PROMETHEUS (CM)

1) What is Prometheus?

A) Prometheus is an open-source monitoring and alerting toolkit originally developed by SoundCloud in 2012 and later donated to the Cloud Native Computing Foundation (CNCF) in 2016. It is widely used in the field of cloud-native and containerized environments for monitoring and managing the health and performance of various systems and applications.

Key features of Prometheus include:

Time Series Database: Prometheus stores all the collected monitoring data as time-series, allowing it to track and analyse metrics over time.

Metrics Collection: Prometheus pulls metrics data from various sources, such as applications, services, and system components, through an HTTP-based pull model. These sources need to expose their metrics in a specific format called the Prometheus exposition format.

Query Language: Prometheus provides a powerful query language called PromQL (Prometheus Query Language) that allows users to perform complex queries and aggregations on the collected metrics.

Alerting: Prometheus has a built-in alerting mechanism that allows users to define alerting rules based on specific conditions and thresholds. When a rule is triggered, it can send alerts to various channels like email, Slack, or other alerting systems.

Service Discovery: Prometheus supports service discovery, making it easier to monitor dynamic systems like container orchestration platforms (e.g., Kubernetes) where instances of applications and services can change rapidly.

Grafana Integration: Prometheus is often used in combination with Grafana, a popular open-source visualization tool. Grafana can connect to Prometheus and create interactive, visually appealing dashboards to display monitoring data.

Prometheus has become an essential part of many cloud-native deployments due to its flexibility, scalability, and ability to handle high-dimensional data. It plays a crucial role in helping developers and operators gain insights into the performance and health of their systems, troubleshoot issues, and ensure reliability in modern, distributed infrastructure environments.

2) What is prometheus exporter?

A) A Prometheus Exporter is a part of software that allows it to fetch statistics from another, non-prometheus system. It converts those statistics into prometheus metrics, using a client library. You can start a web server which exposes a /metrics URL, and can see that URL display the system metrics.

3) **How To Install & configure prometheus, node_exporter and grafana on Ubuntu 20.04/22.04?**

A) For standalone installation of prometheus, node_exporter and grafana on UBUNTU 20.04/22.04 follow the following steps

To properly configure Prometheus, you must follow the below mentioned steps.

STEP-1: UPDATE SYSTEM PACKAGES

sudo apt update && sudo apt upgrade

STEP-2: CREATE PROMETHEUS USER AND GROUP

First, create the "prometheus" system group using the following command

sudo groupadd --system prometheus

Next, create the "prometheus" system user using the following command

sudo useradd -s /sbin/nologin --system -g prometheus prometheus

STEP 3: CREATE DIRECTORIES FOR PROMETHEUS

sudo mkdir /var/lib/prometheus

Next, create the primary configuration files directory for Prometheus using the following command. All Prometheus related data will be stored in this folder.

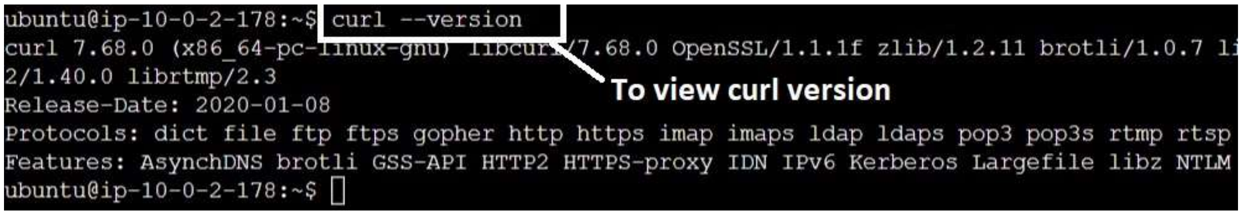
for i in rules rules.d files_sd; do sudo mkdir -p /etc/prometheus/${i}; done

