Construct a data pipeline to capture and process data in real-time using Azure Event Hub, Stream Analytics, and Storage Accounts. The pipeline should ingest data from an Event Hub, store it in a raw container, process the data, and then store the processed data in a separate container

1. Set Up Azure Resources

- Event Hub: Create an Event Hub namespace and an Event Hub instance within it.
- Storage Account: Create a Storage Account with two containers:
    - Raw Container: For storing unprocessed data directly from the Event Hub.
    - Processed Container: For storing cleaned and transformed data.
- Stream Analytics Jobs: Configure two Stream Analytics jobs:
    - Job 1: Ingests data from the Event Hub and stores it in the raw container.
    - Job 2: Reads data from the raw container, processes it (e.g., filtering, aggregation), and stores the results in the processed container.

2. Configure Event Hub and Generate Data

- Event Hub Configuration: Set up necessary authentication policies and connection strings.
- Data Generation: Use a sample script or Azure Event Hub data generator to simulate data with fields like `timestamp`, `sensorId`, and `temperature`.

3. Stream Analytics Job 1: Event Hub to Raw Container

- Input: Connect the job to your Event Hub.
- Sample Query:

```
SELECT *
INTO [raw-output]
FROM [event-hub-input]
```

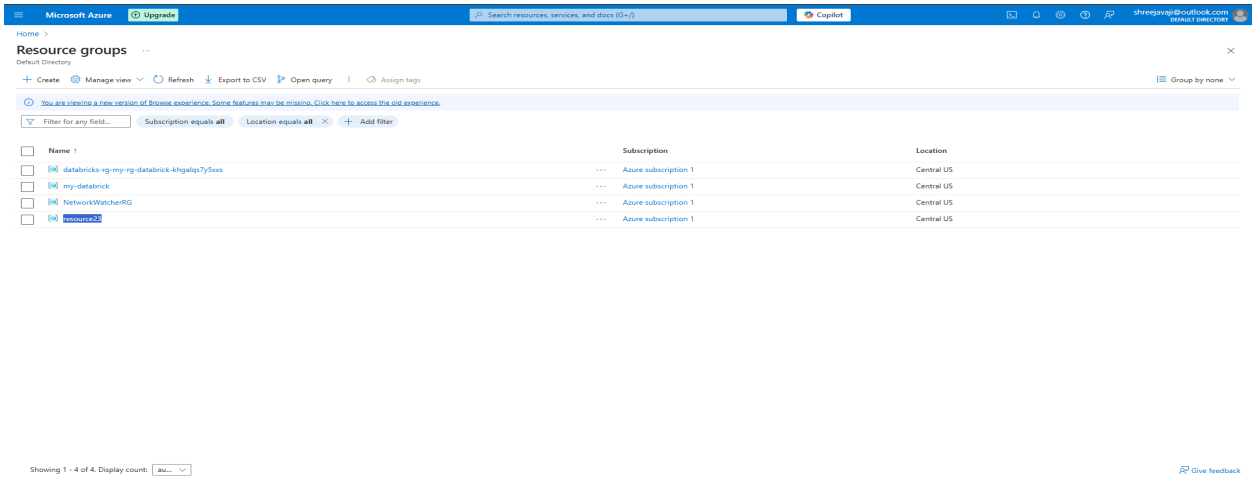
- Output: Configure the output to the raw container with a path pattern like:

  `raw/{date}/{hour}/events.json`.

Document for 1st Job:

