PROJECT-3
DOCUMENTATION

Integrate Grafana with Linux Server for high cpu utilization and create a graph in Grafina

➢ Table of Contents

- ❖ Introduction
- ❖ Prerequisites
- ❖ Setting Up the Environment
    - o Launch an EC2 Instance
    - o Connect to the EC2 Instance
- ❖ Installing and Configuring Prometheus
- ❖ Installing and Configuring Node Exporter
- ❖ Installing and Configuring Grafana
- ❖ Configuring Security Groups
- ❖ Adding Prometheus as a Data Source in Grafana
- ❖ Creating a CPU Utilization Dashboard in Grafana

PROJECT-3

Integrate Grafana with Linux Server for high cpu utilization and create a graph in Grafina

Introduction

This document provides a step-by-step guide to integrating Grafana with a Linux server to monitor high CPU utilization using Prometheus and Node Exporter. We will cover the installation and configuration of Prometheus, Node Exporter, and Grafana on an AWS EC2 instance.

Prerequisites

- AWS account with permissions to create EC2 instances and security groups.
- SSH client installed on your local machine.
- Basic knowledge of Linux command-line operations.

❖ Introduction to Grafana

Grafana is an open-source analytics and monitoring platform that is highly extensible and widely used for visualizing time-series data from various data sources, such as Prometheus, InfluxDB, Elasticsearch, and many more. It provides an intuitive web-based interface to create, explore, and share dashboards that help visualize and monitor system metrics, logs, and application data.

➢ Features of Grafana

- **Dashboards**: Customizable dashboards that provide a rich set of visualizations for data analysis.
- **Data Source Management**: Integrate with various data sources seamlessly.
- **Alerting**: Set up alert rules and notifications to monitor critical metrics.
- **Templating**: Use templates to create reusable dashboards.
- **Annotations**: Add contextual information directly to your graphs.
- **User Management**: Control access with fine-grained user permissions and roles.
- **Plugins**: Extend Grafana's functionality with a wide array of plugins.

➢ LAB STEPS:-

❖ Sign in to AWS Management Console

1. Click on the Open Console button, and you will get redirected to AWS Console in a new browser tab.

2. On the AWS sign-in page,

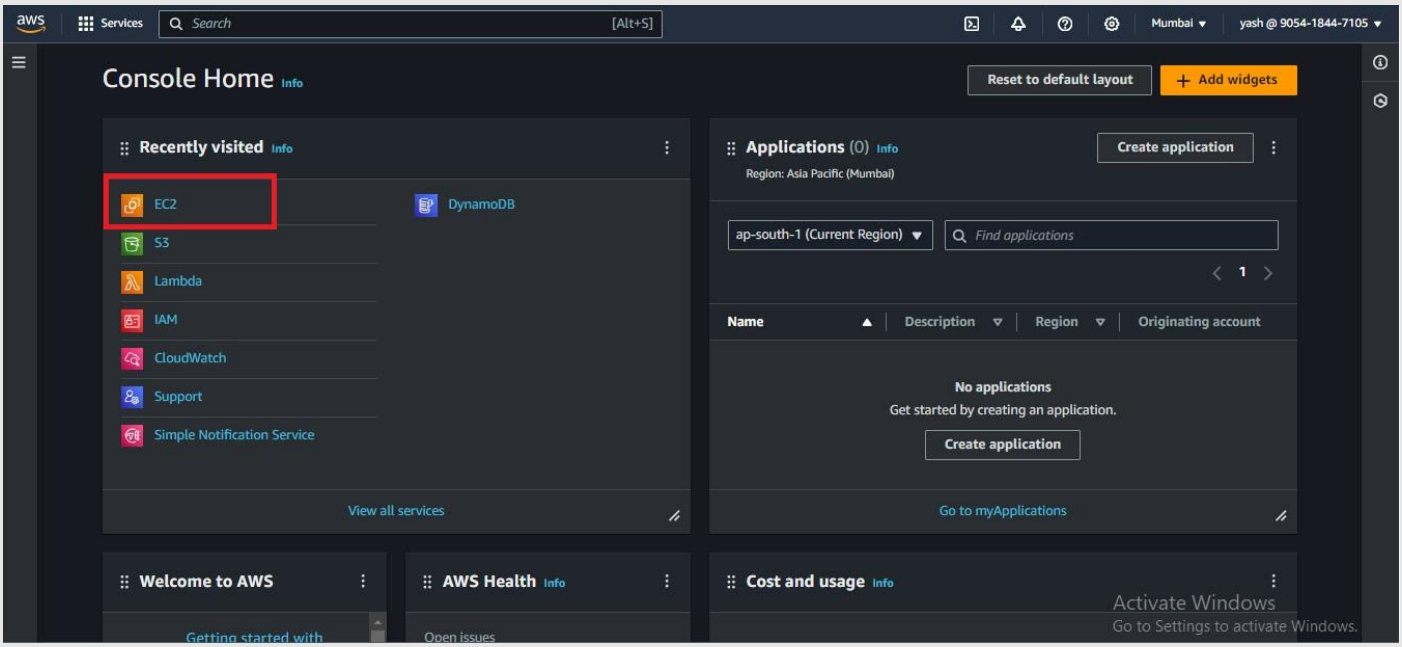
   ❖ Leave the Account ID as default. Never edit/remove the 12 digit Account ID present in the AWS Console. otherwise, you cannot proceed with the lab.

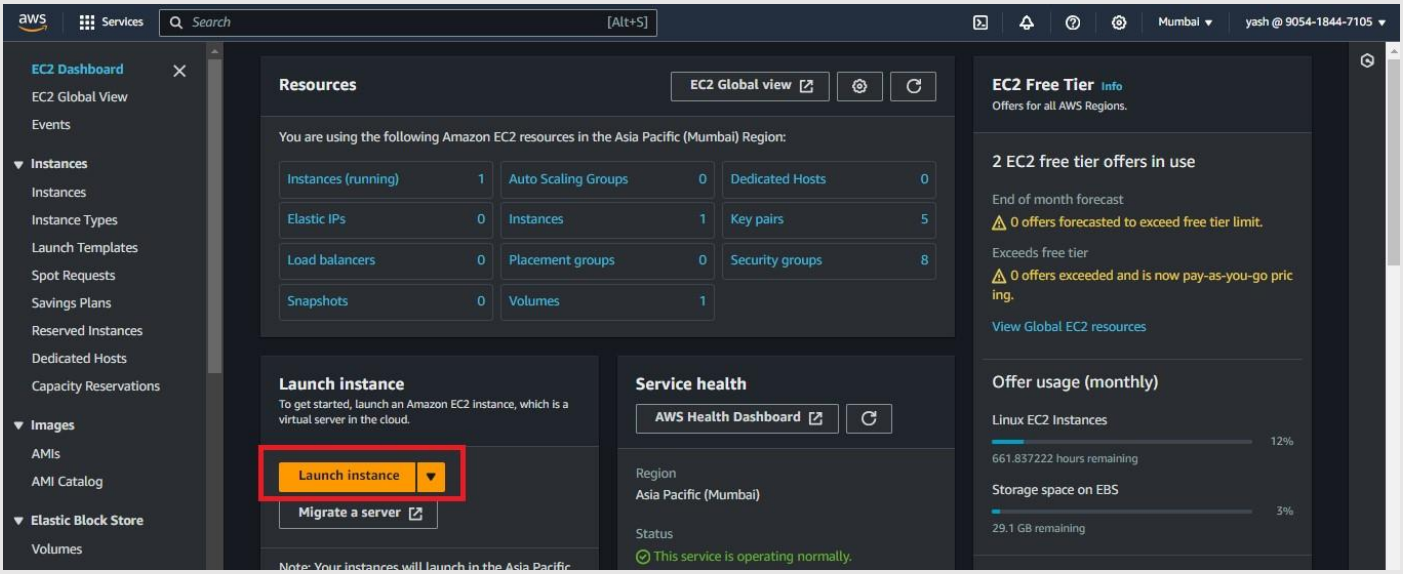
   ❖ Now copy your User Name and Password in the Lab Console to the IAM Username and Password in AWS Console and click on the Sign in button.

3. Once Signed In to the AWS Management Console, Make the default AWS Region as US East (N. Virginia) us-east-1.

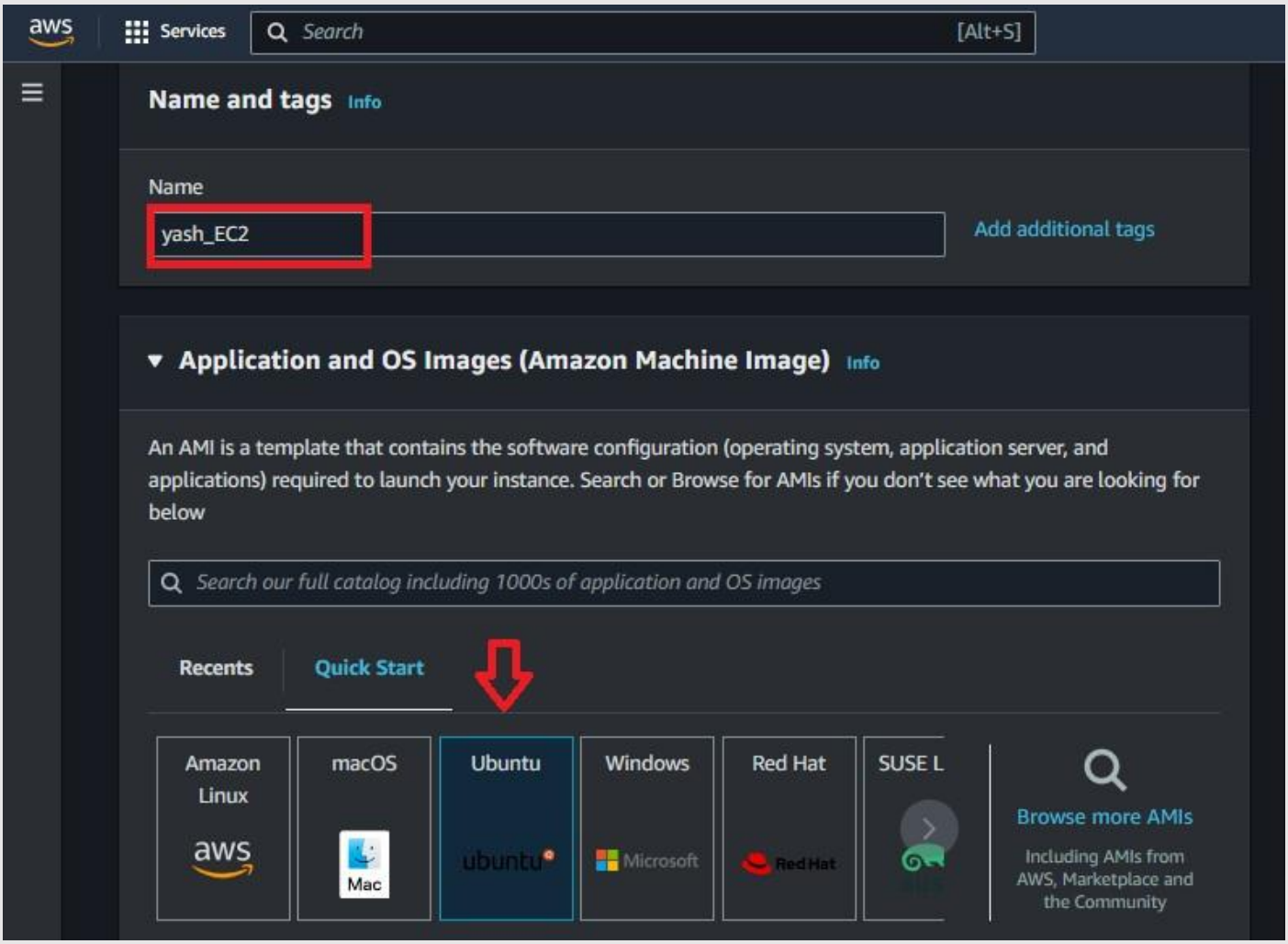
❖ Create an EC2 Instance(ubuntu):

- For creating an EC2 instance follow the following steps as shown in snapshots.

