CLOUD COMPUTING WITH AWS SERVICES

PROJECT

Integrate Grafana with a Linux Server for high CPU utilization and create a graph in Grafana.

BY:-ANIKET MISHRA

Step 1 - Update and upgrade

sudo apt update -y && sudo apt upgrade -y

```
demo-user@demo:~$ sudo apt update -y && sudo apt upgrade -y
[sudo] password for demo-user:
Get:1 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Hit:2 http://archive.ubuntu.com/ubuntu jammy InRelease
Get:3 http://archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:4 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [946 kB]
Get:5 http://security.ubuntu.com/ubuntu jammy-security/main Translation-en [187 kB]
Get:6 http://security.ubuntu.com/ubuntu jammy-security/main amd64 c-n-f Metadata [11.4 kB]
Get:7 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [1085 kB]
Get:8 http://security.ubuntu.com/ubuntu jammy-security/restricted Translation-en [176 kB]
Get:9 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 c-n-f Metadata [520 B]
Get:10 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [793 kB]
Get:11 http://security.ubuntu.com/ubuntu jammy-security/universe Translation-en [146 kB]
Get:12 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 c-n-f Metadata [16.8 kB]
Get:13 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 Packages [36.5 kB]
Get:14 http://security.ubuntu.com/ubuntu jammy-security/multiverse Translation-en [7060 B]
Get:15 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 c-n-f Metadata [260 B]
Get:16 http://archive.ubuntu.com/ubuntu jammy-backports InRelease [109 kB]
Get:17 http://archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14.1 MB]
Get:18 http://archive.ubuntu.com/ubuntu jammy/universe Translation-en [5652 kB]
Get:19 http://archive.ubuntu.com/ubuntu jammy/universe amd64 c-n-f Metadata [286 kB]
Get:20 http://archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [217 kB]
Get:21 http://archive.ubuntu.com/ubuntu jammy/multiverse Translation-en [112 kB]
Get:22 http://archive.ubuntu.com/ubuntu jammy/multiverse amd64 c-n-f Metadata [8372 B]
Get:23 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [1158 kB]
```

Step 2 - Install the required packages

Next, run the following command to install the packages needed for the installation:

```
sudo apt install -y apt-transport-https software-properties-common wget
```

```
demo-user@demo:~$ sudo apt install -y apt-transport-https software-properties-common wget
[sudo] password for demo-user:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
wget is already the newest version (1.21.2-2ubuntu1).
wget set to manually installed.
software-properties-common is already the newest version (0.99.22.7).
software-properties-common set to manually installed.
The following NEW packages will be installed:
  apt-transport-https
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 1510 B of archives.
After this operation, 169 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu jammy-updates/universe amd64 apt-transport-https all 2.4.10 [151
0 B]
Fetched 1510 B in 0s (5548 B/s)
Selecting previously unselected package apt-transport-https.
(Reading database ... 93858 files and directories currently installed.)
Preparing to unpack .../apt-transport-https_2.4.10_all.deb ...
Unpacking apt-transport-https (2.4.10) ...
Setting up apt-transport-https (2.4.10) ...
Scanning processes...
Scanning candidates...
Scanning linux images...
```

Step 3 - Add the Grafana GPG key

```
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
```

The first command creates a directory where the key will be stored. The second command will download, convert, and store the key in the specified location for secure APT package management.

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

Step 4 - Add Grafana APT repository

```
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
```

After adding the repository to your system, update the package index to include information from the newly added repository using:

```
sudo apt update
```

```
demo-user@demo:~$ 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
deb [signed-by=/etc/apt/keyrings/grafana.gpg] https://apt.grafana.com stable main
demo-user@demo:~$ sudo apt update
Get:1 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:2 https://apt.grafana.com stable InRelease [5984 B]
Get:3 https://apt.grafana.com stable/main amd64 Packages [167 kB]
Hit:4 http://archive.ubuntu.com/ubuntu jammy InRelease
Get:5 http://archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Hit:6 http://archive.ubuntu.com/ubuntu jammy-backports InRelease
Fetched 402 kB in 1s (434 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
demo-user@demo:~$
```

