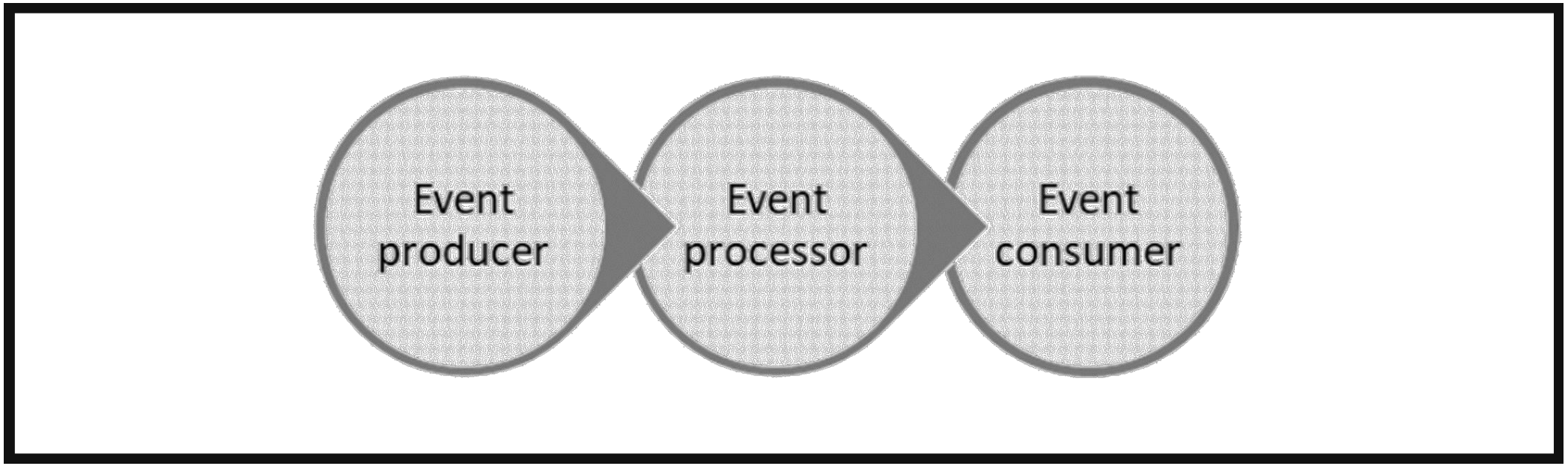
# Azure Streaming Analytics

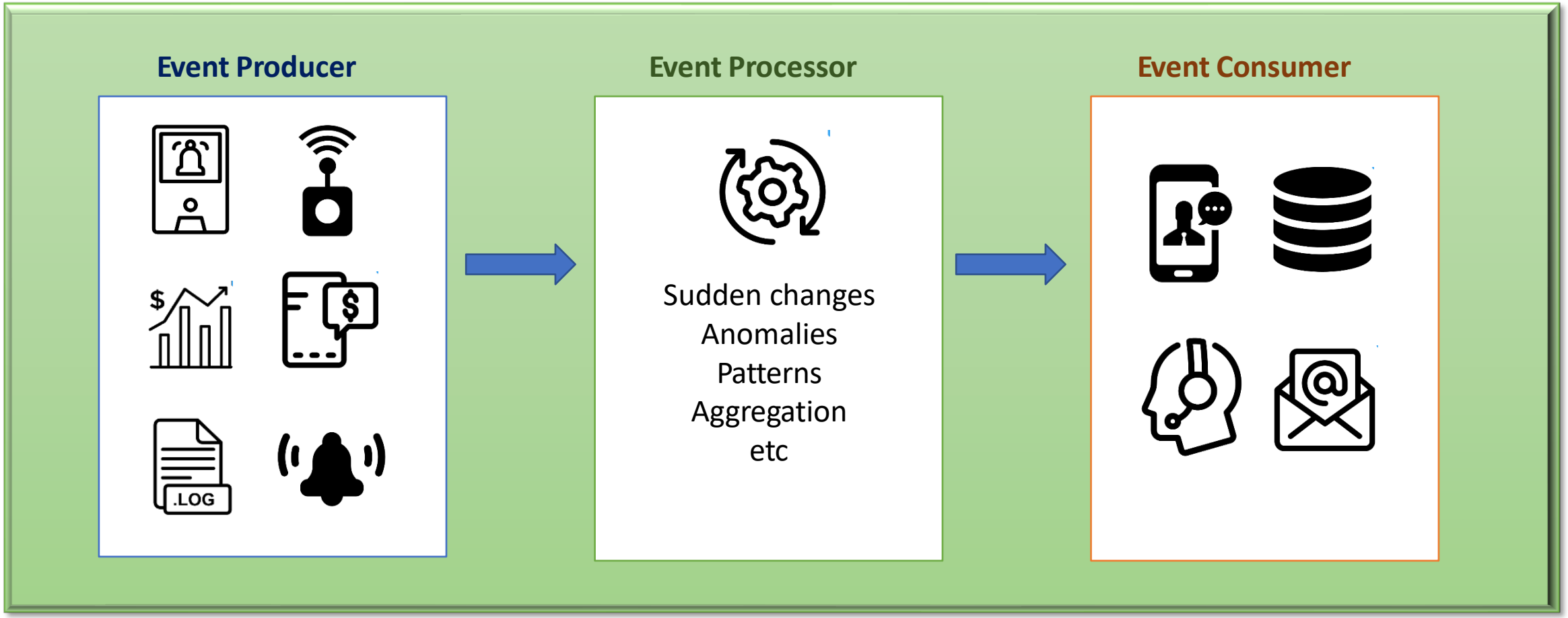
LearnCloud.Info

# Event Processing




- **Event Producer** – Process that generate data continuously
- **Event Processor -** An engine to consume event data streams and derive insights from them. -
- **Event Consumer-** An application that consumes the data and takes specific action based on the insights.

# Live Event Processing



Challenges

# Live Data Processing Challenges

- Data ingestion, processing and output should happen in real-time
- Support high volume of data
- Enough processing power
- Output storage should have high bandwidth
- Quick act on Output processing