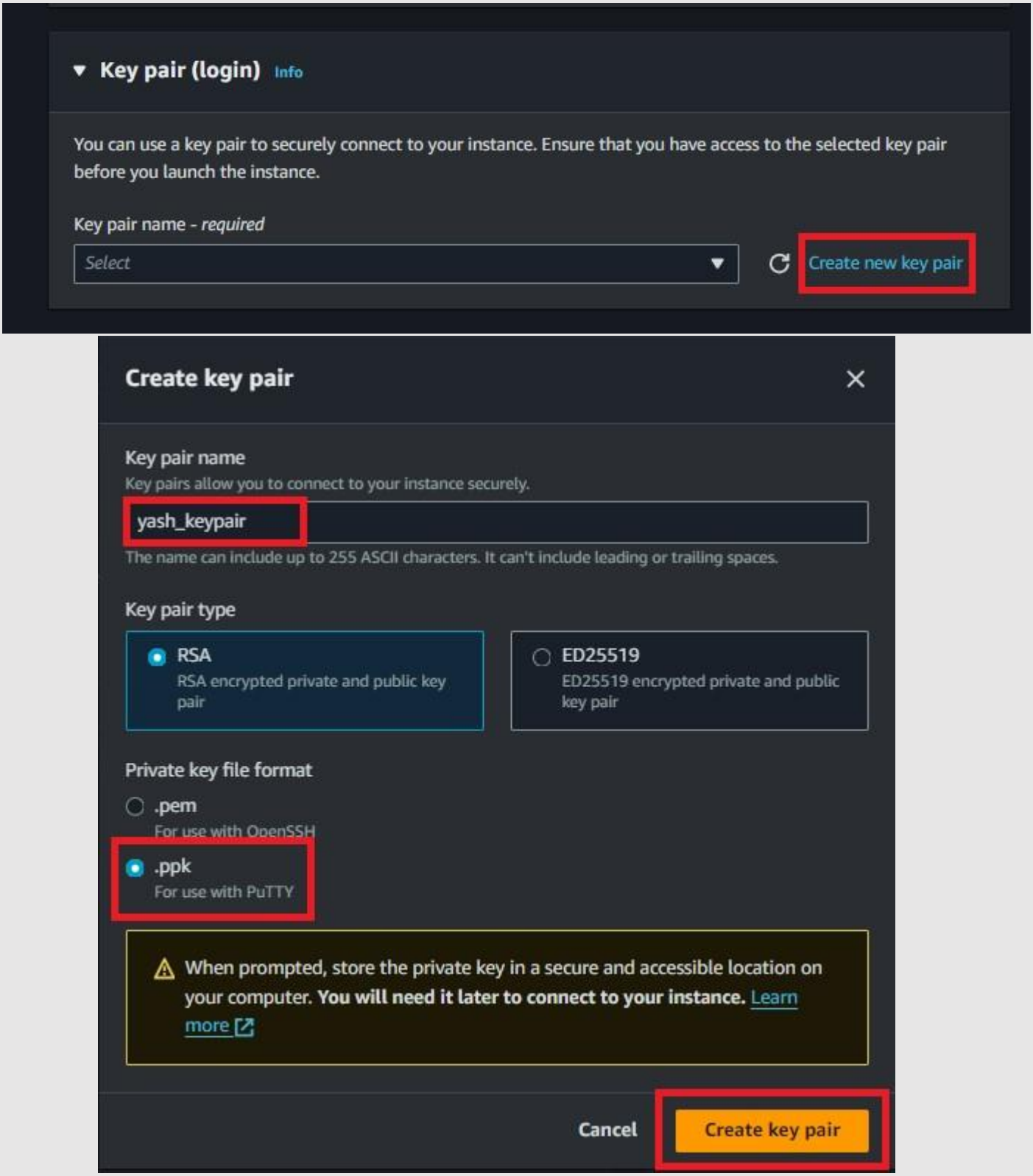




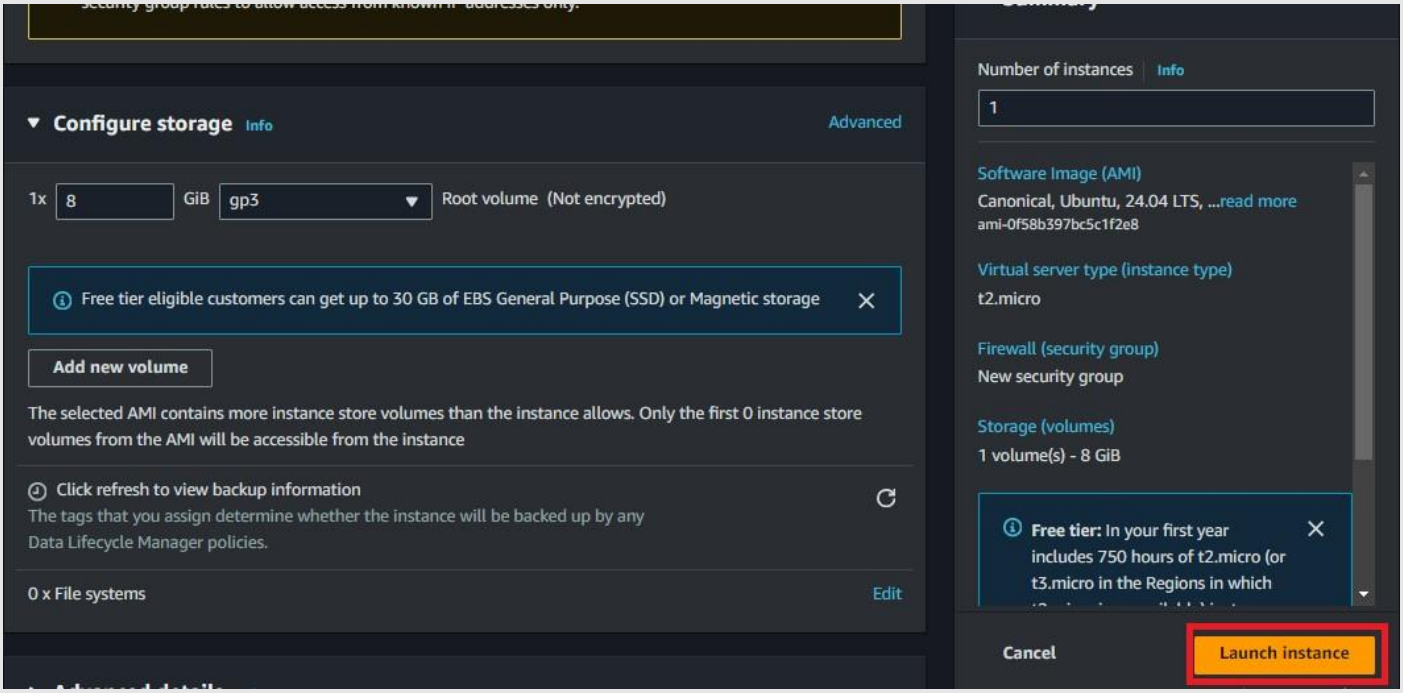
- Provide the EC2 name of your choise and select **”Ubuntu”** as an OS Image.



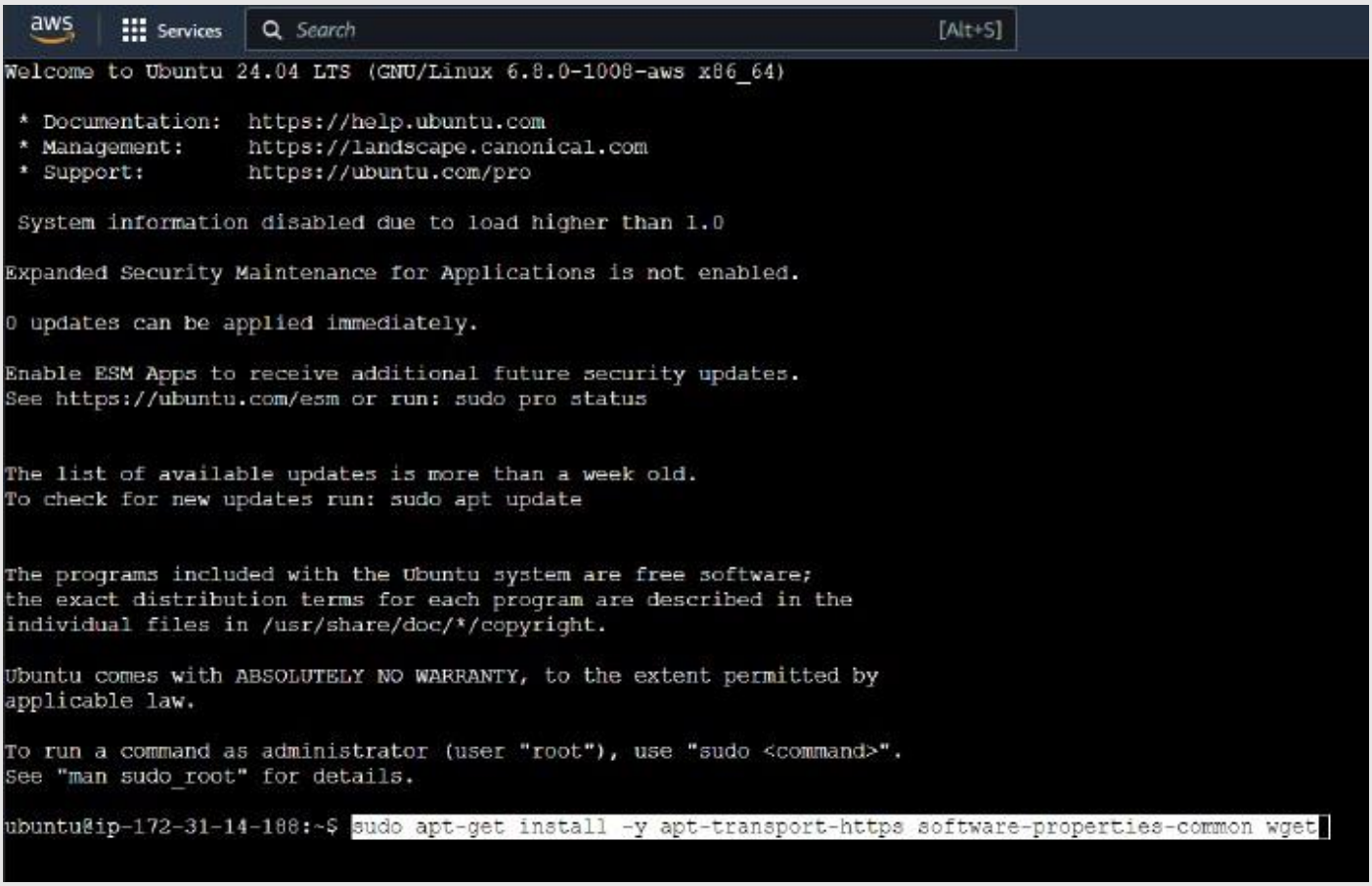
- Create a New Key Pair.