Step 5 - Install Grafana

```
sudo apt install Grafana
```

```
demo-user@demo:~$ sudo apt install grafana
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  fontconfig-config fonts-dejavu-core libfontconfig1 musl
The following NEW packages will be installed:
  fontconfig-config fonts-dejavu-core grafana libfontconfig1 musl
0 upgraded, 5 newly installed, 0 to remove and 0 not upgraded.
Need to get 105 MB of archives.
After this operation, 386 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://archive.ubuntu.com/ubuntu jammy/main amd64 fonts-dejavu-core all 2.37-2build1 [1041 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy/main amd64 fontconfig-config all 2.13.1-4.2ubuntu5 [29.1 k
B]
Get:3 http://archive.ubuntu.com/ubuntu jammy/main amd64 libfontconfig1 amd64 2.13.1-4.2ubuntu5 [131 kB]
Get:4 http://archive.ubuntu.com/ubuntu jammy/universe amd64 musl amd64 1.2.2-4 [407 kB]
Get:5 https://apt.grafana.com stable/main amd64 grafana amd64 10.2.0 [104 MB]
Fetched 105 MB in 5s (20.9 MB/s)
Selecting previously unselected package fonts-dejavu-core.
(Reading database ... 93862 files and directories currently installed.)
Preparing to unpack .../fonts-dejavu-core_2.37-2build1_all.deb ...
Unpacking fonts-dejavu-core (2.37-2build1) ...
Selecting previously unselected package fontconfig-config.
Preparing to unpack .../fontconfig-config_2.13.1-4.2ubuntu5_all.deb ...
```

Step 6 - Start the Grafana service

```
sudo grafana-server -v
```

Next, start the Grafana service and enable it to start automatically at system reboot using the following commands:

```
sudo systemctl start grafana-server
sudo systemctl enable grafana-server
```

```
demo-user@demo:~$ sudo grafana-server -v
Version 10.2.0 (commit: 895fbafb7a, branch: HEAD)
demo-user@demo:~$ sudo systemctl enable grafana-server
Synchronizing state of grafana-server.service with SysV service script with /lib/systemd/systemd-sysv-i
nstall.
Executing: /lib/systemd/systemd-sysv-install enable grafana-server
Created symlink /etc/systemd/system/multi-user.target.wants/grafana-server.service → /lib/systemd/syste
m/grafana-server.service.
demo-user@demo:~$ sudo systemctl start grafana-server
```

Step 7 - Verify that the Grafana service is running

```
sudo systemctl status grafana-server
```

If the Grafana service was started successfully, you should see a sign that it is active and running.

```
demo-user@demo:~$ sudo systemctl status grafana-server
● grafana-server.service - Grafana instance
     Loaded: loaded (/lib/systemd/system/grafana-server.service; enabled; vendor preset: enabled)
     Active: active (running) since Mon 2023-11-13 16:46:31 EET; 1min 16s ago
       Docs: http://docs.grafana.org
   Main PID: 9208 (grafana)
      Tasks: 10 (limit: 1101)
     Memory: 112.6M
        CPU: 4.464s
     CGroup: /system.slice/grafana-server.service
             └─9208 /usr/share/grafana/bin/grafana server --config=/etc/grafana/grafana.ini --pidfile=>

Nov 13 16:46:45 demo grafana[9208]: logger=ngalert.migration orgID=1 t=2023-11-13T16:46:45.085057311+0>
Nov 13 16:46:45 demo grafana[9208]: logger=ngalert.migration orgID=1 t=2023-11-13T16:46:45.085393962+0>
Nov 13 16:46:45 demo grafana[9208]: logger=sqlstore.transactions t=2023-11-13T16:46:45.107359673+02:00>
Nov 13 16:46:45 demo grafana[9208]: logger=ngalert.migration t=2023-11-13T16:46:45.1412684+02:00 level>
Nov 13 16:46:45 demo grafana[9208]: logger=ngalert.migration orgID=1 t=2023-11-13T16:46:45.141723102+0>
Nov 13 16:46:45 demo grafana[9208]: logger=ngalert.migration orgID=1 t=2023-11-13T16:46:45.142087674+0>
Nov 13 16:46:45 demo grafana[9208]: logger=ngalert.migration orgID=1 t=2023-11-13T16:46:45.142418864+0>
Nov 13 16:46:45 demo grafana[9208]: logger=ngalert.migration t=2023-11-13T16:46:45.14906027+02:00 leve>
Nov 13 16:46:45 demo grafana[9208]: logger=grafana.update.checker t=2023-11-13T16:46:45.414043294+02:0>
Nov 13 16:46:45 demo grafana[9208]: logger=plugins.update.checker t=2023-11-13T16:46:45.444271306+02:0>
lines 1-21/21 (END)
```

