

# Monitoring Task

## Task Description:

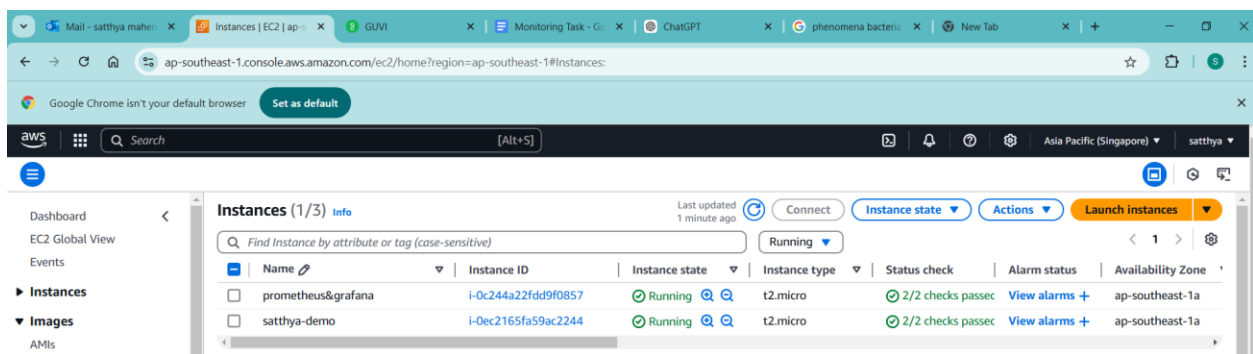
Install Prometheus and Grafana on a Linux EC2 machine, connect Prometheus to Grafana, and create a dashboard to view metrics.

## Techstacks needs to be used :

- AWS EC2
- Prometheus
- Grafana
- Node Exporter

## Step1

- Launch EC2 Instance
- Open security group port
  - ssh (port22)
  - Prometheus (port 9090)
  - Grafana (port 3000)
  - Node Exporter (port 9100)



## Step2

- Install Prometheus

- wget <https://github.com/prometheus/prometheus/releases/download/v3.1.0/prometheus-3.1.0.linux-amd64.tar.gz>
- tar -xvzf prometheus-3.1.0.linux-amd64.tar.gz

```
ubuntu@ip-172-31-22-218: ~  
ubuntu@ip-172-31-22-218:~$ ll  
total 111492  
drwxr-x--- 4 ubuntu ubuntu    4096 Jan  9 02:19 ./  
drwxr-xr-x 3 root  root      4096 Jan  9 01:08 ../  
-rw-r--r-- 1 ubuntu ubuntu    220 Mar 31 2024 .bash_logout  
-rw-r--r-- 1 ubuntu ubuntu   3771 Mar 31 2024 .bashrc  
drwx----- 2 ubuntu ubuntu    4096 Jan  9 02:13 .cache/  
-rw-r--r-- 1 ubuntu ubuntu    807 Mar 31 2024 .profile  
drwx----- 2 ubuntu ubuntu    4096 Jan  9 01:08 .ssh/  
-rw-r--r-- 1 ubuntu ubuntu      0 Jan  9 02:19 .sudo_as_admin_successful  
-rw-rw-r-- 1 ubuntu ubuntu    165 Jan  9 02:17 .wget-hsts  
-rw-rw-r-- 1 ubuntu ubuntu 114133789 Jan  2 14:14 prometheus-3.1.0.linux-amd64.tar.gz  
ubuntu@ip-172-31-22-218:~$ tar -xvzf prometheus-3.1.0.linux-amd64.tar.gz  
prometheus-3.1.0.linux-amd64/  
prometheus-3.1.0.linux-amd64/NOTICE  
prometheus-3.1.0.linux-amd64/promtool  
prometheus-3.1.0.linux-amd64/LICENSE  
prometheus-3.1.0.linux-amd64/prometheus  
prometheus-3.1.0.linux-amd64/prometheus.yml  
ubuntu@ip-172-31-22-218:~$ ls  
prometheus-3.1.0.linux-amd64  prometheus-3.1.0.linux-amd64.tar.gz  
ubuntu@ip-172-31-22-218:~$
```

