

# Solution Proposal

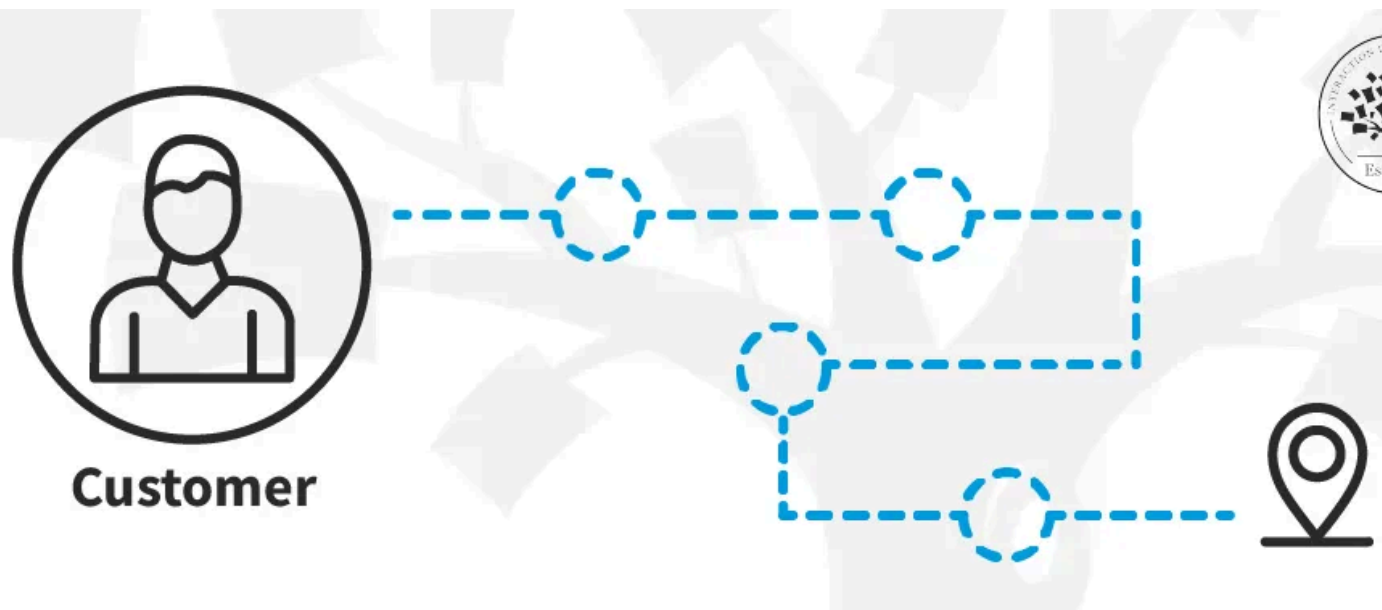
## Challenge 2: Customer Journey Algorithm

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# Introduction



## Customer Journey Algorithm

- Programming language: Python
- Calculate and statistically analyze the percentage of customer interactions based on randomly generated input.

## Setting Up Grafana Solution To Monitor AWS services

Monitoring EC2 instance by Prometheus and Grafana



# Grafana

# Customer Journey Algorithm

## 1. Generate Input Data

- Generate 1000 random customer journey
- Each journey is a list starting with “Sign in” and ending with “End”

## 2. Calculate Layer Interactions Percentages

- Count interactions between layers in customer journeys
- Calculate percentage of layer interactions from counts

## 3. Complexity:

### • Time Complexity:

- Generating journeys/Calculate percentages:  $O(n.m)$

### • Space Complexity:

- Storing journeys:  $O(n.m)$
- Storing layer interactions:  $O(m^2)$

n: the number of journeys

m: the average number of layers per journey

Layer interaction percentages:

From Sign in:

To Pay bill: 14.00%

To Withdraw: 18.30%

To Top up: 14.30%

To Transfer money: 11.20%

To Create credit card: 14.10%

To Check balance: 14.00%

To Play game: 14.10%

From Pay bill:

To Play game: 13.16%

To Transfer money: 12.28%

To Create credit card: 11.53%

To End: 18.92%

To Top up: 11.03%

To Check balance: 12.03%

To Pay bill: 11.28%

To Withdraw: 9.77%

From Play game:

To End: 17.96%

To Withdraw: 11.08%

To Create credit card: 11.97%

To Transfer money: 12.48%

To Play game: 11.46%

To Check balance: 10.96%

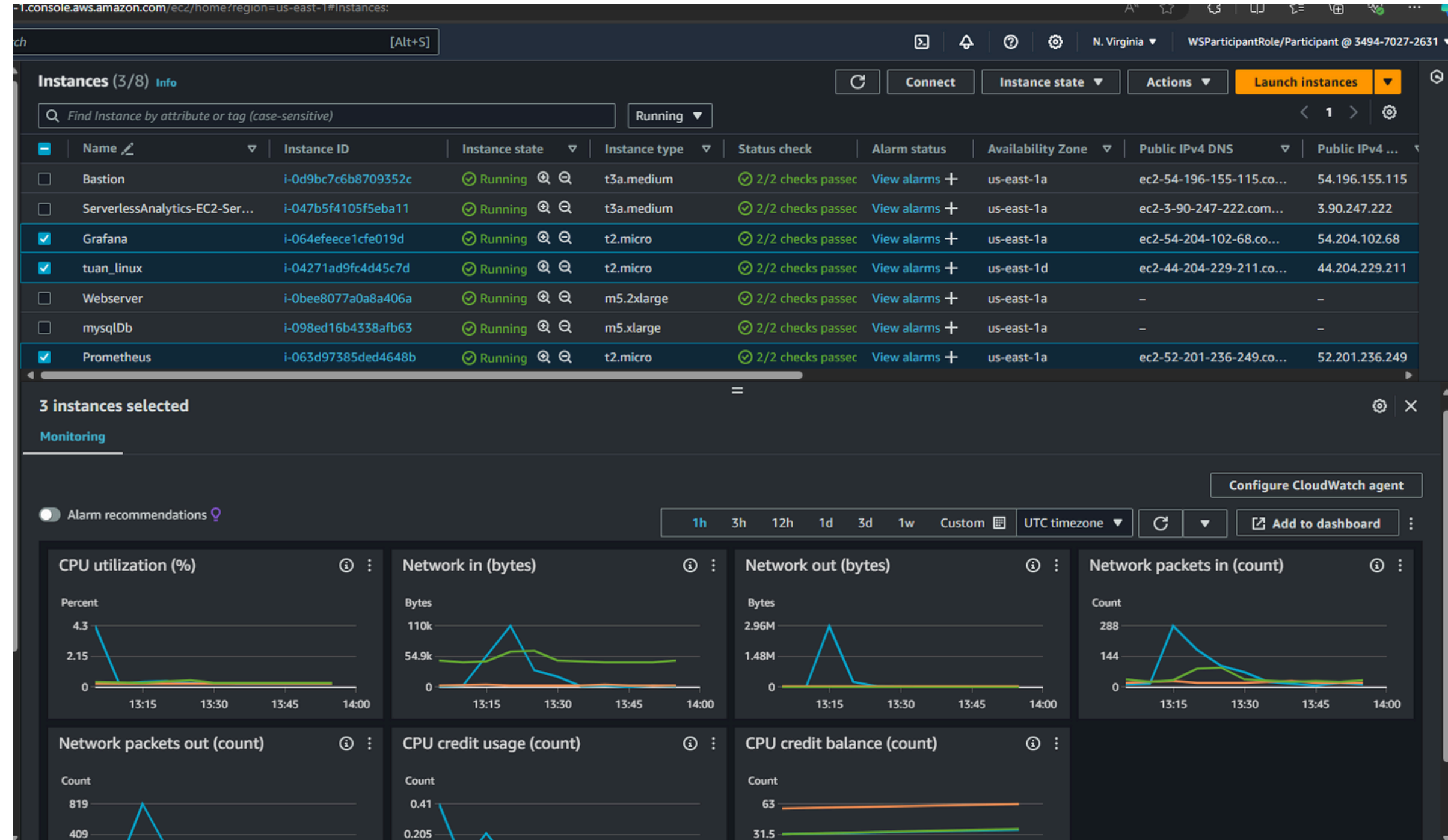
To Pay bill: 12.48%

To Top up: 11.59%

# Setting Up Grafana Solution to Monitor EC2 Instance

## 1. Launching 3 EC2 Linux Instances:

- **tuan-linux**: Instance to be monitored
- **Prometheus**: Instance to aggregate and monitor data from tuan-linux
- **Grafana**: Instance to visualize the monitored data



