



# Implementing an Azure Data Solution Crash Course

Microsoft Certified: Azure Data Engineer  
Associate

February/2021



# Reza Salehi

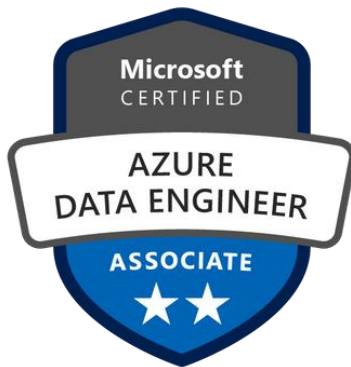
Cloud Consultant and Trainer



@zaalion

**Microsoft**  
**CERTIFIED**  
*Trainer*

2008 - 2018



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# Questions & Resources

- Post questions in the QnA box
- Resources are in the course repository
  - <https://github.com/zaalion/oreilly-dp-200-201>
- Reach out:
  - Twitter: [@zaalion](https://twitter.com/zaalion)



# Course Overview

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# DP-200 Candidate Profile

- Microsoft Azure data engineers who
  - Collaborate with business stakeholders to identify and meet the data requirements
  - To implement data solutions that use Azure data services.



# Azure Data Engineers

- Responsible for data-related implementation tasks
  - Include provisioning data storage services
  - Ingesting streaming and batch data, transforming data.
  - Implementing security requirements
  - Implementing data retention policies
  - Identifying performance bottlenecks, and
  - Accessing external data sources.



# DP-200 Candidates

- Must be able to implement data solutions that use
  - Azure Cosmos DB, Azure SQL Database, Azure Synapse Analytics (formerly Azure SQL DW)
  - Azure Data Lake Storage
  - Azure Data Factory, Azure Stream Analytics, Azure Databricks, and Azure Blob storage.



# DP-200 Skills Measured

- Skills measured:
  - Implement data storage solutions (40-45%)
  - Manage and develop data processing (25-30%)
  - Monitor and optimize data solutions (30-35%)





# DP-200 Skills Measured

Exam DP-200: Implementing an Azure Data Solution skills



# Implement Data Storage Solutions

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# Implement Data Storage Solutions

- Implement non-relational data stores
- Implement relational data stores
- Manage data security





# Implement Non-relational Data Stores

- Implement a solution that uses Cosmos DB, Data Lake Storage Gen2, or Blob storage
- Implement data distribution and partitions
- Implement a consistency model in Cosmos DB
- Provision a non-relational data store
- Provide access to data to meet security requirements
- Implement for high availability, disaster recovery, and global distribution





# Plan for Secure Endpoints

- Secure endpoints:
  - Azure Cosmos DB
  - Azure Storage Account
  - Azure Synapse Analytics
  - Azure Data Factory
  - Azure Databricks



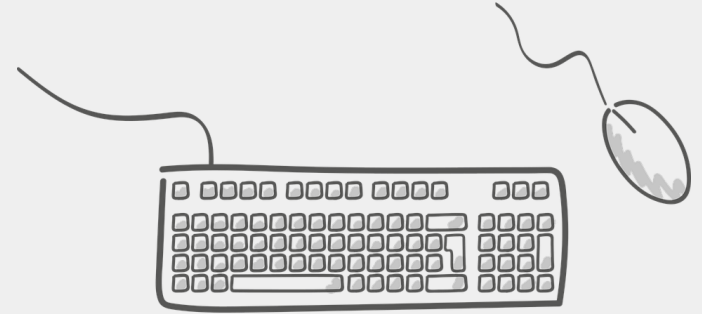
# Cosmos DB Consistency Levels



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# Demo

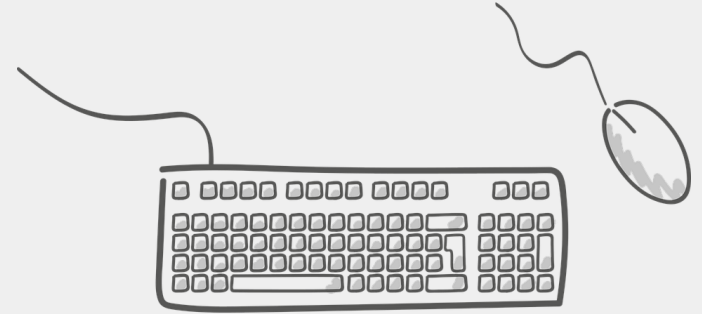
- Azure Cosmos DB
  - Provisioning
  - Data explorer
  - Throughput
  - Security
  - Disaster recovery
  - Consistency levels