STEP 4: DOWNLOAD PROMETHEUS

First check whether curl is available or not in UBUNTU, as follows

curl –version

If curl is available, the following message shown in screenshot will appear.



```
ubuntu@ip-10-0-2-178:~$ curl --version
curl 7.68.0 (x86_64-pc-linux-gnu) libcurl/7.68.0 OpenSSL/1.1.1f zlib/1.2.11 brotli/1.0.7 li
2/1.40.0 librtmp/2.3
Release-Date: 2020-01-08
Protocols: dict file ftp ftps gopher http https imap imaps ldap ldaps pop3 pop3s rtmp rtsp
Features: AsynchDNS brotli GSS-API HTTP2 HTTPS-proxy IDN IPv6 Kerberos Largefile libz NTLM
ubuntu@ip-10-0-2-178:~$ 
```

After that, run the following commands for downloading the Prometheus.

mkdir -p /tmp/prometheus

cd /tmp/prometheus

curl -s https://api.github.com/repos/prometheus/prometheus/releases/latest | grep browser_download_url | grep linux-amd64 | cut -d '"' -f 4 | wget -qi -

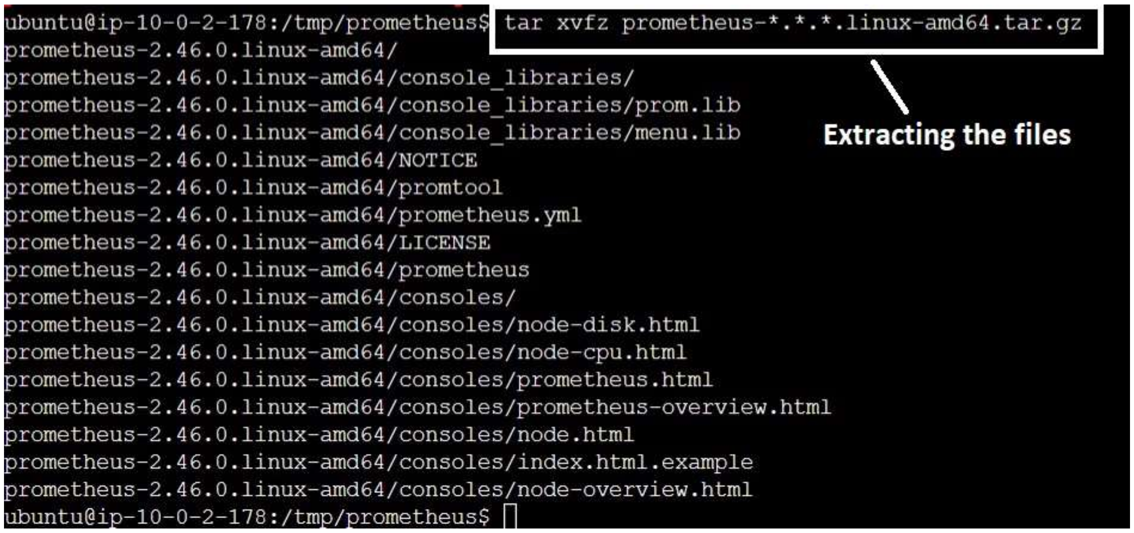
After executing the above commands, Prometheus will gets downloaded in that folder.

STEP 5: EXTRACT PROMETHEUS

Once you have downloaded the latest version of Prometheus for your Ubuntu system, you can extract the software using the following command.

tar xvfz prometheus-*.*.*.linux-amd64.tar.gz

After executing the above command, the following messages shown in screen will appear.



```
ubuntu@ip-10-0-2-178:/tmp/prometheus$ tar xvfz prometheus-*.*.*.linux-amd64.tar.gz
prometheus-2.46.0.linux-amd64/
prometheus-2.46.0.linux-amd64/console_libraries/
prometheus-2.46.0.linux-amd64/console_libraries/prom.lib
prometheus-2.46.0.linux-amd64/console_libraries/menu.lib
prometheus-2.46.0.linux-amd64/NOTICE
prometheus-2.46.0.linux-amd64/promtool
prometheus-2.46.0.linux-amd64/prometheus.yml
prometheus-2.46.0.linux-amd64/LICENSE
prometheus-2.46.0.linux-amd64/prometheus
prometheus-2.46.0.linux-amd64/consoles/
prometheus-2.46.0.linux-amd64/consoles/node-disk.html
prometheus-2.46.0.linux-amd64/consoles/node-cpu.html
prometheus-2.46.0.linux-amd64/consoles/prometheus.html
prometheus-2.46.0.linux-amd64/consoles/prometheus-overview.html
prometheus-2.46.0.linux-amd64/consoles/node.html
prometheus-2.46.0.linux-amd64/consoles/index.html.example
prometheus-2.46.0.linux-amd64/consoles/node-overview.html
ubuntu@ip-10-0-2-178:/tmp/prometheus$
```

Then, enter into the extracted folder by using the following command

cd prometheus*/

After entering into that folder, run the following commands for configuring the Prometheus.