Step 8 - Open the port in the chrome

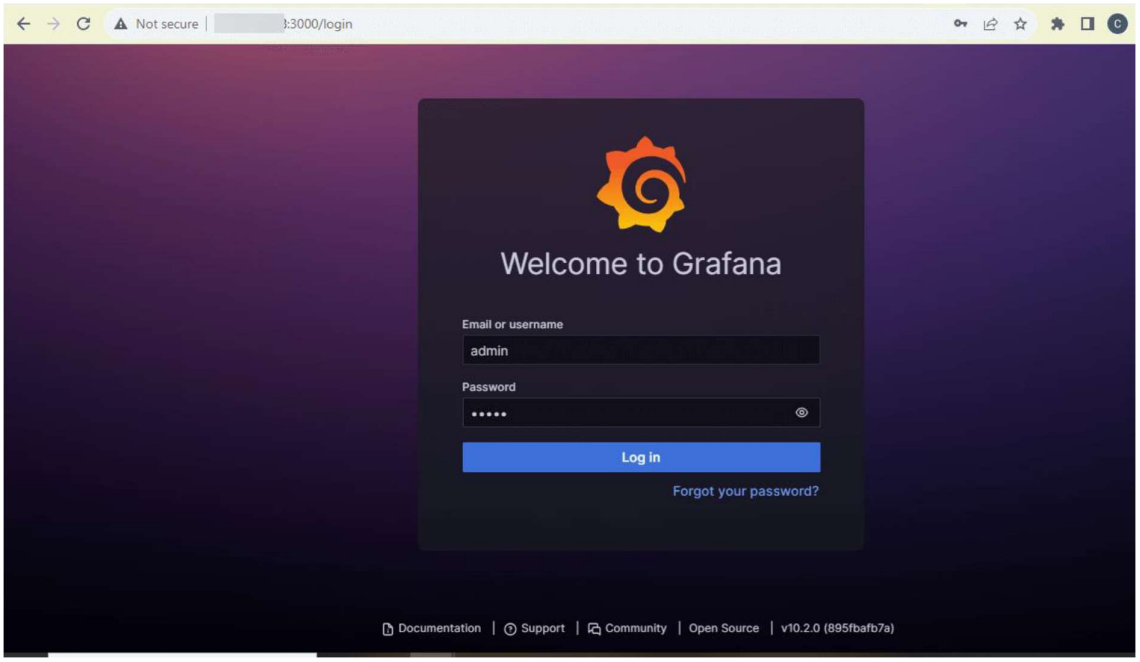
```
sudo ufw enable
sudo ufw allow ssh
sudo ufw allow 3000/tcp
```

```
demo-user@demo:~$ sudo ufw enable
Command may disrupt existing ssh connections. Proceed with operation (y|n)? y
Firewall is active and enabled on system startup
demo-user@demo:~$ sudo ufw allow ssh
Rule added
Rule added (v6)
demo-user@demo:~$ sudo ufw allow 3000/tcp
Rule added
Rule added (v6)
demo-user@demo:~$
```