# Azure options for Live Data Processing

HDInsight with Spark Streaming

HDInsight with Storm

Apache Spark in Azure Databricks

Azure Functions

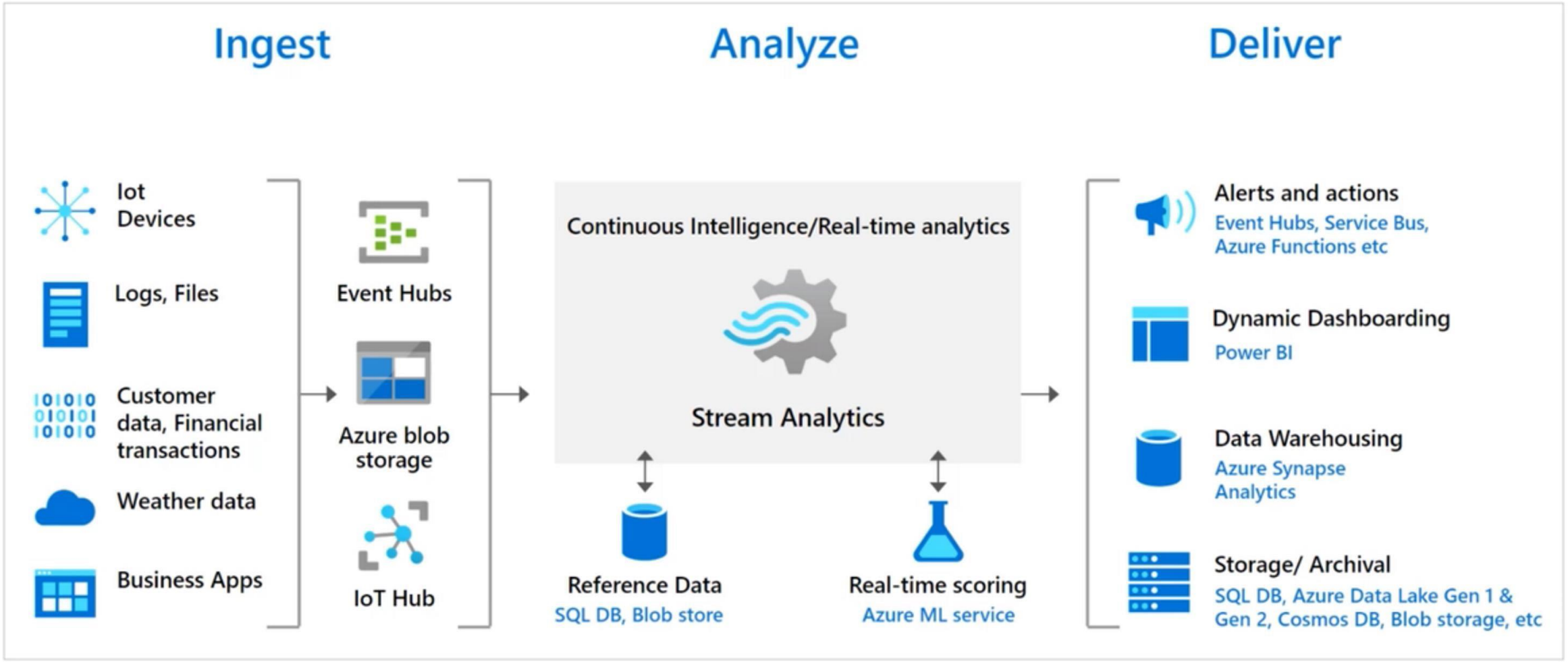
WebJobs

Azure Stream Analytics

# Azure Stream Analytics

"A fully managed, real-time analytics service designed to process fast moving streams of data."