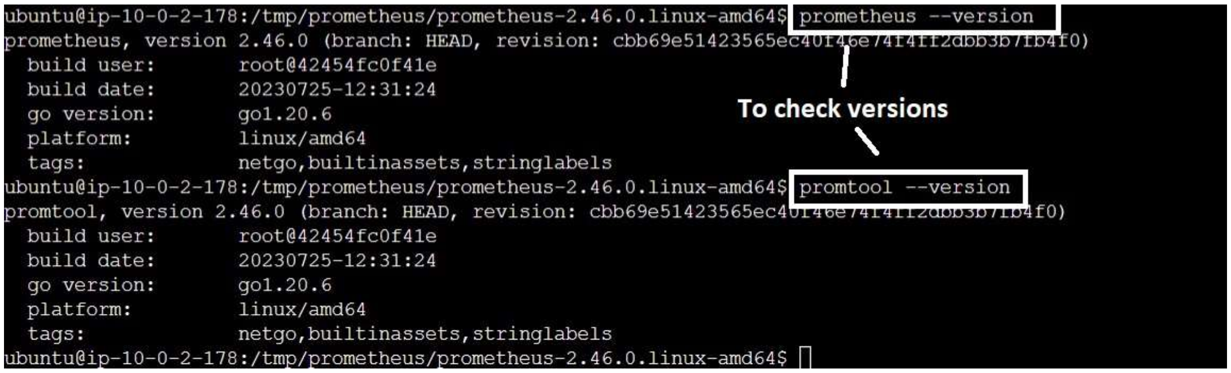
Next, move the binary files to the **/usr/local/bin/** directory using the following command.

sudo mv prometheus promtool /usr/local/bin/

To verify the installation of Prometheus, you can use the following commands.

prometheus --version
promtool --version

After executing the above commands, the following message will get displayed.



```
ubuntu@ip-10-0-2-178:/tmp/prometheus/prometheus-2.46.0.linux-amd64$ prometheus --version
prometheus, version 2.46.0 (branch: HEAD, revision: cbb69e51423565ec40f46e74f4ff2dbb3b7fb4f0)
  build user:       root@42454fc0f41e
  build date:       20230725-12:31:24
  go version:       go1.20.6
  platform:         linux/amd64
  tags:             netgo,builtinassets,stringlabels
ubuntu@ip-10-0-2-178:/tmp/prometheus/prometheus-2.46.0.linux-amd64$ promtool --version
promtool, version 2.46.0 (branch: HEAD, revision: cbb69e51423565ec40f46e74f4ff2dbb3b7fb4f0)
  build user:       root@42454fc0f41e
  build date:       20230725-12:31:24
  go version:       go1.20.6
  platform:         linux/amd64
  tags:             netgo,builtinassets,stringlabels
ubuntu@ip-10-0-2-178:/tmp/prometheus/prometheus-2.46.0.linux-amd64$
```

Then, move the Prometheus configuration template to the /etc/prometheus/ directory using the following command

sudo mv prometheus.yml /etc/prometheus/prometheus.yml

Finally, move the consoles and console_libraries directories to the /etc/prometheus/ directory using the following command.

sudo mv consoles/ console_libraries/ /etc/prometheus/

cd $HOME

<u>**STEP 6**</u>**:** CREATE SYSTEMD SERVICE

By default, Prometheus does not come with a systemd service, which makes it difficult to manage and control the software.

To, create the systemd service file using the following command.

