Experiment 5

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1. **Aim:** Set up a system using IoT sensor data to AWS IoT Core and store it in an S3 bucket.

2. **Objective:** To demonstrate the process of integrating IoT sensors with AWS IoT core, transmitting sensor data, and storing the data in AWS S3 for further analysis.

3. **Hardware / Software Used:**
   a. AWS IOT Core
   b. AWS S3
   c. Operating System
   d. IOT Sensors (if integrated)
   e. Internet Connectivity

4. **Procedure:**
   a. Log in to **AWS**, navigate to **S3**, and create a bucket (e.g., s3-bucket-for-iot-data) in the preferred AWS region.
   b. Open AWS IoT Core, navigate to Act → Rules, and create a rule (IoT_data_rule_for_S3).
   c. Set an SQL query to collect data: SELECT * FROM 'iotdevice/+/datas3'.
   d. Add an action: "Store a message in an Amazon S3 bucket."
   e. Go to MQTT Test Client, publish data to iotdevice/55/datas3 with payload.
   f. Verify data storage in S3 by navigating to the bucket.
   g. Open S3, select the created bucket, and find the folder corresponding to the IoT device ID.
   h. Download the stored data to verify successful transmission.

5. Result:

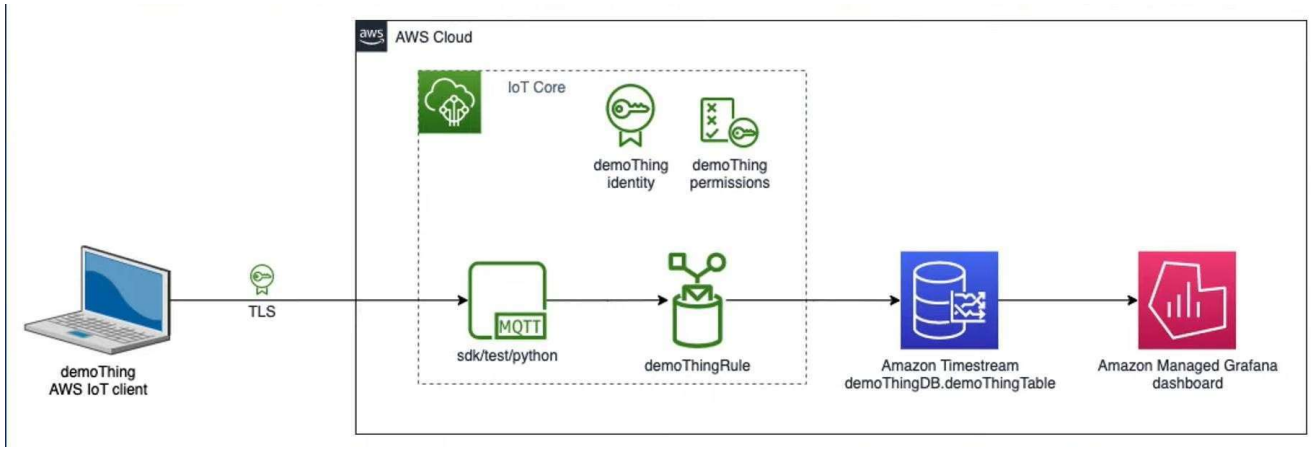

