Master Class: Designing and Implementing Cloud Native Applications using Microsoft Azure

Category: Cloud Platforms | **Vendor:** Microsoft

Duration: 40.00 hours (5 days) **32.5 CPD Hours** **Rating:** ⭐ 4.6 (5,878 reviews)

Course Information

Delivery Format: Instructor Led - Online

Course Overview

The seminar is aimed at Azure developers and software architects who want to get an overview of the core elements of developing and deploying cloud-native applications in Microsoft Azure.

In addition to the theoretical parts of the individual modules, we modernize an app consisting of a classic monolith with UI into a cloud-native app with microservices (catalog, orders, payment, production delivery) and the related micro frontends. We discuss topics like the Cloud Maturity Model and place value on the use of best practices and cloud design patterns. In the introduction we also present the .NET Aspire framework, which we will partly use to implement the microservices.

We teach container essentials and concepts such as optimization of Container sizes, security patching, stateful containers or sidecar patterns. To ensure a developer centric focus, we will deploy the microservices to the Kubernetes based Azure Container Apps und cover topics such as secrets, revisions, configuration management, health checks, Kubernetes event-driven auto-scaling - KEDA, as well as stateful containers and container jobs. For service to service authentication, we use managed identities and service connectors. The skills learned can also be applied to other container hosting platforms such as Azure Kubernetes Service (AKS) or Azure Red Hat OpenShift (ARO).

We use Azure Functions to implement stateful microservices, which we publish either as serverless or as containers to Azure Container Apps using .NET isolation. We cover topics such as OData, Open API support, dependency injection, and durable functions. We will use durable entities to implement and discuss virtual actors and durable saga pattern. We also cover topics such as monitoring and Dapr integration.

We will discuss the advantages of NoSQL databases and accompany you on your way from relational DB design to Cosmos DB NoSQL API and thereby introduce fundamentals of Domain Driven Design. We cover data modelling, performance optimization as well as access using SDK's and the Data Api Builder. We also cover topics such as change feed, event sourcing, materialized views and CQRS.

We teach the basics of message & event-driven applications, their transaction patterns, which we implement using saga pattern. As alternative to .NET Aspire we will connect the individual services using Distributed Application Runtime (Dapr) and cover topics such as service invocation, pub/sub messaging, secrets, configuration, Dapr Actors, Dapr and Function integration as well as distributed tracing and observability.

We publish and secure the app and its microservices with API management and cover topics like

versioning, revisions, authentication and BFF pattern using GraphQL.

Last but not least, we will connect the micro frontends using Azure Event Grid and SignalR to create a real-time connected app.

About This Course

- Introduction to Cloud Native Applications & the Cloud Maturity Model
- Container Essentials & Configuration Management
- Developing & Publishing Microservices using Azure Container Apps (ACA)
- Stateful Microservices using Azure Functions
- NoSQL Data & Event storage using Cosmos DB
- Designing and Implementing Message based & Event Driven Apps
- Using Distributed Application Runtime - Dapr
- Optimizing and Securing Access using Api Management & Application Gateway
- Connecting Real Time Micro Frontends using Event Grid

Find out more in our course video

Who Should Attend

Azure Developers & Software Architects

Prerequisites & Entry Requirements

General Prerequisites:

Course participants who want to successfully complete the labs should have acquired knowledge and experience of the knowledge taught in Develop Solutions for Microsoft Azure (AZ-204T00). Topics marked with RECAP are brief summaries of AZ-204 content as refreshers. DevSecOps relevant topics are covered in a separate course.

Detailed Course Outline

Introduction to Cloud Native Applications & Cloud Maturity Model

- What are Cloud Native Applications
- Cloud Maturity Model: Monolith vs Microservices Architecture
- Clean Architecture
- Introduction to .NET Aspire: Orchestration, Components, Tooling
- Microservices Communication Patterns
- Architecture Overview of the Sample App & Services
- Cloud Architecture Design Patterns
- Container Hosting & DevOps
- Provisioning of Azure Resources using Azure CLI & Bicep
- Introduction to Azure Cost Management

Container Essentials & Configuration Management

- Docker Development Workflow: Multistage Build, Run & Debug Recap
- Container builds using Azure Container Registry
- Using docker-compose.yaml to run multiple containers for local development
- Kubernetes Developer Essentials
- Container Configuration Management (Env Variables, Key Vault & Azure App Config Service)
- Understanding the Sidecar Pattern
- Optimizing .NET 8 Container Size using chiseled, trim and aot
- Container Security Patching

Developing & Publishing Microservices using Azure Container Apps (ACA)