- sudo mv prometheus /usr/local/bin/
- sudo mv promtool /usr/local/bin
- sudo mkdir /etc/prometheus
- sudo mv Prometheus.yml /etc/prometheus/

```
ubuntu@ip-172-31-22-218: ~/prometheus-3.1.0.linux-amd64  
ubuntu@ip-172-31-22-218:~/prometheus-3.1.0.linux-amd64$ ll  
total 284832  
drwxr-xr-x 2 ubuntu ubuntu    4096 Jan  2 14:10 ./  
drwxr-x--- 5 ubuntu ubuntu    4096 Jan  9 02:22 ../  
-rw-r--r-- 1 ubuntu ubuntu   11357 Jan  2 14:07 LICENSE  
-rw-r--r-- 1 ubuntu ubuntu    3773 Jan  2 14:07 NOTICE  
-rwxr-xr-x 1 ubuntu ubuntu 150413151 Jan  2 13:54 prometheus*  
-rw-r--r-- 1 ubuntu ubuntu     934 Jan  2 14:07 prometheus.yml  
-rwxr-xr-x 1 ubuntu ubuntu 141220034 Jan  2 13:54 promtool*  
ubuntu@ip-172-31-22-218:~/prometheus-3.1.0.linux-amd64$ sudo mv prometheus /usr/local/bin/  
ubuntu@ip-172-31-22-218:~/prometheus-3.1.0.linux-amd64$ sudo mv promtool /usr/local/bin/  
ubuntu@ip-172-31-22-218:~/prometheus-3.1.0.linux-amd64$ sudo mkdir /etc/prometheus  
ubuntu@ip-172-31-22-218:~/prometheus-3.1.0.linux-amd64$ sudo mv prometheus.yml /etc/prometheus/  
ubuntu@ip-172-31-22-218:~/prometheus-3.1.0.linux-amd64$
```

- cd /etc/systemd/system
- sudo vi prometheus.service

```
ubuntu@ip-172-31-22-218: /etc/systemd/system
[unit]
Description= Prometheus Monitoring Tool for Grafana
Wants=network-online.target
After=network-online.target
[Service]
User=root
Group=root
Type=simple
ExecStart=/usr/local/bin/prometheus \
    --config.file /etc/prometheus/prometheus.yml \
    --storage.tsdb.path=/var/lib/prometheus/ \
    --web.console.templates=/usr/local/bin/consoles \
    --web.console.libraries=/usr/local/bin/consoles_libraries

[Install]
WantedBy=multi-user.target
~
```