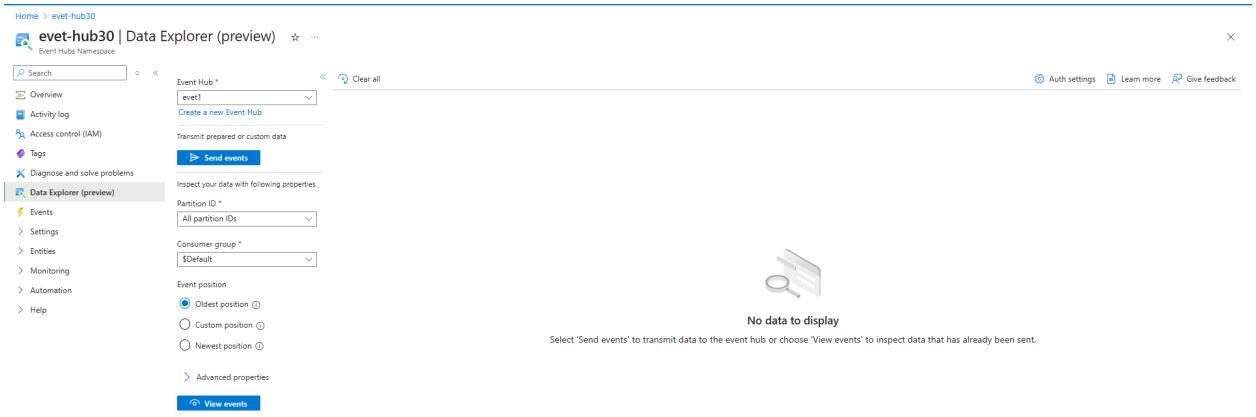
Step 1: Create resource group

- Resource group name: “resource23”



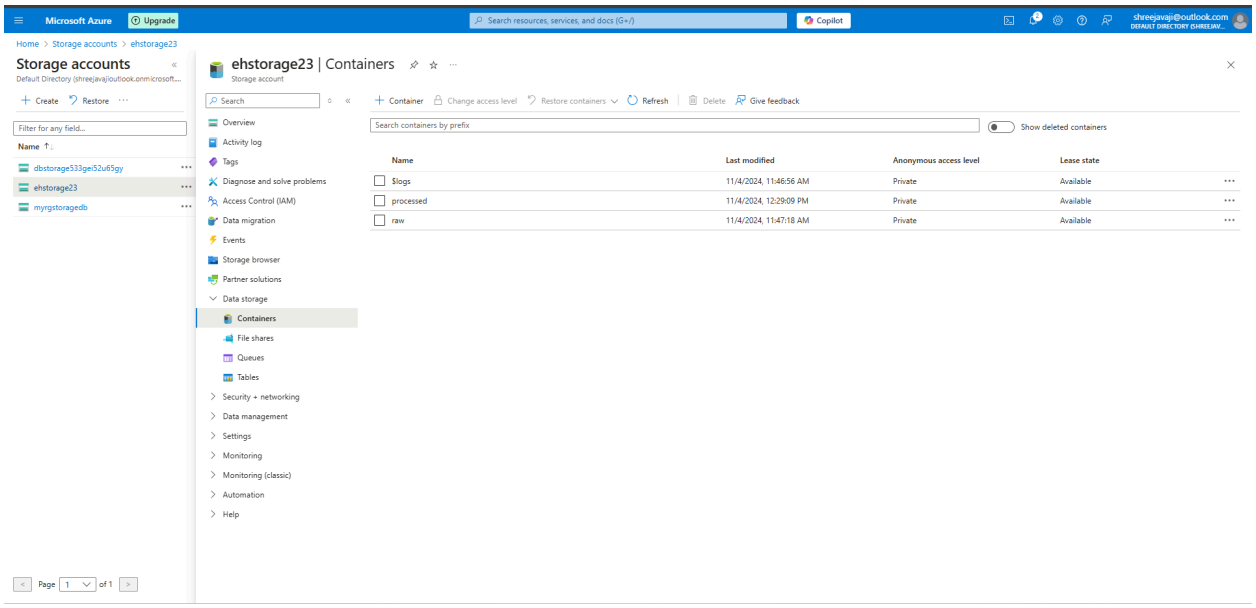
Step 2: Create Event hub namespace and event hub instance.