# Azure Stream Analytics Data Flow

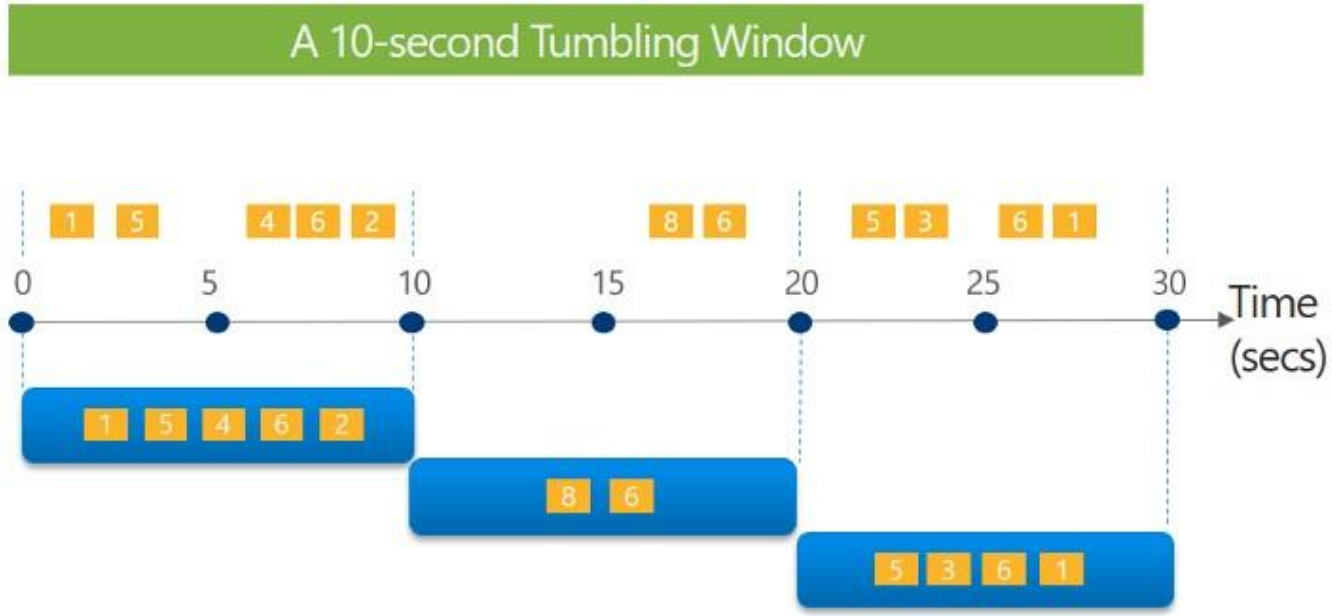


# Azure Stream Analytics Windowing

- Each data event has a timestamp
- There is an need to perform an operation (e.g. Count) on events falling in the same time window.
- Azure Stream Analytics achieve this through windows
- Four types of window functions
  - Tumbling window
  - Hopping window
  - Sliding window
  - Session window