Figure 1: End-to-End AWS Architecture

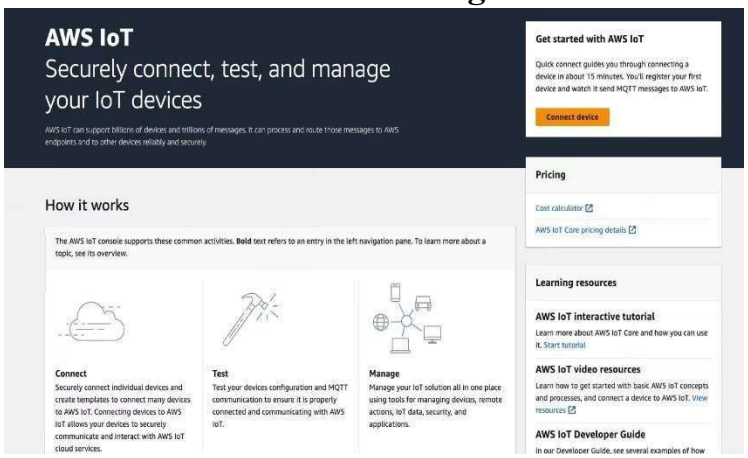

Figure 2: AWS IOT Connection

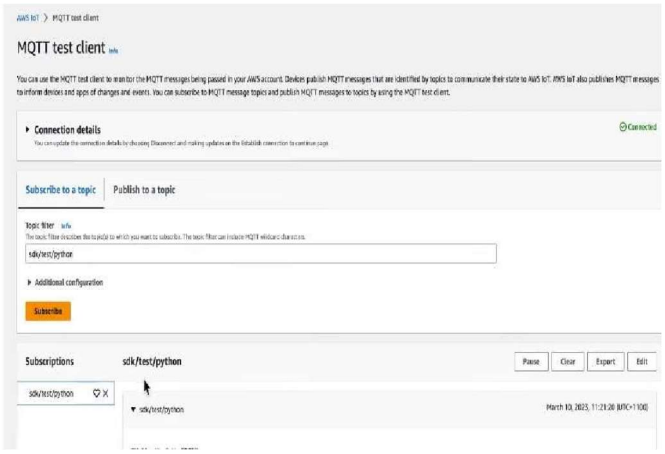

Figure 3: MQTT Test Client

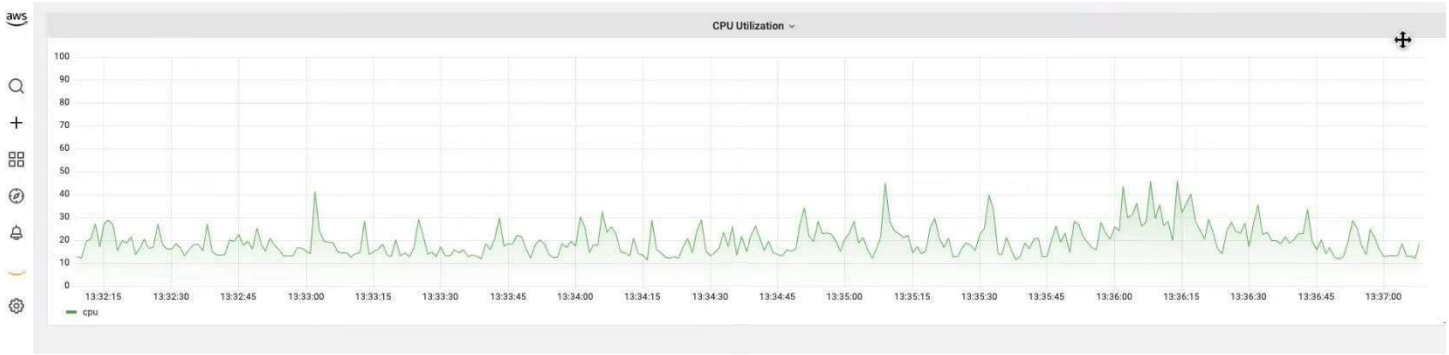

Figure 4: CPU Utilization Stats

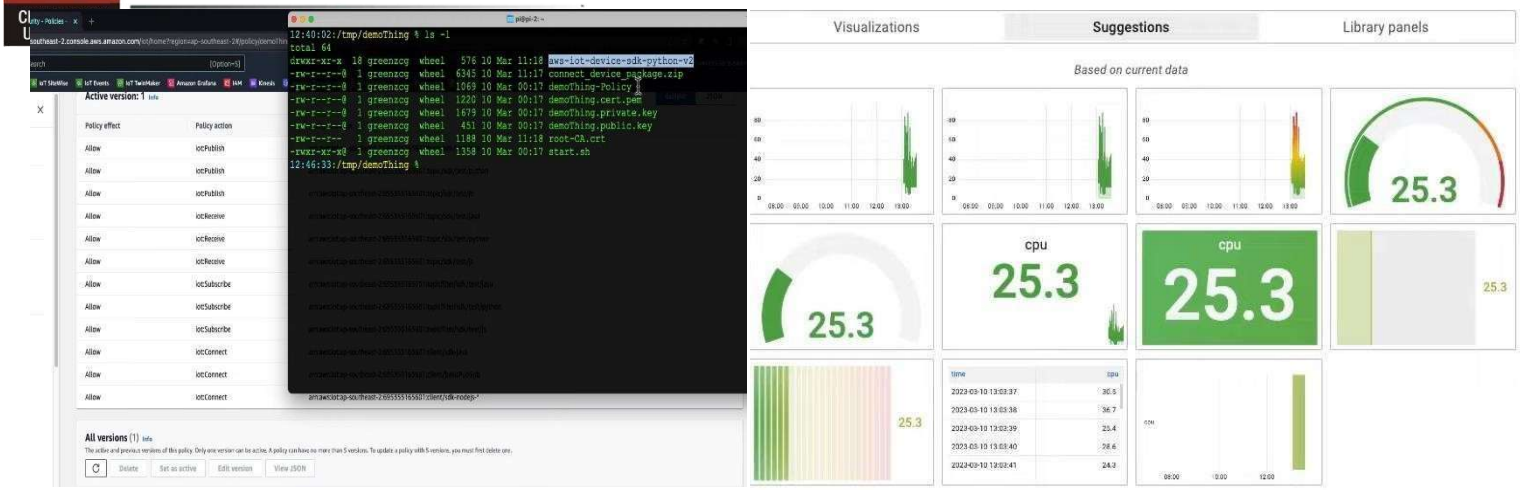

Figure 5: Integration and Graphical Visualization

6. Conclusion:

As a result, AWS IoT Core with the IoT Rule engine will assist in filtering IoT topics and the storage of data in AWS S3. AWS IoT core can receive and send millions of IoT data at a time, and the AWS IoT Rule engine can filter MQTT topics from IoT devices and send them to other AWS Services and a time stamp. For data backup and archive, AWS S3 will be used.

7. Learning Outcomes:

a) Learned how to **connect IoT sensors** with AWS IoT Core and process sensor data in the cloud.
b) Gained knowledge of **MQTT message publishing**, subscribing, and rule-based filtering in AWS IoT Core.
c) Understood how **AWS IoT Core, S3, and IAM roles** work together to manage and secure IoT data.
d) Learned how to **store IoT data securely** in S3 for long-term analysis and scalability.
e) Understood the IOT-Cloud integration.