

Lab4

CST8912_011

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Submitted to : Prof. Tanishq Bansal

Introduction :-

Cloud databases are modern kinds of databases that can be adjusted to any level and they are based on the cloud infrastructure. This lab was oriented on creating an Azure SQL Database with the help of the test data, and then running SQL queries on that data, configuring an Azure Storage Account, and using Azure Data Factory to transfer data from these two to a Blob Storage. Furthermore, the lab underlined the main cloud service models (IaaS, PaaS, SaaS) and it was shown how these elements work together in order to make sure that there is a high availability, resiliency, and scalability.

Que :- 1 & 2.

Microsoft Azure

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panu0012@algonquiniv...
ALGONQUIN COLLEGE (ALGONQ...

All services > SQL databases >

Create SQL Database

Microsoft

Changing Basic options may reset selections you have made. Review all options prior to creating the resource.

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

Resource group *

[Create new](#)

COMPUTE COST / V-CORE SECOND 0.000174 USD

NOTES
Serverless databases are billed in vCore seconds based on a combination of CPU and memory utilization. [Learn more about serverless billing](#)

Database details

Enter required settings for this database, including picking a logical server and configuring the compute and storage resources

Database name *

Server *

[Create new](#)

Want to use SQL elastic pool? ☐ Yes ☒ No

Workload environment
☒ Development
☐ Production

Default settings provided for Development workloads. Configurations can be modified as needed.

Compute + storage *
Standard-series (Gen5), 1 vCore, 32 GB storage, zone redundant disabled
[Configure database](#)

[Review + create](#) [Next: Networking >](#)

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All services > SQL databases > Create SQL Database >

Create SQL Database Server

Microsoft

Enter required settings for this server, including providing a name and location. This server will be created in the same subscription and resource group as your database.

Server name *

Location *

Authentication

Azure Active Directory (Azure AD) is now Microsoft Entra ID. [Learn more](#)

Select your preferred authentication methods for accessing this server. Create a server admin login and password to access your server with SQL authentication, select only Microsoft Entra authentication [Learn more](#) using an existing Microsoft Entra user, group, or application as Microsoft Entra admin [Learn more](#), or select both SQL and Microsoft Entra authentication.

Authentication method
☐ Use Microsoft Entra-only authentication
☐ Use both SQL and Microsoft Entra authentication
☒ Use SQL authentication

Server admin login *

Password *

Confirm password *

[OK](#)

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Home > db8912 (db8912sam/db8912)

db8912 (db8912sam/db8912) | Query editor (preview)

SQL database

Search

Login + New Query Open query Feedback Getting started

Overview

Activity log

Tags

Diagnose and solve problems

Query editor (preview)

Mirror database in Fabric (preview)

Settings

Data management

Integrations

Power Platform

Security

Intelligent performance

Monitoring

Automation

Help

Tables

dbo.BuildVersion

dbo.ErrorLog

SalesLT.Address

SalesLT.Customer

SalesLT.CustomerAddress

SalesLT.Product

SalesLT.ProductCategory

SalesLT.ProductDescription

SalesLT.ProductModel

SalesLT.ProductModelProductDesc

SalesLT.SalesOrderDetail

SalesLT.SalesOrderHeader

Views

Stored Procedures

Showing limited object explorer here. For full capability please click here to open Azure Data Studio.

Query 1

Run Cancel query Save query Export data as Show only Editor Open Copilot

1

Results Messages

Search to filter items...

Ready

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Microsoft Azure

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Query 1

Run Cancel query Save query Export data as Show only Editor Open Copilot

```
1 SELECT ProductID, Name, ListPrice, ProductCategoryID
2 FROM SalesLT.Product;
3
4 SELECT p.ProductID, p.Name AS ProductName,
5        c.Name AS Category, p.ListPrice
6 FROM SalesLT.Product AS p
7 JOIN [SalesLT].[ProductCategory] AS c
8 ON p.ProductCategoryID = c.ProductCategoryID;
```

Results Messages

Search to filter items...

ProductID	ProductName	Category	ListPrice
771	Mountain-100 Silver, 38	Mountain Bikes	3399.9900
772	Mountain-100 Silver, 42	Mountain Bikes	3399.9900
773	Mountain-100 Silver, 44	Mountain Bikes	3399.9900
774	Mountain-100 Silver, 48	Mountain Bikes	3399.9900
775	Mountain-100 Black, 38	Mountain Bikes	3374.9900
776	Mountain-100 Black, 42	Mountain Bikes	3374.9900

Query succeeded | 0s

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Home > Storage accounts >

Create a storage account

Azure storage is a Microsoft-managed service providing cloud storage that is highly available, secure, durable, scalable, and redundant. Azure Storage includes Azure Blobs (objects), Azure Data Lake Storage Gen2, Azure Files, Azure Queues, and Azure Tables. The cost of your storage account depends on the usage and the options you choose below. [Learn more about Azure storage accounts](#)

Project details

Select the subscription in which to create the new storage account. Choose a new or existing resource group to organize and manage your storage account together with other resources.