- Creating a event hub namespace: “evet-hub30”
- Creating a event hub instance: “evet1”



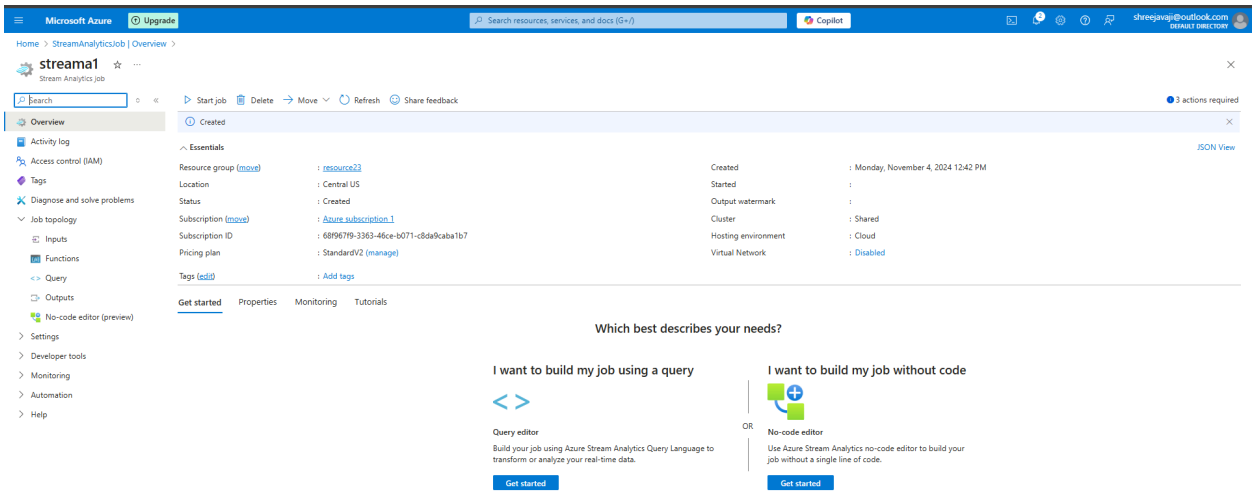
Step 3: Create storage account

- Storage account name: “ehstorage23”
- Create 2 containers:
- Container 1 name: “ raw”
- Container 2 name: “processed”

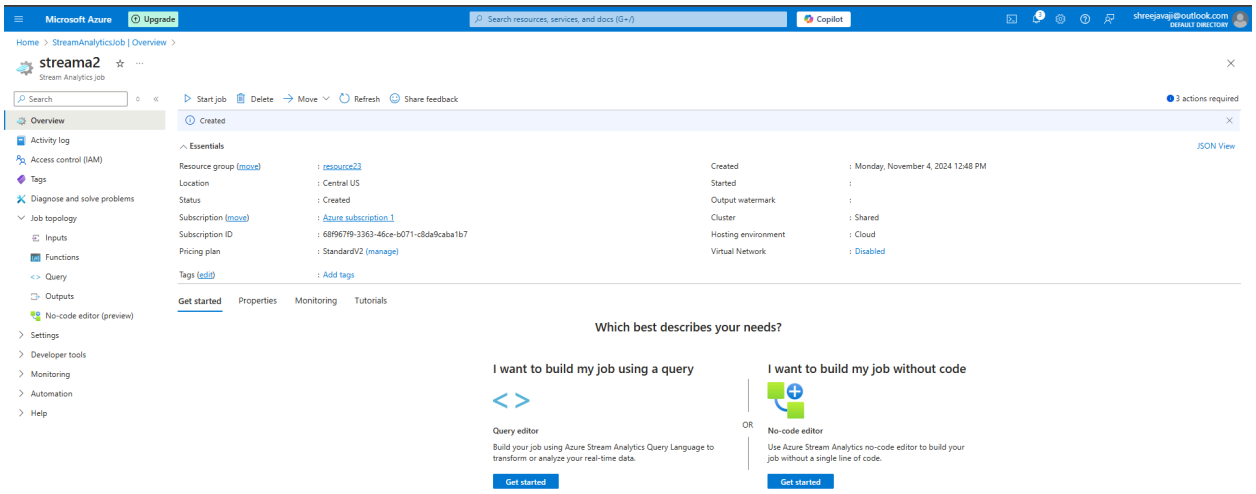


Step 4: Create Stream Analytics Job

- 1st Stream analytics name: “streama1”

