## Lab Report: CST8912 – Cloud Solution Architecture, Graded Lab Activity #10

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**Date:** Mar 27, 2025

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**Title**

Automating Alerts and Monitoring in Azure Logic Apps for SQL Database and Blob Storage

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**Introduction or Purpose**

The purpose of this lab was to explore and implement cloud-based automation workflows using Azure Logic Apps, a Platform as a Service (PaaS) offering from Microsoft Azure. The main objectives were to create automated workflows for alerting users based on data updates in a SQL Database, monitoring file uploads in Azure Blob Storage, and analyzing workflow performance using Azure Monitor. Specifically, the lab involved:

1. Creating a Logic App to send email notifications when specific data is present in a SQL Database.
2. Designing a Logic App to alert users when a file is not uploaded to a specific folder in Blob Storage by a certain time.
3. Monitoring the workflows using Azure Monitor.
4. Cleaning up all resources created during the lab.

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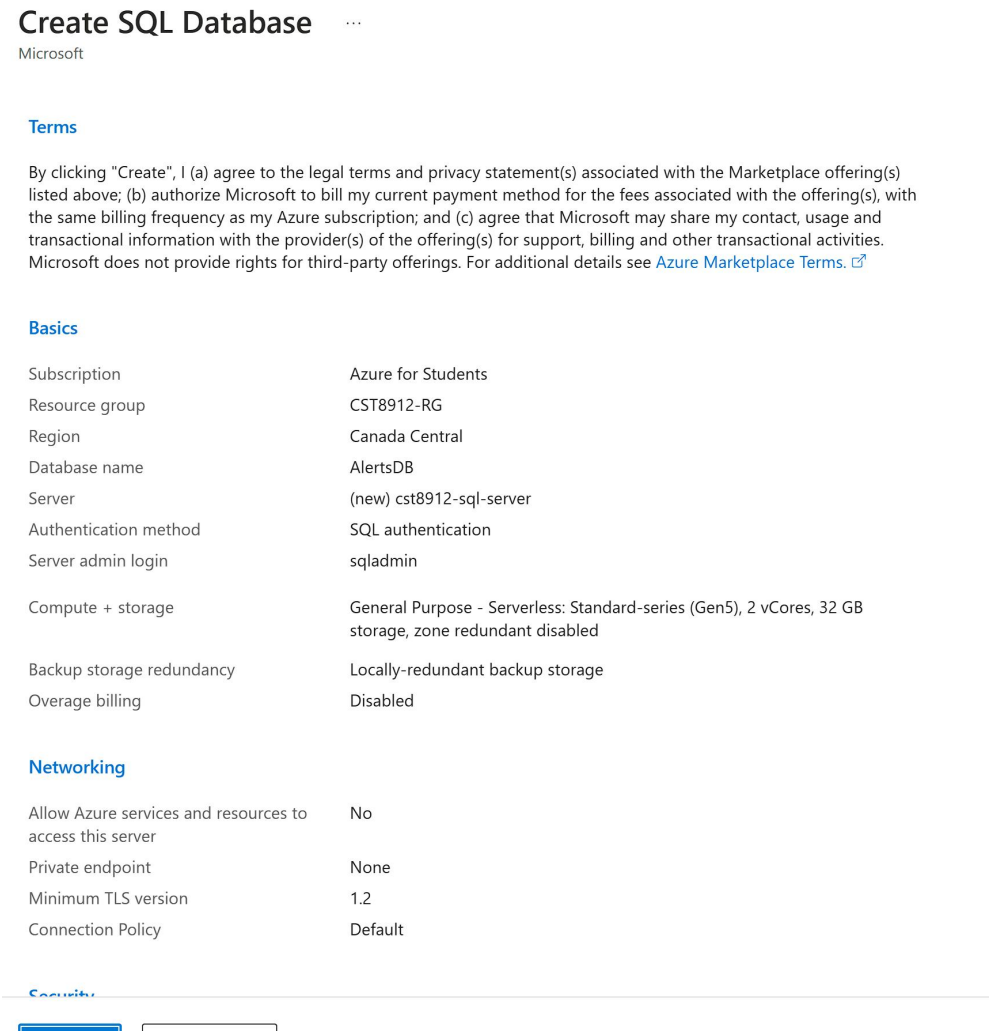
**Steps Covered in the Lab**

**Task 1: Alert Users Based on Data in SQL Database**

1. **Created Logic App and SQL Database**:
    1. Created a Logic App named AlertsLogicApp with a consumption-based plan in the Canada Central region.