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

After creating prometheus.service file, you have to paste the following content in it and save it.

```
[Unit]
Description=Prometheus
Documentation=https://prometheus.io/docs/introduction/overview/
Wants=network-online.target
After=network-online.target

[Service]
Type=simple
User=prometheus
Group=prometheus
ExecReload=/bin/kill -HUP \$MAINPID
ExecStart=/usr/local/bin/prometheus \
  --config.file=/etc/prometheus/prometheus.yml \
  --storage.tsdb.path=/var/lib/prometheus \
  --web.console.templates=/etc/prometheus/consoles \
  --web.console.libraries=/etc/prometheus/console_libraries \
  --web.listen-address=0.0.0.0:9090 \
  --web.external-url=

SyslogIdentifier=prometheus
Restart=always

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

Next, change the directory permissions for the Prometheus user and group using the following commands, one by one.

for i in rules rules.d files_sd; do sudo chown -R prometheus:prometheus /etc/prometheus/${i}; done

for i in rules rules.d files_sd; do sudo chmod -R 775 /etc/prometheus/${i}; done

sudo chown -R prometheus:prometheus /var/lib/prometheus/

After changing the directory permissions, reload the systemd daemon using the following command.

sudo systemctl daemon-reload

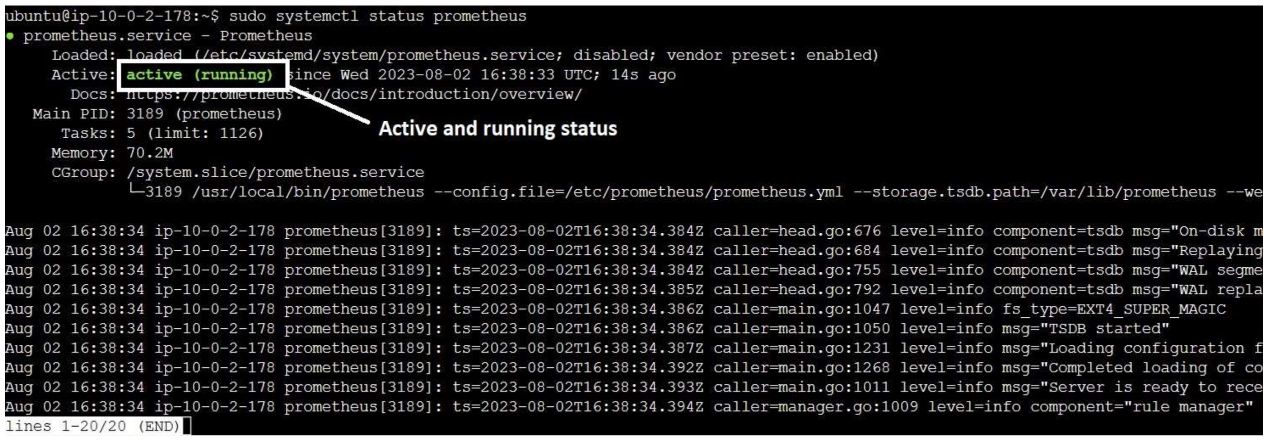
Finally, to start the Prometheus systemd service use the following command.

sudo systemctl start prometheus

After starting the prometheus service, use the following command to view the status.

sudo systemctl status prometheus

After executing the above command, the following screen will appear.



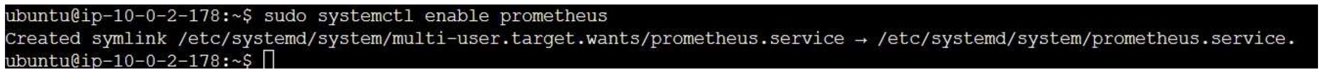
```
ubuntu@ip-10-0-2-178:~$ sudo systemctl status prometheus
● prometheus.service - Prometheus
     Loaded: loaded (/etc/systemd/system/prometheus.service; disabled; vendor preset: enabled)
     Active: active (running) since Wed 2023-08-02 16:38:33 UTC; 14s ago
       Docs: https://prometheus.io/docs/introduction/overview/
   Main PID: 3189 (prometheus)
      Tasks: 5 (limit: 1126)
     Memory: 70.2M
     CGroup: /system.slice/prometheus.service
             └─3189 /usr/local/bin/prometheus --config.file=/etc/prometheus/prometheus.yml --storage.tsdb.path=/var/lib/prometheus --we

