# Spring Boot and Microservices

## Overview

Get your Microservices to production standard! On this course, you'll use Spring Boot to develop a small set of Microservices, collaborating as a full system.

## Prerequisites

Prior experience with JAVA

## Objectives

* Build web application interfaces with Spring MVC
* Use Spring as a back-end for Ajax applications
* NoSQL are very popular RDBMS alternatives for working with extremely large amounts of data. Spring Data and Spring HD are projects that offer Java developers a way to reduce time in application development in these areas.
* Create Spring MVC-based RESTful web services
* This Spring Boot Microservices training course will show you how Boot, which is built on top of the Spring Framework, garners all the benefits of Spring's maturity, while decorating the complexities of the underlying framework with opinionated fixtures that aid in the development of microservices.
* Much of Spring Boot is aimed at developer productivity by making common concepts, like RESTful HTTP and embedded web application runtimes, easy to wire up and use.

**Duration : 5 Days**

**Day 1**

## Module 1 SPRING BOOT TRAINING OUTLINE

* Introduction
* Installing Spring Boot CLI
* Building and Deploying an Application
* Using Templates
* Gathering Metrics
* Using Java With start.spring.io
* Spring Boot Starters
* Building as a Runnable JAR
* Data Access with Spring Data
* Property Support
* Actuator  
      Microservices and Cloud
* Securing an Application

#### **Module 2** **BUILDING WEB APPLICATIONS IN SPRING BOOT**

* Spring MVC Controllers
* Using ModelAttributes
* @RequestMapping and @RequestParam
* Using a ModelAndView
* Using images and templates for views
* Using an Embedded database with JdbcTemplate
* Executing Sql scripts
* Using a production database
* JPA Data and JPA Repositories

DAY 2

#### **Module 3 RESTFUL WEB SERVICES**

* REST Overview (Characteristics/Capabilities, URI Templates, REST vs SOAP
* REST and Spring MVC
* Spring support for REST
* @RequestMapping/@PathVariable, @RequestBody, @ResponseBody, HTTP Method conversion
* URI Templates and @PathVariable
* Writing RESTful Controllers / @RestController
* JSON Representations for Resources
* Message Converters
* Generating XML
* JAXB and Jackson Message Converters for XML
* JAXB / @XmlRootElement
* Content Negotiation
* Client Requirements and Spring's RestTemplate

#### **SECURING AN APPLICATION WITH SPRING BOOT AND SPRING SECURITY**

* Spring Security Overview using the DelegatingFilterChainProxy and FilterChainProxy
* Using Spring Web Authentication
* The key Classes of HttpSecurity, AuthenticationProvider, UserDetailsService, UserDetails, AuthenticationManager, Authentication and GrantedAuthorities
* Using your own AuthenticationProvider and UserDetailsService with hashed passwords and tokens
* Spring Security Authorization overview with the AccessDecisionManager and AccessDecisionVoters
* Authorization using @EnableGlobalMethodSecurity, JSR250 and Spring Security Annotations
* Using a @ControllerAdvice for ExceptionHandling
* Creating your own custom Authorization Voter and AccessControlManager
* Using HTTPS
* Securing a Restful service via a customized UsernamePasswordAuthenticationFilter

#### **JMS SERVICES**

* RabbitMQ support
* Using JmsTemplate
* MessageListenerAdapter
* SimpleMessageListenerContainer
* JmsListenerContainerFactory

**DAY 3**

**Module 4:**  Overview of Microservices

* + Introducing Antifragile Software and Simplicity
  + Defining Microservices in term of their Principles, Benefits and Challenges
  + Understand and explore the forces (stressors) of change on software
  + Shift in Thought Process: Monolith to Microservices
  + Working with traditional RDBMS & NoSQL
  + Building Microservices: Using an API Gateway
  + Introduction to Eureka
  + Inter-Process Communication in a Microservices Architecture
  + Service Discovery in Microservices Architecture
  + Event-Driven Data Management for Microservices

**Module 5:** [**Spring Cloud Consul - Service Discovery**](javascript:void(0))

[Preview](https://www.udemy.com/new-lecture/2897362/popup/)

An explanation of passive service discovery, how to create a Consul server, and how to register a Consul client.