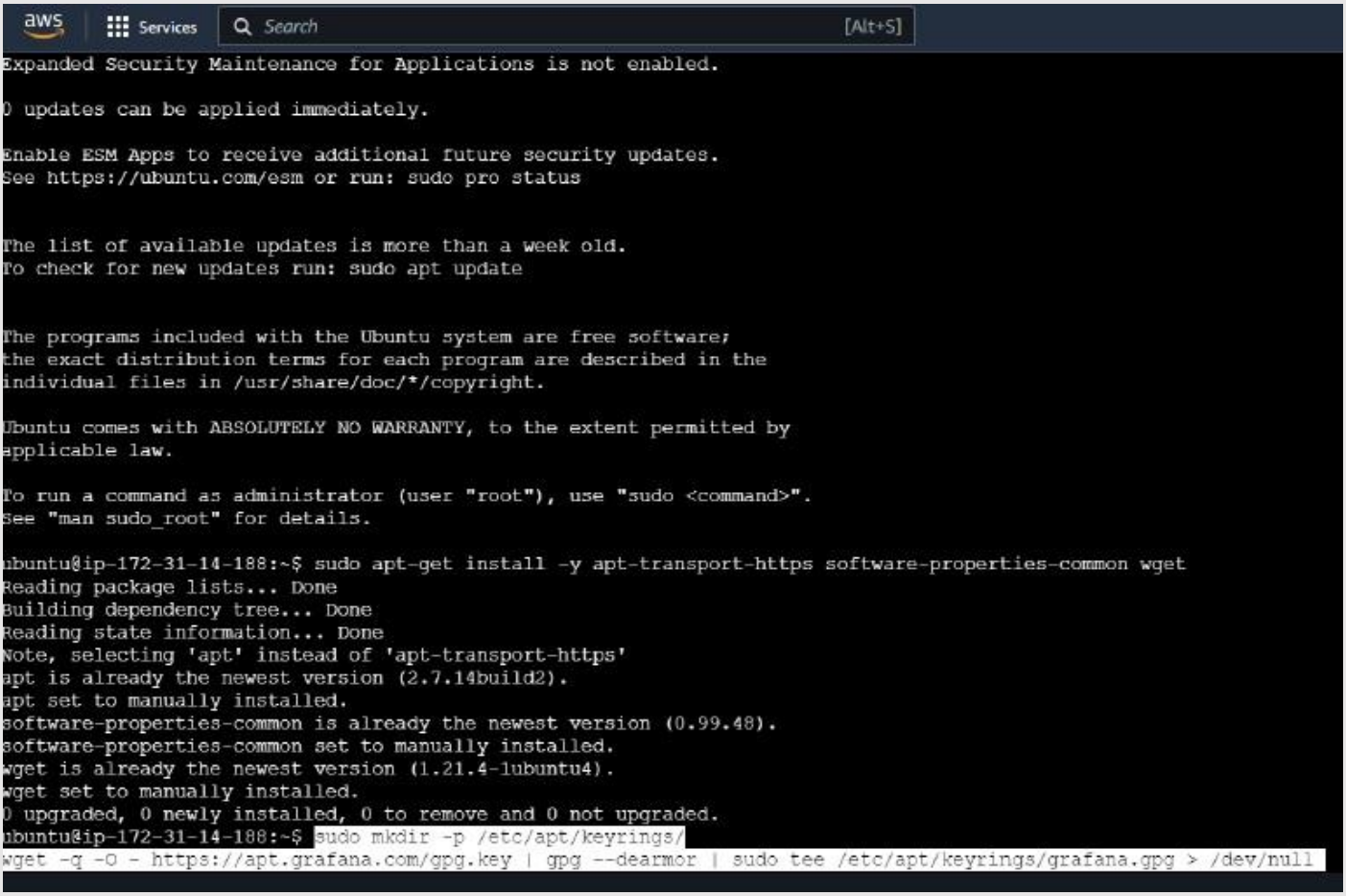
- Scroll down and click on **Launch Instance.**



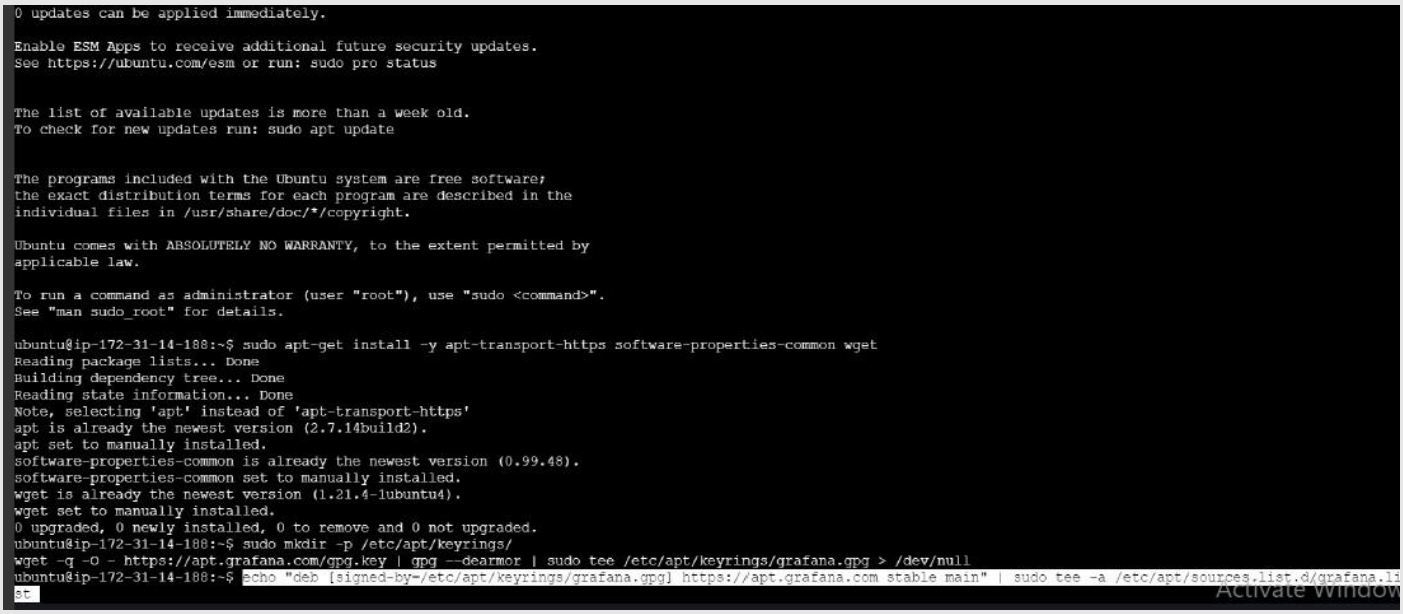
- Then open your instance and connect that instance by putty or on web browser.
- After connecting the instance follow the given command or read Grafana documentation for help.



- sudo apt-get install -y apt-transport-https software-propertiescommon



- sudo mkdir -p /etc/apt/keyrings/wget -q -O - https://apt.grafana.com/gpg.key | gpg --dearmor | sudo tee /etc/apt/keyrings/grafana.gpg > /dev/null



- echo "deb [signed-by=/etc/apt/keyrings/grafana.gpg] https://apt.grafana.com stable main" | sudo tee -a /etc/apt/sources.list.d/grafana.list

```
See https://ubuntu.com/esm or run: sudo pro status


The list of available updates is more than a week old.
To check for new updates run: sudo apt update


The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-14-188:~$ sudo apt-get install -y apt-transport-https software-properties-common wget
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Note, selecting 'apt' instead of 'apt-transport-https'
apt is already the newest version (2.7.14build2).
apt set to manually installed.
software-properties-common is already the newest version (0.99.48).
software-properties-common set to manually installed.
wget is already the newest version (1.21.4-1ubuntu4).
wget set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
ubuntu@ip-172-31-14-188:~$ sudo mkdir -p /etc/apt/keyrings/
wget -q -O - https://apt.grafana.com/gpg.key | gpg --dearmor | sudo tee /etc/apt/keyrings/grafana.gpg > /dev/null
ubuntu@ip-172-31-14-188:~$ echo "deb [signed-by=/etc/apt/keyrings/grafana.gpg] https://apt.grafana.com stable main" | sudo tee -a /etc/apt/sources.list.d/grafana.li
st
deb [signed-by=/etc/apt/keyrings/grafana.gpg] https://apt.grafana.com stable main
ubuntu@ip-172-31-14-188:~$ # Updates the list of available packages
sudo apt-get update
```

Activate Windows

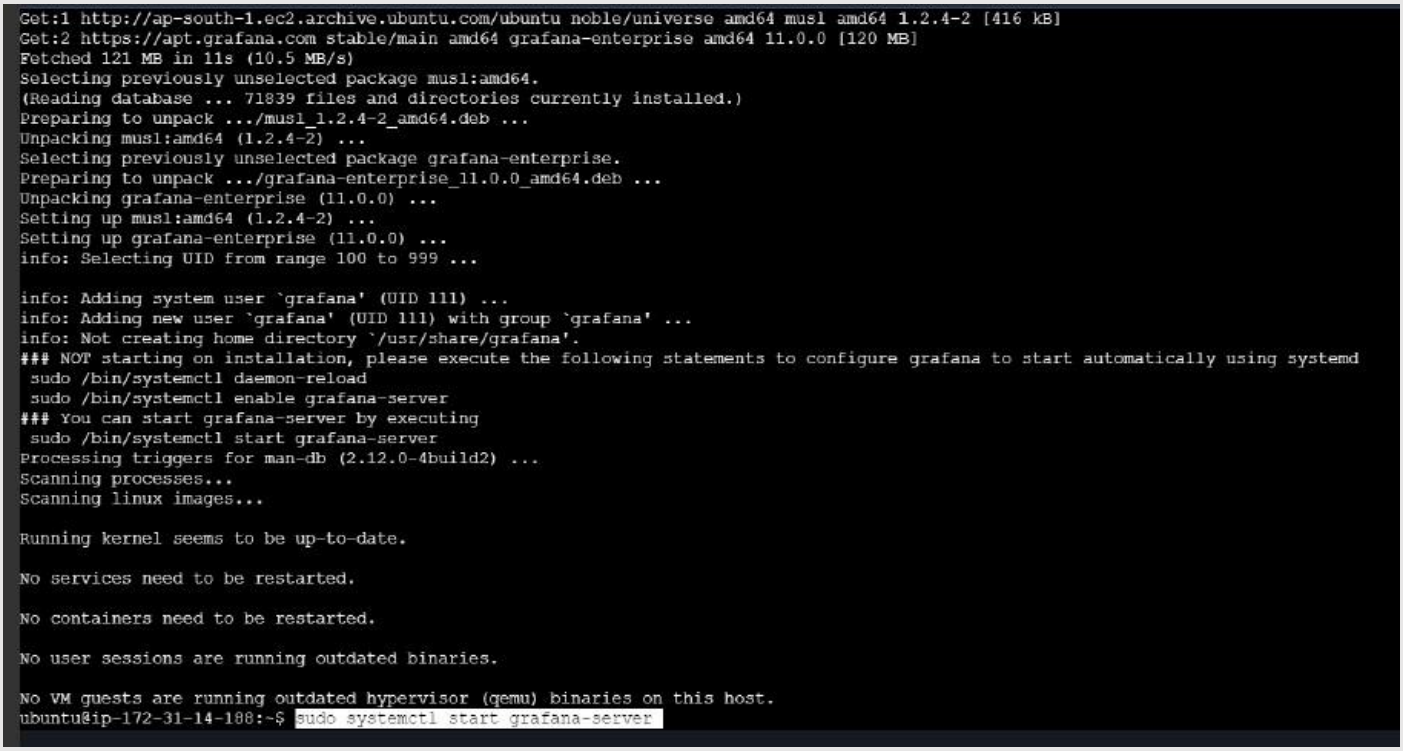
 # To updates the list of available packages

- sudo apt-get update

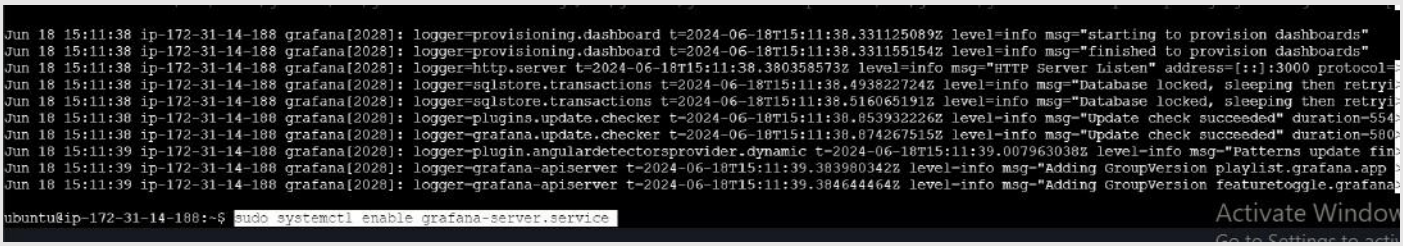
```
Get:22 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [25.1 kB]
Get:23 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [45.0 kB]
Get:24 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [112 B]
Get:25 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [70.1 kB]
Get:26 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [14.3 kB]
Get:27 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:28 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [2968 B]
Get:29 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [968 B]
Get:30 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [212 B]
Get:31 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 c-n-f Metadata [116 B]
Get:32 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [208 B]
Get:33 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 c-n-f Metadata [112 B]
Get:34 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [6840 B]
Get:35 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe Translation-en [9652 B]
Get:36 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [17.6 kB]
Get:37 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 c-n-f Metadata [116 B]
Get:38 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]
Get:39 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 c-n-f Metadata [116 B]
Get:40 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Get:41 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 c-n-f Metadata [116 B]
Get:42 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [158 kB]
Get:43 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [41.5 kB]
Get:44 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [6876 B]
Get:45 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [44.4 kB]
Get:46 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [17.0 kB]
Get:47 https://apt.grafana.com stable/main amd64 Packages [250 kB]
Get:48 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [8632 B]
Get:49 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [112 B]
Get:50 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [70.1 kB]
Get:51 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [14.3 kB]
Get:52 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:53 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [208 B]
Get:54 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [116 B]
Fetched 29.4 MB in 6s (4962 kB/s)
Reading package lists... Done
ubuntu@ip-172-31-14-188:~$ sudo apt-get install grafana-enterprise
```

