DP-420: Designing and Implementing Cloud-Native Applications Using Microsoft Azure Cosmos DB

Microsoft - Data & AI

- **Localidade:** Porto
- **Data:** 27 Jun 2022
- **Preço:** 1430 € (Os valores apresentados não incluem IVA. Oferta de IVA a particulares e estudantes.)
- **Horário:** Manhã das 9h00 - 17h00
- **Nível:** Intermédio
- **Duração:** 28h

Sobre o curso

This course teaches developers how to create application using the SQL API and SDK for Azure Cosmos DB.

Students will learn how to write efficient queries, create indexing policies, manage and provisioned resources, and perform common operations with the SDK.

Destinatários

- Software engineers tasked with authoring cloud-native solutions that leverage Azure Cosmos DB SQL API 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.

Objetivos

You will learn to:

- Create and configure Azure Cosmos DB SQL API account, database, and container
- Use the .NET SDK to manage resources and perform operations
- Perform queries of varying complexity
- Design a data modeling and partitioning strategy
- Optimize queries and indexes based on characteristics of an application

- Use the Azure Resource Manager to manage accounts and resources with CLI or JSON and Bicep templat

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Pré-requisitos

Before attending this course, students must have:

- Knowledge of Microsoft Azure and ability to navigate the Azure portal (AZ-900 equivalent)
- Experience writing in an Azure-supported language at the intermediate level. (C#, JavaScript, Python, or Java)
- Ability to write code to connect and perform operations on a SQL or NoSQL database product. (SQL Server, Oracle, MongoDB, Cassandra or similar)

Programa

- Get started with Azure Cosmos DB SQL API
- Plan and implement Azure Cosmos DB SQL API
- Connect to Azure Cosmos DB SQL API with the SDK
- Access and manage data with the Azure Cosmos DB SQL API SDKs
- Execute queries in Azure Cosmos DB SQL API
- Define and implement an indexing strategy for Azure Cosmos DB SQL API
- Integrate Azure Cosmos DB SQL API with Azure services
- Implement a data modeling and partitioning strategy for Azure Cosmos DB SQL API
- Design and implement a replication strategy for Azure Cosmos DB SQL API
- Optimize query performance in Azure Cosmos DB SQL API
- Administrating and Monitoring tasks for an Azure Cosmos DB SQL API solution
- Manage an Azure Cosmos DB SQL API solution using DevOps practices
- Create server-side programming constructs in Azure Cosmos DB SQL API

Get started with Azure Cosmos DB SQL API

Modern apps thrive on real-time data from different sources and shaped in different forms. These apps require a modern database that can handle the variety and velocity of data that will be thrown at it. In this module, we will explore Azure Cosmos DB and how the SQL API can solve some of the problems presented by modern applications.

Lessons

- Introduction to Azure Cosmos DB SQL API

- Try Azure Cosmos DB SQL API

Lab : Exercise: Create an Azure Cosmos DB SQL API account

Plan and implement Azure Cosmos DB SQL API

Creating a new Azure Cosmos DB account often requires making a lot of configuration choices that can, at first, be daunting. While the defaults fit a lot of scenarios, it makes the most sense to familiarize yourself with the configuration options to ensure that your account and resources are optimally configured for your solution. In this module, you will learn how to prepare and configure an Azure Cosmos DB account and resources for a new solution.

Lessons

- Plan Resource Requirements
- Configure Azure Cosmos DB SQL API database and containers
- Moving data into and out of Azure Cosmos DB SQL API

Labs

- Exercise: Configure throughput for Azure Cosmos DB SQL API with the Azure portal
- Exercise: Migrate existing data using Azure Data Factory

Connect to Azure Cosmos DB SQL API with the SDK

There are various SDKs available to connect to the Azure Cosmos DB SQL API from many popular programming languages including, but not limited to .NET (C#), Java, Python, and JavaScript (Node.js). In this module, you will get hands-on with with the .NET SDK for the Azure Cosmos DB SQL API.

Lessons

- Use the Azure Cosmos DB SQL API SDK
- Configure the Azure Cosmos DB SQL API SDK

Labs

- Exercise: Configure the Azure Cosmos DB SQL API SDK for offline development
- Exercise: Connect to Azure Cosmos DB SQL API with the SDK

Access and manage data with the Azure Cosmos DB SQL API SDKs

The SQL API SDK for Azure Cosmos DB is used to perform various point operations, perform transactions, and to process bulk data. In this module, you will use the SDK to manipulate documents either individually or in groups.

Lessons

- Implement Azure Cosmos DB SQL API point operations
- Perform cross-document transactional operations with the Azure Cosmos DB SQL API
- Process bulk data in Azure Cosmos DB SQL API

Labs

- Exercise: Create and update documents with the Azure Cosmos DB SQL API SDK
- Exercise: Batch multiple point operations together with the Azure Cosmos DB SQL API SDK
- Exercise: Move multiple documents in bulk with the Azure Cosmos DB SQL API SDK

Execute queries in Azure Cosmos DB SQL API

The Azure Cosmos DB SQL API supports Structured Query Language (SQL) as a JSON query language. In this module, you will learn how to create efficient queries using the SQL query language.

Lessons

- Query the Azure Cosmos DB SQL API
- Author complex queries with the Azure Cosmos DB SQL API

Labs

- Exercise: Paginate cross-product query results with the Azure Cosmos DB SQL API SDK
- Exercise: Execute a query with the Azure Cosmos DB SQL API SDK

Define and implement an indexing strategy for Azure Cosmos DB SQL API

By default, Azure Cosmos DB automatically indexes all paths of documents stored using the SQL API. This is great for developing new applications as you can create complex queries almost immediately. As your application matures, you can customize your indexing policy to better match the needs of your solution. In this module, you will learn how to create a custom indexing policy.