Aug 02 16:38:34 ip-10-0-2-178 prometheus[3189]: ts=2023-08-02T16:38:34.384Z caller=head.go:676 level=info component=tsdb msg="On-disk m
Aug 02 16:38:34 ip-10-0-2-178 prometheus[3189]: ts=2023-08-02T16:38:34.384Z caller=head.go:684 level=info component=tsdb msg="Replaying
Aug 02 16:38:34 ip-10-0-2-178 prometheus[3189]: ts=2023-08-02T16:38:34.384Z caller=head.go:755 level=info component=tsdb msg="WAL segme
Aug 02 16:38:34 ip-10-0-2-178 prometheus[3189]: ts=2023-08-02T16:38:34.385Z caller=head.go:792 level=info component=tsdb msg="WAL repla
Aug 02 16:38:34 ip-10-0-2-178 prometheus[3189]: ts=2023-08-02T16:38:34.386Z caller=main.go:1047 level=info fs_type=EXT4_SUPER_MAGIC
Aug 02 16:38:34 ip-10-0-2-178 prometheus[3189]: ts=2023-08-02T16:38:34.386Z caller=main.go:1050 level=info msg="TSDB started"
Aug 02 16:38:34 ip-10-0-2-178 prometheus[3189]: ts=2023-08-02T16:38:34.387Z caller=main.go:1231 level=info msg="Loading configuration f
Aug 02 16:38:34 ip-10-0-2-178 prometheus[3189]: ts=2023-08-02T16:38:34.392Z caller=main.go:1268 level=info msg="Completed loading of co
Aug 02 16:38:34 ip-10-0-2-178 prometheus[3189]: ts=2023-08-02T16:38:34.393Z caller=main.go:1011 level=info msg="Server is ready to rece
Aug 02 16:38:34 ip-10-0-2-178 prometheus[3189]: ts=2023-08-02T16:38:34.394Z caller=manager.go:1009 level=info component="rule manager"
lines 1-20/20 (END)
```

To start the Prometheus service automatically, when system startup, use the following command.

sudo systemctl enable prometheus

The following message will appear.



```
ubuntu@ip-10-0-2-178:~$ sudo systemctl enable prometheus
Created symlink /etc/systemd/system/multi-user.target.wants/prometheus.service → /etc/systemd/system/prometheus.service.
ubuntu@ip-10-0-2-178:~$
```

STEP 7: CONFIGURE SECURITY GROUPS/ UFW FIREWALL

Option-1: If you are using UBUNTU in AWS cloud, you have to edit inbound rules for the ports 9090 and 9093 in the security groups.

Note:- Don't do the following option2 in AWS cloud.
Option-2: If you are using UBUNTU in local machine, you have to allow the ports and enable the UFW status. By using the following commands.

sudo ufw status (It displays the UFW status)

```
sudo ufw allow 9090/tcp
sudo ufw allow 9093/tcp
```

After executing the above commands, you have to enable the UFW by using the following commands.

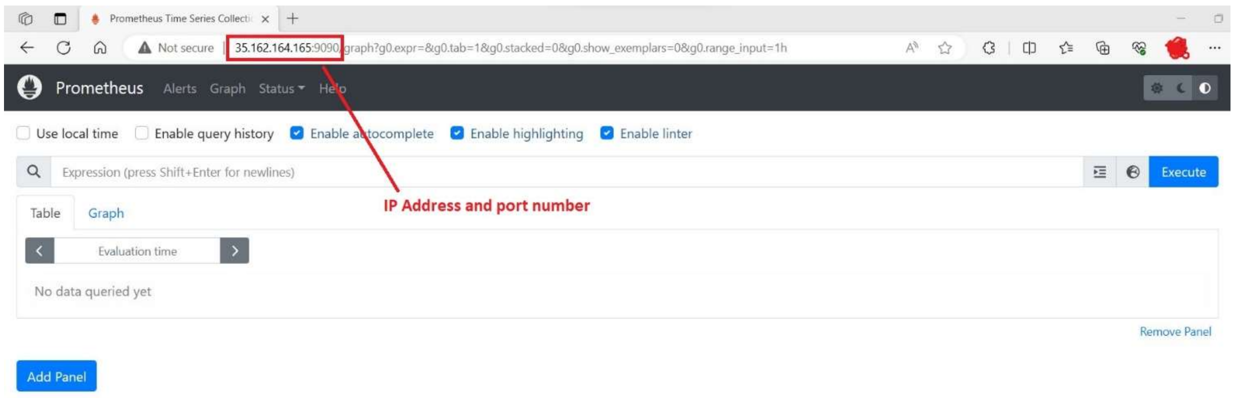
sudo ufw enable (Only Installing in local VM's we have to do this)

STEP 8: ACCESS PROMETHEUS WEB UI

After completion of above steps, to view prometheus web page use the following URL in browser.

http://YOUR_IP:9090/

The following page will appear.



If you are seeing this page, prometheus setup was completed successfully.

Node Exporter Installation

Now we have to install node_exporter for monitoring linux system and visualize the data, Grafana need to be installed and integrated with node_exporter as follows.

To download node_exporter, first enter into /opt directory. As follows

