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Task - 02 : Set up monitoring for a cloud-based application using AWS CloudWatch, Google Cloud Monitoring, or Azure Monitor, with configured alerts and a dashboard showcasing metrics

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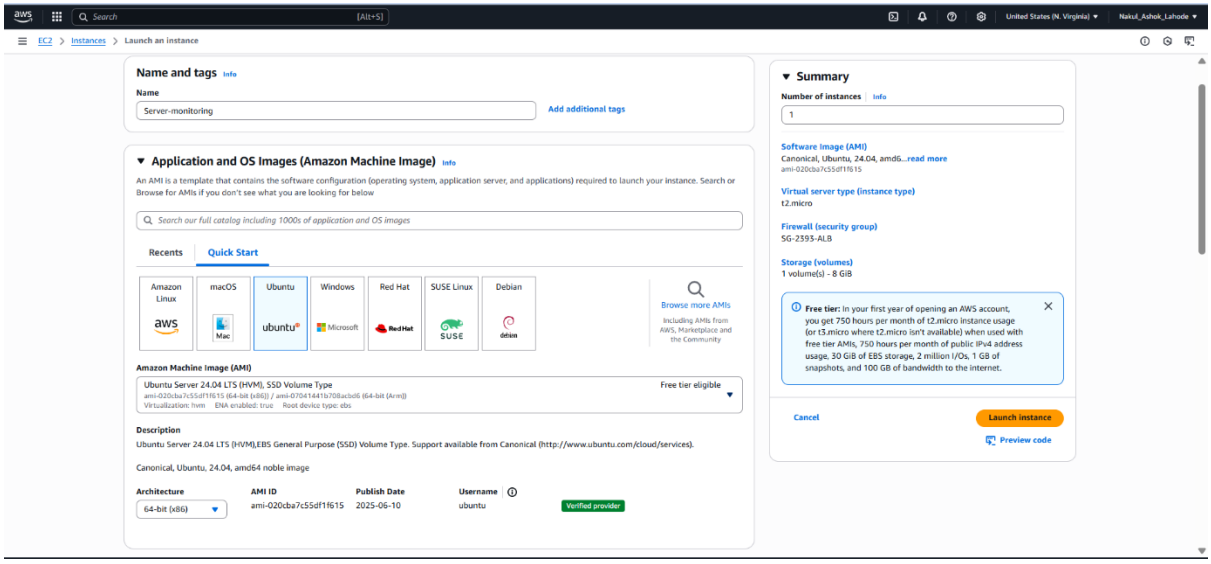
Overview of AWS CloudWatch :

1. **Monitoring Service**
    - CloudWatch monitors AWS resources and applications in real-time.
2. **Metrics Collection**
    - Automatically collects metrics like **CPU usage**, **network traffic**, and **disk I/O** from services like EC2, RDS, and Lambda.
3. **Custom Dashboards**
    - Allows creation of **visual dashboards** to monitor selected metrics.
4. **Alarms & Notifications**
    - Set alarms on thresholds and get alerts via **SNS** (email/SMS) or trigger actions like **Lambda functions**.
5. **Log Management**
    - Collects and stores logs from applications and services using **CloudWatch Logs**.
6. **Event-Driven Actions**
    - Responds to system events automatically using **CloudWatch Events (EventBridge)**.
7. **Custom Metrics Support**
    - Supports pushing custom metrics from applications using AWS SDK or CLI.