TUMBLING WINDOW

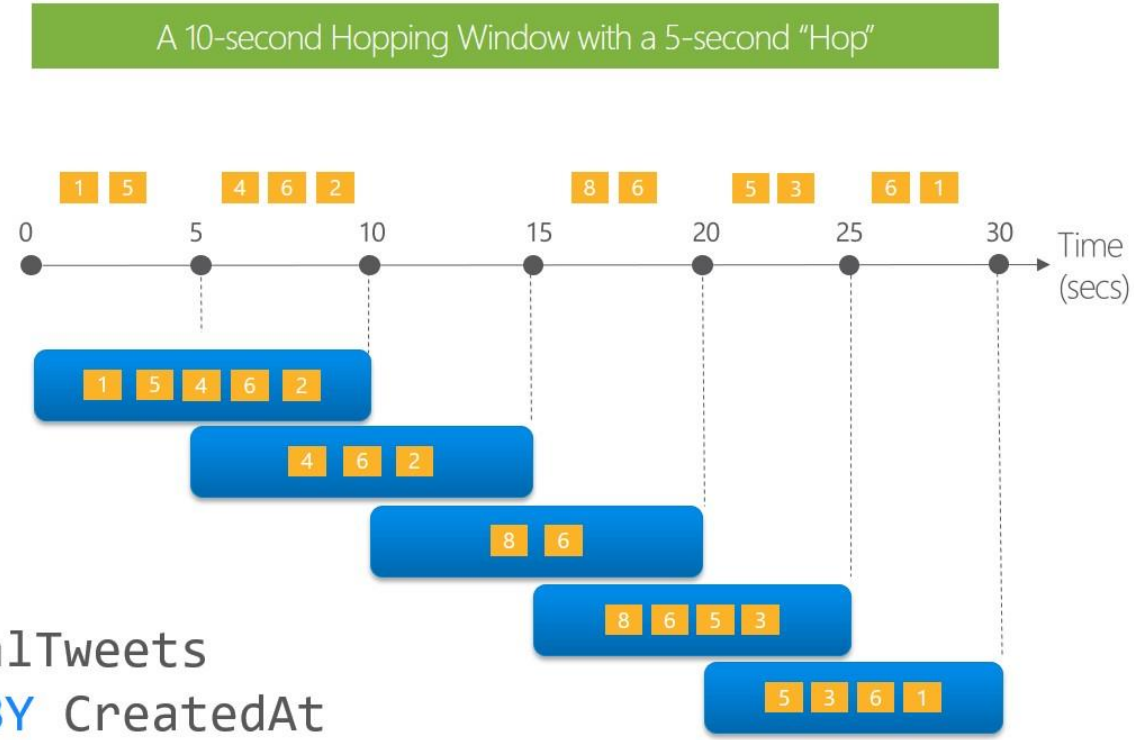
# Tell me the count of tweets per time zone every 10 seconds




```
SELECT TimeZone, COUNT(*) AS Count
FROM TwitterStream TIMESTAMP BY CreatedAt
GROUP BY TimeZone, TumblingWindow(second,10)
```