 # To installs the latest Enterprise release:

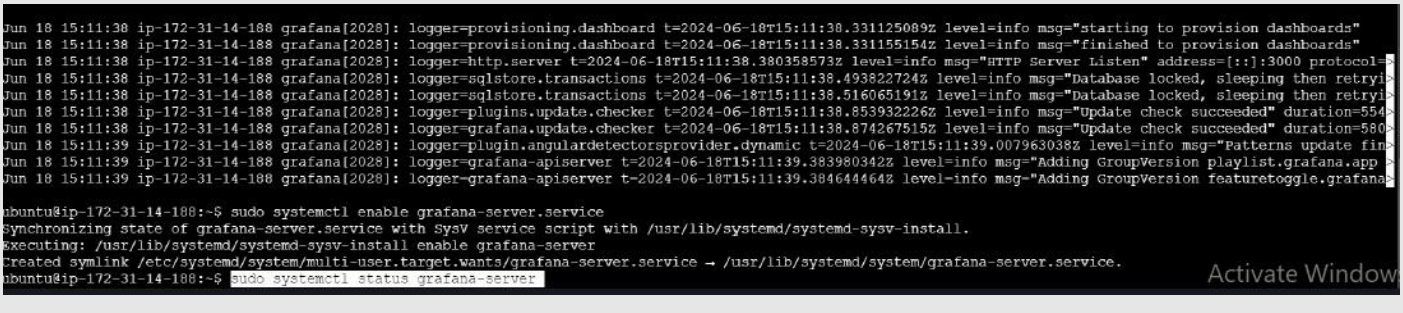
- sudo apt-get install grafana-enterprise



- sudo systemctl start grafana-server



- sudo systemctl enable grafana-server.service



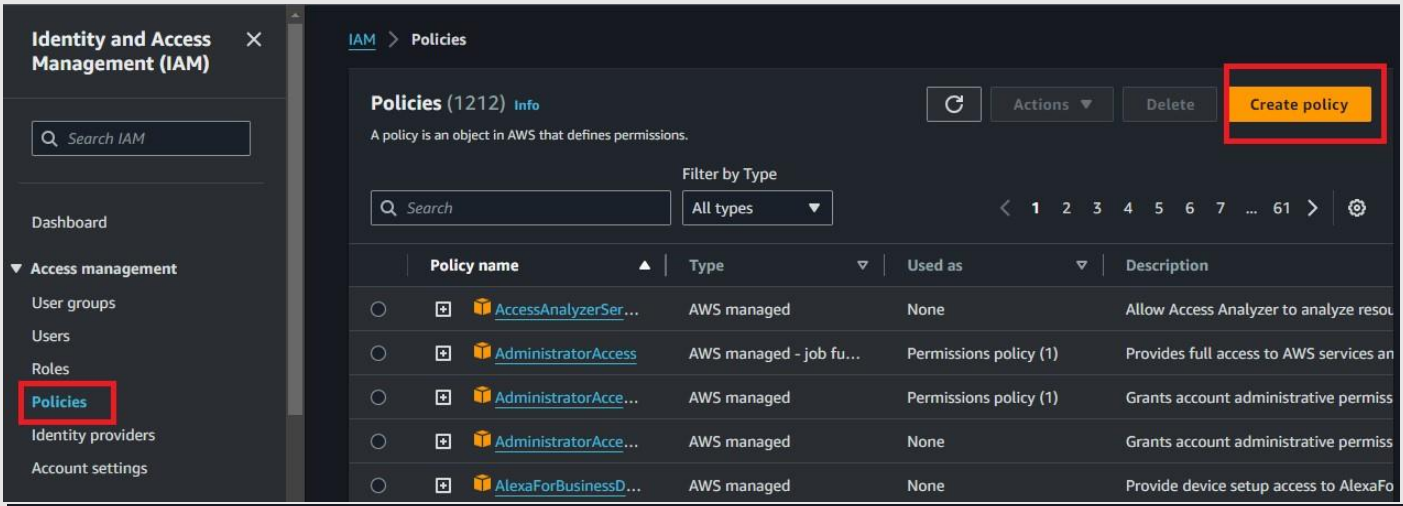
- sudo systemctl status grafana-server.service

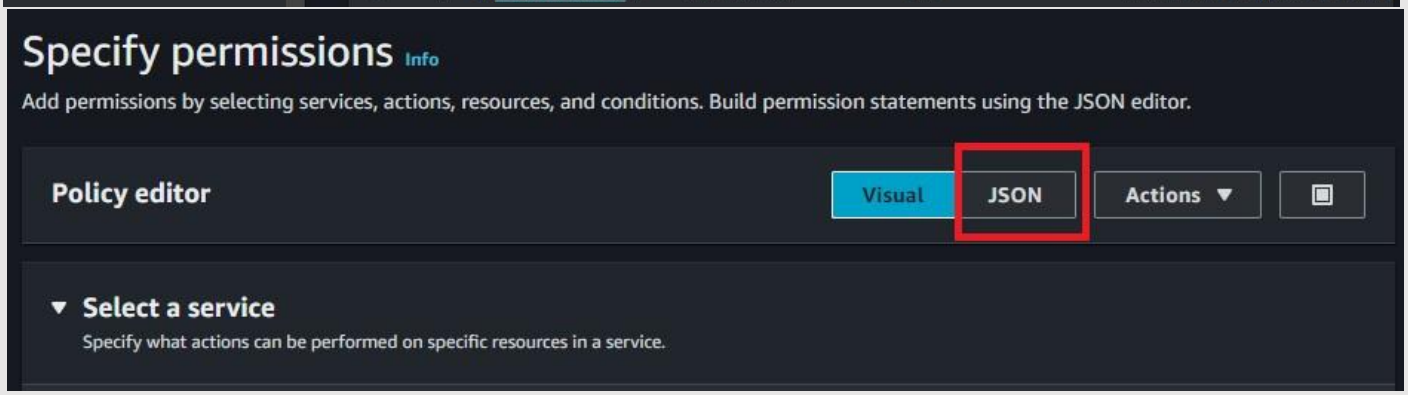
```
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-14-188:~$ sudo systemctl start grafana-server
ubuntu@ip-172-31-14-188:~$ sudo systemctl status grafana-server
● grafana-server.service - Grafana instance
     Loaded: loaded (/usr/lib/systemd/system/grafana-server.service; disabled; preset: enabled)
     Active: active (running) since Tue 2024-06-18 15:11:29 UTC; 21s ago
       Docs: http://docs.grafana.org
   Main PID: 2028 (grafana)
      Tasks: 16 (limit: 1130)
     Memory: 88.9M (peak: 89.3M)
        CPU: 3.284s
```

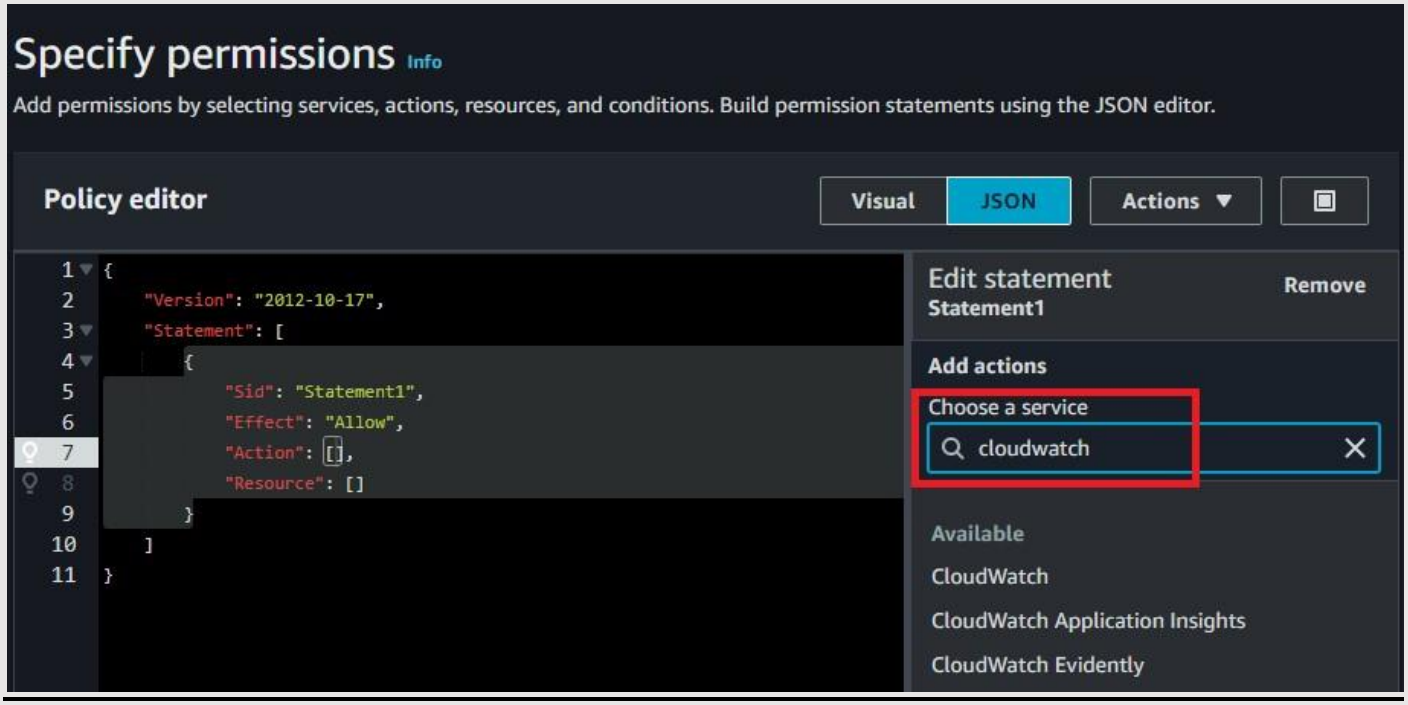
 # Active(running)