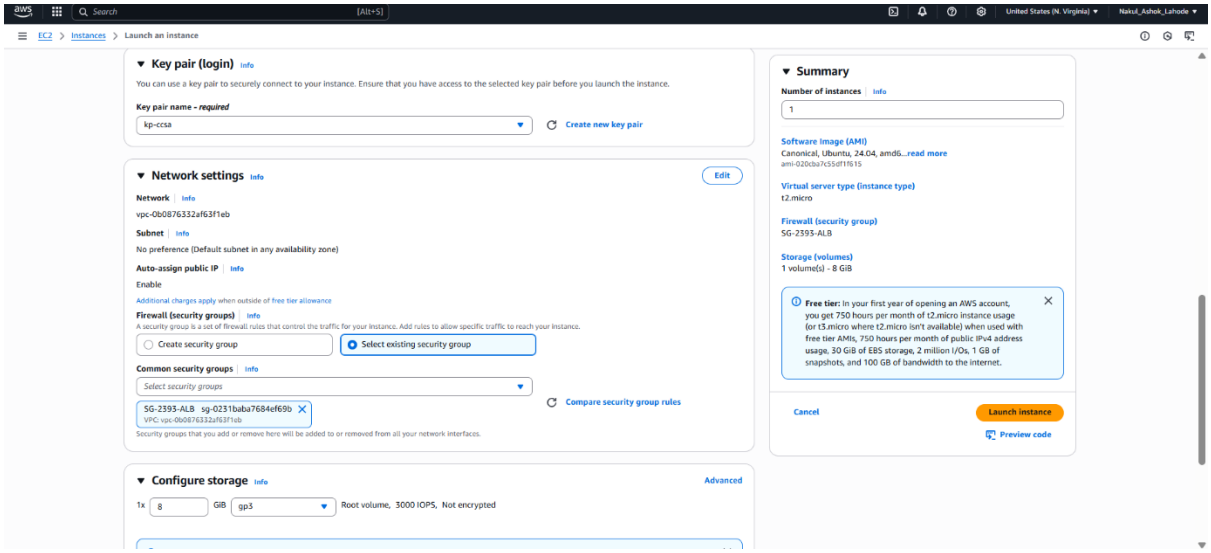
Step 1: Launch EC2 Instance & Install Apache

1. Log in to the **AWS Management Console** and navigate to **EC2**.
2. Click on **"Launch instance"** to create a new EC2 instance.

3. Configure the instance with the following:
    - Instance Name: Ec2-Monitoring
    - Amazon Machine Image (AMI): **Ubuntu**

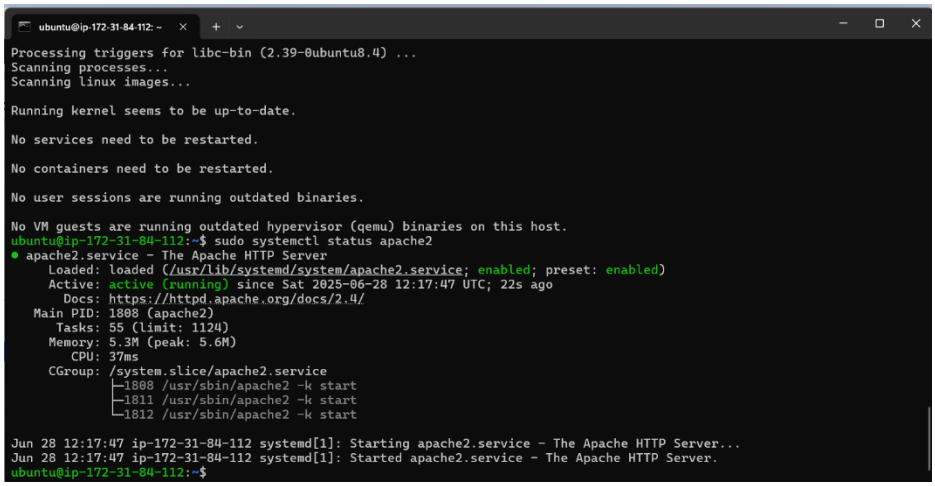


    - Select an existing **Security Group** (or create a new one as needed).