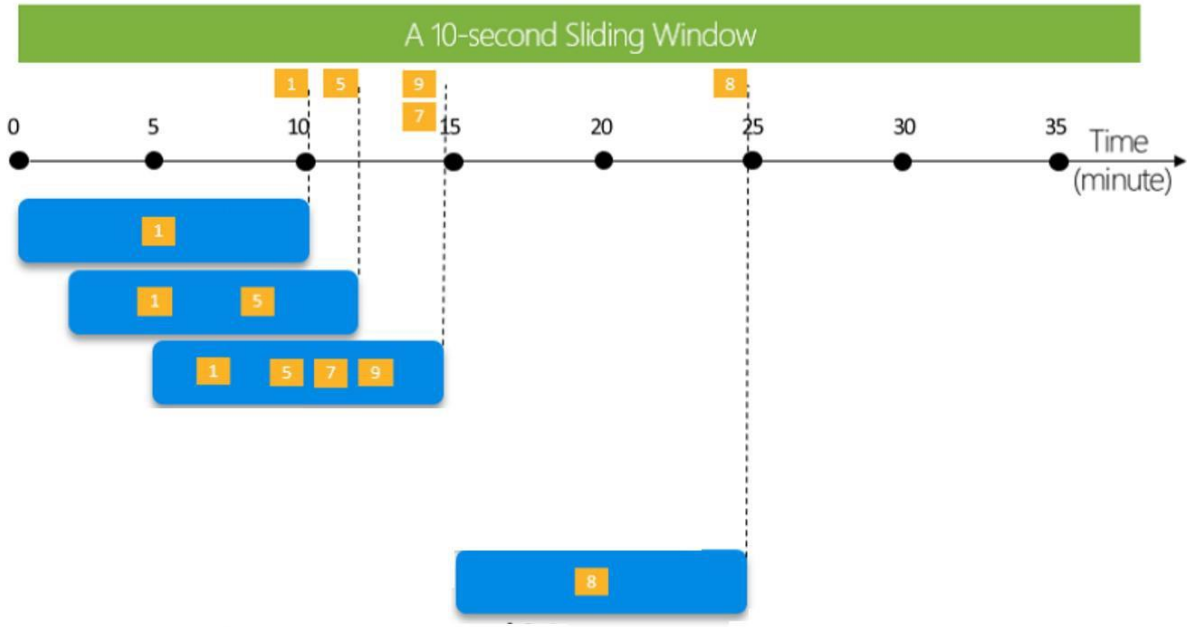
# HOPPING WINDOW

Every 5 seconds give me the count of tweets over the last 10 seconds




```
SELECT Topic, COUNT(*) AS TotalTweets
FROM TwitterStream TIMESTAMP BY CreatedAt
GROUP BY Topic, HoppingWindow(second, 10 , 5)
```

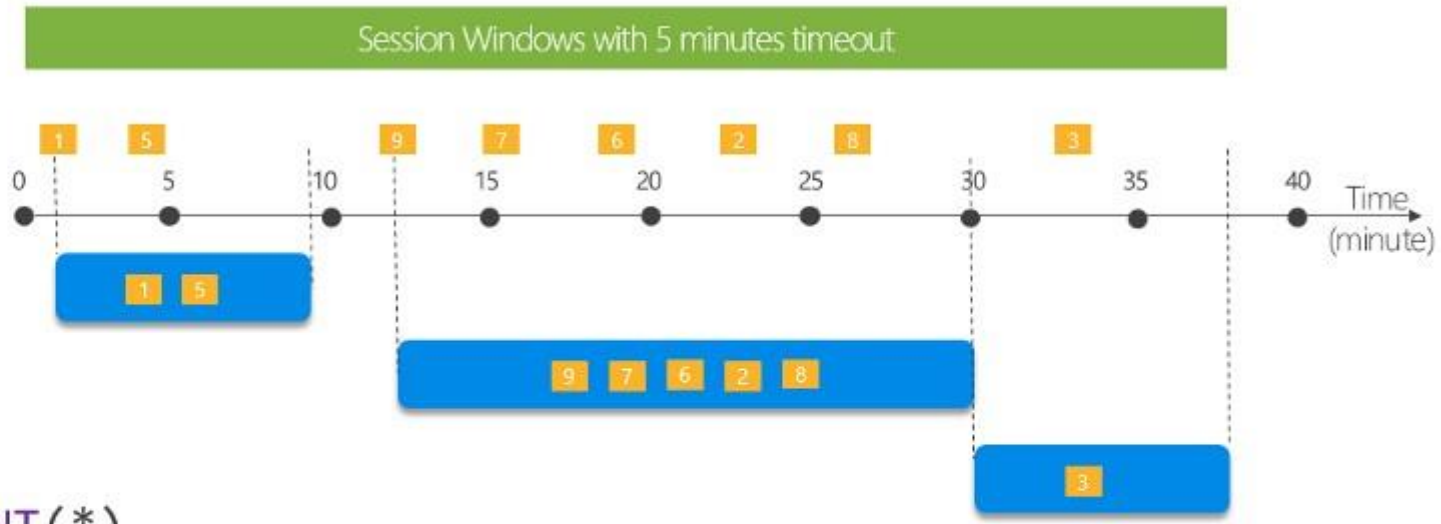
# SLIDING WINDOW




```
SELECT COUNT(*)
FROM Input
GROUP BY SlidingWindow(second, 10)
```

