

VMware - Spring: Core Training

Code:	SP-CORE
Length:	4 days
URL:	View Online

This course offers hands-on experience with the major features of Spring and Spring Boot, which includes configuration, data access, REST, AOP, auto-configuration, actuator, security, and Spring testing framework to build enterprise and microservices applications. On completion, participants will have a foundation for creating enterprise and cloud-ready applications.

Skills Gained

By the end of the training, students will:

- Spring configuration using Java Configuration and Annotations
- Aspect oriented programming with Spring
- Testing Spring applications using JUnit 5
- Spring Data Access - JDBC, JPA and Spring Data
- Spring Transaction Management
- Simplifying application development with Spring Boot
- Spring Boot auto-configuration, starters and properties
- Build a simple REST application using Spring Boot, embedded Web Server and fat JARs or classic WARs
- Implementing REST client applications using RestTemplate and WebClient
- Spring Security
- Enable and extend metrics and monitoring capabilities using Spring Boot actuator
- Utilize Spring Boot enhancements to testing

Who Can Benefit

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Prerequisites

Some developer experience using Java, an IDE (Eclipse, STS or IntelliJ) and build tools such as Maven or Gradle

Course Details

Course Modules

1. Introduction to Spring

- Java configuration and the Spring application context
- @Configuration and @Bean annotations
- @Import: working with multiple configuration files
- Defining bean scopes
- Launching a Spring Application and obtaining Beans

2. Spring JAVA Configuration: A Deeper Look

- External properties & Property sources
- Environment abstraction
- Using bean profiles
- Spring Expression Language (SpEL)

3. Annotation-based Dependency Injection

- Component scanning
- Autowiring using @Autowired
- Java configuration versus annotations, mixing.
- Lifecycle annotations: @PostConstruct and @PreDestroy
- Stereotypes and meta-annotations

4. Factory Pattern in Spring

- Using Spring FactoryBeans

5. Advanced Spring: How Does Spring Work Internally?

- The Spring Bean Lifecycle
- The BeanFactoryPostProcessor interception point
- The BeanPostProcessor interception point
- Spring Bean Proxies
- @Bean method return types

6. Aspect-oriented programming

- What problems does AOP solve?
- Defining pointcut expressions
- Implementing various types of advice

7. Testing a Spring-based Application

- Spring and Test-Driven Development
- Spring 5 integration testing with JUnit 5
- Application context caching and the `@DirtiesContext` annotation
- Profile selection with `@ActiveProfiles`
- Easy test data setup with `@Sql`

8. Data Access and JDBC with Spring

- How Spring integrates with existing data access technologies
- `DataSourceException` hierarchy
- Spring's `JdbcTemplate`

9. Database Transactions with Spring

- Transactions overview
- Transaction management with Spring
- Transaction propagation and rollback rules
- Transactions and integration testing

10. Spring Boot Introduction

- Introduction to Spring Boot Features
- Value Proposition of Spring Boot
- Creating a simple Boot application using Spring Initializer website

11. Spring Boot Dependencies, Auto-configuration, and Runtime

- Dependency management using Spring Boot starters
- How auto-configuration works
- Configuration properties
- Overriding auto-configuration
- Using `CommandLineRunner`

12. JPA with Spring and Spring Data

- Quick introduction to ORM with JPA
- Benefits of using Spring with JPA
- JPA configuration in Spring
- Configuring Spring JPA using Spring Boot
- Spring Data JPA dynamic repositories

13. Spring MVC Architecture and Overview

- Introduction to Spring MVC and request processing
- Controller method signatures

- Using @Controller, @RestController and @GetMapping annotations
- Configuring Spring MVC with Spring Boot
- Spring Boot packaging options, JAR or WAR

14. Rest with Spring MVC

- An introduction to the REST architectural style
- Controlling HTTP response codes with @ResponseStatus
- Implementing REST with Spring MVC, @RequestMapping, @RequestBody and @ResponseBody
- Spring MVC's HttpMessageConverters and automatic content negotiation

15. Spring Security

- What problems does Spring Security solve?
- Configuring authentication
- Implementing authorization by intercepting URLs
- Authorization at the Java method level
- Understanding the Spring Security filter chain
- Spring security testing

16. Actuators, Metrics and Health Indicators

- Exposing Spring Boot Actuator endpoints
- Custom Metrics
- Health Indicators
- Creating custom Health Indicators
- External monitoring systems

17. Spring Boot Testing Enhancements

- Spring Boot testing overview
- Integration testing using @SpringBootTest
- Web slice testing with MockMvc framework
- Slices to test different layers of the application

18. Spring Security OAuth (Optional Topic)

- OAuth 2 Overview
- Implementing OAuth 2 using Spring Security OAuth

19. Reactive Applications with Spring (Optional Topic)

- Overview of Reactive Programming concepts
 - Reactive Programming support in Spring
 - Using Spring's reactive WebClient
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