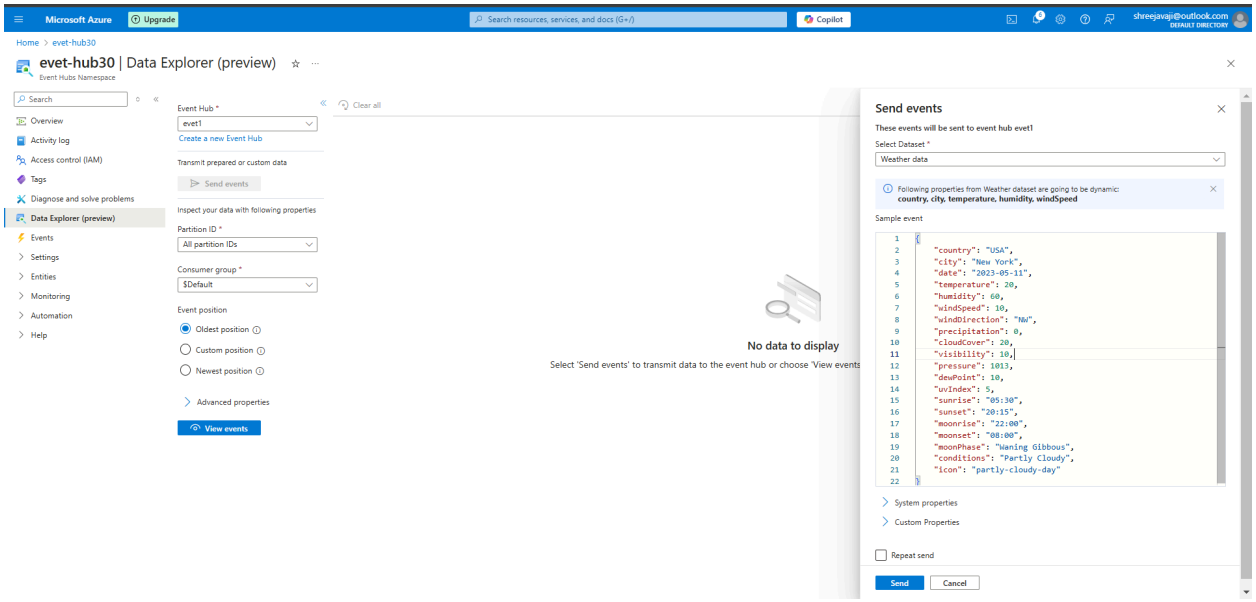


- 2nd Stream Analytics name: “streama2”



Step 5: Go to Event hub - “evet-hub30”

- Select - Data Explorer
- Select - Send Events
- In “Select datasets” : select “Weather Data”



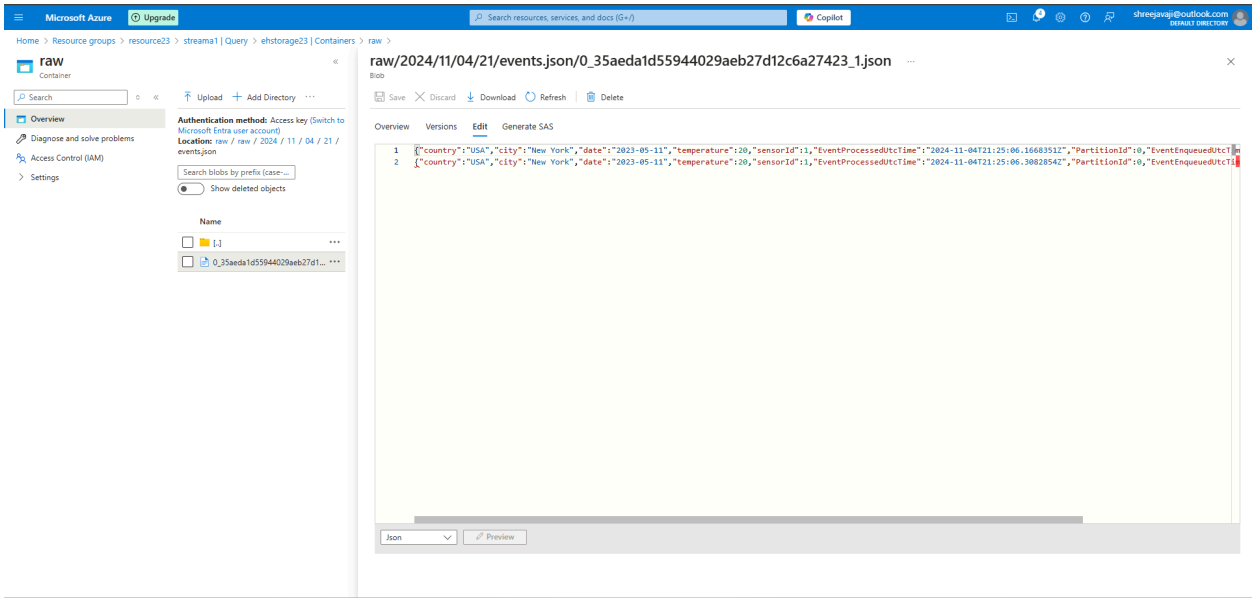
Step 6: Go to Stream Analytics - streama1