# SESSION WINDOW

Tell me the count of tweets that occur within 5 minutes to each other.




```
SELECT Topic, COUNT(*)
FROM TwitterStream TIMESTAMP BY CreatedAt
GROUP BY Topic, SessionWindow(minute, 5, 10)
```

# Demo Overview



Azure Blob Storage

INPUT

OUTPUT

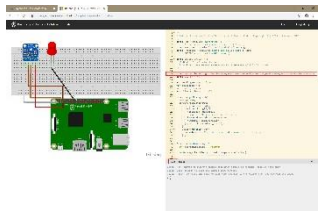
INPUT

OUTPUT

Streaming analytics job

– Query (Processing Logic)

# Demo Overview



Azure IoT Hub

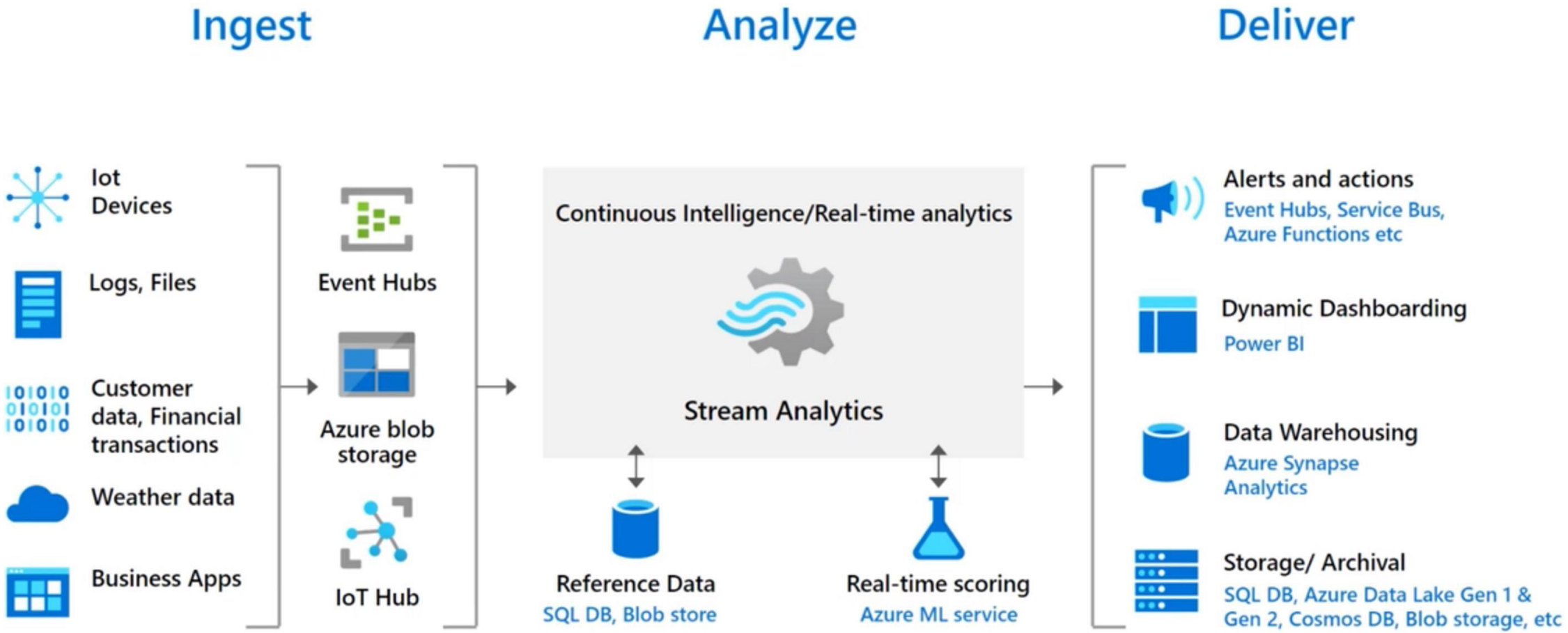
INPUT

Streaming analytics job

OUTPUT

Azure Blob Storage

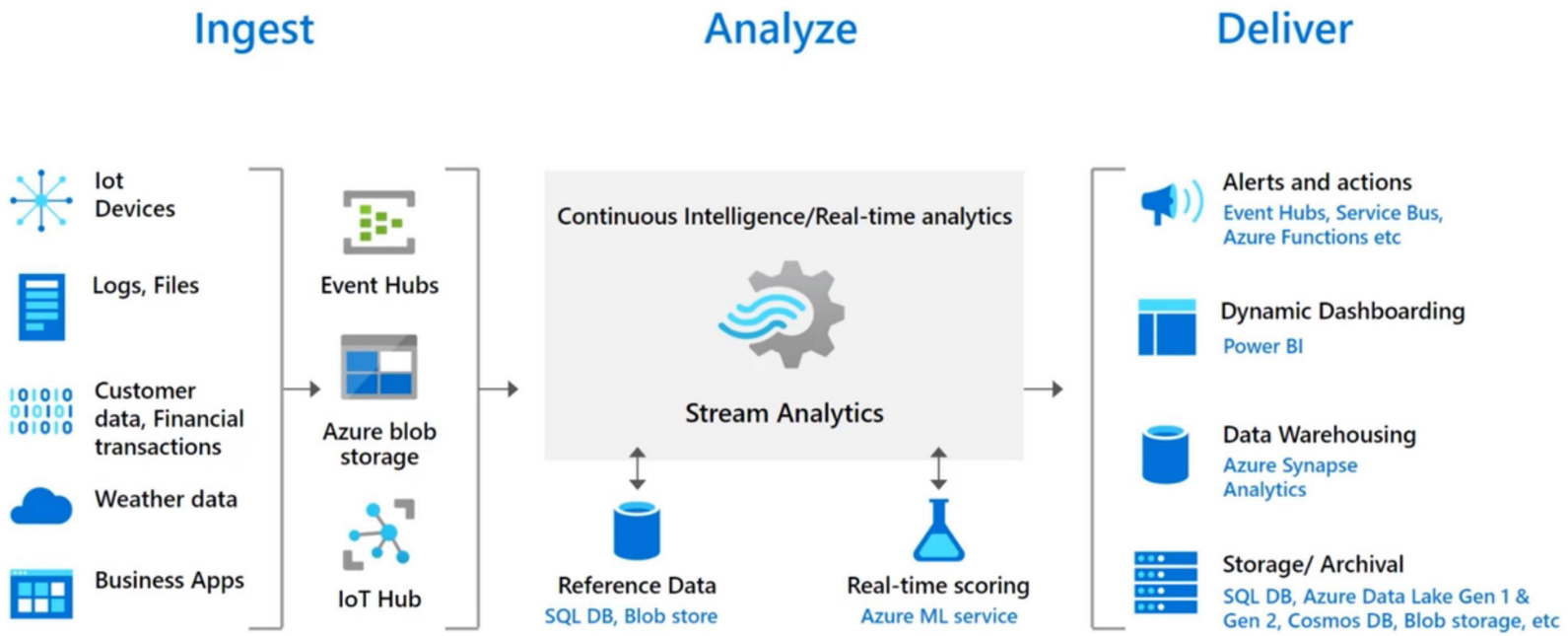
