Introduction to MicroServices with Moleculer Framework

Service Oriented Architecture (SOA) defines data sharing between the applications in language and platform independent applications as services. SOAP Web services support communication and data sharing across the applications in a language neutral way suing xml as content language.
REST architecture is the new way of building service oriented applications on the internet, which becomes platform independent and enable the data sharing in defined formats. REST services work faster and flexible compared to SOAP services.

MicroServices is a variant of the service-oriented architecture (SOA) architectural style that defines the application as a composition of loosely coupled services.
In MicroServices architecture the big application is decomposed into different smaller and isolated service units which improves modularity and makes the application easier to understand, develop and test. It enables isolated parallel development by small distributed teams in develop, deploy and scaling the respective service units independently. MicroServices are flexible in scaling and load balancing in the deployments.
Varieties of patterns are specified for MicroServices which further simplifies MicroServices deployments and data sharing.

Moleculer is a Node.js based framework for design and deployment of fast and powerful MicroServices with JavaScript. It helps to build efficient, reliable & scalable services. Moleculer provides many built-in features for managing the MicroServices such as Service discovery, gateway, Circuit-Breaker, asynchronous service invocations etc.

Course Objectives

This course imparts practical introduction to developers on MicroService applications with Moleculer framework.

The attendees:

- Understand the basics of MicroServices architecture.
- Understand and use the basics of Moleculer Framework for MicroServices.
- Understand and learn to use the Moleculer framework services.

Prerequisites

The participants must be well versed in Node JS based web application development with MongoDB NO-SQL Database with exposure to Soap and REST services is mandatory.

Training Methodology
Each topic is supplemented with practical demonstrations and exercises for the participants.
The theoretical topics are discussed interactively and technical details are discussed with practical demonstrations and followed by the participants. The participants work on the hands on exercises which strengthen the concepts learned.
The training material including documents, presentations with demo exercises and sample case studies are shared with the participants in soft format.

Software Installations
Intel dual/quad core compatible CPU with minimum 4GB RAM and 500GB HDD with Windows 10 64 bit with Adobe pdf reader, Google Chrome and Firefox browser latest to be installed.
Following additional tools from the URLs as shared should be installed.
NODE JS ver. 12.13.x,Curl ver. 7.70.0,MongoDB ver. 4.2 Community Edition to be installed as service, MongoDB Compass ver.1.21.2 Community Edition, Microsoft VS Code editor.

The participants must have admin rights on their systems.
Live internet connection with reasonable speed and download permissions is required to download the dependencies and plug-ins.

Training duration: Two days (16 hrs).

Instructor: Prakash Badhe.

Course Plan

SOA and Web services Review

- SOA overview.
- The need of SOA in the Enterprise
- Applications as services
- Soap and REST Services overview
- Design and Build NODE js based web and service applications

MicroService Architecture

The participants are introduced with MicroServices architecture and case study implementation is demonstrated with Spring Boot framework.

MicroServices Introduction

- Monolithic SOA applications services pros and cons
- Breaking the monolith to micro levels
- MicroService Architecture

- MicroService pros and cons
- Monolith vs. MicroServices
- Demo-Decomposing big fat application into smaller service units
- Features
  - Loose coupling
  - Isolated development and isolated testing
  - Performance enhancement and maintainability
  - Scaling the services with ease

The MicroServices implementation with Node js and Moleculer are demonstrated with examples.

Moleculer Framework for MicroServices

- Introduction and features
- Install and configuration
- Moleculer architecture
- Moleculer CLI for code generation
- Build and test the services
- Services offered by Moleculer
- Tracing and logging
- Cache middleware implementation

Micro-Services Patterns and implementation

- Fewer patterns for MicroServices
- Decompose the monolith into MicroServices
  - Decompose by Business Capabilities
  - Decompose by Domain
- Session façade as front end service
- Aggregation of services
- Split into services

Deployment Scenarios implementation

- Scaling the services
- Service instance per host
- Using API-Gateway
- Service Discovery and registration
- Load balancing across instances
- Circuit Breaker for graceful handling
  a. Protect from fault
  b. Fallback

Micro-Services communication

- Communication between services
- Role of Transporter
- NATS and TCP Transporter
- Use of Avro Serializers

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