Subscription * Azure for Students

Resource group * CST8912-demo

[Create new](#)

Instance details

Storage account name * demo8912

Region * (Canada) Canada Central

[Deploy to an Azure Extended Zone](#)

Primary service * Select a primary service

Performance * ☒ Standard: Recommended for most scenarios (general-purpose v2 account)

☐ Premium: Recommended for scenarios that require low latency.

Redundancy * Locally-redundant storage (LRS)

Previous

Next

Review + create

Give feedback

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Home > Create a resource >

Create Data Factory

Basics Git configuration Networking Advanced Tags Review + create

One-click to create data factory with sample pipeline and datasets. [Try it](#)

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * Azure for Students

Resource group * CST8912-demo

[Create new](#)

Instance details

Name * demodb8912

Region * Canada Central

Version * V2

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Review + create

Give feedback

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Copy Data tool

1 Properties
2 Source
3 Dataset
4 Configuration
5 Destination
6 Settings
7 Review and finish

Source data store

Specify the source data store for the copy task. You can use an existing data store connection or specify a new data store.

Source type: Azure SQL Database

Connection: Select... + New connection

New connection

Azure SQL Database [Learn more](#)

Name: db8912sam

Description:

Connect via integration runtime: AutoResolveIntegrationRuntime

Version: Recommended (Legacy) Import from connection string

Account selection method: From Azure subscription (Enter manually)

Azure subscription: Azure for Students (63593e07-b1bc-4b20-8c26-b7fafac46e9f)

Server name: db8912sam

Database name: db8912

Create Cancel Test connection

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Copy Data tool

1 Properties
2 Source
3 Dataset
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7 Review and finish

Source data store

Specify the source data store for the copy task. You can use an existing data store connection or specify a new data store.

Source type: Azure SQL Database

Connection: AzureSqlDatabase1 Edit + New connection

Source: Tables Query

Filter by name... Show views Refresh Showing 12 out of 12 tables, 0 out of 3 views (0 selected)

<input type="checkbox"/>	Select all	
<input type="checkbox"/>	dbo.BuildVersion	
<input type="checkbox"/>	dbo.ErrorLog	
<input type="checkbox"/>	SalesLT.Address	
<input type="checkbox"/>	SalesLT.Customer	
<input type="checkbox"/>	SalesLT.CustomerAddress	
<input checked="" type="checkbox"/>	SalesLT.Product	
<input type="checkbox"/>	SalesLT.ProductCategory	

< Previous Next > Cancel

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Copy Data tool

- Properties
- Source
- Destination**
- Dataset
- Configuration
- Settings
- Review and finish

Destination data store

Specify the destination data store for the copy task. You can use an existing data store connection or specify a new data store.

Destination type: **Azure Blob Storage**

Connection: **Select...** + New connection

New connection

Name *
AzureBlobStorage1

Description

Connect via integration runtime *
☒ AutoResolveIntegrationRuntime

Authentication type
Account key

Connection string **Azure Key Vault**

Account selection method *
☒ From Azure subscription ☐ Enter manually

Azure subscription *
Azure for Students (63593e07-b1bc-4b20-8c26-b7fafac46e9f)

Storage account name *
demo8912

Additional connection properties
+ New

Create **Cancel** [Test connection](#)

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Copy Data tool

- Properties
- Source
- Destination**
- Dataset
- Configuration
- Settings
- Review and finish

Destination data store

Specify the destination data store for the copy task. You can use an existing data store connection or specify a new data store.

Destination type: **Azure Blob Storage**

Connection: **AzureBlobStorage1** [Edit](#) + New connection

Folder path *
If the identity you use to access the data store only has permission to subdirectory instead of the entire account, specify the path to browse.
productdata8912/ [Browse](#)

File name
samproduct

Max concurrent connections *

Block size (MB) *

Metadata *
+ New

< Previous **Next >** **Cancel**

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Copy Data tool

- Properties
- Source
- Destination
- Dataset
- Configuration
- Settings
- Review and finish

File format settings

File format: DelimitedText

Column delimiter: Comma (,) ☐ Edit

Row delimiter: Default (\r\n, or \n) ☐ Edit

☒ Add header to file ☐

Advanced

Quote character ☐: Double quote (") ☐ Edit

Escape character ☐: Backslash (\) ☐ Edit

Null value

< Previous Next > Cancel

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Copy Data tool

- Properties
- Source
- Destination
- Settings
- Review and finish

Settings

Enter name and description for the copy data task, more options for data movement

Task name *: CopyPipeline_kec

Task description:

Data consistency verification ☐

Fault tolerance

Enable logging ☐

Enable staging ☐



> Advanced

< Previous Next > Cancel

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Copy Data tool

- Properties
- Source
- Destination
- Settings
- Review and finish
- Review
- Deployment

