.NET Microservices Training

Duration: **5 Day**

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Overview

Microservices architecture is a software design approach in which different business capabilities are implemented as independent services. Instead of building an entire system as a single large application, this architecture divides it into smaller services, each responsible for a specific function and designed to operate independently.

A microservice can be described as a small, self-contained software service with a clearly defined responsibility. This approach allows different application components to be developed and managed separately, while introducing additional considerations related to service communication, security, and distributed system management.

Although microservices offer a powerful and flexible way to structure applications, designing and implementing them requires careful planning. **.NET Microservices Architecture Training** is designed to help participants understand the essential principles of this approach and begin developing microservice-based applications using .NET technologies.

The course covers microservices design concepts, authentication and authorization with IdentityServer, messaging through RabbitMQ, containerization with Docker and Docker Compose, and key considerations for developing distributed applications with .NET.

Prerequisites

There are no prerequisites for attending this training.

What You Will Learn

By the end of this training, participants will be able to:

- Understand microservices architecture principles and design patterns.
- Develop microservices-based applications using .NET.
- Explore authentication and authorization with IdentityServer, OAuth 2.0, and OpenID Connect.
- Implement inter-service messaging using RabbitMQ.
- Apply Inbox/Outbox, Distributed Lock, and Idempotent Consumer patterns.
- Configure microservices environments using Docker and Docker Compose.
- Use API versioning, asynchronous programming, and distributed logging.
- Develop secure microservices solutions using SSL/TLS and data protection techniques.

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Outline

1. Fundamentals of Microservices Architecture

- Core characteristics and operating principles of microservices
- Understanding microservices architecture
- Essential concepts in microservice-based systems
- Design patterns used in microservices architecture
- Main components of a microservices environment

2. IdentityServer

- Introduction to IdentityServer
- Understanding OAuth 2.0 and OpenID Connect
- OAuth 2.0 authorization grant types
- Configuring identity management for microservices with IdentityServer
- Working with Access Tokens, ID Tokens, and Refresh Tokens

3. Message Brokers and Service Communication

- Synchronous and asynchronous communication approaches
- Messaging with RabbitMQ
- Exchange types and their purposes
- Distributed Lock mechanisms
- Message versioning strategies
- Inbox and Outbox patterns
- The Idempotent Consumer approach

4. Docker and Docker Compose

- Containerizing .NET applications with Docker
- Installing and working with Docker images
- Understanding Docker Container Registry
- Managing data with Docker Volumes
- Configuring SSL/TLS certificates in Docker environments

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- Managing containers using Docker Compose

5. Building Microservices with .NET

- Asynchronous programming in .NET Core
- API versioning practices
- Data protection
- Operational control and management
- Flexibility and adaptability
- Distributed logging
- Secure communication using SSL/TLS certificates