- Select - Job Topology
- Select - Inputs
- Select - Add Inputs
- Select - “Event hub” and cross check the data.
- Select - Save
- Click on - Test Inputs

- Select - Outputs
- Select - Blob Storage/ADLS Gen2
- Select storage account - “ehstorage23”
- Select Container - “raw”
- Path Pattern - `raw/{date}/{hour}/events.json`.
- Save the path.
- Go to Event Hub - “evnt-hub30”
- Put the sample code:

```
{
"country": "USA",
"city": "New York",
"date": "2023-05-11",
"temperature": 20,
"sensorId":1
}
```

- Go to Stream Analytics - “streama1”
- Select - Query
- Select - Start Job - Start
- Go to Event Hub - “evnt-hub30”
- Click on send
- Go to Stream Analytics - “streama1”
- Click on refresh, it will fetch the data.
- Click on output “raw” select open blob storage.
- Select - container
- Select - raw
- Data will display.



- Stop the job.

Stream Analytics Job 2: Raw Container to Processed Container

- Input: Configure the job to read from the raw container.
- Sample Query:

```
SELECT
    sensorId,
    AVG(temperature) AS AvgTemperature,
    System.Timestamp AS ProcessedTime
INTO [processed-output]
FROM [raw-input]
GROUP BY
    sensorId,
    TumblingWindow(minute, 5)
```

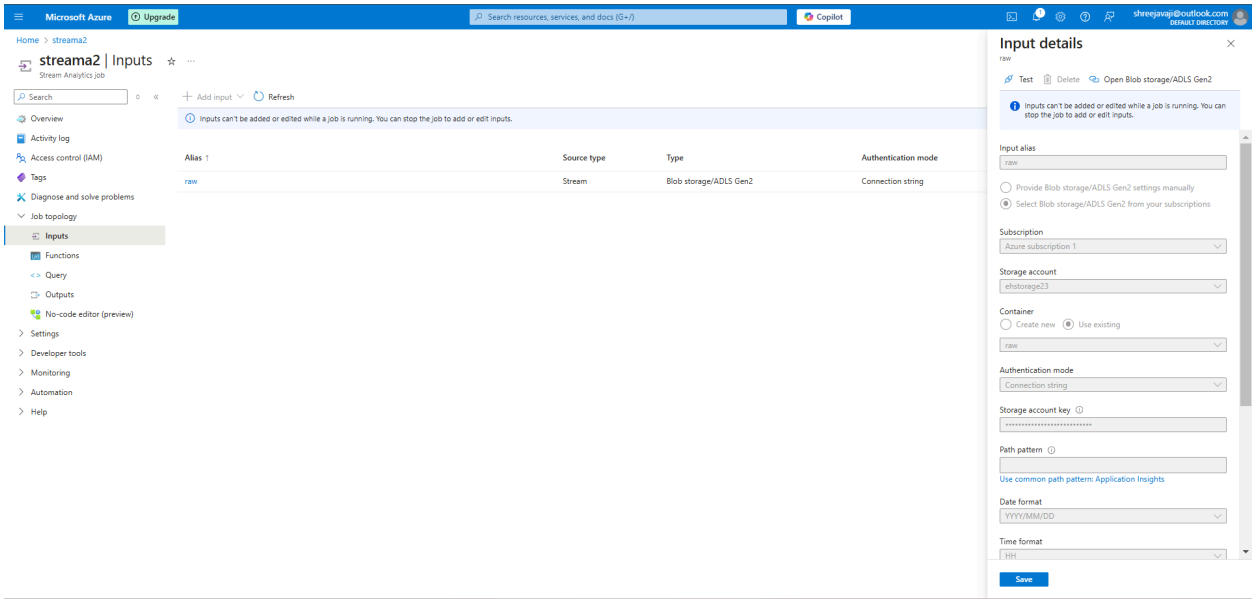
- Output: Configure the output to the processed container with a path pattern like:

  `processed/{date}/{hour}/processed_data.json`.