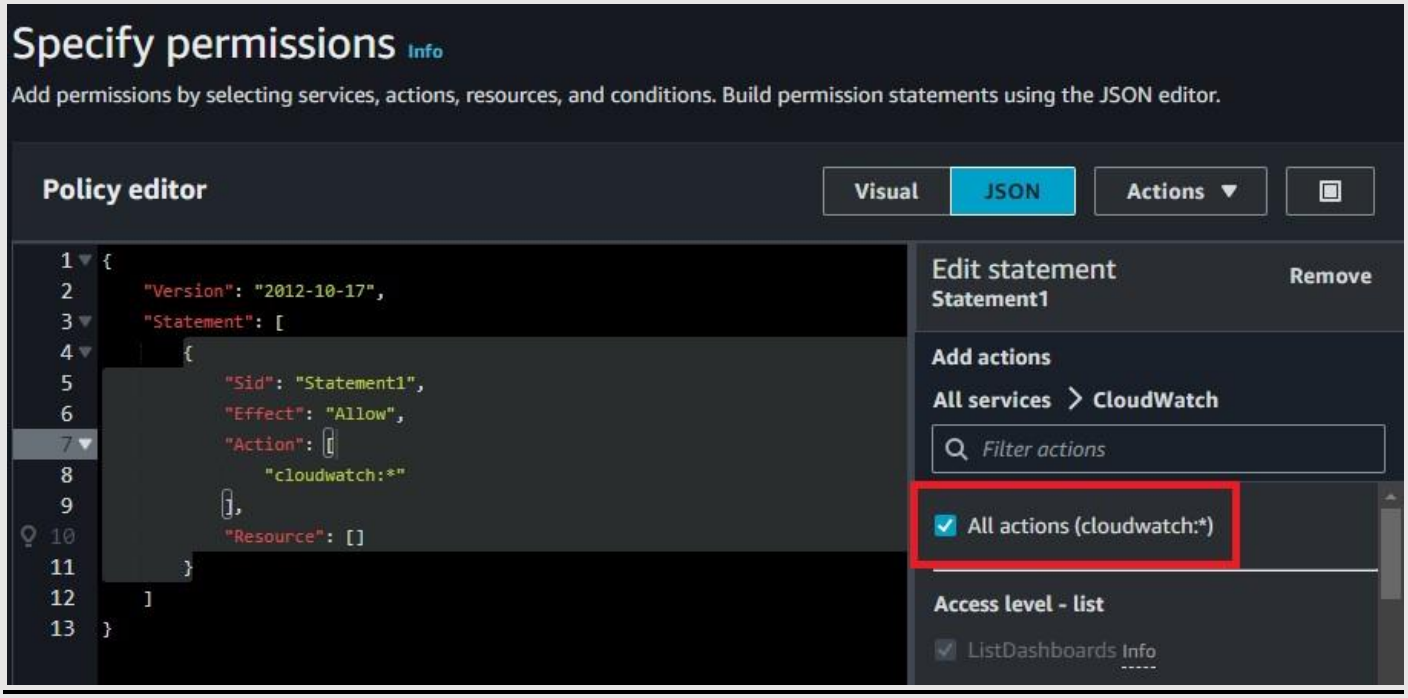
Create Policy and Roles:-

 # Follow the following below rectangular box steps for POLICY









Policy Editor:-

{

"Version": "2012-10-17",

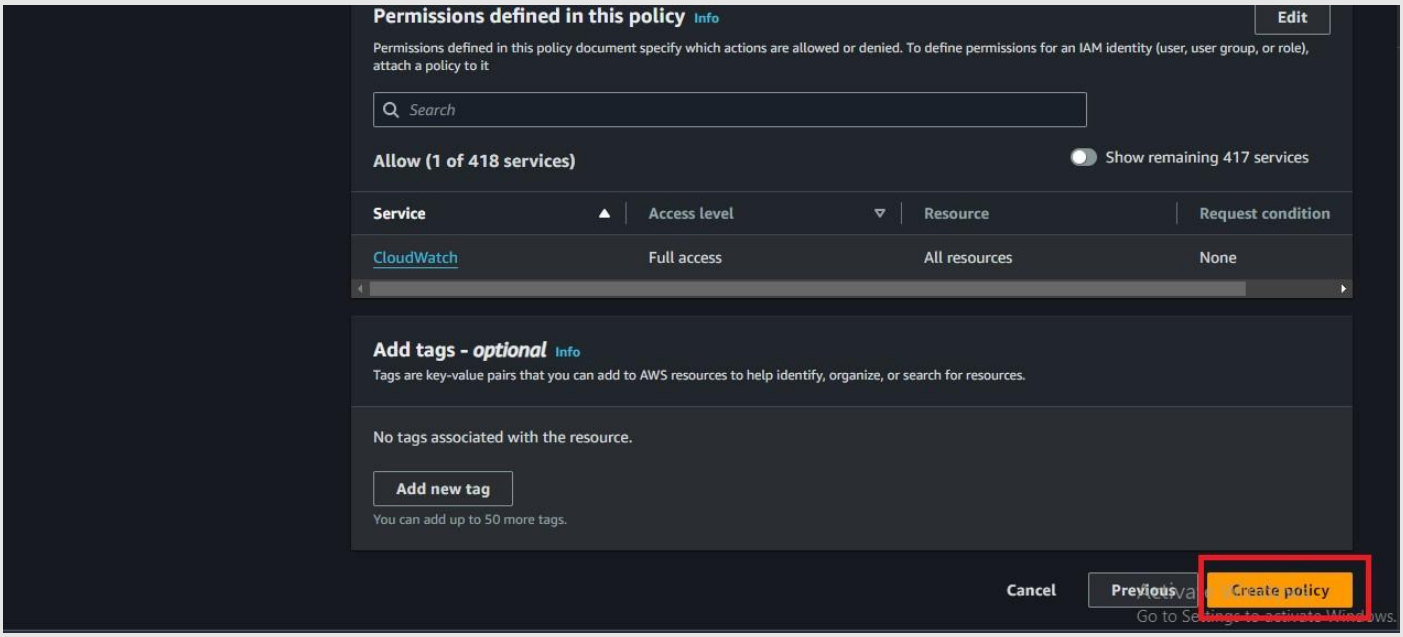
"Statement": [

{

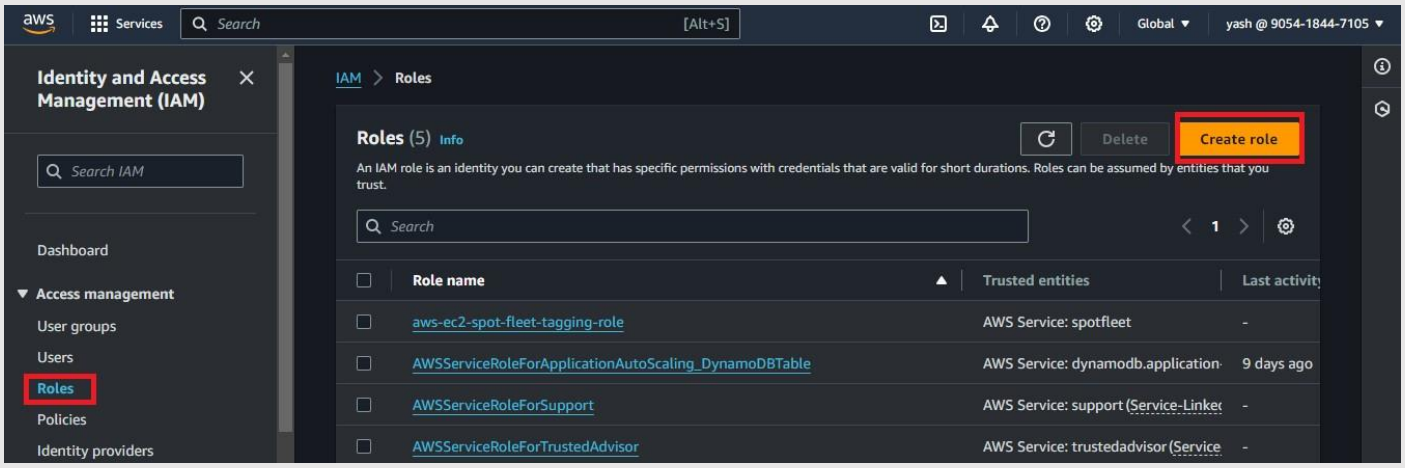
"Sid": "Statement1", "Effect": "Allow",

"Action": [

```
                "cloudwatch:*"

            ],

                "Resource":"*"

        }

    ]

}
```



 # Follow the following below rectangular box steps for ROLE



Select trusted entity Info

Trusted entity type

- **AWS service**
  Allow AWS services like EC2, Lambda, or others to perform actions in this account.
- **AWS account**
  Allow entities in other AWS accounts belonging to you or a 3rd party to perform actions in this account.
- **Web identity**
  Allows users federated by the specified external web identity provider to assume this role to perform actions in this account.
- **SAML 2.0 federation**
  Allow users federated with SAML 2.0 from a corporate directory to perform actions in this account.
- **Custom trust policy**
  Create a custom trust policy to enable others to perform actions in this account.

Use case

Allow an AWS service like EC2, Lambda, or others to perform actions in this account.