2.Created a SQL Database instance named AlertsDB in the Canada Central region, with a server named cst8912-sql-server and admin credentials (sqladmin, password: P@ssw0rd123!).



Create SQL Database ...

Microsoft

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**Basics**

| | |
|---|---|
| Subscription | Azure for Students |
| Resource group | CST8912-RG |
| Region | Canada Central |
| Database name | AlertsDB |
| Server | (new) cst8912-sql-server |
| Authentication method | SQL authentication |
| Server admin login | sqladmin |
| Compute + storage | General Purpose - Serverless: Standard-series (Gen5), 2 vCores, 32 GB storage, zone redundant disabled |
| Backup storage redundancy | Locally-redundant backup storage |
| Overage billing | Disabled |

**Networking**

| | |
|---|---|
| Allow Azure services and resources to access this server | No |
| Private endpoint | None |
| Minimum TLS version | 1.2 |
| Connection Policy | Default |

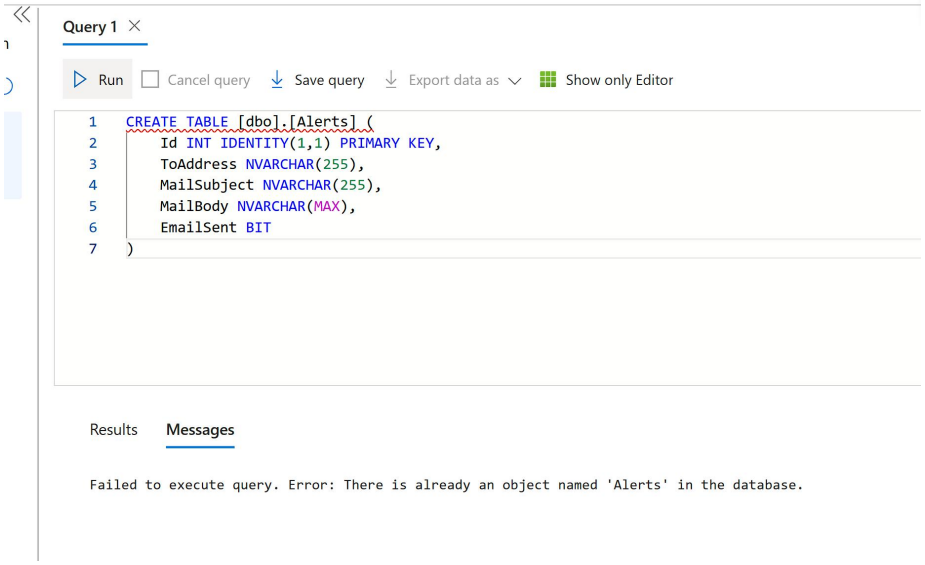
Security

2. **Created Alerts Table**:

1.Used the Query Editor in Azure SQL to create a table named [dbo].[Alerts] with columns: Id, ToAddress, MailSubject, MailBody, and EmailSent.