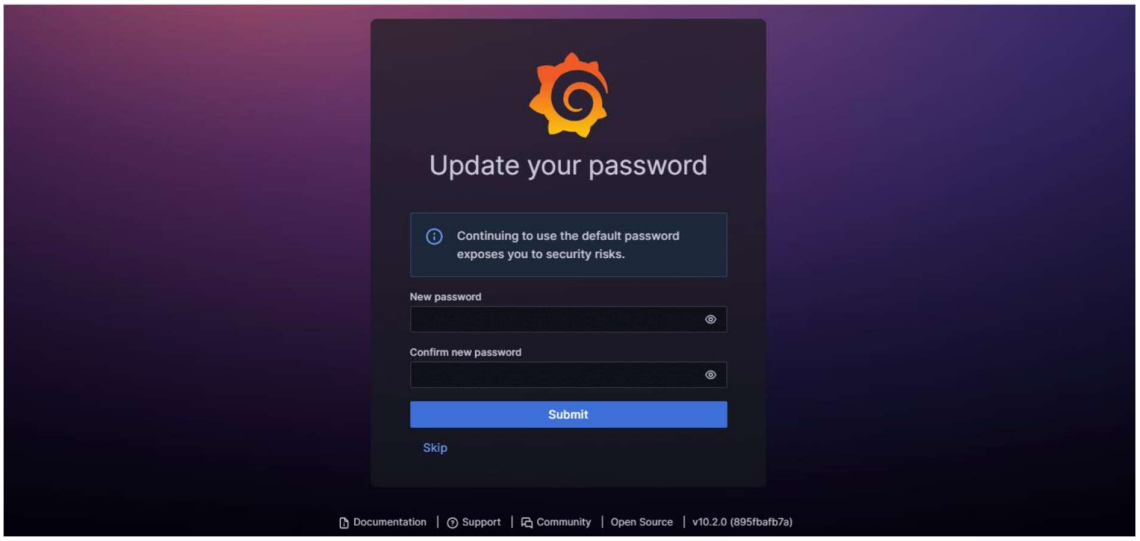
Step 9 - Access the Grafana web interface

To access the Grafana web interface, open a web browser and enter the IP address of your server (or hostname if applicable), followed by port 3000. The URL format should be http://your_server_IP:3000. Once loaded, you should see the Grafana login page. The default credentials are:

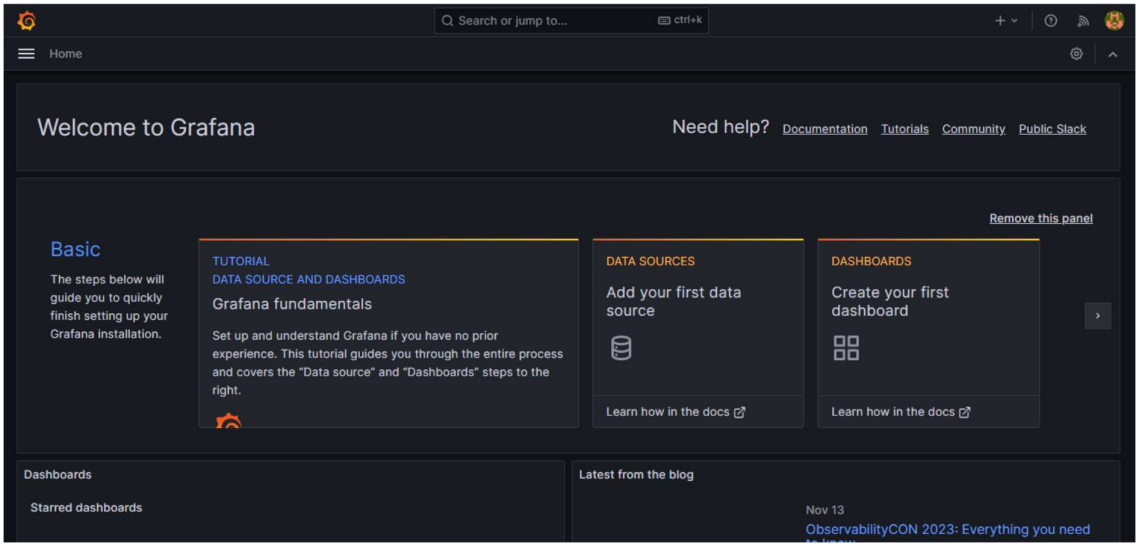
- **Username: admin**
- **Password: admin**