```
cd /opt
```

Then, we have to execute the following commands for downloading the node_exporter.

```
sudo wget https://github.com/prometheus/node_exporter/releases/download/v1.6.1/node_exporter-1.6.1.linux-amd64.tar.gz
```

After completion of downloading the file, extract that folder by using the following commands.

```
sudo tar -xvzf node_exporter-1.6.1.linux-amd64.tar.gz
```

After extracting the file, rename the folder by using the following commands

```
sudo mv node_exporter-1.6.1.linux-amd64 node_exporter
```

By, default node_exporter was not starting automatically. So, to set it we have to create a systemd service file, by using the following commands.

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

paste the following content in that service file

```
[Unit]
Description=Prometheus Node Exporter
Documentation=https://github.com/prometheus/node_exporter
After=network-online.target

[Service]
User=root
EnvironmentFile=/etc/default/node_exporter
ExecStart=/opt/node_exporter/node_exporter $OPTIONS
Restart=on-failure
RestartSec=5

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

After saving the file, you have to run the following command.

sudo systemctl daemon-reload

After that, create the options file by using the following commands

sudo vi /etc/default/node_exporter

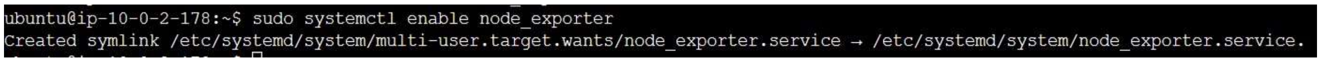
We have to paste the following content into that file.

OPTIONS=''

To start the service at system startup. We have to execute the following commands.

systemctl enable node_exporter

After executing the above command, the following message will appear.



```
ubuntu@ip-10-0-2-178:~$ sudo systemctl enable node_exporter
Created symlink /etc/systemd/system/multi-user.target.wants/node_exporter.service → /etc/systemd/system/node_exporter.service.
```

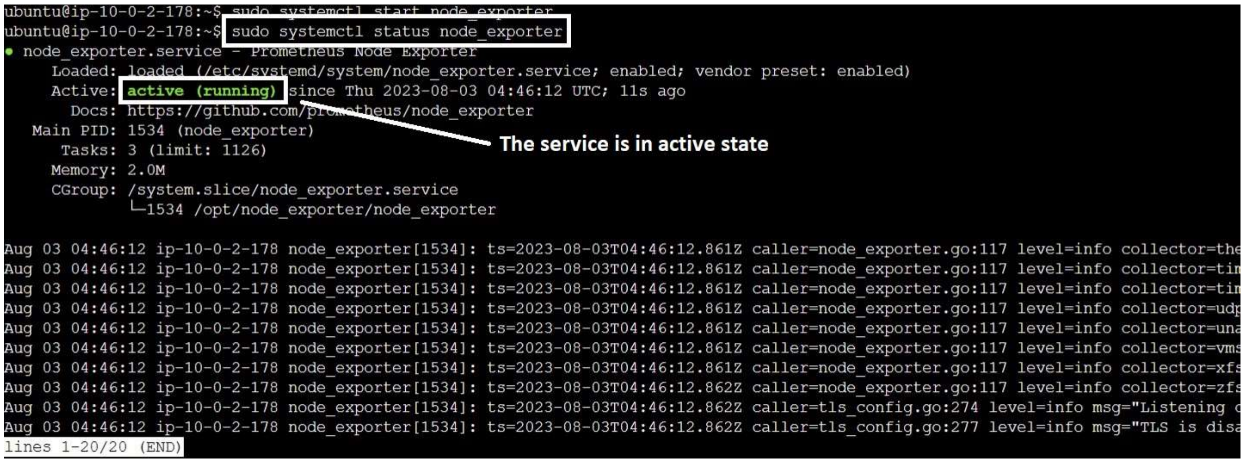
To start the node_exporter service, execute the following commands.

systemctl start node_exporter

To view the status, execute the following command.

systemctl status node_exporter

After executing the above command, the following message will appear.