- sudo systemctl daemon-reload
- sudo systemctl enable prometheus.service
- sudo systemctl start prometheus.service
- sudo systemctl status prometheus.service

```
ubuntu@ip-172-31-22-218: /etc/systemd/system
ubuntu@ip-172-31-22-218: /etc/systemd/system$ sudo systemctl daemon-reload
ubuntu@ip-172-31-22-218: /etc/systemd/system$ sudo systemctl enable prometheus.service
Created symlink /etc/systemd/system/multi-user.target.wants/prometheus.service → /etc/systemd/system/prometheus.service.
ubuntu@ip-172-31-22-218: /etc/systemd/system$ sudo systemctl start prometheus.service
ubuntu@ip-172-31-22-218: /etc/systemd/system$ sudo systemctl status prometheus.service
● prometheus.service
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; preset: enabled)
   Active: active (running) since Thu 2025-01-09 02:59:22 UTC; 7s ago
     Main PID: 8223 (prometheus)
        Tasks: 6 (limit: 1150)
      Memory: 16.4M (peak: 16.0M)
         CPU: 62ms
    CGroup: /system.slice/prometheus.service
            └─8223 /usr/local/bin/prometheus --config.file=/etc/prometheus/prometheus.yml --storage.tsdb.path=/var/lib/prometheus/ --web.console.templates=/usr/local/bin/consoles --web.console.libraries=/usr/local/bin/consoles_libraries

Jan 09 02:59:22 ip-172-31-22-218 prometheus[8223]: time=2025-01-09T02:59:22.436Z level=INFO source=head.go:795 msg="WAL segment loaded" component=tsdb segment=0 maxSegment=0
Jan 09 02:59:22 ip-172-31-22-218 prometheus[8223]: time=2025-01-09T02:59:22.436Z level=INFO source=head.go:832 msg="WAL replay completed" component=tsdb checkpoint_replay_duration=41.094us wal_replay_duration=3.17641ms wbl_replay_duration=
Jan 09 02:59:22 ip-172-31-22-218 prometheus[8223]: time=2025-01-09T02:59:22.440Z level=INFO source=main.go:1245 msg="filesystem information" fs_type=EXT4_SUPER_MAGIC
Jan 09 02:59:22 ip-172-31-22-218 prometheus[8223]: time=2025-01-09T02:59:22.441Z level=INFO source=main.go:1248 msg="TSDB started"
Jan 09 02:59:22 ip-172-31-22-218 prometheus[8223]: time=2025-01-09T02:59:22.441Z level=INFO source=main.go:1433 msg="Loading configuration file" filename=/etc/prometheus/prometheus.yml
Jan 09 02:59:22 ip-172-31-22-218 prometheus[8223]: time=2025-01-09T02:59:22.445Z level=INFO source=main.go:1472 msg="updated GOGC" old=100 new=75
Jan 09 02:59:22 ip-172-31-22-218 prometheus[8223]: time=2025-01-09T02:59:22.445Z level=INFO source=main.go:1482 msg="Completed loading of configuration file" db_storage=1.792us remote_storage=2.111us web_handler=885ns query_engine=1.172us
Jan 09 02:59:22 ip-172-31-22-218 prometheus[8223]: time=2025-01-09T02:59:22.445Z level=INFO source=main.go:1269 msg="Server is ready to receive web requests."
Jan 09 02:59:22 ip-172-31-22-218 prometheus[8223]: time=2025-01-09T02:59:22.445Z level=INFO source=manager.go:169 msg="Starting rule manager..." component="rule manager"
Jan 09 02:59:29 ip-172-31-22-218 systemd[1]: /etc/systemd/system/prometheus.service:1: Unknown section 'unit'. Ignoring.
lines 1-20/20 (END)
```

- configure Prometheus : edit Prometheus.yml to include the Node Exporter target
- sudo /etc/prometheus
- sudo vi prometheus.yml
- sudo systemctl restart prometheus.service

```
ubuntu@ip-172-31-22-218: /etc/prometheus
# my global config
global:
  scrape_interval: 15s # Set the scrape interval to every 15 seconds. Default is every 1 minute.
  evaluation_interval: 15s # Evaluate rules every 15 seconds. The default is every 1 minute.
  # scrape_timeout is set to the global default (10s).

# Alertmanager configuration
alerting:
  alertmanagers:
    - static_configs:
      - targets:
        # - alertmanager:9093

# Load rules once and periodically evaluate them according to the global 'evaluation_interval'.
rule_files:
  # - "first_rules.yml"
  # - "second_rules.yml"

# A scrape configuration containing exactly one endpoint to scrape:
# Here it's Prometheus itself.
scrape_configs:
  # The job name is added as a label 'job=<job_name>' to any timeseries scraped from this config.
  - job_name: "prometheus"

    # metrics_path defaults to '/metrics'
    # scheme defaults to 'http'.

    static_configs:
      - targets: ["localhost:9090"]

  - job_name: 'node_exporter'
    static_configs:
      - targets: ['localhost:9100']
```

## Prometheus Installation version

```
ubuntu@ip-172-31-22-218: ~
ubuntu@ip-172-31-22-218:~$ ubuntu@ip-172-31-22-218:~$ prometheus --version
prometheus, version 3.1.0 (branch: HEAD, revision: 7086161a93b262aa0949dbf2aba15a5a7b13e0a3)
  build user:      root@74c225e2044f
  build date:      20250102-13:52:43
  go version:      go1.23.4
  platform:        linux/amd64
  tags:            netgo,builtinassets,stringlabels
ubuntu@ip-172-31-22-218:~$
```

