

KOENIG SOLUTIONS · COURSE OUTLINE

Building Microservices (Arcitura)

Learn to design, build, secure and connect microservices with ASP.NET Core, from first service to distributed transactions.

5 Days

DURATION

17

MODULES

38

TOPICS

5

HANDS-ON ACTIVITIES

COURSE OVERVIEW

This course covers the design and development of microservices, starting with the differences between microservices and monolithic architecture before building a first ASP.NET Core Web API with database storage using Entity Framework Core. It then addresses expanding a system across multiple services, using both synchronous REST communication and asynchronous messaging, and connecting a frontend to these services. Identity, authentication and authorization are covered in depth, including JWT tokens, gateway authentication, role-based and policy-based access control, and securing both APIs and frontend integration. The final modules address distributed transactions through the saga pattern, including orchestration, compensation and idempotency, concluding with a complete frontend store experience.

WHO THIS COURSE IS FOR

Backend Developers

Software Architects

Full-Stack Developers

.NET Developers

API Developers

LEARNING OBJECTIVES

- Explain the differences between microservices and monolithic architecture
- Build a basic ASP.NET Core Web API as a microservice
- Implement database storage using Entity Framework Core
- Apply synchronous communication between services using HttpClient
- Implement asynchronous communication using messaging such as RabbitMQ
- Configure authentication and token validation using JWT
- Apply role-based and policy-based authorization in microservices
- Implement the saga pattern for distributed transactions

17 Modules, 38 Topics

DAY 1

Introduction to Microservices & First Service

01

Introduction to Microservices

TOPICS

Microservices vs Monolithic Architecture · Core principles of microservices · Real-world use cases

02

Your First Microservice

TOPICS

- Setting up the .NET development environment
- Creating a basic ASP.NET Core Web API
- Solution and project structure for microservices

03

Adding Database Storage

Lab

TOPICS

Introduction to relational databases · Setting up SQL Server or SQLite · Using Entity Framework Core for data access

DAY 2

Expanding the System & Communication Basics

04

Preparing for the Next Microservice

TOPICS

- Creating additional microservices (e.g., Order Service)
- Independent deployments and service isolation

05

Synchronous Inter-Service Communication

TOPICS

REST API integration using HttpClient · Handling timeouts and retries

06**Lab**

Asynchronous Inter-Service Communication

TOPICS

- Basics of messaging systems (RabbitMQ or similar)
- Implementing event-based communication

DAY 3

Frontend and Microservice Security Introduction

07

Initial Frontend Integration

TOPICS

- Building a simple frontend using HTML/JavaScript or Blazor
- Calling microservices APIs from frontend

08

Identity in Microservices

TOPICS

- Basics of authentication and identity providers
- Understanding tokens (JWT) and claims

09**Lab**

Microservices Security Patterns and Techniques

TOPICS

Gateway authentication · Service-to-service token validation · Secure-by-default practices

DAY 4

Security Implementation and Authorization

10

Implementing Microservices Security

TOPICS

- Enabling authentication middleware in ASP.NET Core
- Securing API endpoints using JWT tokens

11

Authorization in Microservices

TOPICS

Role-based and policy-based access control · Using claims for custom authorization logic

12

Lab

Frontend Integration to Secure Microservices

TOPICS

- Managing login and tokens in frontend
- Handling authorization failures and session expiry

DAY 5 Transactions and Store Experience

13

Transactions with Microservices

TOPICS

Challenges with distributed transactions · Eventual consistency and reliability concerns

14

Preparing the Saga Participants

TOPICS

- Saga design pattern fundamentals
- Setting up participant services (Order, Payment, Inventory)

15

Implementing the Purchase Saga

TOPICS

Orchestration-based implementation · Handling success/failure paths

16

Compensation and Idempotency

TOPICS

Undoing actions when part of a flow fails · Ensuring operations are idempotent

The Frontend Store Experience

TOPICS

- Integrating complete purchase flow
- Displaying products, placing orders, handling responses

HANDS-ON ACTIVITIES

Practise What You Learn

#	MODULE	ACTIVITY
03	Adding Database Storage	Lab: Build and run a microservice with database integration (e.g., Product Service)
06	Asynchronous Inter-Service Communication	Lab: Implement inter-service communication using both HTTP and asynchronous messaging
09	Microservices Security Patterns and Techniques	Lab: Connect a frontend to microservices with secure token-based authentication
12	Frontend Integration to Secure Microservices	Lab: Secure multiple services and integrate authenticated access in the frontend
17	The Frontend Store Experience	Final Lab: Full store experience including secure login, order placement, and recovery

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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