

KOENIG SOLUTIONS · COURSE OUTLINE

Build AI applications with Azure Cosmos DB

4 Days

DURATION

3

MODULES

176

TOPICS

DP-420T00-A

COURSE CODE

COURSE OVERVIEW

This course teaches developers how to create application using the NoSQL API and SDK for Azure Cosmos DB. Students will learn how to design, build, and optimize high-performance, scalable AI applications with Azure Cosmos DB.

WHO THIS COURSE IS FOR

- Software engineers tasked with authoring cloud-native solutions that leverage Azure Cosmos DB for NoSQL and its various SDKs. They are familiar with C#, Python, Java, or JavaScript. They also have experience writing code that interacts with a SQL or NoSQL database platform.

3 Modules, 176 Topics

01

Design and develop Azure Cosmos DB database solutions

TOPICS

Explore Azure Cosmos DB for NoSQL

- Introduction
- What is azure cosmos db nosql
- How azure cosmos db nosql works
- Evaluate azure cosmos db for workload
- Explore resources basic operations
- Exercise create account resources
- Knowledge check
- Summary

Configure resources, throughput, and consistency

- Introduction
- Evaluate throughput ru requirements
- Choose throughput model
- Configure throughput scope
- Evaluate configure consistency
- Configure ttl data retention
- Exercise configure throughput consistency
- Knowledge check
- Summary

Connect to Azure Cosmos DB with the SDK

- Introduction
- Understand import sdk
- Connect client singleton
- Configure connectivity mode
- Enable offline development emulator
- Handle errors logging parallelism

Design and develop Azure Cosmos DB database solutions

TOPICS (CONTINUED)

- Exercise connect app
- Knowledge check
- Summary

Implement Azure Cosmos DB operations with the SDK

- Introduction
- Perform point reads
- Create replace upsert delete
- Update with patch
- Configure item ttl
- Implement optimistic concurrency
- Execute transactional batch
- Process bulk operations
- Exercise implement data operations
- Knowledge check
- Summary

Query data in Azure Cosmos DB for NoSQL

- Introduction
- Understand sql query language
- Create execute queries
- Implement correlated subqueries
- Create cross product queries
- Page results continuation tokens
- Exercise author page queries
- Knowledge check
- Summary

Design a data modeling and partitioning strategy

- Introduction
- Identify access patterns
- Embed or reference

Design and develop Azure Cosmos DB database solutions

TOPICS (CONTINUED)

- Optimize data reads
- Select partition key
- Implement hierarchical partition keys
- Synthetic keys multitenant
- Identify antipatterns estimate cost
- Exercise design model partitioning
- Knowledge check
- Summary

Process the Azure Cosmos DB for NoSQL change feed

- Introduction
- Understand change feed
- Implement change feed processor
- Choose change feed mode
- Handle events azure functions
- Move data container copy jobs
- Exercise process changes copy data
- Knowledge check
- Summary

Implement AI-assisted development tools for Azure Cosmos DB

- Introduction
- Understand ai assisted toolset
- Use cosmos db mcp server
- Use agent toolkits
- Choose tool understand scope
- Exercise inspect azure cosmos db azure mcp server
- Knowledge check
- Summary

Secure, optimize, and deploy Azure Cosmos DB solutions

TOPICS

Secure an Azure Cosmos DB solution

- Introduction
- Implement entra authentication
- Configure key authentication rotation
- Implement rbac
- Configure network security
- Configure dynamic data masking
- Exercise secure account
- Knowledge check
- Summary

Configure backup and restore in Azure Cosmos DB

- Introduction
- Evaluate backup options
- Configure continuous backup
- Perform point in time recovery
- Describe azure backup for cosmos db
- Exercise recover recovery point
- Knowledge check
- Summary

Design multi-region availability and failover in Azure Cosmos DB

- Introduction
- Explore global distribution
- Add regions configure reads
- Configure multi region writes
- Resolve write conflicts
- Configure account failover
- Configure partition level failover
- Exercise configure regions failover
- Knowledge check

Secure, optimize, and deploy Azure Cosmos DB solutions

TOPICS (CONTINUED)

- Summary

Design and optimize an indexing strategy in Azure Cosmos DB

- Introduction
- Understand indexing policies
- Configure indexing policies workloads
- Configure composite spatial indexes
- Configure computed properties
- Implement global secondary indexes
- Exercise optimize indexing
- Knowledge check
- Summary

Analyze and tune query and operation performance in Azure Cosmos DB

- Introduction
- Evaluate request unit high cost queries
- Analyze query metrics
- Analyze index metrics
- Optimize cross partition queries
- Exercise tune query
- Knowledge check
- Summary

Monitor and troubleshoot Azure Cosmos DB

- Introduction
- Interpret response codes throttling
- Monitor latency partition utilization
- Configure azure monitor alerts
- Analyze diagnostic logs
- Exercise diagnose alert
- Knowledge check
- Summary

02

Secure, optimize, and deploy Azure Cosmos DB solutions

TOPICS (CONTINUED)

Manage Azure Cosmos DB at scale with fleets

- Introduction
- Understand azure cosmos db fleets
- Create organize fleet
- Configure fleet throughput pools
- Monitor fleet analytics
- Exercise create monitor fleet
- Knowledge check
- Summary

03

Implement AI and analytics capabilities in Azure Cosmos DB

TOPICS

Implement full-text and vector search in Azure Cosmos DB for NoSQL

- Introduction
- Implement full text search
- Design vector data policies
- Configure vector indexes partitioning
- Implement vector search
- Refresh embeddings change feed
- Exercise build native search
- Knowledge check
- Summary

Implement hybrid search and optimize AI retrieval in Azure Cosmos DB for NoSQL

- Introduction
- Choose retrieval strategy
- Implement hybrid search rrf

Implement AI and analytics capabilities in Azure Cosmos DB

TOPICS (CONTINUED)

- Optimize fulltext vector performance
- Isolate search with gsi
- Exercise build tune hybrid search
- Knowledge check
- Summary

Build RAG applications with Azure Cosmos DB for NoSQL

- Introduction
- Understand retrieval augmented generation on cosmos db
- Prepare content retrieval
- Retrieve context ground responses
- Orchestrate retrieval augmented generation pipeline
- Exercise build retrieval augmented generation assistant
- Knowledge check
- Summary

Design and implement agent memory stores in Azure Cosmos DB

- Introduction
- Understand agent memory architectures
- Implement conversation state
- Implement semantic memory
- Optimize memory retrieval context injection
- Design memory retention pruning
- Exercise build memory store
- Knowledge check
- Summary

Implement operational analytics with Microsoft Fabric

- Introduction
- Choose cosmos db or fabric
- Configure mirroring into fabric
- Monitor mirroring

03

Implement AI and analytics capabilities in Azure Cosmos DB

TOPICS (CONTINUED)

- Query mirrored data tsqI spark
- Exercise mirror and query
- Knowledge check
- Summary

WHAT IS INCLUDED

Everything You Need to Succeed

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

FLEXIBLE DELIVERY

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Fly-Me-A-Trainer (FMAT)

Flexi (Self-Paced)

1-on-1 Training



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