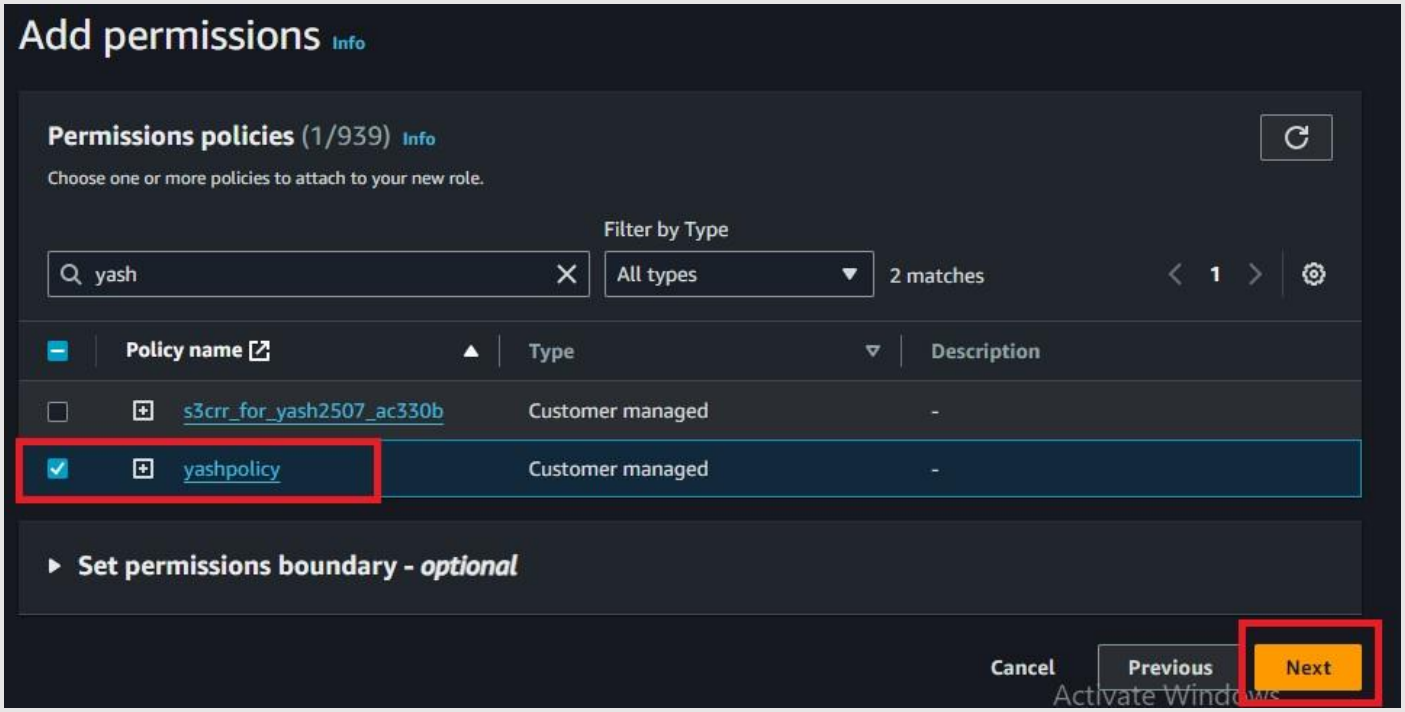
Service or use case

EC2

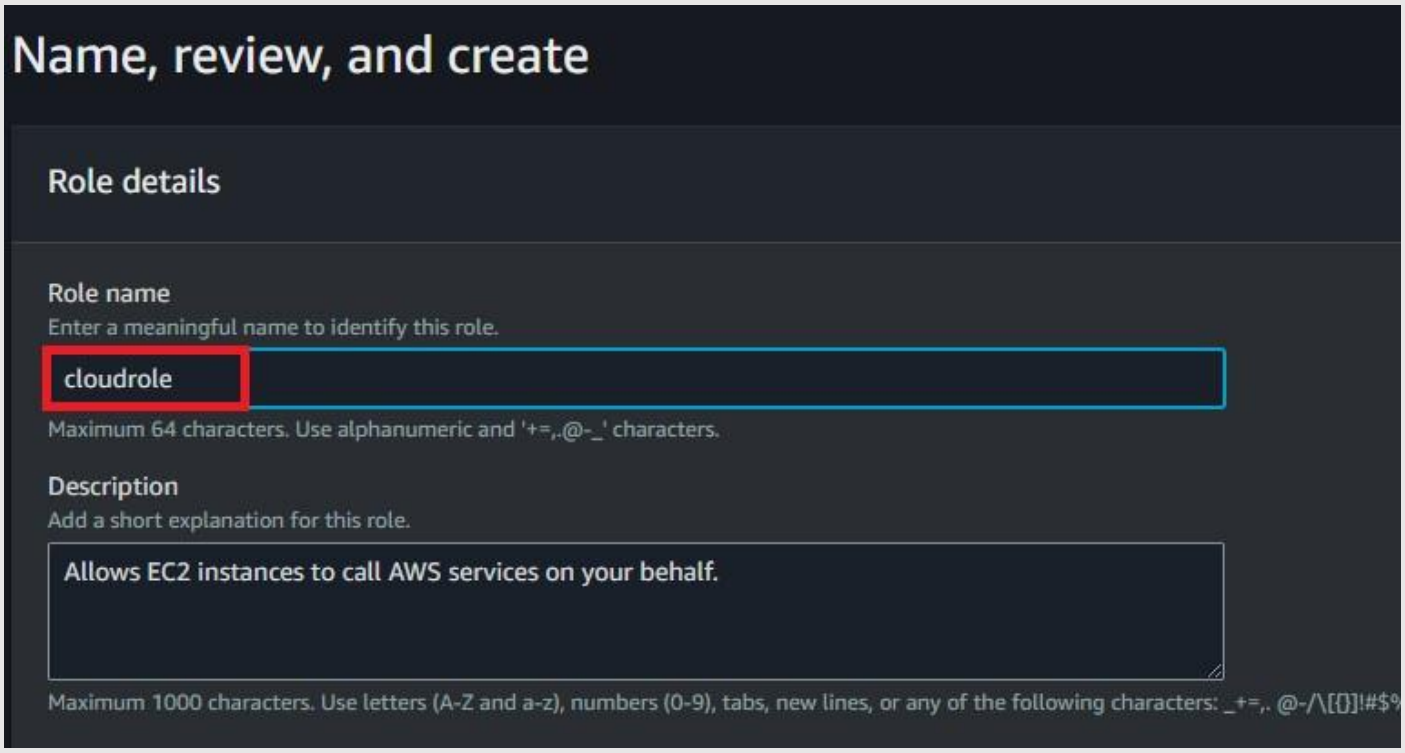
Choose a use case for the specified service.

Use case

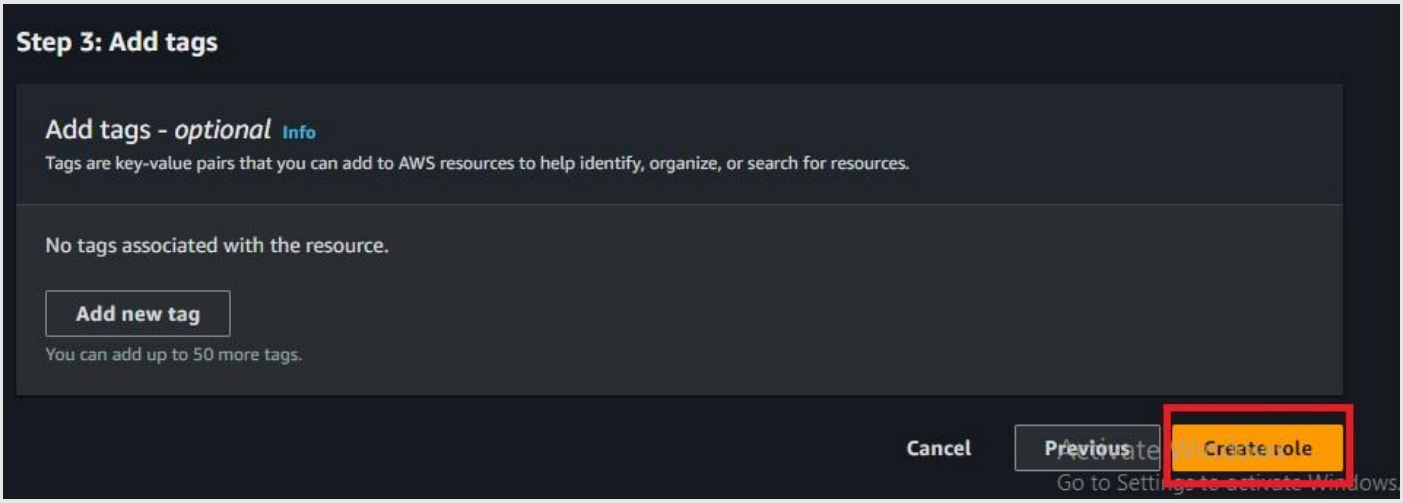
- **EC2**
  Allows EC2 instances to call AWS services on your behalf.
- **EC2 Role for AWS Systems Manager**
  Allows EC2 instances to call AWS services like CloudWatch and Systems Manager on your behalf.
- **EC2 Spot Fleet Role**
  Allows EC2 Spot Fleet to request and terminate Spot Instances on your behalf.
- **EC2 - Spot Fleet Auto Scaling**
  Allows Auto Scaling to access and update EC2 spot fleets on your behalf.



#Select your policy

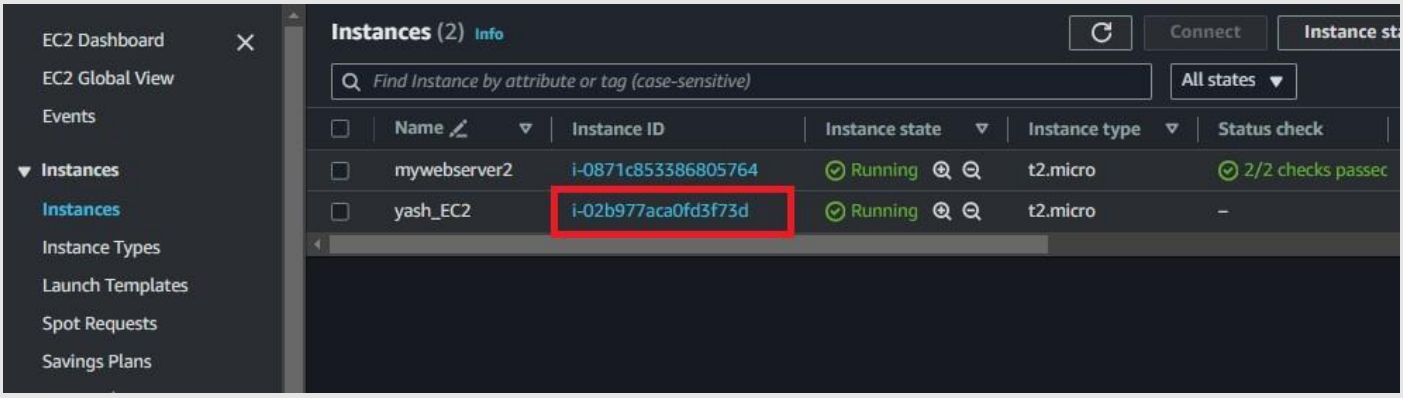


 # Give a name your choise to the role

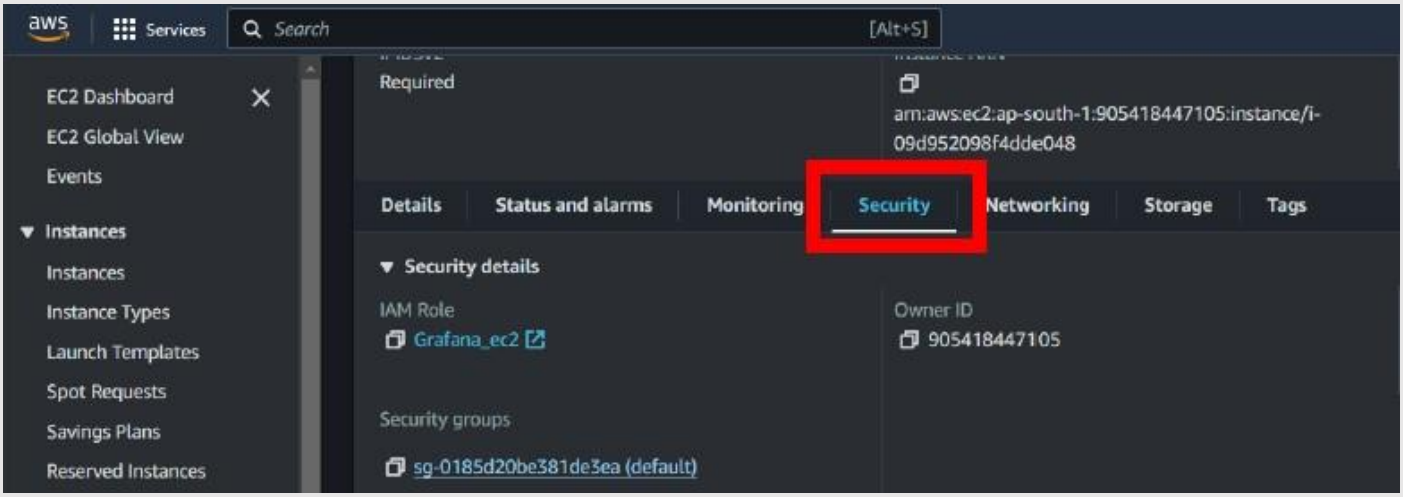


Create a Graph in GRAFANA

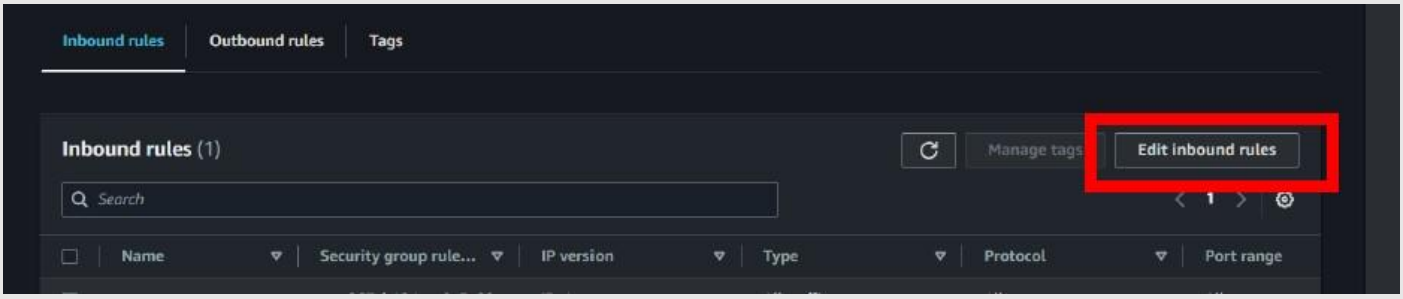
 # Follow the following below rectangular box steps



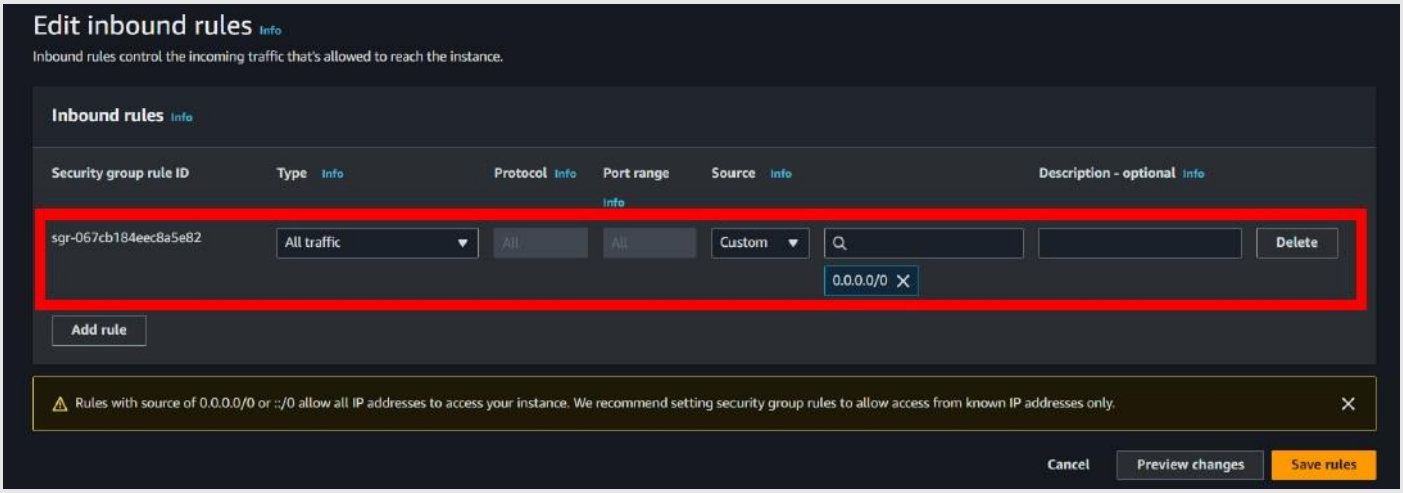
- After creating your role and policy go to instance and open your instance , which you have already created.



