MICROSERVICES Using Spring Boot and Java
By Dr. Vishwanath Rao

Objectives

- Understand and differentiate between various Microservices Architectural styles
- Apply Microservices Architecture principles
- Know how to make the appropriate Microservice Architecture decision
- Develop and test a Microservice
- Know what technologies can be used to enable Microservices with an example
- You will be able develop MICROSERVICES with Spring Boot
- You will be able to develop and design RESTful web services with Spring Boot
- You will setup Centralized Microservices Configuration

Day 1

Breaking Up Monoliths – Pros and Cons
Traditional Monolithic Applications and Their Place Disadvantages of Monoliths Developer's Woes
Architecture Modernization
Architecture Modernization Challenges Microservices Architecture is Not a Silver Bullet! What May Help?
In-Class Discussion Summary

Microservice Development What are Microservices?
Microservices vs Classic SOA
Principles of Microservices Architecture Design Domain-Driven Design
Domain-Driven Design – Benefits Microservices and Domain-Driven Design
Designing for failure
Microservices Architecture – Pros Microservices Architecture – Cons

Docker and Microservices
Microservice Deployment with Docker – Workflow Writing Dockerfile
Kubernetes
Microservices and Various Applications Web Applications
Web Applications – Reference Architecture Web Applications – When to use?
Single Page Applications
Single Page Applications – Benefits Traditional Enterprise Application

Serverless & Event-driven Microservice

Twelve-factor Applications Twelve-factor Applications
Twelve Factors, Microservices, and App Modernization The Twelve Factors
Categorizing the 12 Factors
12-Factor Microservice Codebase

12-Factor Microservice Dependencies 12-Factor Microservice Config
12-Factor Microservice Backing Services 12-Factor Microservice Build, Release,

Day 2

Run 12-Factor Microservice Processes 12-Factor Microservice Port Binding
12-Factor Microservice Concurrency 12-Factor Microservice Disposability 12-Factor Microservice Dev/Prod Parity 12-Factor Microservice Logs
12-Factor Microservice Admin Processes

REST Services
Many Flavors of Services Understanding REST Principles of RESTful Services
REST Example – Create
REST Example – Retrieve REST Example – Update REST Example – Delete
REST Example – Client Generated ID

SOAP Equivalent Examples REST Example – JSON Famous RESTful Services
Additional Resources
What is gRPC? Protocol Buffers REST vs. gRPC
Protobuf vs. JSONHTTP/2 vs. HTTP 1.1 HTTP/2 vs. HTTP 1.1 (Contd.)
Messages vs. Resources and Verbs Streaming vs. Request-Response Strong Typing vs. Serialization Web Browser Support
REST vs. gRPC – In a Nutshell

SPRING BOOT

Spring Boot Starters
Spring Boot Auto-configuration Spring Boot Actuators
Spring Boot MVC Spring Boot Test

Day 3

SPRING MICRO SERVICES

Introduction
Evaluation of Micro Services Principles Of Micro Services Characteristics of Micro Services Micro services Benefits Relationship with SOA

Twelve Factor Apps Micro Services use cases
Micro Services early adopters Building micro services with boot Micro Services Capability model Micro Services Use case

SPRING JPA

Application Managed Container Entity Managed Container Application

SPRING DATA SPRING MESSAGING

JMS / AMQP
ActiveMQ / RabbitMQ Server