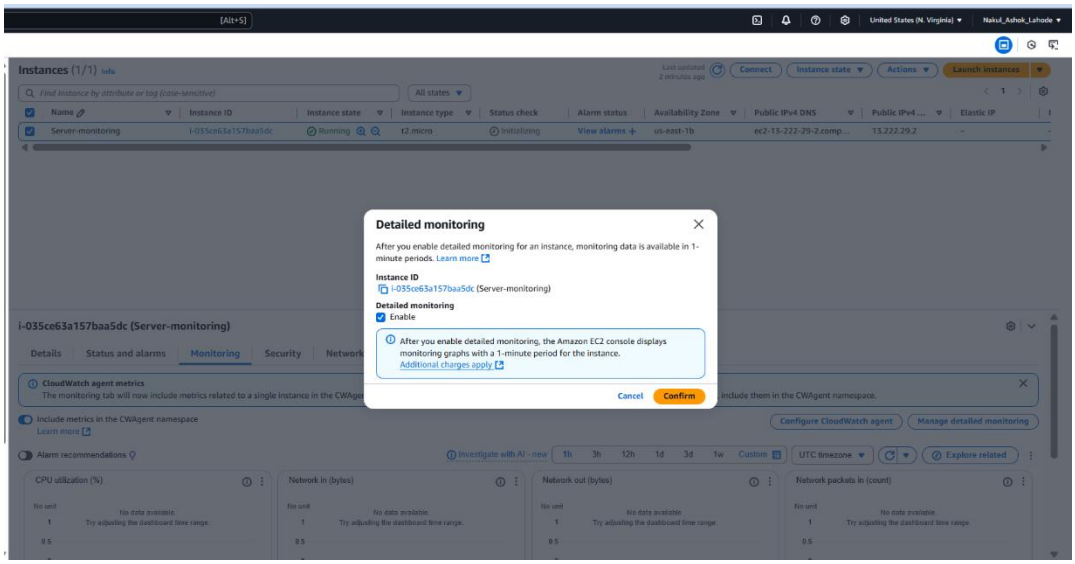


4. Launch the instance and wait for it to initialize.
5. Once running, **connect** to the EC2 instance using SSH.
6. Install **Apache Server** by running the following commands:

