

KOENIG SOLUTIONS • COURSE OUTLINE

Service API Specialist

Learn to design, implement and manage service APIs, from SOA and microservice foundations to REST, gRPC, GraphQL and service mesh patterns.

4

MODULES

55

TOPICS

12

LAB EXERCISES

COURSE OVERVIEW

This course covers the business drivers, principles and technologies behind service-oriented architecture, services and microservices, including API gateways, virtualization, containerization and cloud computing. It then examines microservice technology concepts such as REST, SOAP, WSDL, WS-* technologies and cloud scaling and deployment models. The course moves into fundamental and advanced service API design and management, covering contracts, coupling, data serialization formats, API gateways, gRPC, GraphQL, Falcor, Thrift and service mesh architecture. A hands-on lab reinforces these concepts through a case study involving service API definition, coupling analysis and service design exercises.

WHO THIS COURSE IS FOR

API Designers

Solution Architects

Service Developers

Integration Engineers

Cloud Architects

LEARNING OBJECTIVES

- Explain the business and technology drivers for SOA and microservices
- Describe the four pillars of service-orientation and service models
- Compare service implementation mediums, such as REST and SOAP
- Identify cloud computing models, including IaaS, PaaS and SaaS
- Analyse service coupling types and contract centralization approaches
- Apply data serialization formats such as XML, JSON and Protocol Buffers
- Evaluate API gateway, service mesh and service broker architectures
- Design service APIs using gRPC, GraphQL and Falcor concepts

4 Modules, 55 Topics

01

Fundamental SOA, Services & Microservices

TOPICS

- 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-Oriented as a Design Paradigm, including coverage of the Four Pillars of Service-Oriented
- 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

02

Microservice Technology Concepts

TOPICS

- 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

03

Fundamental Service API Design & Management

TOPICS

- Introduction to APIs and API Roles
- Public, Private and Partner API Models
- The Service API Lifecycle
- Decoupled Contracts and Service Façades
- Contract Centralization and Service Agents
- Positive and Negative Service Coupling Types
- Text-based Data Serialization Formats (XML, JSON)
- Binary Data Serialization Protocols (Apache Avro, Thrift, Google Protocol Buffer)
- REST APIs and REST Properties
- Endpoint Redirection, Entity Linking and Idempotent Capabilities
- Lightweight Endpoints and Uniform Contracts
- API Gateways and Service Brokers
- Data Model and Format Transformation, Protocol Bridging
- Intermediate Routing, Brokered Authentication and Multi-Channel Endpoints

04

Advanced Service API Design & Management

TOPICS

- Understanding gRPC for (.proto and XML)
- Unary RPC, Client/Server Streaming RCP and Bidirectional RPC
- Understanding GraphQL, Data Requests and Fetches, Caching
- Understanding Falcor, Falcor vs. GraphQL, Request Batching
- Understanding Thrift (Processor, Protocol and Transport Layers)
- Concurrent Contracts, Contract Denormalization and Canonical Schema
- Schema Centralization, Policy Centralization and Canonical Protocol
- Dual Protocols and Legacy Wrappers
- Messaging Metadata and State Messaging
- Service Mesh Model, Library, Proxy and Sidecar
- Service Mesh vs. API Gateway
- Service API Management
- Decomposed Capability, Distributed Capability and Proxy Capability
- Validation Abstraction and Partial Validation

Service API Design & Management Lab

12 Lab Exercises

Practise What You Learn

#	MODULE	ACTIVITY
05	Service API Design & Management Lab	■ Reading Exercise 14.1: Case Study Background: Handy ■ Lab Exercise 14.2: Define Lines of Communication ■ Lab Exercise 14.3: Define Service API View ■ Lab Exercise 14.4: Define Communication Support in Processing Logic ■ Lab Exercise 14.5: Identify Coupling Types ■ Lab Exercise 14.6: Identify Hidden Coupling Issues ■ Lab Exercise 14.7: Solve Coupling Problems ■ Reading Exercise 14.8: Order Processing Service APIs ■ Lab Exercise 14.9: Optimize Service API for Performance ■ Lab Exercise 14.10: Deal Service Extension ■ Lab Exercise 14.11: Design Product Service ■ Lab Exercise 14.12: Enhance Product Service Architecture

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

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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