# INDEX



## WHAT IS CLOUD-NATIVE

Cloud native is a lot more than just signing up with a cloud provider and using it to run your existing applications. It affects the design, implementation, deployment, and operation of your application. It is an approach to building and running applications that fully exploit the advantages of the cloud computing model.

## WHY ONE SHOULD LEARN MICROSERVICES?

We have noticed that technologies today have evolved a lot to suit the requirements of today's needs of customers and projects.

If you are a hardcore developer in Microsoft stack and not using the latest features of the technology especially .NET Core very soon you will find yourself outdated.

Building a Microservices application will give you an opportunity to touch base with all the advanced features of the language and expand your scope.

## OUR TRAINING METHODOLOGY

In this course we will start with a basic CRUD microservice and then progressively develop the same project and add new features with more and more microservices. This will give the audience the feel of working with a live project as in real-time development scenarios. The same is reflected in our syllabus in the form an eStoreApplication at the end of each module.

Our **star trainer Mr. Sandeep Soni** having 23+ years of experience in IT industry has compiled this course and he will be himself delivering it.

The teaching methodology of Mr. Sandeep Soni, is very **simple but comprehensive**, every topic begins with in-depth concepts of Microservices Architecture, to position the candidate in a comfortable state about what is being talked about, followed by that **practical demos** as in real-time on every topic is taken explaining how the feature can be incorporated in real-time situations.

**You will be given enough subject knowledge for you to feel that you have additional 2 to 4 years of experience in technology.**

## WHO CAN DO THIS COURSE?

1. Any MS.NET developer with knowledge of .NET and C# can take this.
2. Architects looking forward to build Microservices based applications.

## WHAT WILL YOU GET? (SPECIAL OFFER for this batch only!)

- Exhaustive training by Microsoft Certified Trainer, **Mr. Sandeep Soni** having **2 years** of experience.
- You will get video access to the recorded sessions of the live training.
- You will get in-detailed and **Complete Courseware** prepared by Mr. Sandeep Soni himself and same can be used as for practice and reference.
- **ONE YEAR validity** – You can repeat this course three times a year.
- You can attend **Microservices Full-day Bootcamps** in future.

## COURSE OBJECTIVES

Understanding Microservices Architecture for building Enterprise Applications

Building and consuming Restful Microservices

Building Multi-Layer Architecture within a Microservice

Using Swagger for Testing Microservices

Implementing Repository Pattern

Deploying multiple microservices using Docker and YAML

Implementing Security in Microservices using OAuth and OpenIDConnect

Implementing API Gateway for Microservices using Ocelot

Asynchronous Communication between Microservices using Azure Service Bus

Understanding and Implementation of CQRS Pattern

Understanding and Implementing Domain Driven Design

Implementing Circuit Breaker Pattern using Poly.

Deploying Microservices using a CI and CD pipeline in Azure DevOps

Understanding how Kubernetes Orchestration can be used for hosting Microservices

## SYLLABUS

### Architecting and Building Microservices

**Understanding Microservices**

- Understanding Monolithic Architecture
    - What are Monolithic Applications
    - Deploying
    - Containerizing using Docker
    - Scaling Applications
    - Managing State and Data
    - Benefits and Drawbacks of Monolithic Architecture
- Microservices Architecture
    - What are Microservices
    - Monolithic vs Microservices Architecture
    - Characteristics of Microservices Architecture
    - Benefits of using Microservices Architecture
    - Microservices Design Principles.
- SOA vs. Microservice
- Handling Data in Microservices
- Communication between Microservices
    - Synchronous Communication across Microservices.
    - Asynchronous communication across Microservices.
- API Gateway Pattern
- Microservices Patterns
    - Domain Driven Design
    - Command and Query Responsibility Separation (CQRS)
    - Event Sourcing
- Creating Composite UI with Microservices
- Drawbacks of Microservices

**Setup Microservice Based Application and Perform CRUD Operations**

- Creating a Solution and Project Layout
- Implementing a CRUD microservice
- Writing Domain Classes and Controllers
- Data Context Class and Data Seeding
- Using Repository Classes

- Swagger and SwashBuckle Integration
- **Practical Demonstration using eStoreApplication**
    - Product CatalogService with SQL Server
    - Invoking both services using Swagger UI
    - Implementing Layered Architecture
    - Generic Repository Pattern
- **Azure Services Covered:**
    - **Azure App Service**
    - **SQL Database**
    - **Programming Storage Account**