### Step3

- Install Grafana
  - `sudo apt-get install -y adduser libfontconfig1 musl`
  - `wget https://dl.grafana.com/enterprise/release/grafana-enterprise_11.4.0_amd64.deb`
  - `sudo dpkg -i grafana-enterprise_11.4.0_amd64.deb`
  - `sudo /bin/systemctl daemon-reload`
  - `sudo systemctl enable grafana.service`
  - `sudo /bin/systemctl enable grafana-server`
  - `sudo /bin/systemctl start grafana-server`

```
ubuntu@ip-172-31-22-218: ~  
ubuntu@ip-172-31-22-218:~$ grafana-server -v  
Version 11.4.0 (commit: b58701869e1a11b696010a6f28bd96b68a2cf0d0, branch: HEAD, enterprise-commit: 2fe8504b3099dbab23eea8c738706bfb44686078)  
ubuntu@ip-172-31-22-218:~$
```

### Step4

- Install Node Exporter in “satthya-demo” server
  - `wget https://github.com/prometheus/node\_exporter/releases/download/v1.8.2/node\_exporter-1.8.2.linux-amd64.tar.gz`
  - `tar -xvzf node_exporter-1.8.2.linux-amd64.tar.gz`

```
ubuntu@ip-172-31-26-114: ~  
ubuntu@ip-172-31-26-114:~$ ll  
total 10460  
drwxr-x--- 4 ubuntu ubuntu    4096 Jan  9 06:09 ./  
drwxr-xr-x 3 root  root      4096 Jan  9 01:09 ../  
-rw-r--r-- 1 ubuntu ubuntu    220 Mar 31 2024 .bash_logout  
-rw-r--r-- 1 ubuntu ubuntu   3771 Mar 31 2024 .bashrc  
drwx----- 2 ubuntu ubuntu    4096 Jan  9 06:06 .cache/  
-rw-r--r-- 1 ubuntu ubuntu    807 Mar 31 2024 .profile  
drwx----- 2 ubuntu ubuntu    4096 Jan  9 01:09 .ssh/  
-rw-rw-r-- 1 ubuntu ubuntu    165 Jan  9 06:09 .wget-hsts  
-rw-rw-r-- 1 ubuntu ubuntu 10676343 Jul 14 11:58 node_exporter-1.8.2.linux-amd64.tar.gz  
ubuntu@ip-172-31-26-114:~$ tar -xvzf node_exporter-1.8.2.linux-amd64.tar.gz  
node_exporter-1.8.2.linux-amd64/  
node_exporter-1.8.2.linux-amd64/NOTICE  
node_exporter-1.8.2.linux-amd64/node_exporter  
node_exporter-1.8.2.linux-amd64/LICENSE  
ubuntu@ip-172-31-26-114:~$ ll  
total 10464  
drwxr-x--- 5 ubuntu ubuntu    4096 Jan  9 06:11 ./  
drwxr-xr-x 3 root  root      4096 Jan  9 01:09 ../  
-rw-r--r-- 1 ubuntu ubuntu    220 Mar 31 2024 .bash_logout  
-rw-r--r-- 1 ubuntu ubuntu   3771 Mar 31 2024 .bashrc  
drwx----- 2 ubuntu ubuntu    4096 Jan  9 06:06 .cache/  
-rw-r--r-- 1 ubuntu ubuntu    807 Mar 31 2024 .profile  
drwx----- 2 ubuntu ubuntu    4096 Jan  9 01:09 .ssh/  
-rw-rw-r-- 1 ubuntu ubuntu    165 Jan  9 06:09 .wget-hsts  
drwxr-xr-x 2 ubuntu ubuntu    4096 Jul 14 11:58 node_exporter-1.8.2.linux-amd64/  
-rw-rw-r-- 1 ubuntu ubuntu 10676343 Jul 14 11:58 node_exporter-1.8.2.linux-amd64.tar.gz  
ubuntu@ip-172-31-26-114:~$
```

- `sudo mv node_exporter /usr/local/bin/`

```
ubuntu@ip-172-31-26-114: ~/node_exporter-1.8.2.linux-amd64
ubuntu@ip-172-31-26-114:~/node_exporter-1.8.2.linux-amd64$ ll
total 20048
drwxr-xr-x 2 ubuntu ubuntu 4096 Jul 14 11:58 ./
drwxr-x--- 5 ubuntu ubuntu 4096 Jan 9 06:11 ../
-rw-r--r-- 1 ubuntu ubuntu 11357 Jul 14 11:57 LICENSE
-rw-r--r-- 1 ubuntu ubuntu 463 Jul 14 11:57 NOTICE
-rwxr-xr-x 1 ubuntu ubuntu 20500541 Jul 14 11:54 node_exporter*
ubuntu@ip-172-31-26-114:~/node_exporter-1.8.2.linux-amd64$ sudo mv node_exporter /usr/local/bin/
ubuntu@ip-172-31-26-114:~/node_exporter-1.8.2.linux-amd64$
```