# Azure Stream Analytics Data Inputs



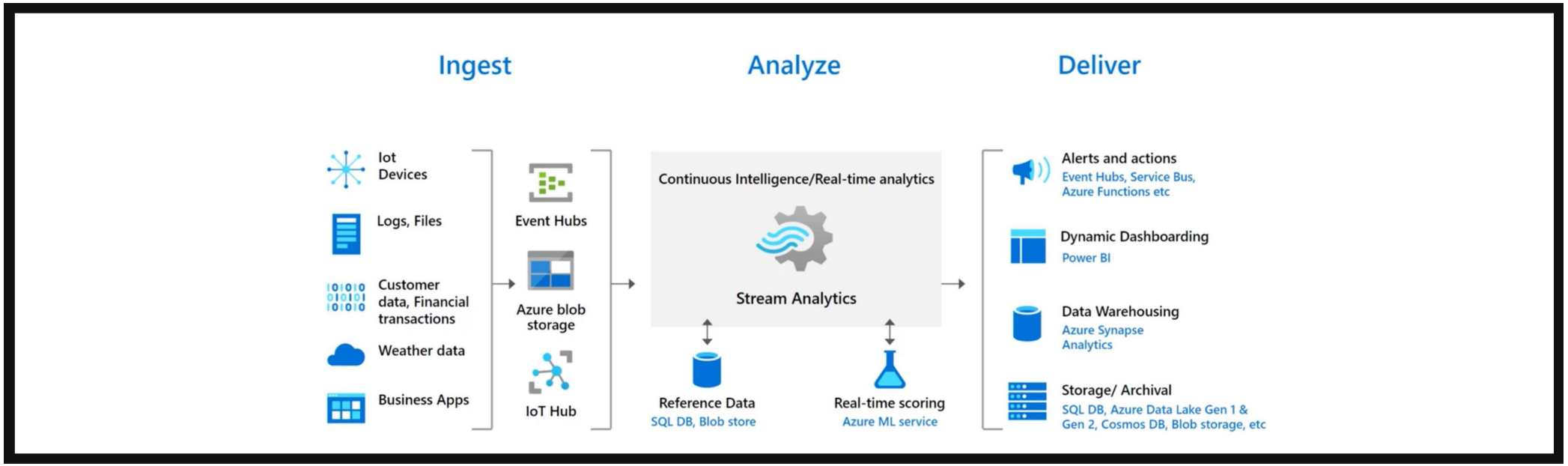
# Azure Stream Analytics Data Inputs

- Reference Data Inputs
  - Metadata Lookups

    (Device name, etc.)



# Reference Data Inputs




**Metadata Lookup**

Device capacity, name, etc.

**Acceptable thresholds**

Allowed temperatures, etc.

**Trusted entities**

Registered devices

**Any lookup or slow**

Changing data

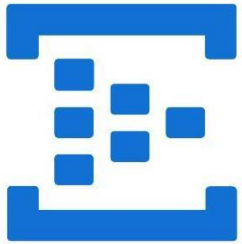
# Azure Stream Analytics Stream Data Output



Azure SQL Database


Azure Blob Storage

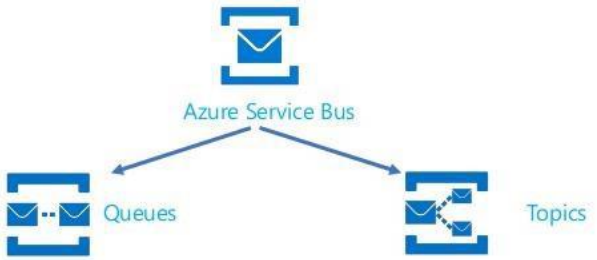