- Azure Container Apps Introduction
- Azure Container Apps vs Kubernetes

- Publish Microservices (Ingress, Egress) and manage Revisions
- Secrets, Managed Identities & Service Connectors
- Using Azure App Configuration in Azure Container Apps
- Task Automation using Jobs
- Scaling & KEDA (Kubernetes Event Driven Auto-Scaling)
- Stateful Apps using Volume Mounts & Persistent Storage
- Microsoft Entra ID Easy Authentication
- Health Probes, Monitoring, Logging & Observability

Stateful Microservices using Azure Functions

- OData, Open API Support and Dependency Injection
- Hosting: Serverless vs Containers
- Environment Variables, Key Vault, and App Configuration
- Using Managed Identities and Service Connector to access Azure Resources
- Implementing and monitoring Durable Functions to implement long running processes
- Azure Durable Entities, Aggregation & Virtual Actors
- Publishing Azure Functions to Azure Container Apps

NoSQL Data & Event storage using Cosmos DB

- From Relational to NoSQL: Do's and Don’ts
- Partitioning Strategies & Performance Optimization
- Domain Driven Design (DDD) Basics & Bounded Context Pattern
- Using SDKs to interact with Cosmos DB
- Using Data Api Builder to expose Cosmos DB
- Implementing an Event Store using Event Sourcing
- Creating Materialized Views using Materialized Views Builder
- Optimizing Read/Write Performance with Change Feed & CQRS

Designing and Implementing Message- & Event Driven Apps

- Introduction to Messaging
- Message Types and Channels
- Introduction to Event Driven Architecture (EDA)
- Event Types: Domain-, Integration-, Cloud Events
- Publishing & Subscribing Events using an Event Bus
- Distributed Transactions
- Saga: Orchestration, Choreography
- Common Message Brokers in Azure

Using Distributed Application Runtime - Dapr

- Introduction to Dapr
- Understanding Dapr Architecture & Building Blocks
- Developer Environment Setup, Debugging & State Management
- Using Dapr Components in Azure Container Apps
- Service Invocation & Bindings
- Pub/Sub Messaging
- Secrets and Configuration
- Azure Functions & Dapr Bindings
- Dapr Actors & Saga
- Observability and Distributed Tracing

Optimizing and Securing Access using Api Management & Application Gateway

- API Management (APIM) Recap
- API Versions and Revisions using Azure Container Apps
- Authenticating to Backend Services
- Understanding Gateway Pattern and Backends for Frontend Pattern (BFF)
- Implement BFF using APIM and GraphQL

Connecting Real Time Micro Frontends using Event Grid

- Micro Frontends: Introduction & Benefits
- Publish the Shop Micro Frontend to Azure Container Apps
- Real-time connected Micro Frontend using Azure Event Grid and SignalR
- Connect the Real Time Kitchen Dashboard
- Connect the Order Status Micro Frontend

Frequently Asked Questions

Q: What delivery options are available for Master Class: Designing and Implementing Cloud Native Applications using Microsoft Azure?

We offer multiple delivery formats:

- Live Instructor-Led Classroom Online (Virtual/Live Online)
- Traditional Instructor-Led Classroom Training (ILT)
- On-site delivery at your offices anywhere in United Kingdom
- Private dedicated courses customized for your team

Q: How many CPD hours does this course provide?

The 5-day Master Class: Designing and Implementing Cloud Native Applications using Microsoft Azure course provides up to 32.5 CPD hours of structured learning. CPD certificates can be provided upon request.

Q: What is the duration of the Master Class: Designing and Implementing Cloud Native Applications using Microsoft Azure training?

The training takes place over 5 day(s), with each day lasting approximately 40.00 hours including breaks for lunch and refreshments.

Q: Do you provide corporate training for Master Class: Designing and Implementing Cloud Native Applications using Microsoft Azure?

Yes, we provide corporate training, dedicated training, and closed classes for Master Class: Designing and Implementing Cloud Native Applications using Microsoft Azure. Training can take place anywhere in United Kingdom including London, Manchester, Birmingham, Edinburgh, or live online allowing teams from across United Kingdom or internationally to attend.

Q: What related terms do people search for?

Popular related searches include: Master Class: Designing and Implementing Cloud Native Applications using Microsoft Azure, Azure Development, DICNMA

Q: Why choose Nexus Human for Master Class: Designing and Implementing Cloud Native Applications using Microsoft Azure?

Nexus Human is recognized as one of the leading training providers. Our trainers have won multiple awards including:

- Small Firms Best Trainer Award
- National Training Partner of the Year (Ireland) - Multiple Years
- Global Top 30 Instructor Awards (2012, 2019, 2021)
- Tech Excellence Award Nominations
- Learning Performance Institute (LPI) External Training Provider Sponsor 2024

Q: Are there any discount codes available?

Yes! Use discount code **PENPAL5** when booking your Master Class: Designing and Implementing Cloud Native Applications using Microsoft Azure training. Please note that only one discount code can be used per booking and cannot be combined with other special offers.

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