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A *Fast AND Steady* Approach

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Micro Services with Spring

Total Duration
5 days

Audience
This workshop is intended for Application developers who know basics of Spring framework and not need to start development of micro services based projects using Spring Boot and Spring cloud.

Course Objectives
After completing this workshop the participants will be able to
➢ Develop Micro services
➢ Work with Spring Boot
➢ Work with Spring Security
➢

Pre-requisites
➢ Basic knowledge of Java EE(Web Application Basics and Three tier architecture)
➢ Working knowledge of JPA and Spring

Course Content
Day 1 :
    Recap of Spring Framework (Theory)
        just highlight DI usage

    JPA (Just Demo)
        JPA Data and JPA Repositories
        Executing SQL scripts
        Switching development and production database
        Introduction to Caching/Caching Configurations (Practical if not done earlier)
        Declarative Transaction Management (Practical if not done earlier)

    Introduction to Spring Web/Spring MVC (Theory

    Building Web Applications (No Practice)
      Spring MVC Controllers
      Using ModelAttributes
      @RequestMapping and @RequestParam
      Using a ModelAndView
      Using images and templates for views
      Using an Embedded database with JdbcTemplate

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Understanding Services (Theory)
- Overview of SOA
- Rich Internet Applications

Starting with RESTful Web Services (microservices)

REST Overview (Theory)
- Characteristics/Capabilities
- URI Templates
- REST vs SOAP,
- REST standards

REST and Spring MVC
Spring support for REST
REST standards

Rest Implementations (Demo + Practice)
Contract first REST Services (e.g. Swagger / YAML)
- @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/JSON
- JAXB / @XmlRootElement
- Content Negotiation
- Client Requirements and Spring's RestTemplate
- ResponseEntity
  - Where to use, why to use

Day 2 :
Layered architecture with RestController(Theory)
- Service, JPA Repository, Entity, DTO
- CRUD microservice and integration with AngularJS
  - (Building AngularJS frontend is not in this Course scope.)

Spring Data JPA

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Calling other micro services (Theory + Practice)
  Understanding timeout, error output, Non-blocking Vs Async
  (proxy, gateway, service discovery),
  calling multiple microservices
    (Aggregator pattern to avoid multiple REST calls),
  Non-blocking Rest services,
  Async Services using ElasticMQ or SQS.

Getting Started with Spring Boot: (Theory + Practice)
  Spring Boot starters, maven
  Application class
  @SpringBootApplication
  Build as a Runnable jar
  Dependency injection, component scans, Configuration
  Externalize your configuration using application.properties
  Context Root and Management ports
  Logging

Day 3 :

Building Web App for Spring Boot (Theory + Practice)
  HATEOAS
  Spring cloud config for external configuration

Exposing Micro Service application using Spring Boot (Practice)

Introduction to Spring Cloud (Theory)
  What and Why cloud

Using Spring Cloud abstractions for using various Cloud services (Theory + Practice)
  1)starting with local cache and replacing with Elastichace,
  2) ElasticMQ for AWS SQS, etc

Day 4 :

Starting with Spring Security (Theory)
  Basic Recap of AOP
  Normal Web App security Vs Spring Security

Securing an REST Application with Spring Security: (Theory + Practice)

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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

Day 5 :

Microservice caching (Again live example of ticketing system) (Theory + Practice)
Using Netflix Fiegn client (Theory + Practice)

Unit testing Sprint Boot REST application, Debugging Application

Spring Batch / Integration (Theory + Demo))

Question / Answers

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