Fundamental Microservice Architecture

OEM: Arcitura • Duration: 3 Days (24 hrs) • Code: S90.09B

COURSE MODULES & TOPICS

Module 1: Fundamental SOA, Services & Microservices

- Business and Technology Drivers for SOA, Services and Microservices
- Strategic Goals and Benefits of Service-Oriented Computing
- Plain English Introduction to Services and Microservices
- Fundamental Characteristics of a Service-Oriented Architecture
- Understanding Service-Orientation as a Design Paradigm, including coverage of the Four Pillars of Service-Orientation
- Introduction to Service Layers, Service Models and Service Compositions
- Service Inventories, Service Layers and Service API Governance and Management
- Introduction to Common Service Technologies, including API Gateways, Virtualization, Containerization
- Introduction to Cloud Computing and Cloud Services
- Adoption Impacts and Requirements, including considerations for Governance, Infrastructure, Performance and Standardization

Module 2: Microservice Technology Concepts

- Comparing Service Implementation Mediums
- Service Roles and Service Agents
- Message Exchange Patterns and Service Activities
- Basic XML, XML Schema, JSON and JSON Schema Concepts
- HTTP Methods, Response Codes and Headers
- Basic REST Service Concepts, including Properties and Constraints
- REST Services, Contracts, Resources and Messaging
- Hypermedia and Late Binding
- Basic WSDL and SOAP Concepts
- WS-* Technologies
- Web Service Contracts, Messaging and Registries
- Cloud Computing Concepts
- Vertical and Horizontal Scaling
- Multitenancy, Elasticity and Resiliency
- On-Demand Usage, Ubiquitous Access and Measured Usage
- Public, Private and Hybrid Clouds
- IaaS, PaaS and SaaS

Module 9: Fundamental Microservice Architecture & Containerization

- Introduction to Microservice Architecture
- Common Microservice Design Challenges
- Microservices and Design Granularity
- Microservice Guiding Design Principles
- Introduction to Containerization
- Containerization vs. Virtualization
- Fundamental Container Architecture Elements
- Container Engines, Build Files, Images and Networking
- Microservice Automation, Logging and Monitoring
- Microservice Instance Registration
- Scaling Technology, Basic Scalability Types and Mechanisms
- Technology Drivers for Cloud-based Microservice Deployments
- Micro Task Abstraction and Micro Task Segregation
- Rich Containers and Logical Pod Containers
- DevOps Practices and Benefits
- DevOps Stages and Toolchains
- Domain-Driven Design and Microservices

Module 10: Advanced Microservice Architecture & Containerization

- Microservice Compositions and Compositor Services
- Autonomous Proxy Services
- Shared Isolated Databases
- Microservice Layers and Isolation Levels
- Pre-Defined Data Views
- Microservice Instance Registrations
- Workload Distribution and Service Load Balancing
- Synchronized Cross-Instance Events
- Event-Driven Messaging for Microservices
- Atomic Event Processing and Appended Events
- Centralized Isolated State Databases
- Container Chains
- Single-Node Multi-Containers
- Multi-Container Isolation Control
- Volatile Container Configurations
- Serverless Microservice Deployments
- Dynamic Scalability Models
- Micro Scatter-Gather Compositions
- Leader Node Election for Microservice Instances
- Redundant Microservice Implementations
- Microservice Composition Autonomy
- Container Sidecars and Microservice Ambassadors

- Log Aggregation for Microservices
- Distributed Diagnostics for Microservices

Module 11: Microservice Architecture & Containerization Lab

- Reading Exercise 11.1: Case Study Background: Cube Cars
- Lab Exercise 11.2: Establishing a Microservice Scaling Architecture
- Lab Exercise 11.3: Redesigning the CubeSoft Microservices
- Lab Exercise 11.4: Scaling the Customer Notification Microservice
- Reading Exercise 11.5: Case Study Background: XYZ Travel Agency
- Lab Exercise 11.6: Extending the XYZ Microservice Architecture
- Lab Exercise 11.7: Optimizing the Payroll Microservice Architecture
- Lab Exercise 11.8: Designing a New Performance Review Solution
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