2.SQL Command:

```
CREATE TABLE [dbo].[Alerts] ( Id INT IDENTITY(1,1) PRIMARY KEY, ToAddress NVARCHAR(255), MailSubject NVARCHAR(255), MailBody NVARCHAR(MAX), EmailSent BIT )
```

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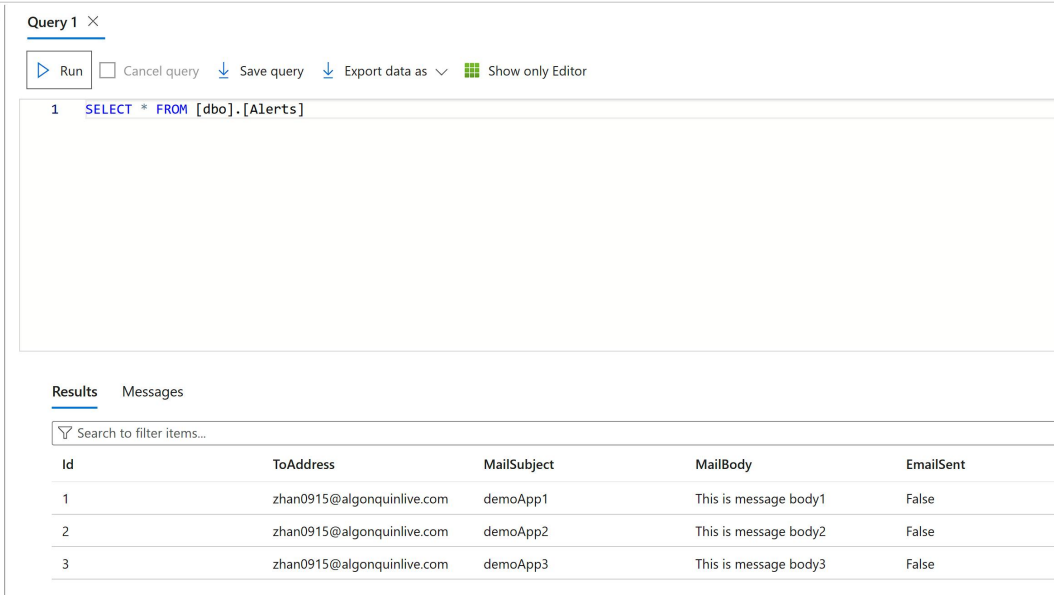
3. **Inserted Records**:

1.Inserted three records into the [dbo].[Alerts] table:

sql

```
INSERT INTO [dbo].[Alerts] (ToAddress, MailSubject, MailBody, EmailSent)
VALUES ('zhan0915@algonquinlive.com', 'demoApp1', 'This is message body1',
0); INSERT INTO [dbo].[Alerts] (ToAddress, MailSubject, MailBody, EmailSent
VALUES ('zhan0915@algonquinlive.com', 'demoApp2', 'This is message body2',
0); INSERT INTO [dbo].[Alerts] (ToAddress, MailSubject, MailBody, EmailSent
VALUES ('zhan0915@algonquinlive.com', 'demoApp3', 'This is message body3',
0);
```




4. **Configured Logic App**:

    1. Added a **"Recurrence"** trigger with an interval of 3 minutes.

    2. Added a **"Get rows (V2)"** action to retrieve rows from [dbo].[Alerts] in AlertsDB.

    3. Added a **"For each"** loop to iterate over the rows (using the value output from **"Get rows (V2)"**).

    4. Added a **"Send an email (V2)"** action to send emails using Office 365 Outlook, with:

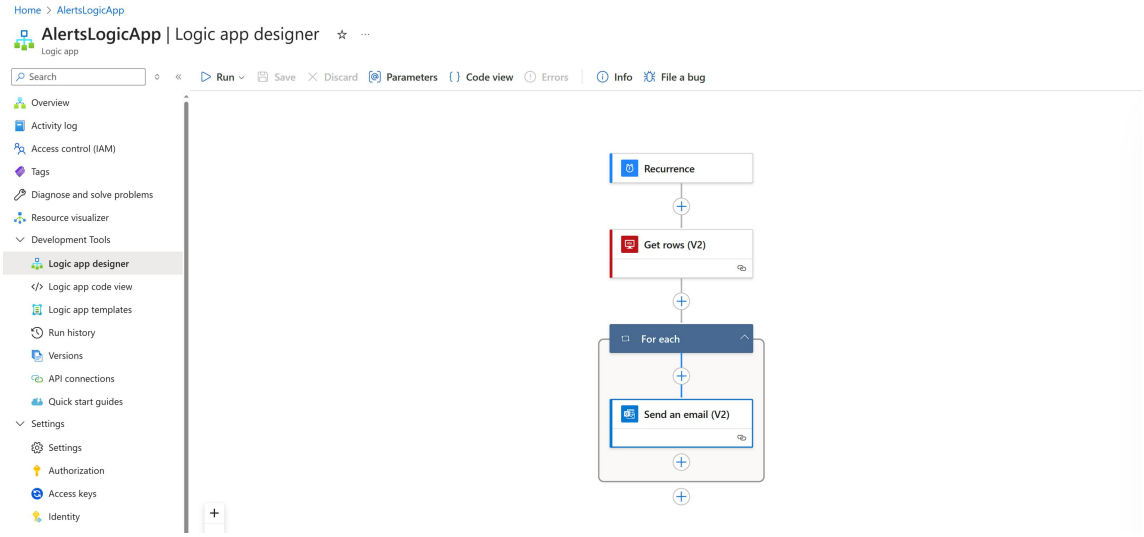
        1. **To**: ToAddress (dynamic content).

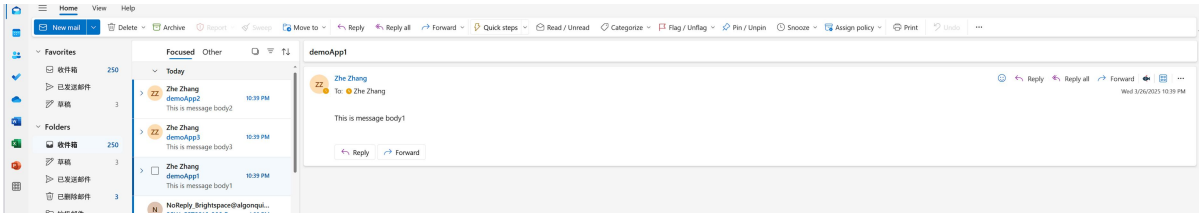
        2. **Subject**: MailSubject (dynamic content).

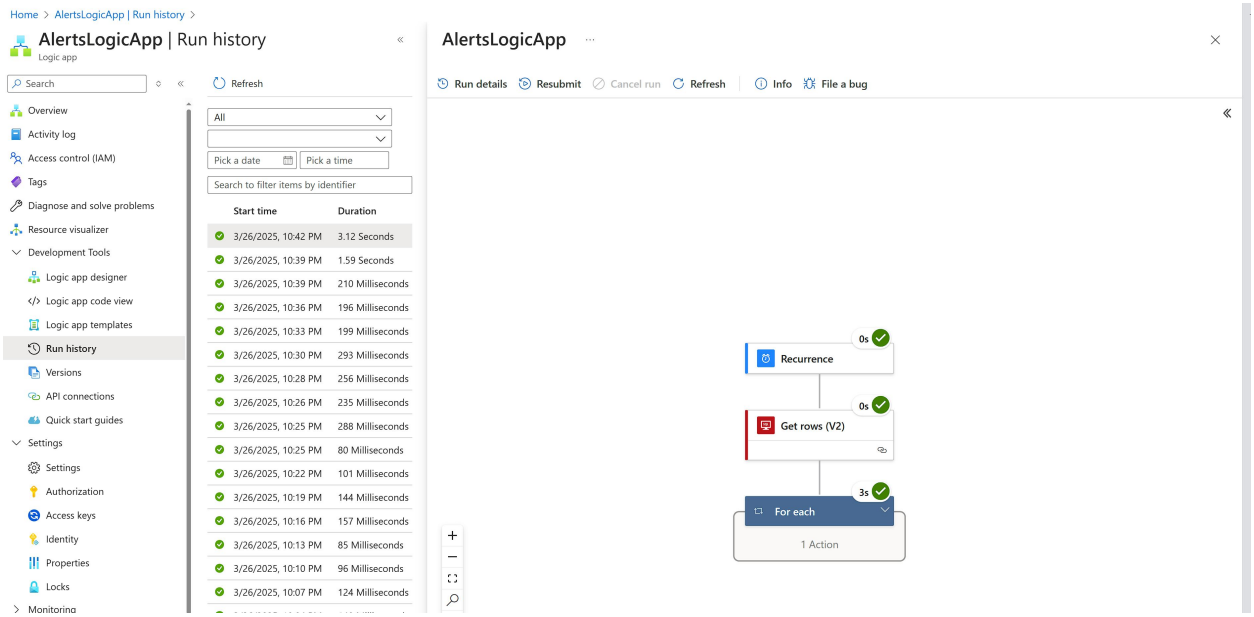
        3. **Body**: MailBody (dynamic content).