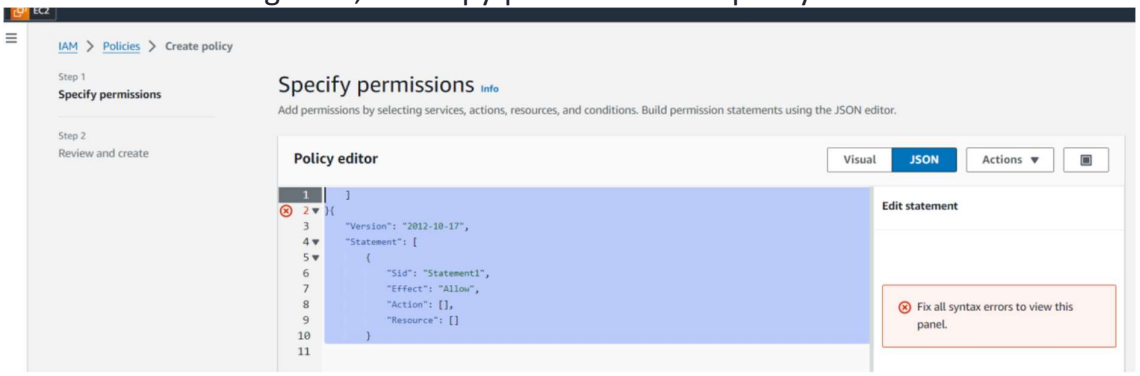
You'll be prompted to create a new password. Input a secure password, confirm it, and click the "Submit" button.



Once done, you'll have access to Grafana's dashboard.



Now open the AWS console and select the option IAM. first, Click on the **JSON** tab, Remove the existing code, and copy-paste the below policy



statement into the editor:

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

"Statement": [

{

"Sid": "VisualEditor0",

"Effect": "Allow",

"Action": [

"ec2:DescribeInstances",

"cloudwatch:GetMetricData",

"ec2:DescribeTags",

"ec2:DescribeRegions",

"cloudwatch:GetMetricStatistics",

"cloudwatch:ListMetrics"

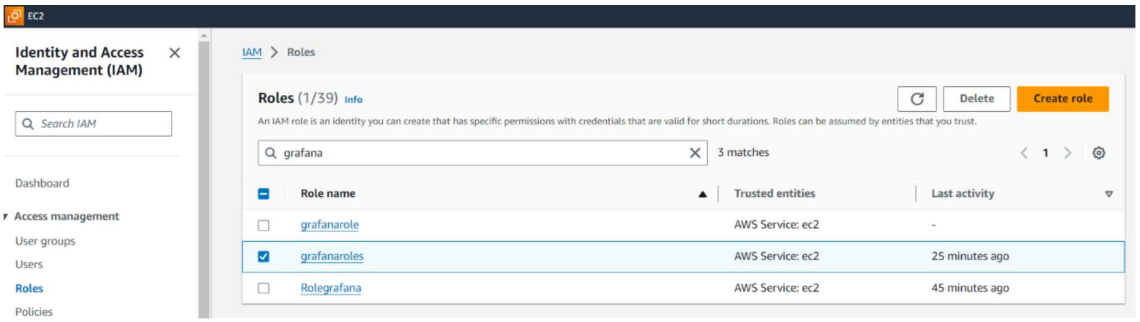
],

"Resource": "*"