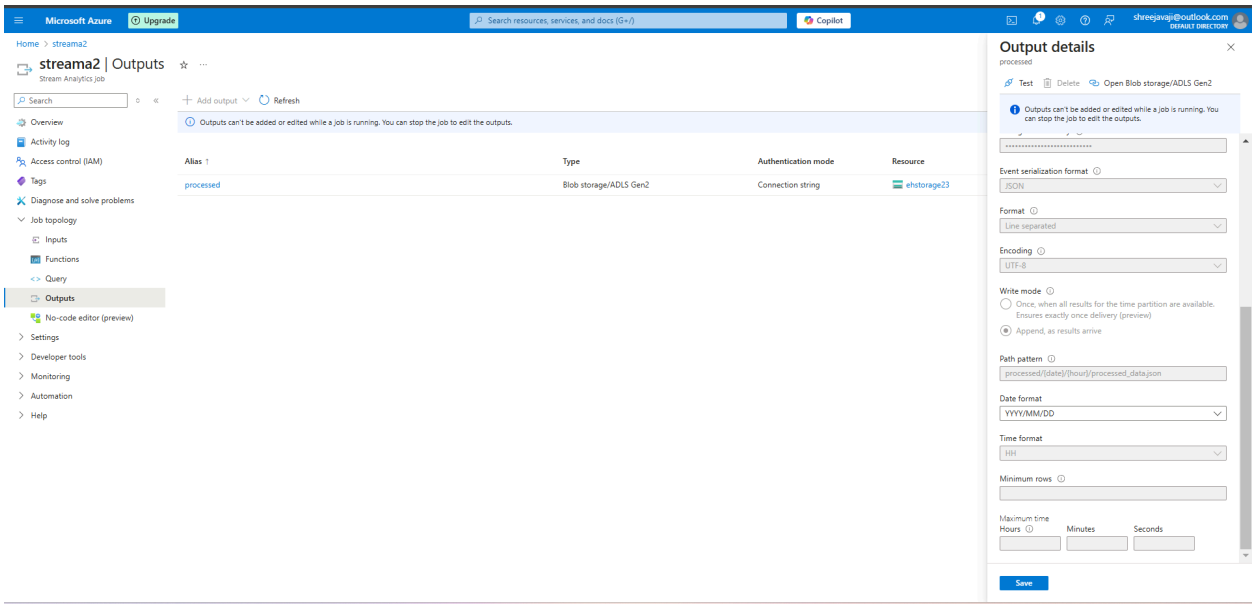
Document for 2st Job:

Step 1: Go to Stream Analytics - “streama2”

- Select - Job Topology
- Select - Inputs
- Select - Add Inputs
- Select - “Blob Storage/ADLS Gen2” and cross check the data.
- Select storage account - “ehstorage23”
- Select Container - “raw”.
- Select - Save
- Click on - Test Inputs



- Select - Outputs
- Select - Blob Storage/ADLS Gen2
- Select storage account - “ehstorage23”
- Select Container - “Processed”
- Path Pattern - `processed/{date}/{hour}/processed_data.json`.
- Save the path.
- Click on - Test outputs



- Select - Query
- Mention this query:

```
SELECT
    sensorId,
    AVG(temperature) AS AvgTemperature,
    System.Timestamp AS ProcessedTime
INTO [processed-output]
FROM [raw-input]
GROUP BY
    sensorId,
    TumblingWindow(minute, 5)
```

- **Select - refresh**
- Select - Start Job - Start
- Click on refresh, it will fetch the data.
- Click on output “processed” select open blob storage.
- Select - container
- Select - processed
- Data will display.