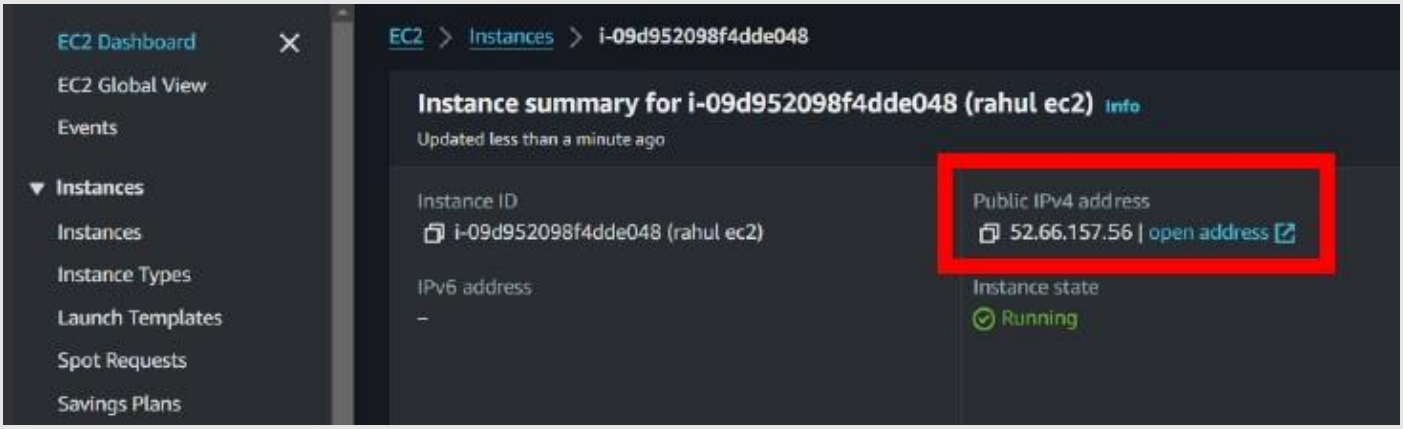
- Scroll down and go to **SECURITY** option**.**



- Then click on **Edit inbound rule.**



- Then modify your rule select type = All traffic and source =0.0.0.0/0

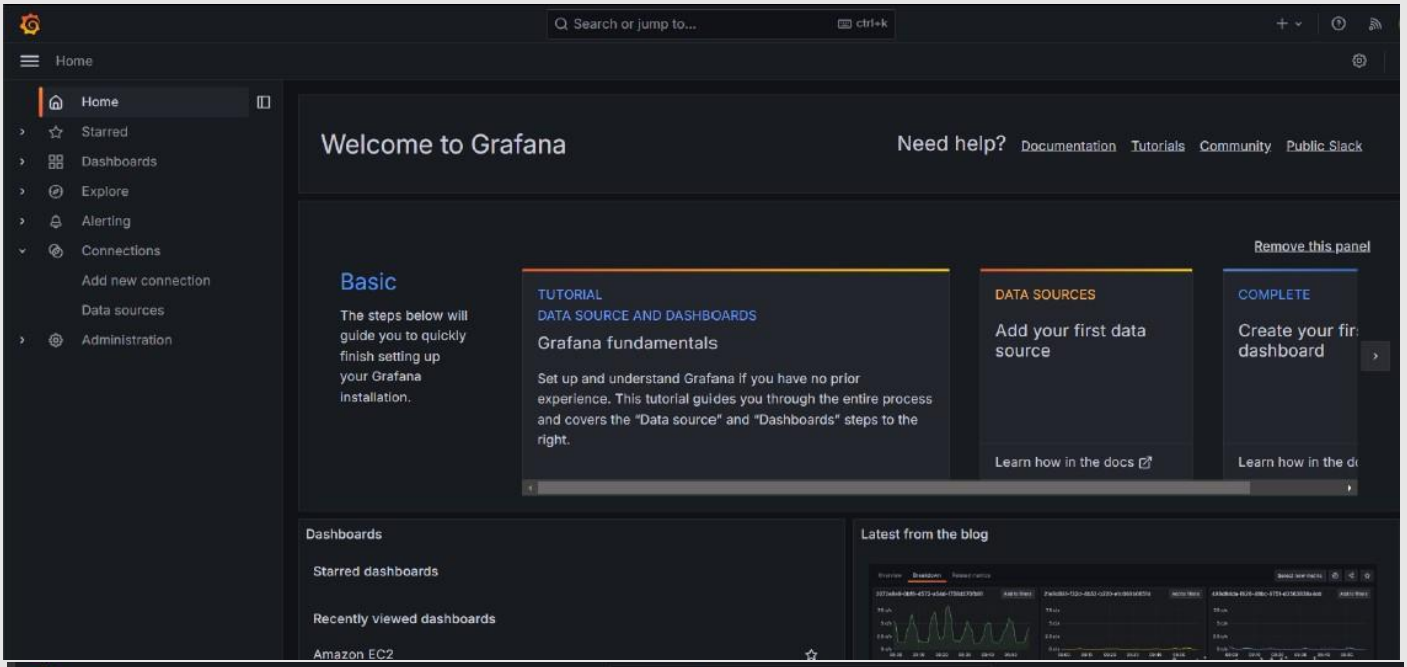


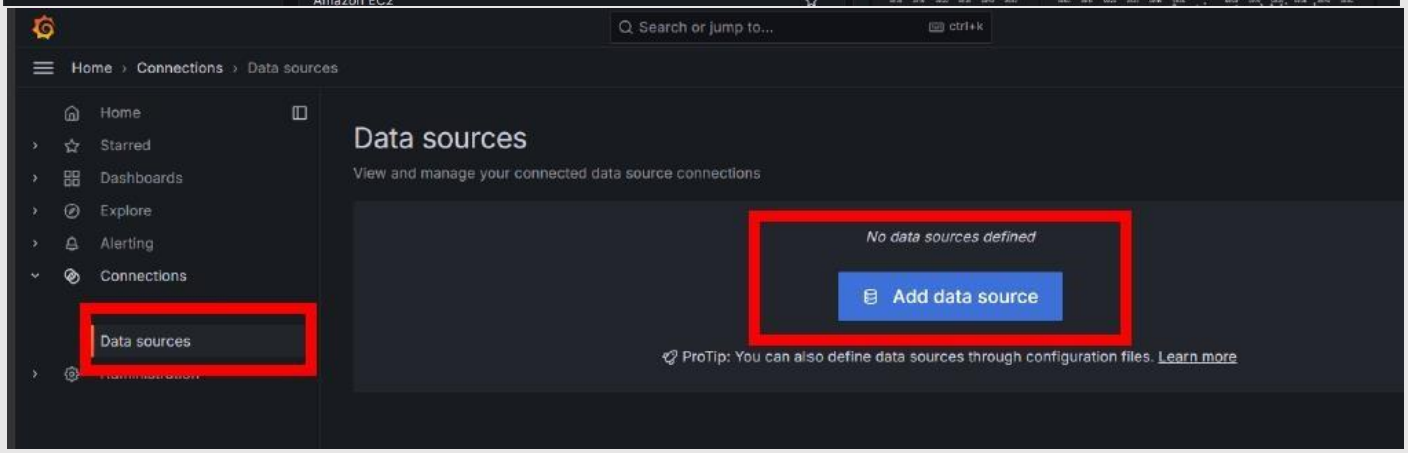
- Then copy your **Public IPv4 address** of your instance.

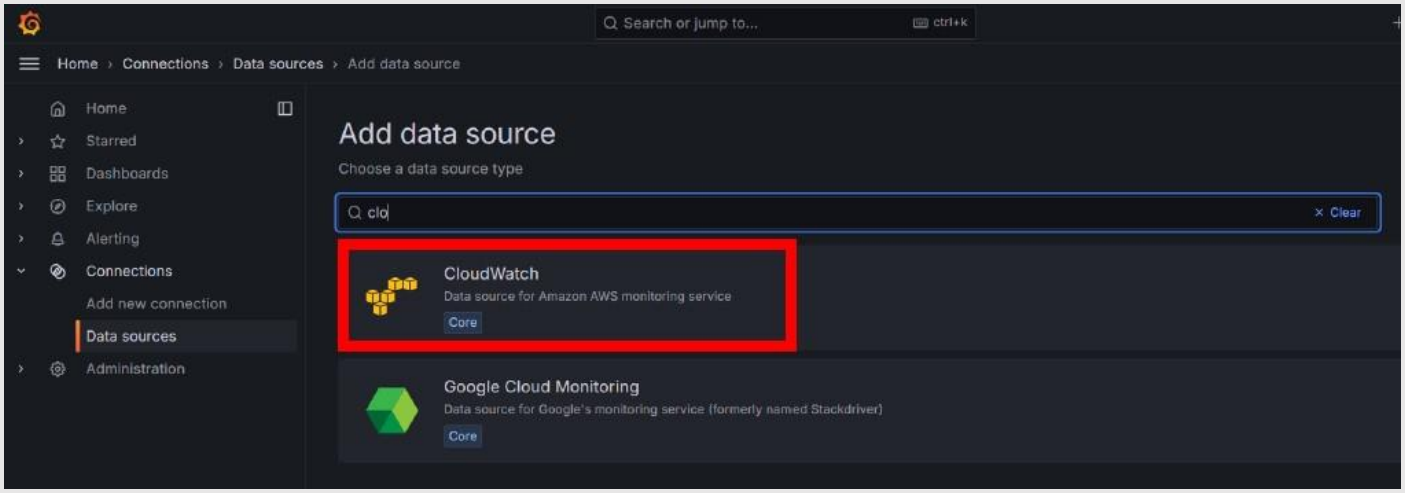
- Then paste your copied ip address and type **":3000"** after ip address and search it .

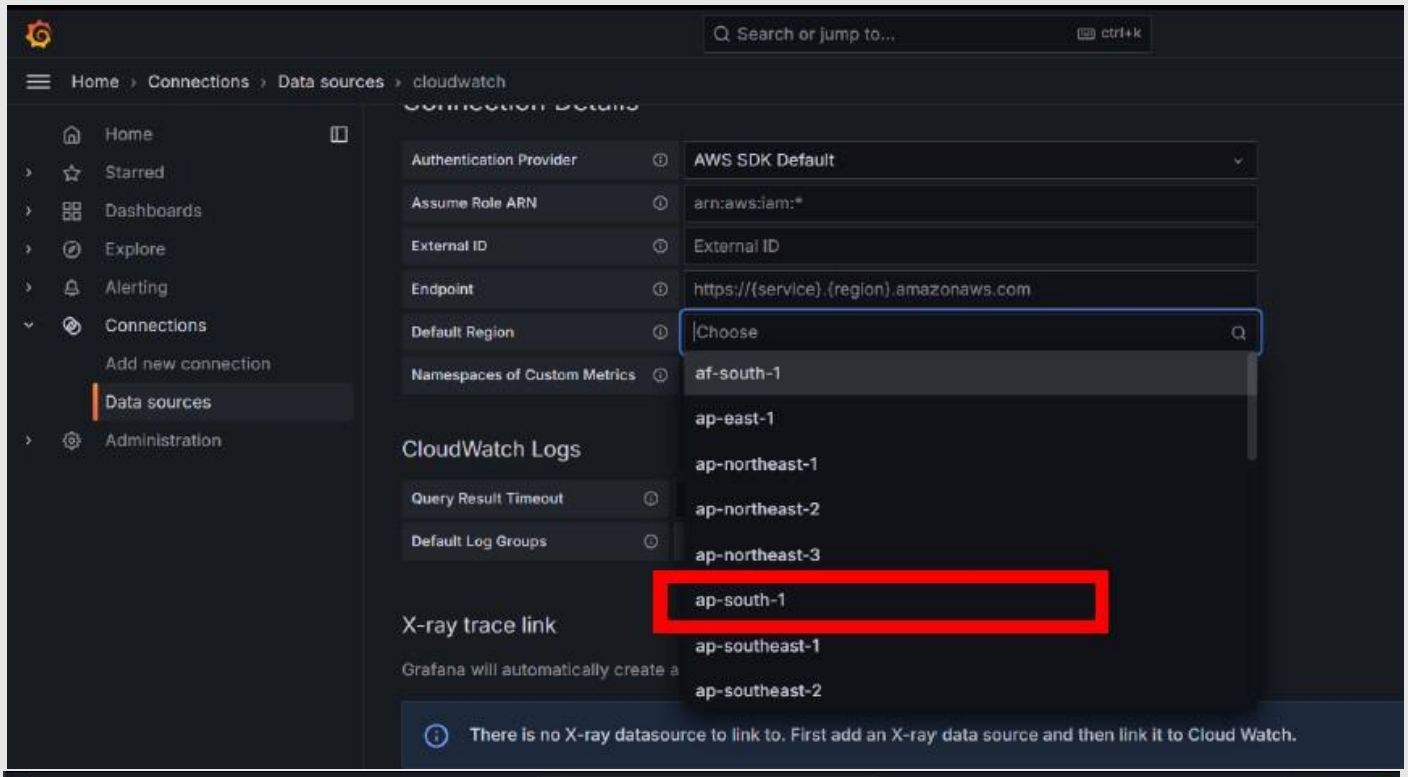
- Then login in Grafana by the help of credientials shown in above snapshot.