- `cd /etc/systemd/system`
- `sudo vi node_exporter.service`

```
ubuntu@ip-172-31-26-114: /etc/systemd/system
[Unit]
Description Node Exporter
After network.target
[Service]
User root
ExecStart=/usr/local/bin/node_exporter
[Install]
WantedBy default.target
~
~
```

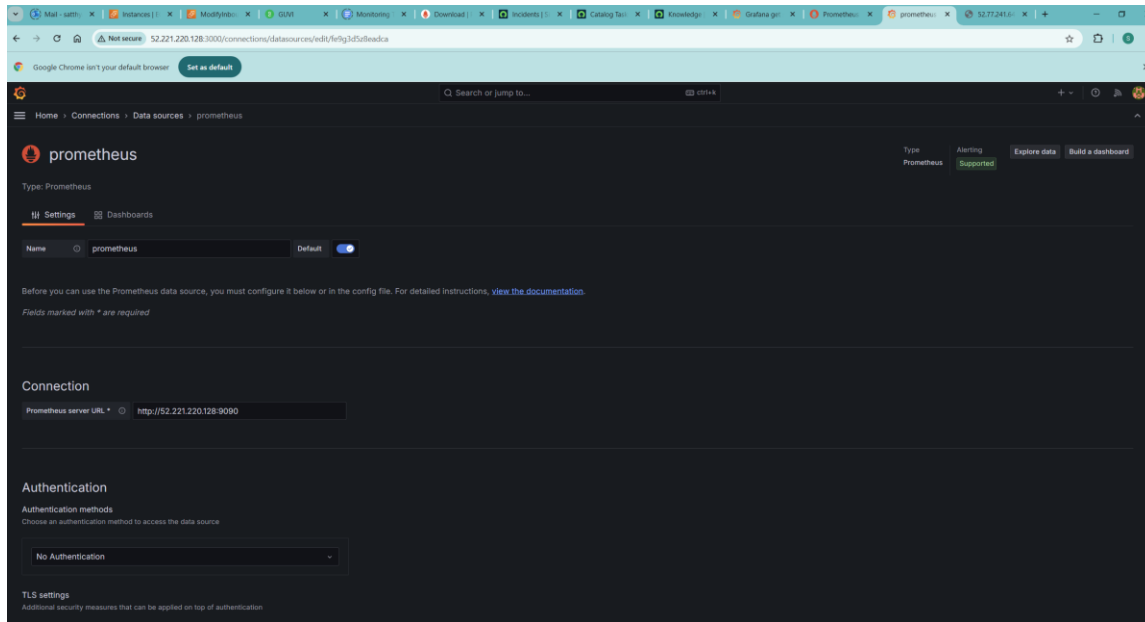
- `sudo systemctl daemon-reload`
- `sudo systemctl enable node_exporter.service`
- `sudo systemctl start node_exporter.service`
- `sudo systemctl status node_exporter.service`

```
ubuntu@ip-172-31-26-114: /etc/systemd/system
ubuntu@ip-172-31-26-114:/etc/systemd/system$ sudo systemctl daemon-reload
ubuntu@ip-172-31-26-114:/etc/systemd/system$ sudo systemctl enable node_exporter.service
Created symlink /etc/systemd/system/default.target.wants/node_exporter.service → /etc/systemd/system/node_exporter.service.
ubuntu@ip-172-31-26-114:/etc/systemd/system$ sudo systemctl start node_exporter.service
ubuntu@ip-172-31-26-114:/etc/systemd/system$ sudo systemctl status node_exporter.service
● node_exporter.service - Node Exporter
   Loaded: loaded (/etc/systemd/system/node_exporter.service; enabled; preset: enabled)
   Active: active (running) since Thu 2025-01-09 06:21:33 UTC; 13s ago
     Main PID: 1633 (node_exporter)
        Tasks: 3 (limit: 1130)
       Memory: 2.0M (peak: 2.2M)
          CPU: 9ms
      CGroup: /system.slice/node_exporter.service
              └─1633 /usr/local/bin/node_exporter

Jan 09 06:21:33 ip-172-31-26-114 node_exporter[1633]: ts=2025-01-09T06:21:33.294Z caller=node_exporter.go:118 level=info collector=time
Jan 09 06:21:33 ip-172-31-26-114 node_exporter[1633]: ts=2025-01-09T06:21:33.294Z caller=node_exporter.go:118 level=info collector=timex
Jan 09 06:21:33 ip-172-31-26-114 node_exporter[1633]: ts=2025-01-09T06:21:33.294Z caller=node_exporter.go:118 level=info collector=udp_queues
Jan 09 06:21:33 ip-172-31-26-114 node_exporter[1633]: ts=2025-01-09T06:21:33.294Z caller=node_exporter.go:118 level=info collector=uname
Jan 09 06:21:33 ip-172-31-26-114 node_exporter[1633]: ts=2025-01-09T06:21:33.294Z caller=node_exporter.go:118 level=info collector=vmstat
Jan 09 06:21:33 ip-172-31-26-114 node_exporter[1633]: ts=2025-01-09T06:21:33.294Z caller=node_exporter.go:118 level=info collector=watchdog
Jan 09 06:21:33 ip-172-31-26-114 node_exporter[1633]: ts=2025-01-09T06:21:33.294Z caller=node_exporter.go:118 level=info collector=xfs
Jan 09 06:21:33 ip-172-31-26-114 node_exporter[1633]: ts=2025-01-09T06:21:33.296Z caller=tls_config.go:313 level=info msg="listening on" address=[::]:9100
Jan 09 06:21:33 ip-172-31-26-114 node_exporter[1633]: ts=2025-01-09T06:21:33.296Z caller=tls_config.go:316 level=info msg="TLS is disabled." http2=false address=[::]:9100
ubuntu@ip-172-31-26-114:/etc/systemd/system$
```