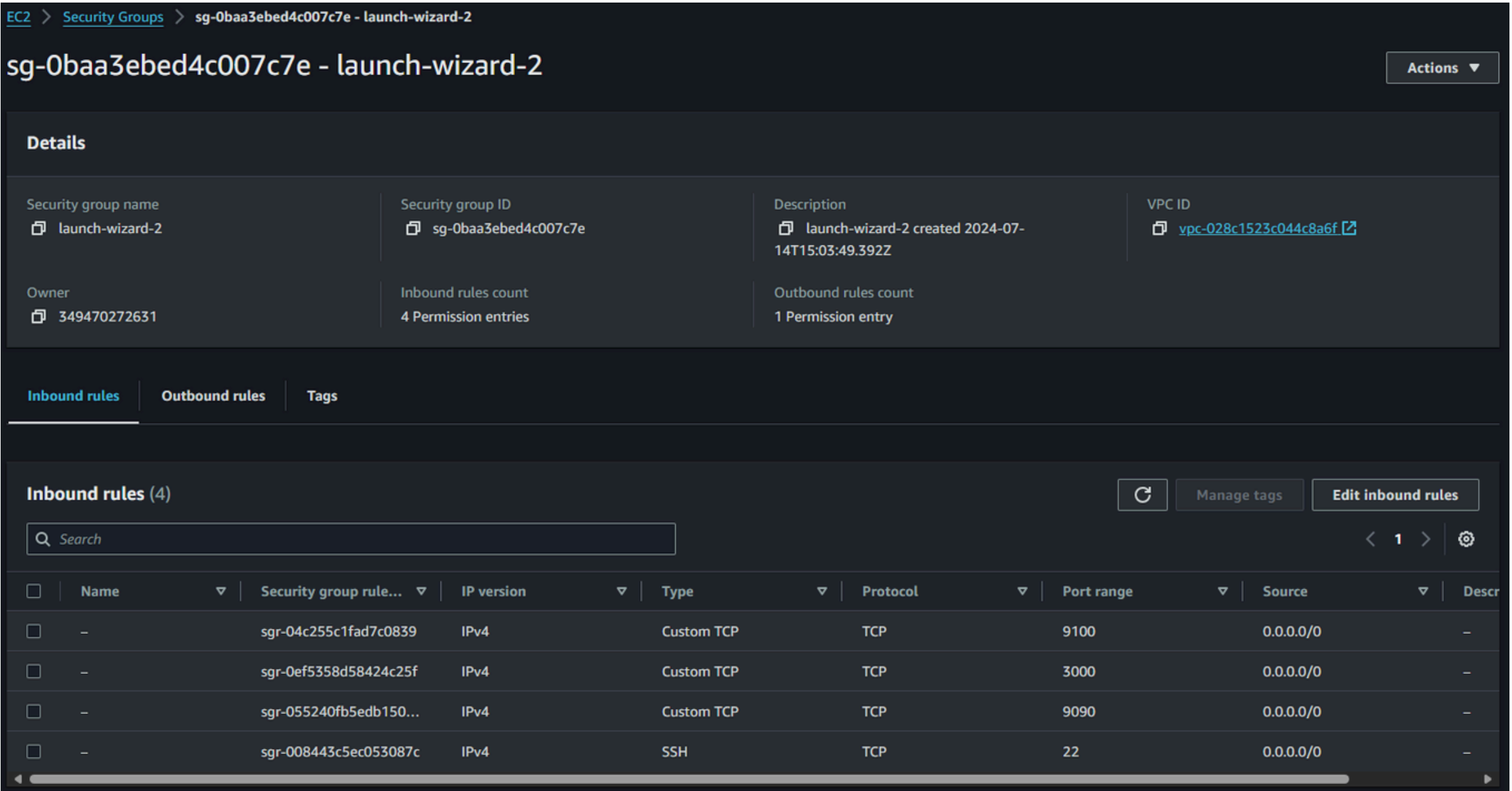
# Setting Up Grafana Solution to Monitor EC2 Instance

## 2. Setting Up and Configuring the Instances SSH into the instances and install the necessary tools:

- tuan-linux: install ‘node\_exporter’
- Prometheus
- Grafana

## Configure the security group to allow inbound traffic on the required ports

- SSH (port 22) for remote access
- Prometheus (default port 9090)
- Grafana (default port 3000)
- Node\_exporter (port 9100)



# Setting Up Grafana Solution to Monitor EC2 Instance

## 3. Result (Grafana Dashboard)