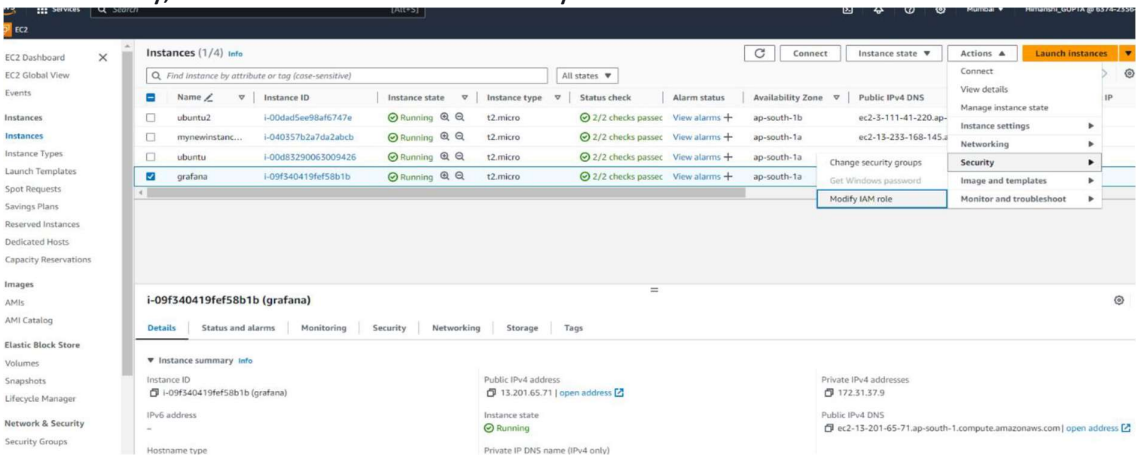
},

{
"Sid": "AllowReadingTagsInstancesRegionsFromEC2",
"Effect":"Allow",
"Action":
["ec2:DescribeTags","ec2:DescribeInstances","ec2:DescribeRegions"],
"Resource":"*"
},
{
"Sid": "AllowReadingResoucesForTags",
"Effect":"Allow",
"Action":"tag:GetResources",
"Resource":"*"
}
]
}

Policy is created Now click on the role tab. select the create role. Choose **Service or use case: EC2** click on the next. Select the policy and create a role. Your role is created-

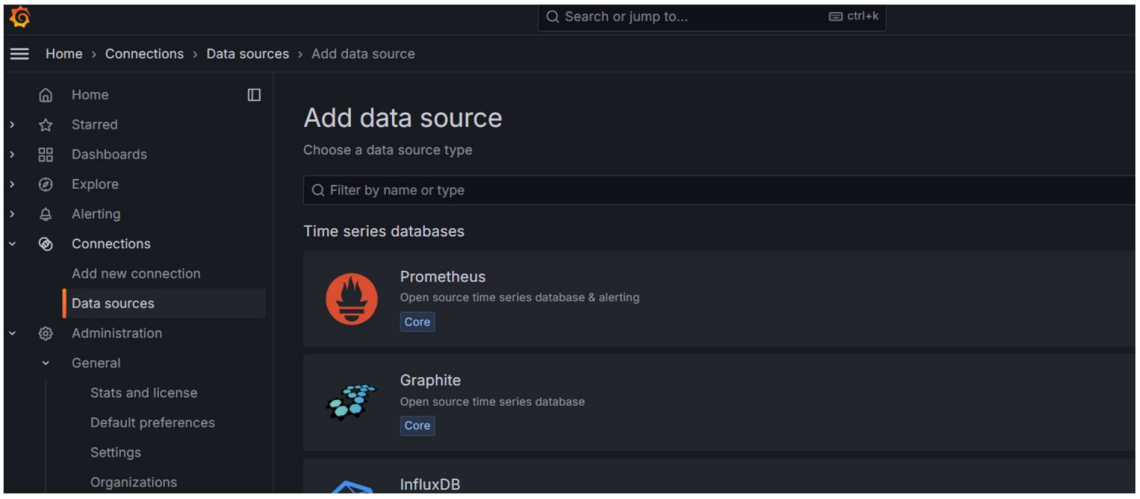


Now go back to the Instances. Select your instance, click on the action tab, select the security, and then click on the Modify IAM role.

