

Spring Boot based Microservices Application

Development and Deployment

Objective:

This course mastering on Spring Boot, Spring Cloud and containerization using Spring Boot application as a way of deploying highly resilient and scalable RESTful services and web applications on Docker and Kubernetes platform.

Pre-requisites:

Basic understandings on software development, containerization and Java Programming

Spring MVC

- Explain how to create a Spring MVC application using Spring Boot

- Describe the basic request processing lifecycle for REST requests

- Create a simple RESTful controller to handle GET requests

- Configure for WAR or JAR deployment

Using Spring with JPA or Hibernate

- Implement a Spring JPA application using Spring Boot

- Create Spring Data Repositories for JPA

- Understand the capabilities the mappings with @Entity

Spring REST Services

- Introduce REST (only when needed)

- Create controllers to support the REST endpoints for various verbs

- Utilize Rest Template to invoke RESTful services

Spring Security

- Securing Web Applications with Spring Security 3.0

- Spring Security 3.0

- Understanding the architecture of Spring Security

- Spring Boot autoconfigures Spring Security when found in the classpath.

- Works with the authentication and authorization mechanisms.

- Using Database User Authentication

- LDAP Authentication

Spring Cloud Config

The Spring Cloud Configuration Server

Why Configuration Management is Important

Configuration Management Challenges in Microservices

Separation of Configuration from Code

Configuration Service

How the Configuration Service Works

Spring Cloud Eureka The

Spring Cloud Eureka

Why Service Discovery is required for

microservices Features of Spring Cloud Eureka

Setting up eureka services

Registering services using Eureka

Service Discovery implementation

Health Monitoring using Eureka

Spring Cloud Circuit Breaker

Resilience4J Overview

Spring Cloud Circuit Breaker using Resilience4J

Features of Spring Cloud Circuit Breaker

Circuit Breaker Properties and Configuration

Bulkhead Properties configuration

Collecting metrics in circuit breaker

Comparing Resilience4J and Spring

Spring Retry

Spring Cloud Gateway

Load Balancing - The Spring Cloud Gateway

Features of Spring Cloud Gateway

Configuring RoutePredicate and Gateway filter

factories Global and HttpHeaders Filters

Implement Load balancing using Spring Cloud Gateway

Spring Cloud Distributed Tracing using Zipkin

Overview on Zipkin

Zipkin Features and Architecture · The Collector

Zipkin Console Homepage ·

Tracings using Zipkin

Dependencies Management in Spring Boot for Zipkin Zipkin

Configuration

Microservices

Explore the ideal software development practice

Understandings of microservices and differences between monolithic to microservices

Design principles of microservices with developers and admin in mind

Learn about the integration and inter-communication patterns

Learn about the decomposition patterns from monolith to microservices

Learn about how to deploy microservices and its patterns

Containerization using Docker Overview

about the containerization

Docker Container Runtime Engine and workflow

Dockerfile and Docker commands

Container Images and Image Registry

Understanding how to prepare image and containers using Docker

Container Orchestration using Kubernetes

Overview about the Kubernetes

Architecture and benefits of Kubernetes Orchestration

Learn about the cluster formation of Kubernetes

Deep dive on the Kubernetes objects

Container Deployment

Understanding Packaging and Deployment

Preparation of pre-requisites for container deployment

Application Development and Deployment on Docker

Application Deployment on Kubernetes