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# Demo

- Azure Blob Storage
  - Provisioning
  - Data explorer
  - Security
  - Tiers

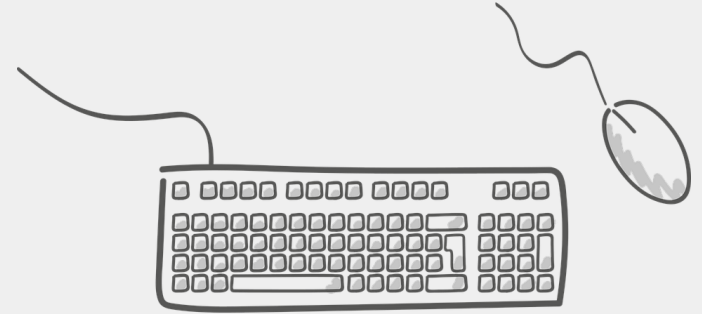




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# Demo

- Azure Data Lake Gen 2



# Implement relational data stores

- Provide access to data to meet security requirements
- Implement for high availability and disaster recovery
- Implement data distribution and partitions for Azure Synapse Analytics
- Implement PolyBase





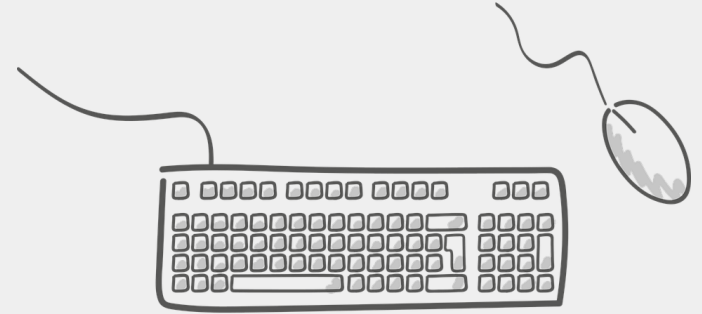
# Plan for Secure Endpoints

- Azure Synapse access:
  - Firewall
  - Azure Active Directory
  - SQL authentication



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# Demo



- Azure Synapse Analytics
  - Provisioning and access
  - Querying/Analytics



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# Manage Data Security

- Implement data masking
- Encrypt data at rest and in motion





# Plan for Secure Endpoints

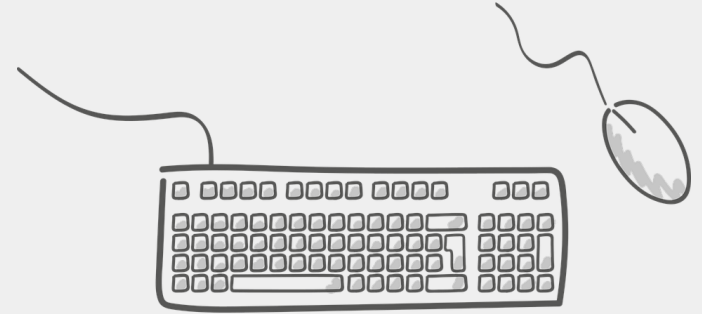
- Azure Synapse security options
  - Dynamic data masking
  - Row level security
  - Transparent Data Encryption
  - Always Encrypted



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# Demo

- Azure Synapse Analytics
  - Securing data



# **Manage and Develop Data Processing**



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# Manage and Develop Data Processing

- **Develop batch processing solutions**
- **Develop streaming solutions**



# Develop Batch Processing Solutions

- Develop batch processing solutions by using Data Factory and Azure Databricks
- Ingest data by using PolyBase
- Implement the integration runtime for Data Factory
- Create linked services and datasets
- Create pipelines and activities
- Create and schedule triggers
- Implement Azure Databricks clusters, notebooks, jobs, and autoscaling
- Ingest data into Azure Databricks



# Azure Data Factory

## Code-Free ETL as a Service

### INGEST



- Multi-cloud and on-prem hybrid copy data
- 90+ native connectors
- Serverless and auto-scale
- Use wizard for quick copy jobs

### CONTROL FLOW



- Design code-free data pipelines
- Generate pipelines via SDK
- Utilize workflow constructs: loops, branches, conditional execution, variables, parameters, ...

