivotal.training.GreetingApplication  : Starting GreetingApplication on Eitans-MBP with PID
s/java/main started by esuez in /Users/esuez/work/new_course_dev/springcloud/greeting-app)
2017-11-20 17:01:41.675  INFO 71777 --- [  restartedMain] io.pivotal.training.GreetingApplication  : No active profile set, falling back to default profi
2017-11-20 17:01:41.719  INFO 71777 --- [  restartedMain] ationConfigEmbeddedWebApplicationContext : Refreshing org.springframework.boot.context.embedded
v 20 17:01:41 CST 2017]; root of context hierarchy
2017-11-20 17:01:42.803  INFO 71777 --- [  restartedMain] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat initialized with port(s): 8100 (http)
2017-11-20 17:01:42.815  INFO 71777 --- [  restartedMain] o.apache.catalina.core.StandardService   : Starting service [Tomcat]
2017-11-20 17:01:42.816  INFO 71777 --- [  restartedMain] org.apache.catalina.core.StandardEngine  : Starting Servlet Engine: Apache Tomcat/8.5.16
```

Embedded HTTP Server


```
➜  greeting-app git:(master) ✗ gradle assemble

BUILD SUCCESSFUL in 2s
5 actionable tasks: 5 executed
➜  greeting-app git:(master) ✗ java -jar build/libs/greeting-app-0.0.1-SNAPSHOT.jar

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 :: Spring Boot ::        (v1.5.6.RELEASE)

2017-11-20 16:46:24.618  INFO 68475 --- [           main] io.pivotal.training.GreetingApplication  : Starting GreetingApplication on Eitans-MBP wit
h PID 68475 (/Users/esuez/work/new_course_dev/springcloud/greeting-app/build/libs/greeting-app-0.0.1-SNAPSHOT.jar started by esuez in /Users/esuez/
work/new_course_dev/springcloud/greeting-app)
2017-11-20 16:46:24.621  INFO 68475 --- [           main] io.pivotal.training.GreetingApplication  : No active profile set, falling back to default
 profiles: default
2017-11-20 16:46:24.666  INFO 68475 --- [           main] ationConfigEmbeddedWebApplicationContext : Refreshing org.springframework.boot.context.em
bedded.AnnotationConfigEmbeddedWebApplicationContext@22927a81: startup date [Mon Nov 20 16:46:24 CST 2017]; root of context hierarchy
2017-11-20 16:46:25.737  INFO 68475 --- [           main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat initialized with port(s): 8080 (http)
2017-11-20 16:46:25.748  INFO 68475 --- [           main] o.apache.catalina.core.StandardService   : Starting service [Tomcat]
2017-11-20 16:46:25.749  INFO 68475 --- [           main] org.apache.catalina.core.StandardEngine  : Starting Servlet Engine: Apache Tomcat/8.5.16
2017-11-20 16:46:25.824  INFO 68475 --- [ost-startStop-1] o.a.c.c.C.[Tomcat].[localhost].[/]       : Initializing Spring embedded WebApplicationCon
text
```

Actuator

" ..features to help you monitor and manage your application when it's pushed to production.."

```
dependencies {
    compile("org.springframework.boot:spring-boot-starter-actuator")
}
```

Actuator Endpoints

ID	Description
`actuator`	Provides a hypermedia-based "discovery page" for the other endpoints. Requires Spring HATEOAS to be on the classpath.
`auditevents`	Exposes audit events information for the current application.
`autoconfig`	Displays an auto-configuration report showing all auto-configuration candidates and the reason why they 'were' or 'were not' applied.
`beans`	Displays a complete list of all the Spring beans in your application.
`configprops`	Displays a collated list of all `@ConfigurationProperties`.
`dump`	Performs a thread dump.
`env`	Exposes properties from Spring's `ConfigurableEnvironment`.
`flyway`	Shows any Flyway database migrations that have been applied.
`health`	Shows application health information (when the application is secure, a simple 'status' when accessed over an unauthenticated connection or full message details when authenticated).

```
localhost:8080/metrics

{
    "mem": 364968,
    "mem.free": 106666,
    "processors": 8,
    "instance.uptime": 31118,
    "uptime": 34181,
    "systemload.average": 2.705078125,
    "heap.committed": 313344,
    "heap.init": 262144,
    "heap.used": 206677,
    "heap": 3728384,
    "nonheap.committed": 53760,
    "nonheap.init": 2496,
    "nonheap.used": 51625,
    "nonheap": 0,
    "threads.peak": 23,
    "threads.daemon": 19,
    "threads.totalStarted": 26,
    "threads": 21,
    "classes": 6535,
    "classes.loaded": 6535,
    "classes.unloaded": 0,
    "gc.ps_scavenge.count": 6,
    "gc.ps_scavenge.time": 37,
    "gc.ps_marksweep.count": 1,
    "gc.ps_marksweep.time": 24,
```

```
localhost:8080/health

{
    "status": "UP",
    "diskSpace": {
        "status": "UP",
        "total": 500068036608,
        "free": 185080360960,
        "threshold": 10485760
    }
}
```

```
localhost:8080/env

{
    "profiles": [],
    "server.ports": {
        "local.server.port": 8080
    },
    "servletContextInitParams": {},
    "systemProperties": { … }, // 63 items
    "systemEnvironment": { … }, // 39 items
    "applicationConfig: [classpath:/application.yml]": {
        "spring.application.name": "greeting",
        "management.security.enabled": false,
        "greeting.displayFortune": true
    }
}
```