5. **Tested Logic App**:

    1. Ran the Logic App and confirmed that three emails were sent to zhan0915@algonquinlive.com with the expected subjects and bodies.



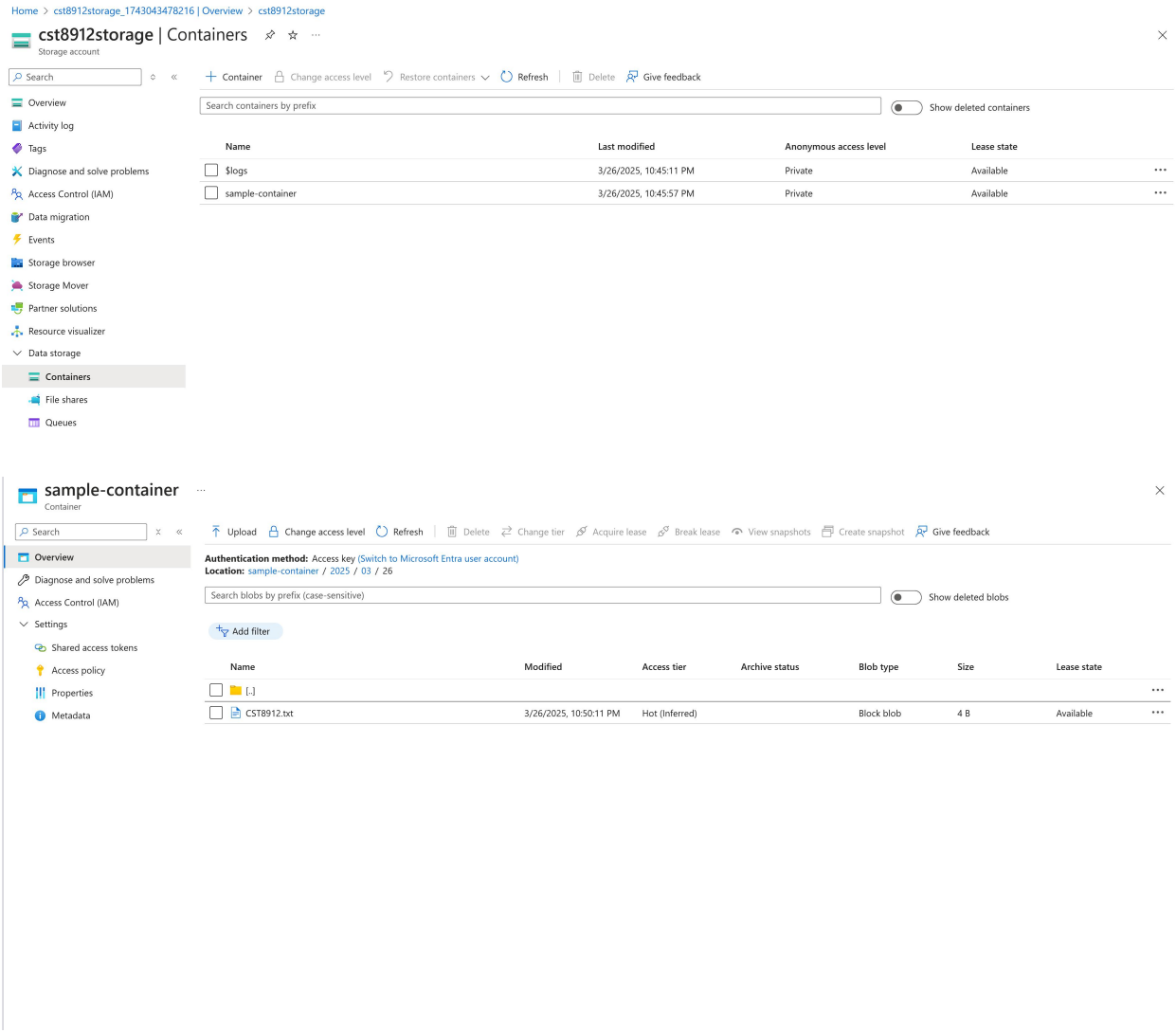

## Task 2: Alert Users When File Not Uploaded to Blob Storage

1. **Created Storage Account:**

1.Created a storage account named cst8912storage in the Canada Central region.

2.Created a container named sample-container with private access.

3.Created a folder structure /2025/03/26 and uploaded a test file (test.txt).




2. **Created Logic App:**

1.Created a new Logic App named FileCheckLogicApp in the Canada Central region.

2.Added a **"Recurrence"** trigger to run daily at 23:00 Eastern Time (UTC 04:00 next day).

3.Added a **"Lists blobs (V2)"** action to check the folder /2025/03/26 (temporarily set as a static value for testing).

4.Added a **"Condition"** action to check if the blob list is empty:

1. Condition: length(body('Lists_blobs_(V2)')?['value']) is equal to 0.

5. In the **"If true"** branch, added a **"Send an email (V2)"** action:

    1. **To**: zhan0915@algonquinlive.com.

    2. **Subject**: File Not Uploaded.

    3. **Body**: concat('No file uploaded to /', utcNow('yyyy/MM/dd'), ' folder today.').

6. **"If false"** branch was left empty.

3. **Tested Logic App:**

    1. Encountered 404 ContainerNotFound errors due to issues with the container. Recreated sample-container and reconfigured the connection.

    2. Tested with /2025/03/26 folder empty: Received the "File Not Uploaded" email.

    3. Tested with /2025/03/26 folder containing a file: No email was sent, as expected.

**Task 3: Monitor Workflows in Azure Monitor**

1. **Enabled Diagnostic Logs:**