### DATA FLOW



- Code-free data transformations that execute in Spark
- Scale-out with Azure Integration Runtimes
- Generate data flows via SDK
- Designers for data engineers and data analysts

### SCHEDULE



- Build and maintain operational schedules for your data pipelines
- Wall clock, event-based, tumbling windows, chained

### MONITOR



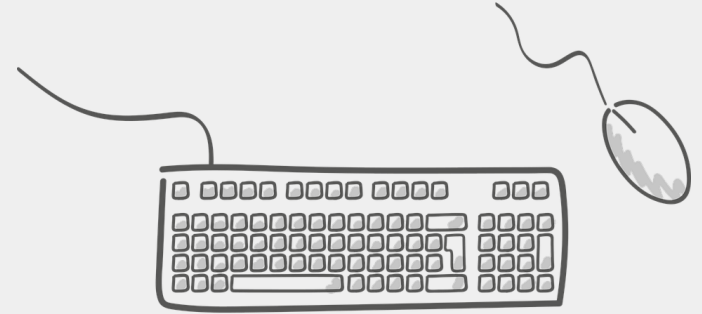
- View active executions and pipeline history
- Detail activity and data flow executions
- Establish alerts and notifications

<https://docs.microsoft.com/en-us/azure/data-factory/introduction>



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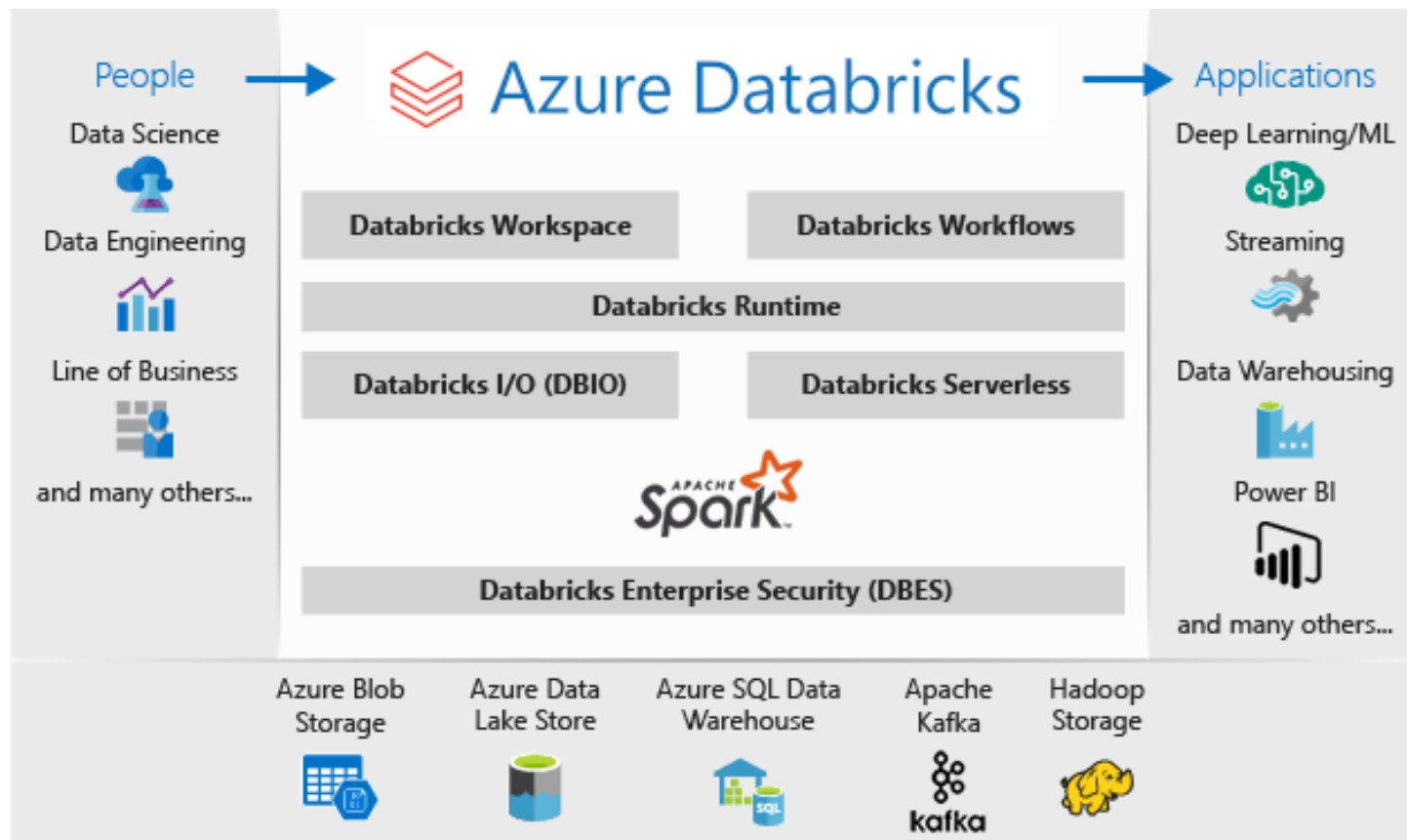
# Demo