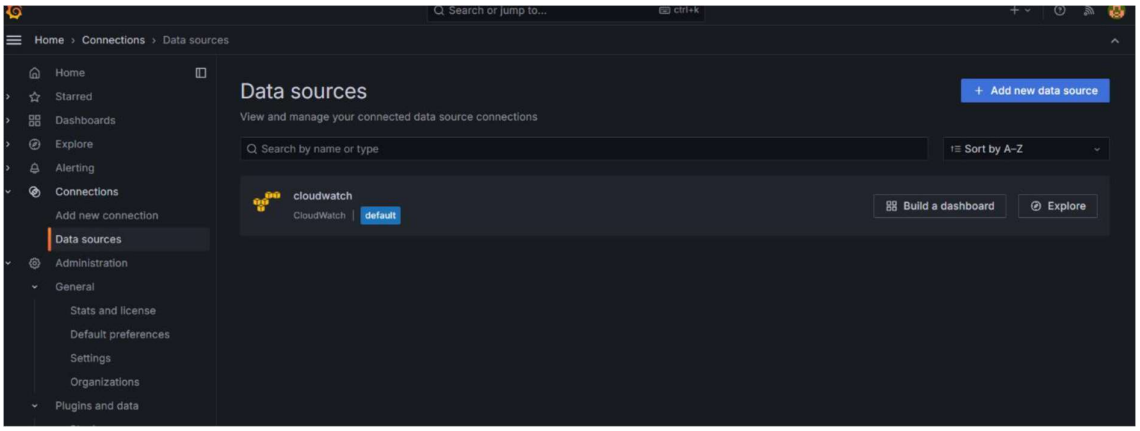


Select your role then click on update IAM role. now it's done to see your graph.

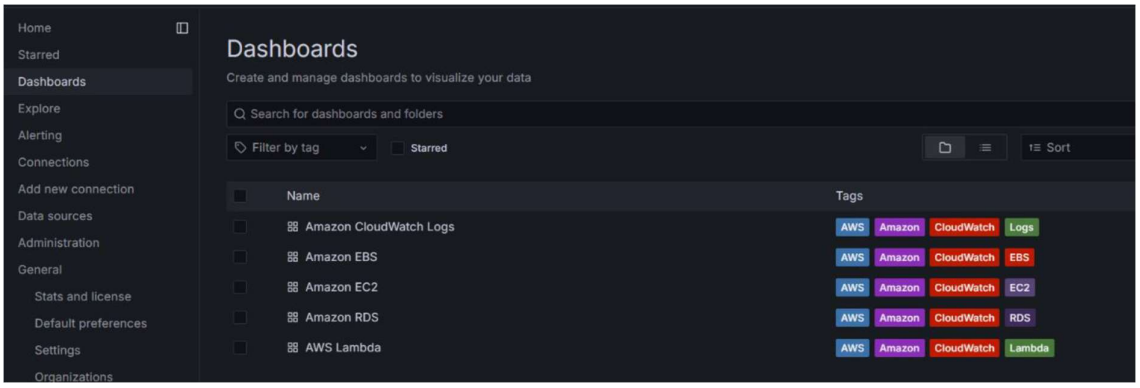
Go back to the Grafana dashboard. click on the connection tab and select the data source option.



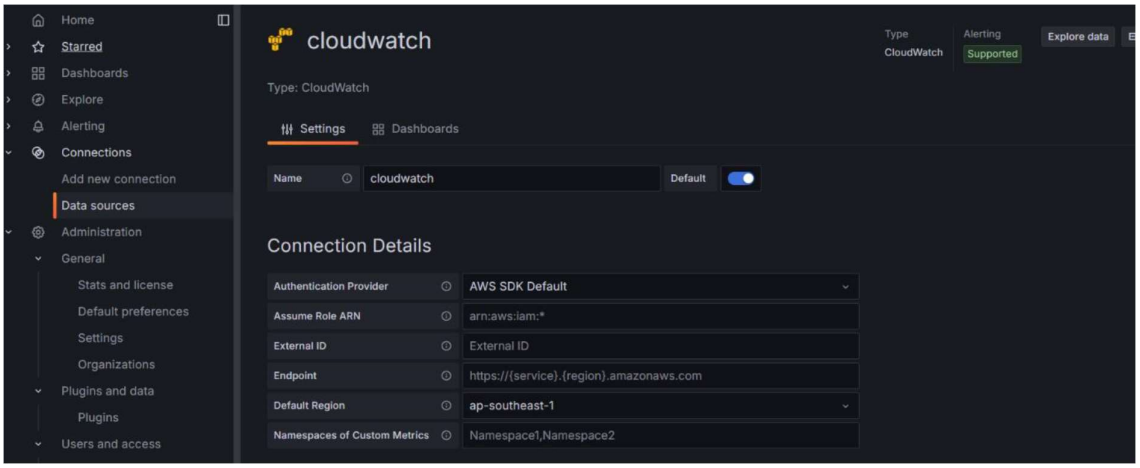
Select the cloud watch.



Check it in the Dashboard. You see your screen like that-



Click on the Amazon ec2 you see some errors.so click on the data source and change the region **ap-southeast-1** like that -



Save those changes.

Go back to the Dashboard now you see your Grafana graph.