Microservices

Pre-requisite:

- Participants must have good Knowledge on basic microservices and Spring boot 2.x

Total Duration: 5 Days (40 hours)

Day 1

- Banking POC discussion
- Spring Boot End point customization (Hands on)
- Wire Mock API testing (Hands on)
- API design Best Practices
- Swagger Documentation (Hands on)
- Naming conventions
- Filtering Flexibility using Graphql, Squiggly, RSQL Visitor (Hands on)
- Paging and Sorting (Hands on)
- Versioning (Hands on)
- HTTP Status Codes (Hands on)
- Stability and Consistency (Hands on)
- Security using OAUth2 and JWT (Hands on)

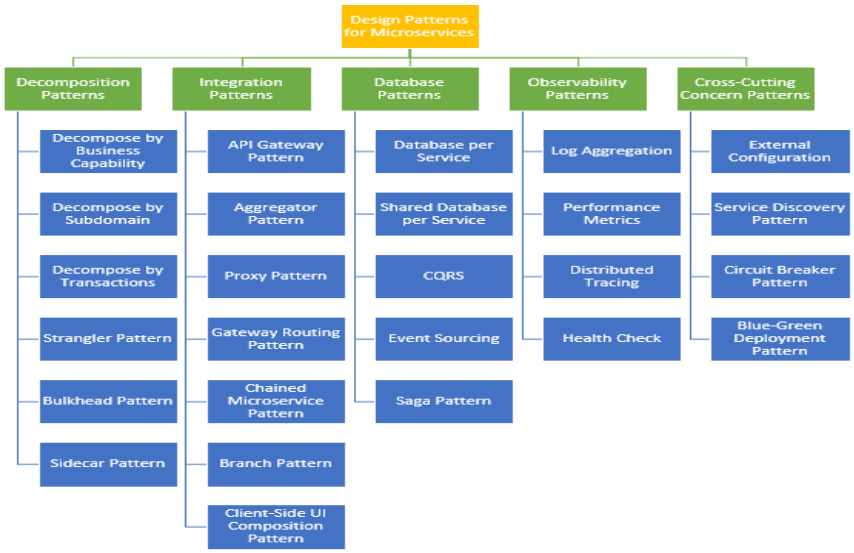
Day 2

- Microservices Design
- Microservice Architecture Decisions
- Microservice Design Patterns
    - High Cohesion
    - Loosely coupled
    - Adapter pattern
    - Chain Pattern
    - Shared Resource Pattern
- Microservices Composition Pattern
- Microservice Security Principles/Techniques
- Ownership and Versioning
- Domain Centric
- Centralized Monitoring

Domain Driven Design

- Strategic Design Tools
- Tactical Design Tools
- Problem Space
- Solution Space
- Sub Domains
- Bounded Context
- Ubiquitous Language
- Context Map
- Model Driven Design
- Entities
- Repositories
- Services
- Aggregators
- Factory
- Value Objects
- Best Practices in Code Implementation

Design Patterns in Microservices



Day 3

Spring Cloud

- Vault Server (Hands on)
- Cloud Bus (Hands on)

Building Data Processing Pipelines Out of Microservices (Hands on)

- Building Data Processing Pipelines Out of Microservices
- The Role of Orchestration and the Problem with the Status Quo
- About Spring Cloud Data Flow
- About the Data Flow Server
- Consider Streams vs. Tasks
- Installing Spring Cloud Data Flow
- Getting Spring Cloud Data Flow up and Running

Building Data Processing Pipelines Out of Microservices (Hands on)

- About Stream Starter Apps
- Creating Streams with Spring Cloud Data Flow
- Deploying Data Pipelines
- Creating Tasks with Spring Cloud Data Flow
- Using the Spring Cloud Data Flow Dashboard and Flo
- Building, Deploying, and Tapping Streams from the Dashboard
- Creating Custom Stream or Task Apps
- Creating, Registering, Using, and Partitioning Custom Apps
- Creating Composed Tasks
- Creating Custom Task Apps and Arranging in a Composed Task
- Monitoring Spring Cloud Data Flow Pipelines
- Updating Apps, Streams, and Tasks

CQRS Pattern using Axon Framework (Hands on)

Saga Pattern Event Driven using Kafka and Zookeeper (Hands on)

Moving Forward with Microservices

- Migration to Microservices
- Microservices Transaction Management

- Microservices Database Migration
- Microservices Reporting
- Integrate with Application Performance Metrics tools such as
- AppDynamics
- Splunk and
- Other tools such as Kibana, ELK search.
- ESB using MuleSoft

Day 4

Docker Overview

- Understanding Docker
- The differences between dedicated hosts, virtual machines, and Docker
- Docker installation
- The Docker command-line client
- Docker and the container ecosystem

Building Container Images

- Introducing the Dockerfile
- Building container images

Storing and Distributing Images

- Technical requirements
- Docker Hub
- Docker Registry
- Docker Trusted Registry

Managing Containers

- Technical requirements
- Docker container commands
- Docker networking and volumes

Containerizing Microservices with Docker

- Microservices and containers

- Deploying microservices in Docker
- Creating a Docker container for Spring boot microservice

Day 5:

Kubernetes Architecture

- Master Components of Kubernetes
  - kube-apiserver
  - etcd key-value store
  - kube-scheduler
  - kube-controller-manager
  - cloud-controller-manager
- Node Components of Kubernetes
  - Docker
  - kubelet
  - kube-proxy
  - kubectl
- Deploying simple applications
- Show case load balancing, Self-healing, DNS allocation
- Labels and Selectors node selection
- Understanding Kubernetes namespaces
- Services
  - NodePort
  - ClusertIP
- Replication Sets
- Deployments
- Daemon Sets
- Jobs
- CronJobs
- Volumes
  - Persistent Volumes
  - Persistent Volume Claims
- ConfigMaps & Secrets
- Kubernetes Deployments Advanced
  - Scaling
  - Rolling Updates
  - Rollback
  - Probes
- Spring Boot Kubernetes [Hands on]
  - ConfigMap integration

- Service Discovery
- Spring Boot Probes integration with Actuator
- Metrics with Prometheus, Grafana and spring cloud sleuth
- Distributed Tracing with Jager