- Azure Data Factory
  - Pipelines
  - Linked services
  - Datasets
  - Schedules
  - Run history



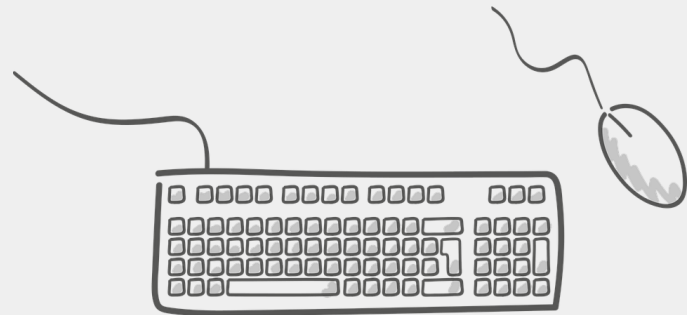
# Azure Databricks



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# Demo

- Azure Databricks
  - Clusters
  - Notebooks
  - Jobs



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# Develop Streaming Solutions

- Configure input and output
- Select the appropriate built-in functions
- Implement event processing by using Stream Analytics



# Azure Stream Analytics

## Ingest

-  IoT Devices
-  Logs, Files
-  Customer data, Financial transactions
-  Weather data
-  Business Apps

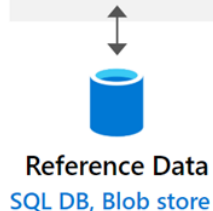


## Analyze

Continuous Intelligence/Real-time analytics



Stream Analytics



## Deliver



Alerts and actions  
Event Hubs, Service Bus,  
Azure Functions etc



Dynamic Dashboarding  
Power BI



Data Warehousing  
Azure Synapse  
Analytics



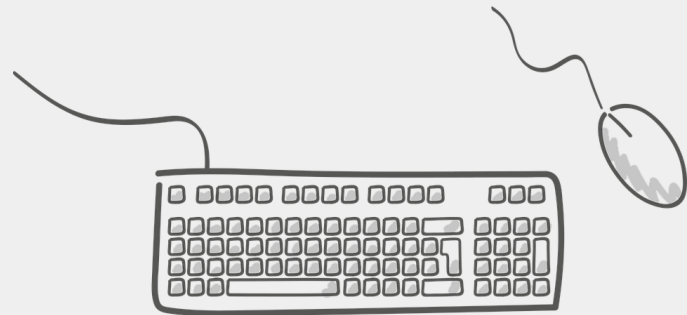
Storage/ Archival  
SQL DB, Azure Data Lake Gen 1 &  
Gen 2, Cosmos DB, Blob storage, etc



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# Demo

- Azure Stream Analytics
  - Inputs
  - Outputs
  - Functions
  - Windows
  - Jobs



# Monitor and Optimize Data Solutions

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# Monitor and Optimize Data Solutions

- Monitor data storage
- Monitor data processing
- Optimize of Azure data solutions



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# Monitor data storage

- Monitor relational and non-relational data stores
- Implement Blob storage monitoring
- Implement Data Lake Storage Gen2 monitoring
- Implement Azure Synapse Analytics monitoring
- Implement Cosmos DB monitoring