    1. In AlertsLogicApp, enabled diagnostic settings to send **"WorkflowRuntime"** logs to a Log Analytics workspace (LogicAppWorkspace).

2. **Ran Query in Azure Monitor:**

    1. Navigated to Azure Monitor > **"Logs"**.

    2. Selected AlertsLogicApp as the scope.

    3. Ran the query:

    kql

    ```
    AzureDiagnostics | where Category == "WorkflowRuntime"
    ```

    3. Initially, no data was found because logs were not configured. After enabling diagnostics and running the Logic App, logs were available.

**Task 4: Clean Resources**

1. **Deleted Resource Group：**

    1.Navigated to **"Resource groups"**, selected CST8912-RG.

    2.Clicked **"Delete resource group"**, confirmed by entering CST8912-RG, and clicked **"Delete"**.

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**Results**

The lab successfully demonstrated the use of Azure Logic Apps to automate workflows for SQL Database and Blob Storage monitoring. Key findings include:

- Task 1: The Logic App successfully sent email notifications based on SQL Database data, though initial connection issues with SQL Server required firewall adjustments.
- Task 2: The Logic App correctly detected missing files in Blob Storage and sent notifications, but container configuration issues caused 404 ContainerNotFound errors, which were resolved by recreating the container.
- Task 3: Azure Monitor provided insights into workflow performance after enabling diagnostic logs.
- Task 4: All resources were cleaned up by deleting the resource group.

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**References**


- Microsoft Azure Documentation: Azure Logic Apps Overview
- Microsoft Azure Documentation: Azure Monitor Logs