DAY 4

**Module 6:** [**Spring Cloud Ribbon - Client-Side Load Balancing**](javascript:void(0)) –

An exploration of server-side and client-side load balancing, and a practical setup to using Ribbon on a client.

**Module 7:** [**Spring Cloud Hystrix - Circuit Breaker**](javascript:void(0))

This module examines the idea of circuit breakers in software, and describes how to use Hystrix with Ribbon and Feign.

**Module 8:** [**Spring Cloud Bus - Dynamic Configuration Changes**](javascript:void(0))

This module re-visits Spring Cloud Config, and demonstrates how to make changes dynamic using Spring Cloud Bus. It also explores how @RefreshScope and @ConfigurationProperties can be used to make an application resilient to live refresh.

DAY 5

**Module 9:API Gateway- Zuul**

* Caching
* Filtering requests and Zuul
* Protocol conversion
* Routing

**Module 10:**Monitoring with Sleuth and Zipkin

* Logging with Sleuth
* Monitor with Zipkin

**Module 11:Spring Cloud security and Oauth2**

* What problems does Spring Security solve?
* Configuring authentication and intercepting URLs
* The Spring Security tag library for JSPs
* Security at the method level
* Customizing the Spring Security filter chain
* Securing a REST Webservice
* An Overview of OAuth

The OAuthRestTemplate

* Additional Scopes

**Module 11: deployment**

* **docker overview**
* **Microservice deployement woth dockers**
* **Monitoring with Kubernetes**
* **Central monitoring & logging**

LABSETUP: Software List:

1. JDK 1.8.0\_152 -->[http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html](https://nam03.safelinks.protection.outlook.com/?url=http%3A%2F%2Fwww.oracle.com%2Ftechnetwork%2Fjava%2Fjavase%2Fdownloads%2Fjdk8-downloads-2133151.html&data=02%7C01%7Ck_pradeep%40live.com%7C0683dacfa3ea4faff33808d531bbb1b2%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C636469604563537952&sdata=JQDkk1PNDhBspKQxdeBny9I%2Fs4WrpoLbYalCPpfbhU0%3D&reserved=0" \t "_blank)

2. Spring STS  ->[https://spring.io/tools/sts/all](https://nam03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fspring.io%2Ftools%2Fsts%2Fall&data=02%7C01%7Ck_pradeep%40live.com%7C0683dacfa3ea4faff33808d531bbb1b2%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C636469604563537952&sdata=GNj12fUvg2xqKas2T7VtwlmP5dEpTMFgKMl5t7Objk4%3D&reserved=0" \t "_blank)

3. MONGODB - [https://www.mongodb.com/download-center#community](https://nam03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.mongodb.com%2Fdownload-center%23community&data=02%7C01%7Ck_pradeep%40live.com%7C0683dacfa3ea4faff33808d531bbb1b2%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C636469604563537952&sdata=JAqRrRXs8B9i7pIRXDd%2F%2B6EGt6ZohZ6puaqCEAHjh3o%3D&reserved=0" \t "_blank)

4. MYSQL 5.5 ->[https://dev.mysql.com/downloads/windows/installer/5.5.html](https://nam03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fdev.mysql.com%2Fdownloads%2Fwindows%2Finstaller%2F5.5.html&data=02%7C01%7Ck_pradeep%40live.com%7C0683dacfa3ea4faff33808d531bbb1b2%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C636469604563537952&sdata=H61R2%2FH1LJeAbLC6ofs2vhyrACS3rQvLTLRK4KK%2F1jY%3D&reserved=0" \t "_blank)

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5 RABBIT MQ :[https://www.rabbitmq.com/download.html](https://nam03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.rabbitmq.com%2Fdownload.html&data=02%7C01%7Ck_pradeep%40live.com%7C0683dacfa3ea4faff33808d531bbb1b2%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C636469604563537952&sdata=VOcacYMWDoPT0c1vhtvQ2csRjwNiv7Jett8mGYP9rKs%3D&reserved=0" \t "_blank)