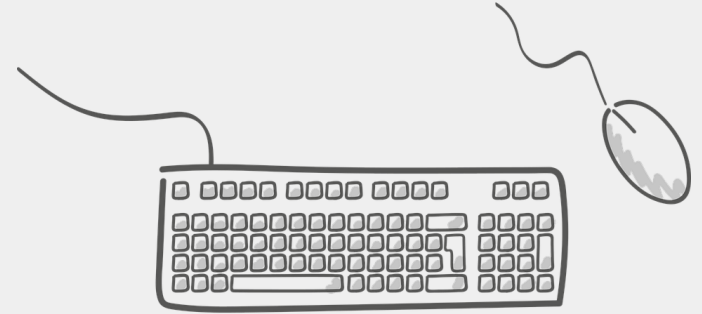


# Monitor data processing

- Monitor Data Factory pipelines
- Monitor Azure Databricks
- Monitor Stream Analytics
- Configure Azure Monitor alerts
- Implement auditing by using Azure Log Analytics



# Demo



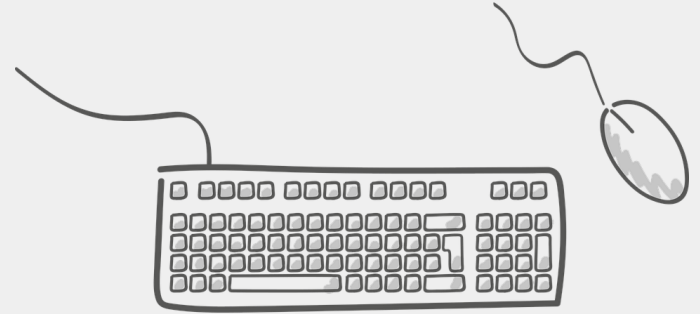
- Configure Monitoring
  - Azure Storage
  - Azure Data Lake Gen 2
  - Azure Cosmos DB
  - Azure Synapse Analytics
  - Azure Stream Analytics



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# Demo

- Configure Monitoring
  - Alerts



# Optimize of Azure Data Solutions

- Troubleshoot data partitioning bottlenecks
- Optimize Data Lake Storage Gen2
- Optimize Stream Analytics
- Optimize Azure Synapse Analytics
- Manage the data lifecycle





# The Exam

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# Questions in DP-200

- Multiple choice
- Drag and drop
- Scenario based
- No hands-on labs (as of December 10, 2020)



# DP-200

- Exam DP-200 : <https://docs.microsoft.com/en-us/learn/certifications/exams/dp-200>
- Skills measured :  
<https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RE3Vzx2>



Azure Data Engineers are responsible for data-related implementation tasks that include provisioning data storage services, ingesting streaming and batch data, transforming data, implementing security requirements, implementing data retention policies, identifying performance bottlenecks, and accessing external data sources.

Candidates for this exam must be able to implement data solutions that use the following Azure services: Azure Cosmos DB, Azure SQL Database, Azure Synapse Analytics (formerly Azure SQL DW), Azure Data Lake Storage, Azure Data Factory, Azure Stream Analytics, Azure Databricks, and Azure Blob storage.

**Part of the requirements for:** [Microsoft Certified: Azure Data Engineer Associate](#)

**Related exams:** [1 related exam](#)

**Important:** [See details](#)

[Go to Certification Dashboard](#)

## Schedule exam

### Exam DP-200: Implementing an Azure Data Solution

United States

**Languages:** English, Japanese, Chinese (Simplified), Korean

**Retirement date:** none

This exam measures your ability to accomplish the following technical tasks: implement data storage solutions; manage and develop data processing; and monitor and optimize data solutions.

[Schedule exam](#)

**\$165 USD\***

Price based on the country in which the exam is proctored.

[Official practice test](#) for Implementing an Azure Data Solution

All objectives of the exam are covered in depth so you'll be ready for any question on the exam.

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DP-200: Implementing an Azure Data Solution

All fields are required.

How do you want to take your exam? [Exam delivery option descriptions](#)

- ☐ At a local test center
- ☒ At my home or office
- ☐ I have a Private Access Code

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If so, perform a quick pre-check to verify compatibility of your device and network before planning to take this exam in your home or office.

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Run pre-check

Next



## System check - Checking your requirements



Microphone

Default - Microphone (SI ▼)



Internet speed



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Integrated Webcam (0c▼)

Next



# Course Repository

<https://github.com/zaalion/oreilly-dp-200-201>







# Q&A



**O'REILLY<sup>®</sup>**

**Thank you!**

**Reza Salehi**

**@zaalion**