 # Follow the below steps in Rectangular box.

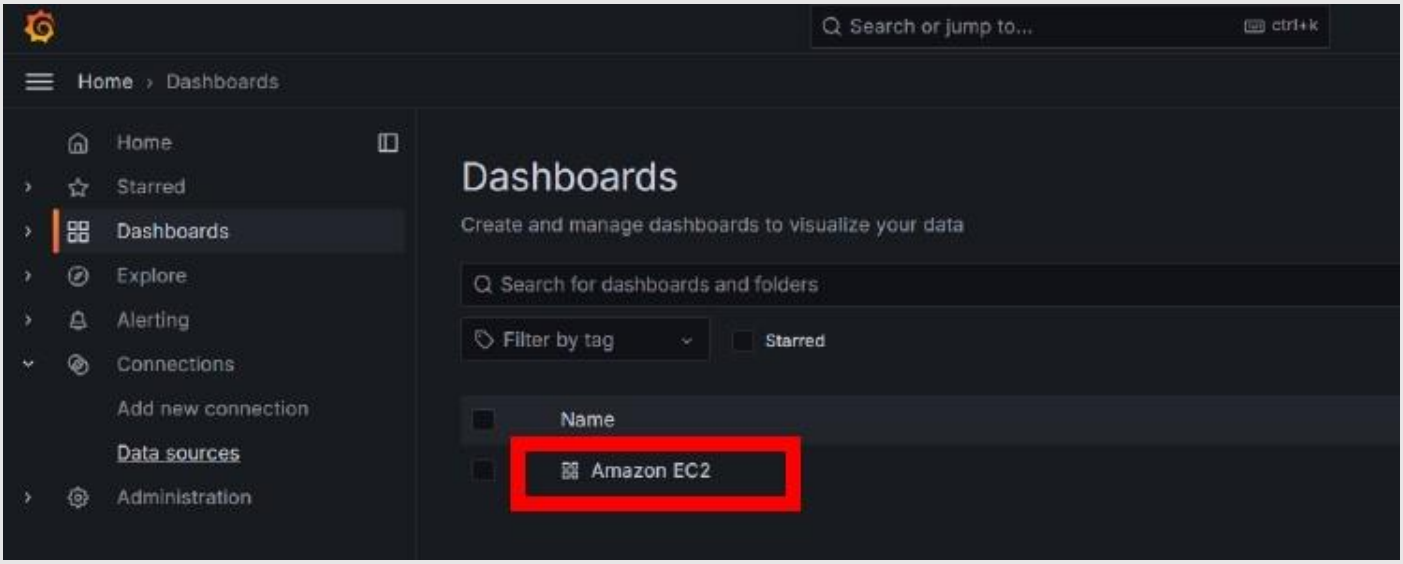






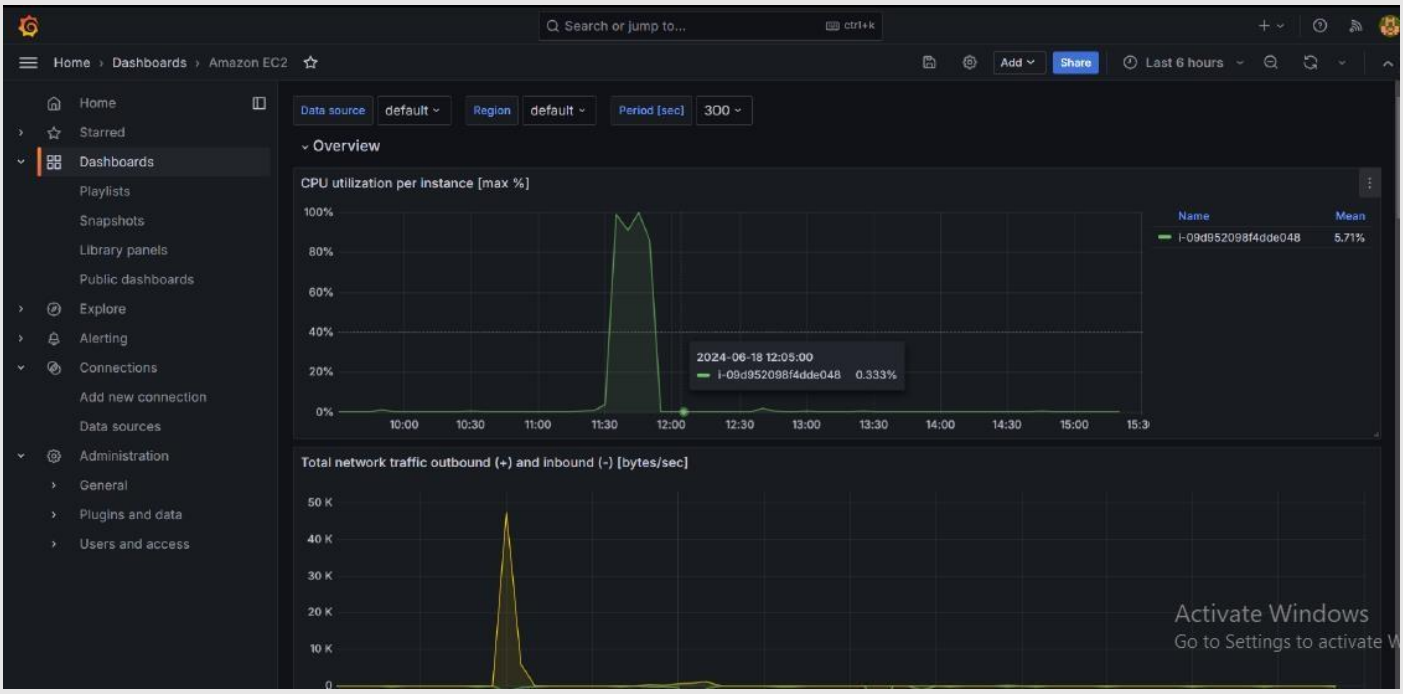


- Then inside your cloudwatch go to dashboard and **Import EC2.**

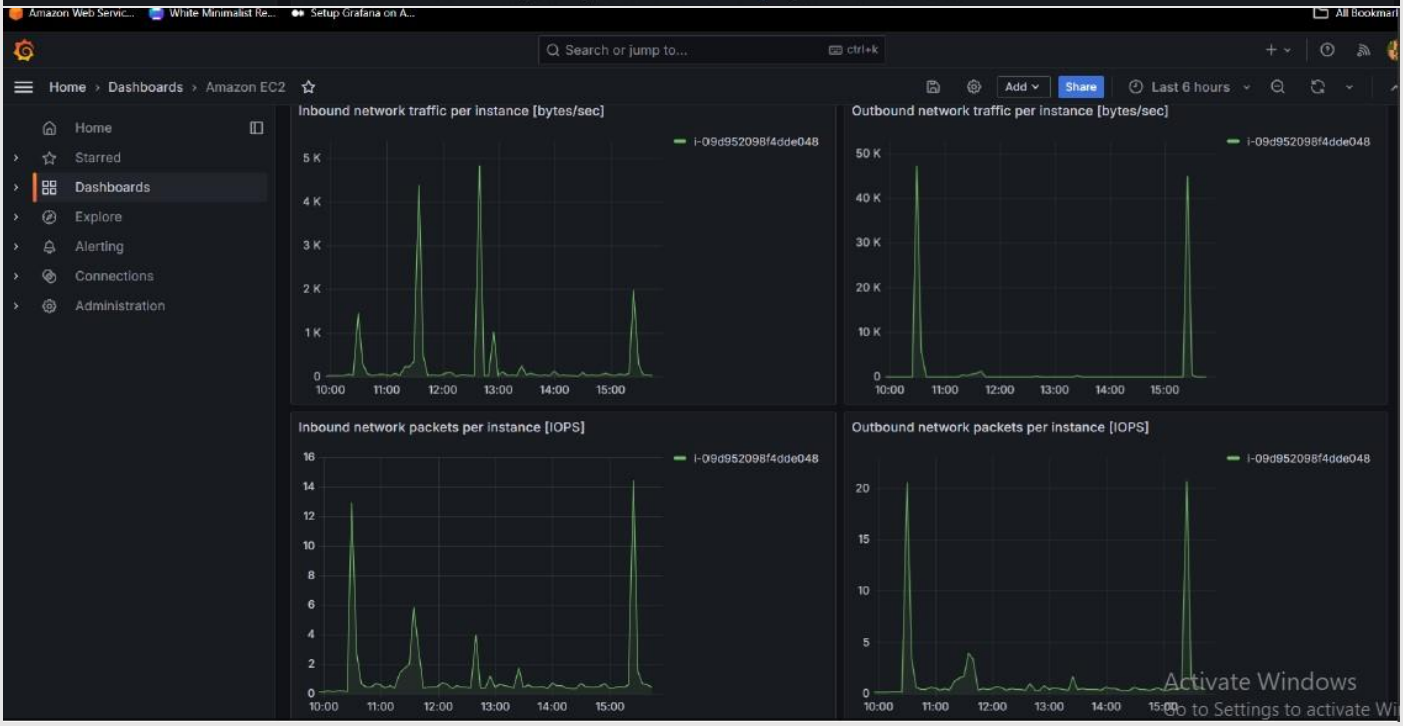


- Then go to dashboard and open your **Amazon EC2.**

 # <u>High cpu utilization and a graph in Grafana</u>



Search or jump to... ctrl+k
Home › Dashboards › Amazon EC2
Add
Share
Last 6 hours
Home
Starred
Dashboards
Explore
Alerting
Connections
Administration
Total network traffic outbound (+) and inbound (-) [bytes/sec]
50 K
40 K
30 K
20 K
10 K
0
-10 K
10:00
10:30
11:00
11:30
12:00
12:30
13:00
13:30
14:00
14:30
15:00
15:30
› Network details (4 panels)
› Disk details (5 panels)
› Status Checks (3 panels)
› Information
For more information about available metrics from Amazon EC2, visit the List of Available CloudWatch Metrics for Your EC2 Instances in the Amazon documentation.
For additional metrics and 1-minute granularity, enable Detailed Monitoring for your Amazon EC2 instances.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White Minimalist Re...
Setup Grafana on A...
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Share
Last 6 hours
Home
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Dashboards
Explore
Alerting
Connections
Administration
Inbound network traffic per instance [bytes/sec]
i-09d952098f4dde048
5 K
4 K
3 K
2 K
1 K
0
10:00
11:00
12:00
13:00
14:00
15:00
Outbound network traffic per instance [bytes/sec]
i-09d952098f4dde048
50 K
40 K
30 K
20 K
10 K
0
10:00
11:00
12:00
13:00
14:00
15:00
Inbound network packets per instance [IOPS]
i-09d952098f4dde048
16
14
12
10
8
6
4
2
0
10:00
11:00
12:00
13:00
14:00
15:00
Outbound network packets per instance [IOPS]
i-09d952098f4dde048
20
15
10
5
0
10:00
11:00
12:00
13:00
14:00
15:00
Activate Windows
Go to Settings to activate Wi