Lessons

- Define indexes in Azure Cosmos DB SQL API
- Customize indexes in Azure Cosmos DB SQL API

Labs

- Exercise: Review the default index policy for an Azure Cosmos DB SQL API container with the portal
- Exercise: Configure an Azure Cosmos DB SQL API container’s index policy with the portal

Integrate Azure Cosmos DB SQL API with Azure services

Azure Cosmos DB has tight integration available with many other Azure services such as Azure Functions, Azure Cognitive Search, Azure Event Hubs, Azure Storage, Azure Data Factory, and Azure Stream Analytics. Going even further, you can use the change feed to integrate Azure Cosmos DB with many other services both in and out of Azure. In this module, we will integrate Azure Cosmos DB with both Azure Functions and Azure Cognitive Search. We will also explore the change feed using the SDK.

Lessons

- Consume an Azure Cosmos DB SQL API change feed using the SDK
- Handle events with Azure Functions and Azure Cosmos DB SQL API change feed
- Search Azure Cosmos DB SQL API data with Azure Cognitive Search

Labs

- Exercise: Archive Azure Cosmos DB SQL API data using Azure Functions
- Exercise: Process change feed events using the Azure Cosmos DB SQL API SDK
- Exercise: Archive data using Azure Functions and Azure Cosmos DB SQL API

Implement a data modeling and partitioning strategy for Azure Cosmos DB SQL API

Azure Cosmos DB is both horizontally scalable and nonrelational. To achieve this level of scalability, users need to understand the concepts, techniques, and technologies unique to NoSQL databases for modeling and partitioning data. In this module, you will model and partition data appropriately for a NoSQL database such as Azure Cosmos DB SQL API.

Lessons

- Model and partition your data in Azure Cosmos DB
- Optimize databases by using advanced modeling patterns for Azure Cosmos DB

Labs

- Exercise: Measure performance for customer entities
- Exercise: Advanced modeling patterns

Design and implement a replication strategy for Azure Cosmos DB SQL API

Today’s applications are required to be highly responsive and always online. To achieve low latency and high availability, instances of these applications need to be deployed in datacenters that are close to their users. In this module, you will explore how to replicate data and manage consistency across the globe using Azure Cosmos DB SQL API.

Lessons

- Configure replication and manage failovers in Azure Cosmos DB
- Use consistency models in Azure Cosmos DB SQL API
- Configure multi-region write in Azure Cosmos DB SQL API

Labs

- Exercise: Configure consistency models in the portal and the Azure Cosmos DB SQL API SDK
- Exercise: Connect to different regions with the Azure Cosmos DB SQL API SDK
- Exercise: Connect to a multi-region write account with the Azure Cosmos DB SQL API SDK

Optimize query performance in Azure Cosmos DB SQL API

Azure Cosmos DB offers a rich set of database operations that operate on the items within a container. The cost associated with each of these operations varies based on the CPU, IO, and memory required to complete the operation. In this module, you will explore how to manage indexing policies and edit queries to minimize per-query request unit (RU) cost.

Lessons

- Choosing indexes in Azure Cosmos DB SQL API
- Optimize queries in Azure Cosmos DB SQL API
- Implement integrated cache

Labs

- Exercise: Optimize an Azure Cosmos DB SQL API container’s index policy for common operations
- Exercise: Optimize an Azure Cosmos DB SQL API container’s index policy for a specific query

Administrating and Monitoring tasks for an Azure Cosmos DB SQL API solution

When you have critical applications and business processes relying on Azure resources such as Azure Cosmos DB, you want to monitor those resources for their availability, performance, and operation. In this module, you will explore how to monitor events and performance of an Azure Cosmos DB account. You will also learn how to implement common security measures along with backup and restore in Azure Cosmos DB.

Lessons

- Measure performance in Azure Cosmos DB SQL API
- Monitor responses and events in Azure Cosmos DB SQL API
- Implementing backup and restore for Azure Cosmos DB SQL API
- Implement security in Azure Cosmos DB SQL API

Labs

- Exercise: Troubleshoot an application using the Azure Cosmos DB SQL API SDK
- Exercise: Use Azure Monitor to analyze an Azure Cosmos DB SQL API account
- Exercise: Recover a database or container from a recovery point
- Exercise: Store Azure Cosmos DB SQL API account keys in Azure Key Vault

Manage an Azure Cosmos DB SQL API solution using DevOps practices

Once an Azure Cosmos DB SQL API account is ready to go through a release lifecycle, it's not uncommon for an operations team to attempt to automate the creation of Azure Cosmos DB resources in the cloud. Automation makes it easier to deploy new environments, restore past environments, or scale a service out. In this module, you will explore how to use Azure Resource Manager to manage an Azure Cosmos DB account and its child resources using JSON templates, Bicep templates, or the Azure CLI.

Lessons

- Write scripts for Azure Cosmos DB SQL API
- Create resource template for Azure Cosmos DB SQL API

Labs

- Exercise: Adjust provisioned throughput using an Azure CLI script
- Exercise: Create an Azure Cosmos DB SQL API container using Azure Resource Manager templates

Create server-side programming constructs in Azure Cosmos DB SQL API

Azure Cosmos DB provides language-integrated, transactional execution of JavaScript. When using the SQL API in Azure Cosmos DB, you can write stored procedures, triggers, and user-defined functions (UDFs) in the JavaScript language. In this module, you will author JavaScript logic that executes directly inside the database engine.

Lessons

- Build multi-item transactions with the Azure Cosmos DB SQL API
- Expand query and transaction functionality in Azure Cosmos DB SQL API

Labs

- Exercise: Implement and then use a UDF using the SDK
- Exercise: Create a stored procedure with the Azure Portal