 Azure SQL Database →  Azure Blob Storage

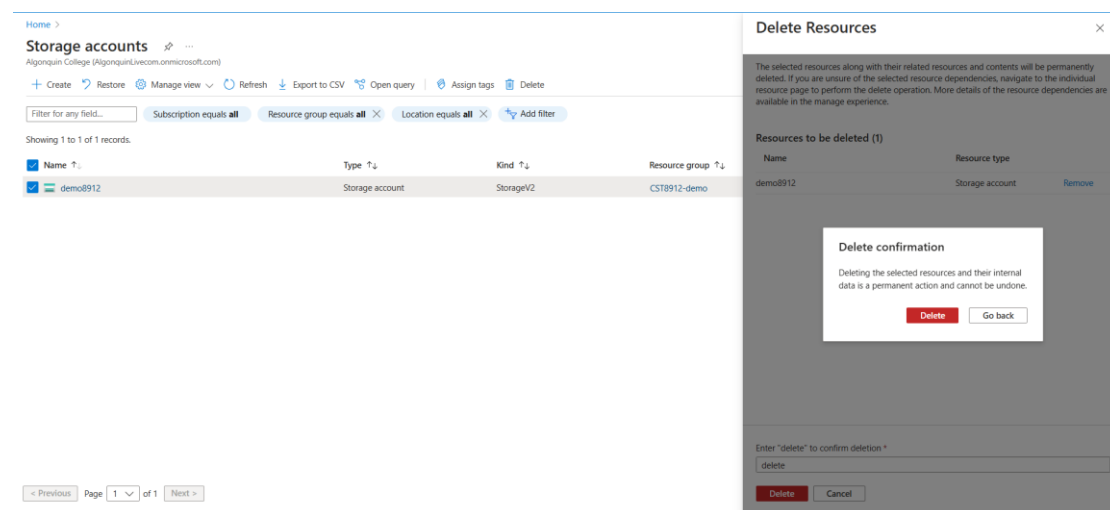
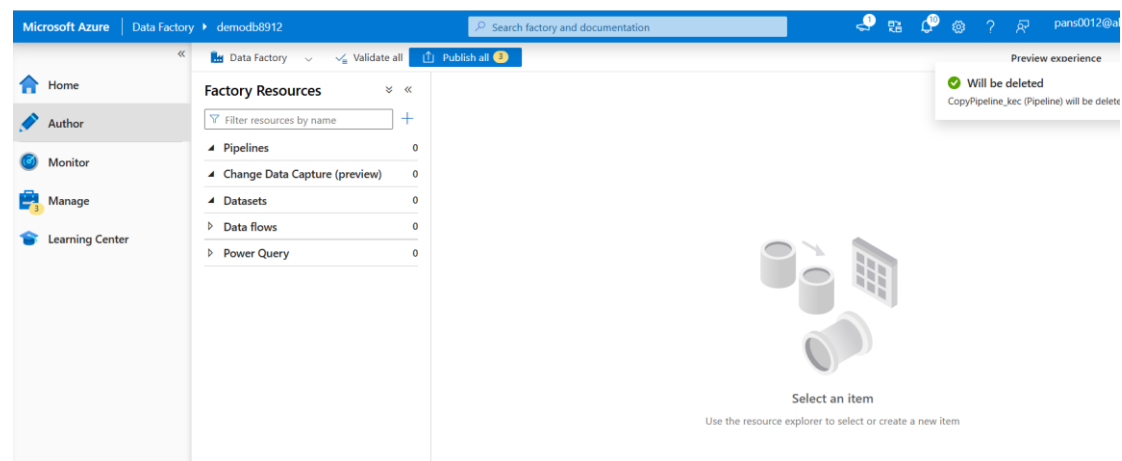
Deployment complete

Deployment step	Status
Validating copy runtime environment	✓ Succeeded
> Creating datasets	✓ Succeeded
> Creating pipelines	✓ Succeeded
> Running pipelines	✓ Succeeded

Datasets and pipelines have been created. You can now monitor and edit the copy pipelines or click finish to close Copy Data Tool.

Finish Edit pipeline Monitor

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Findings and Analysis :

Integration Success: By the lab, it was successfully shown how all the different Azure services can be integrated in order to tackle the issue of a smooth data ingestion process. The usage of a public endpoint and proper firewall rules ensured the secure access to the SQL Database service.

Data Verification: The running of SQL queries confirmed that the files were not corrupted and that they were available. The reports ultimately proved with no doubts that the sample data was loaded correctly and was indeed retrievable.

Process Efficiency: The use of Azure Data Factory for the copy task managed to move data from one service to another in the fastest and easiest way. The successful

run of the pipeline was the best proof that the plumbing was established and the configuration between Azure SQL Database and Azure Blob Storage was done correctly.

Resiliency and Scalability: The lab has shown the very important parts of cloud architecture, i.e. resiliency through backup and security measures as well as scalability based on the use of managed cloud services.

Conclusion

The practical experience in building and provisioning a cloud solution with Azure services was the main contribution of this lab activity. The theoretical concepts like the cloud service models, and resiliency were enhanced by the hands-on exercise which showed the important role of the integration of the main cloud components. The efficiency of using Azure for data management, which involves deployment, querying and data ingestion, is evident.