Azure Data Lake Storage Gen2



Azure Event Hubs

Power BI

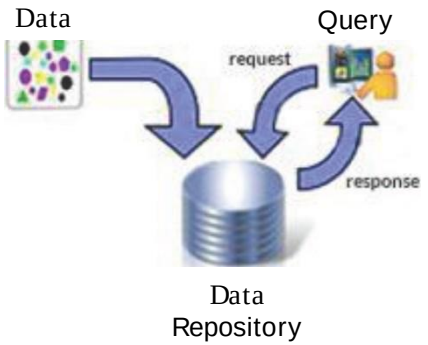
Table Storage




Azure Cosmos DB

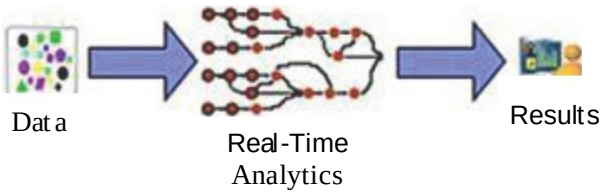
Azure Functions

## Traditional Processing




- Historical fact finding
- Find and analyze information stored on disk
- Batch paradigm, pull model
- Query-driven: submits queries to static data

## Stream Processing




- Current fact finding
- Analyze data in motion - before it is stored
- Low latency paradigm, push model
- Data driven: bring data to the analytics