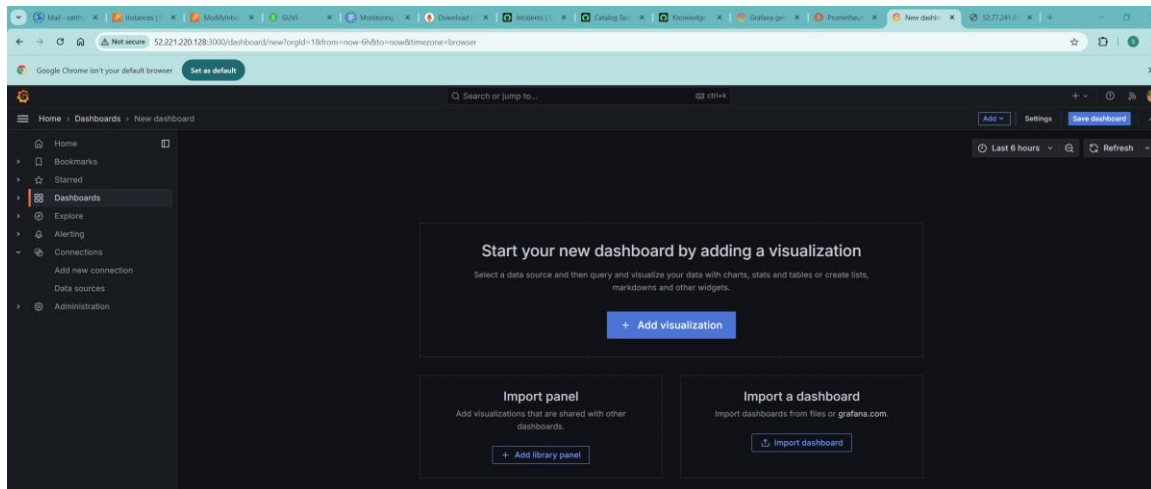
## Step5

- Connect Prometheus to Grafana
  - log in to grafana
  - connections < add new connection.



## Step6

- Create a Dashboard in Grafana
  - Add a Panel
    - Dashboard > Create Dashboard > Add visualization



- Metrix
  - process\_cpu\_seconds\_total
- Label filters
  - Job
  - Prometheus