- sudo apt update
- sudo apt install apache2 -y

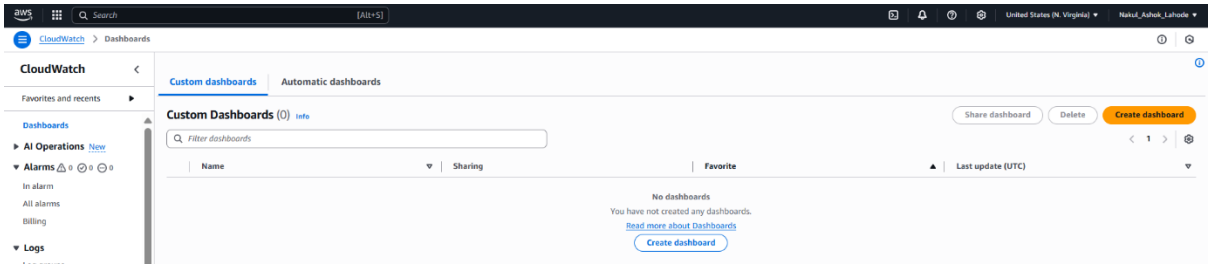


7. Enable **Detailed Monitoring** for the instance in the EC2 settings (if not enabled by default).

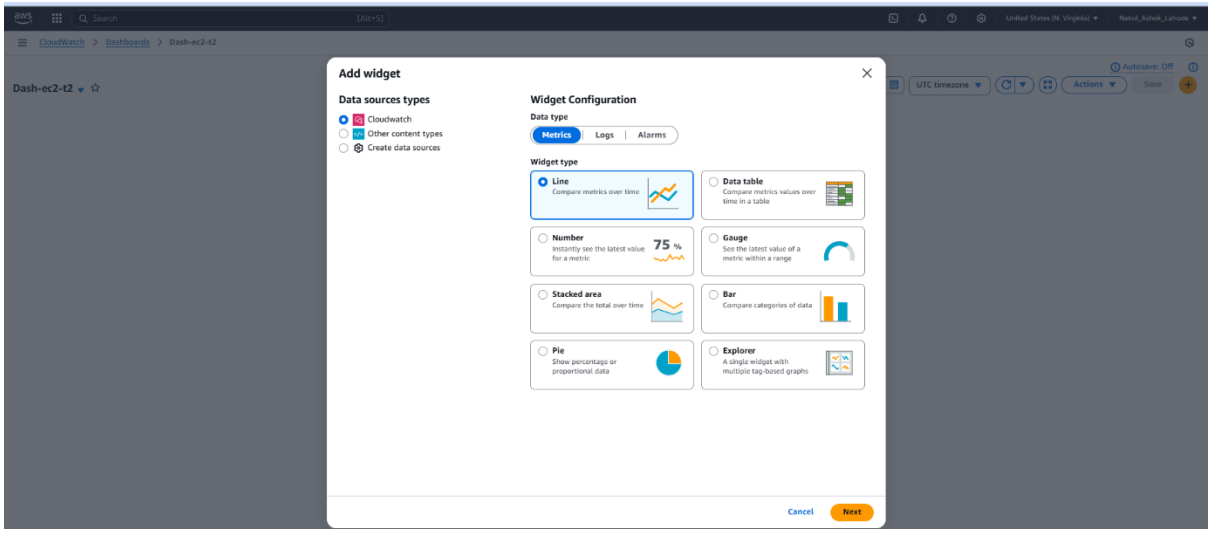


Step 2: Create a CloudWatch Dashboard

1. Navigate to **CloudWatch** in the AWS console.
2. Click on **“Create dashboard”**.

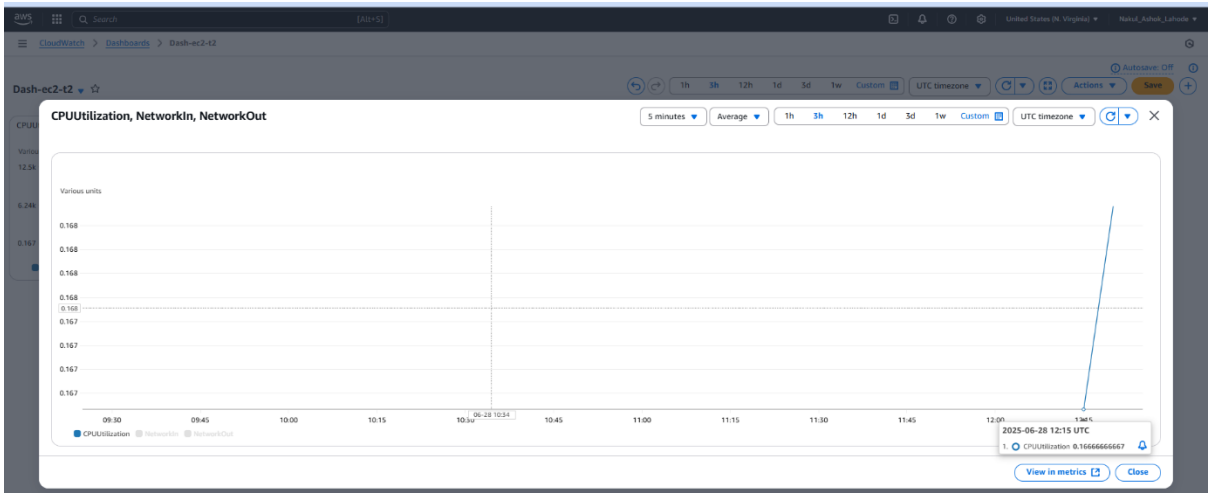


3. Enter a meaningful name for your dashboard (e.g., EC2-Monitoring-Dashboard).
4. Choose the **"Line"** widget type to visualize metrics.
5. In the metric selector:
    - Choose **EC2 metrics**.
    - Select the instance you launched.
6. Add the following key metrics to the graph:
    - **CPUUtilization**
    - **NetworkIn**
    - **NetworkOut**

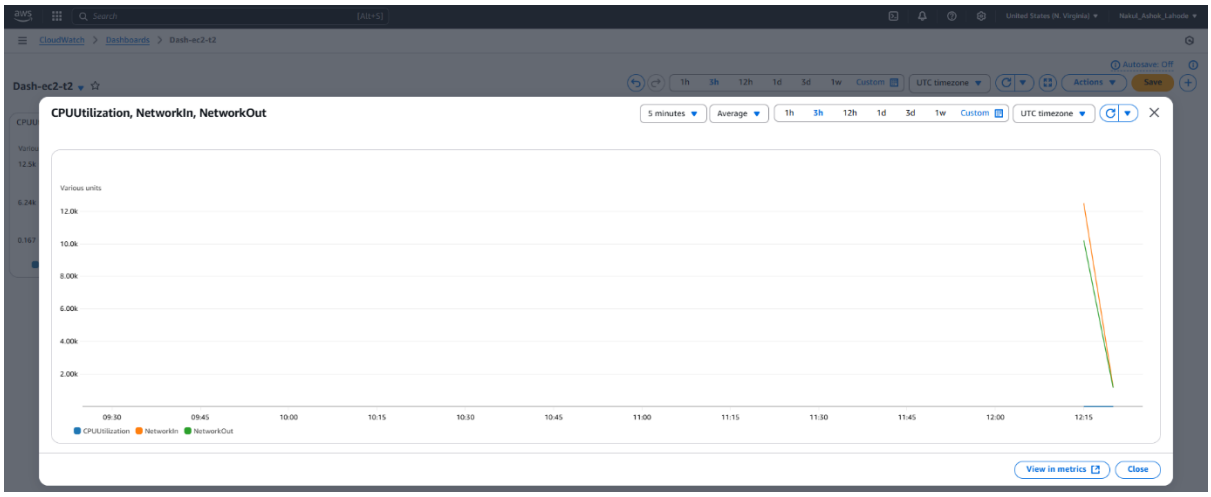


Step 3: Monitor Resources Using the Dashboard

1. Open the dashboard you created.
2. Review the **live monitoring** data for the EC2 instance.
    - CPU usage trends



- Incoming and outgoing network traffic



3. Use this visualization to:
    - Detect performance bottlenecks
    - Track system health