**Build UI Service**

- Adding ASP.NET MVC Project
- Writing Model Classes
- Writing Service Classes
- Building Web Controller and Views
- Practical Demonstration using eStoreApplication
    a. Writing Backend for Frontend (BFF)
    b. UI Microservice to display Product Catalog

**Hosting Microservices using Docker Containers**

- Adding Docker Support to the Microservice Application
- Creating a Dockerfile file
- Designing and Developing Multi-Container Microservices
- Database Connection string and environment variables in Docker containers
- Handling Configuration Data
- **Practical Demonstration using eStoreApplication**
    - Create a docker images for Product Catalog Microservices
    - Create a docker image for UI Microservice
    - Writing a YAML for deploying and executing the application.
- **Azure Services**
    - **Azure Container Registry**
    - **Hosting Multiple Docker Image in App Service using YAML**

**Using Redis Cache in Microservices**

- Understanding Redis Cache importance
- Programming Microservice to use Redis Cache
- Consuming Microservice in Web Client

- **Practical Demonstration using eStoreApplication**
    - Building Shopping Cart Microservice
    - Persisting Cart data in Redis Cache
    - Create a docker image for Shopping Cart Microservice
- **Azure Services**
    - **Redis Cache**

**Understanding OAuth2 and OpenIdConnect**

- Authentication and Authorization
- Introduction to Basic Authentication Workflow
- Understanding OAuth
- OAuth Grant Types
- Understanding OpenIDConnect
- Securing Services and Middleware in ASP.NET Core
- Using JWT Token to Authenticate and Authorize
- Practical
    - Implementing Basic Authentication using JWT Token and .NET Core

**Implementing Security for Microservices**

- The Big Picture
- Using Client Credential Token to Access Microservice
- Using Access Token to call Microservices
- Authentication between Microservices
- Implementing Role based and Policy based Authorization
- **Practical Demonstration using eStoreApplication**
    - Adding Authentication Microservice to Solution
    - Securing ProductCatalog Microservice
    - Accessing secure ProductCatalog in Client Application
- **Azure Services**
    - **Azure AD**

**API Gateway Integration**

- Introduction to API Gateway
- Understanding Ocelot Middleware
- Integrating API Gateway for Routing
- Handling Secure Microservices in API Gateway
- **Practical Demonstration using eStoreApplication**
    - Adding API Gateway Service using Azure API Gateway Middleware

- Updating configuration for routing to ProductCatalog and ShoppingCart Microservices

- Azure Services
  - **API Management (APIM)**
    - **Setup and Understanding Polcies.**

**Microservices Communication**

- Synchronous Communication using REST API
- Asynchronous Communication using Service Bus
- Integration Events and Event Handlers
- Handing Atomicity and Resiliency when Publishing to EventBus
- **Practical Demonstration using eStoreApplication**
  - Adding Product to Shopping Cart Service for logged-in client
  - Create a docker images for Product Catalog Microservices
  - Asynchronous Communicating with Service Bus
- **Azure Services**
  - **Service Bus**

**Implementing CQRS Pattern**

- Overview of CRQS Pattern
- Understanding Command Pattern
- Domain Model and Read Model
- Comparing CQRS with traditional CRUD approach
- Apply CQRS and CQS approach in DDD microservice
- **Practical Demonstration using eStoreApplication**
  a. Build a New ProductCatalog Service Demo
  b. Update ShoppingCart if Product Price changes.
  c. Update ProductCatalog inventory if order is placed.
- **Azure Services**
  a. **Azure Service Bus**

**Domain Driven Pattern**

- Overview of Domain and Domain Driven Design
- Layered Architecture in DDD Microservices
- Implementing the Command and Command Handler Pattern
- About Domain Events
- Command and Command Handler Classes
- Practical Implementation of DDD Pattern
- Practical Demonstration using eStoreApplication

a. Implementing DDD using Order Microservices
b. Usage of MediateR

**Handling Failures**

- Handle Partial failure
- Implement retries and exponential backoff
- Using Polly policies
- Circuit Breaker Pattern
- Practical Demonstration using eStoreApplication
    a. Handle Order Service failure
    b. Handling temporary downtime of SQL Database.


***WE PROMISE 100% MONEY BACK IF THE STUDENT ATTENDS COMPLETE COURSE AND IS NOT SATISFIED WITH THE QUALITY OF TRAINING***

https://www.bestdotnettraining.com/microservices-online-training