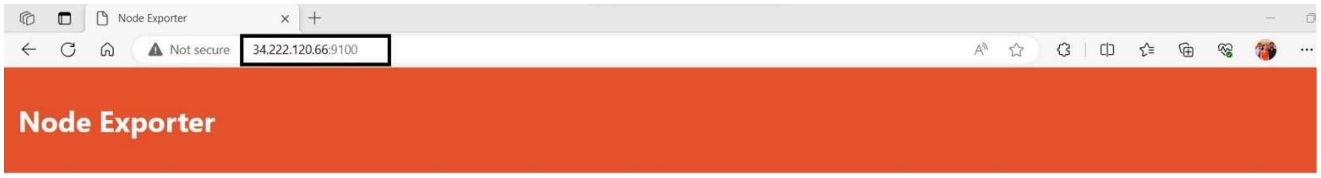
```
ubuntu@ip-10-0-2-178:~$ sudo systemctl start node_exporter
ubuntu@ip-10-0-2-178:~$ sudo systemctl status node_exporter
● node_exporter.service - Prometheus Node Exporter
     Loaded: loaded (/etc/systemd/system/node_exporter.service; enabled; vendor preset: enabled)
     Active: active (running) since Thu 2023-08-03 04:46:12 UTC; 11s ago
       Docs: https://github.com/prometheus/node_exporter
   Main PID: 1534 (node_exporter)
      Tasks: 3 (limit: 1126)
     Memory: 2.0M
     CGroup: /system.slice/node_exporter.service
             └─1534 /opt/node_exporter/node_exporter

Aug 03 04:46:12 ip-10-0-2-178 node_exporter[1534]: ts=2023-08-03T04:46:12.861Z caller=node_exporter.go:117 level=info collector=the
Aug 03 04:46:12 ip-10-0-2-178 node_exporter[1534]: ts=2023-08-03T04:46:12.861Z caller=node_exporter.go:117 level=info collector=tim
Aug 03 04:46:12 ip-10-0-2-178 node_exporter[1534]: ts=2023-08-03T04:46:12.861Z caller=node_exporter.go:117 level=info collector=tim
Aug 03 04:46:12 ip-10-0-2-178 node_exporter[1534]: ts=2023-08-03T04:46:12.861Z caller=node_exporter.go:117 level=info collector=udp
Aug 03 04:46:12 ip-10-0-2-178 node_exporter[1534]: ts=2023-08-03T04:46:12.861Z caller=node_exporter.go:117 level=info collector=una
Aug 03 04:46:12 ip-10-0-2-178 node_exporter[1534]: ts=2023-08-03T04:46:12.861Z caller=node_exporter.go:117 level=info collector=vms
Aug 03 04:46:12 ip-10-0-2-178 node_exporter[1534]: ts=2023-08-03T04:46:12.861Z caller=node_exporter.go:117 level=info collector=xfs
Aug 03 04:46:12 ip-10-0-2-178 node_exporter[1534]: ts=2023-08-03T04:46:12.862Z caller=node_exporter.go:117 level=info collector=zfs
Aug 03 04:46:12 ip-10-0-2-178 node_exporter[1534]: ts=2023-08-03T04:46:12.862Z caller=tls_config.go:274 level=info msg="Listening o
Aug 03 04:46:12 ip-10-0-2-178 node_exporter[1534]: ts=2023-08-03T04:46:12.862Z caller=tls_config.go:277 level=info msg="TLS is disa
lines 1-20/20 (END)
```

To check the node_exporter web UI, execute the following URL in your browser, node_exporter port number is 9100.

http://Your_IP:9100/

After entering that URL in browser, the following page will appear.



Prometheus Node Exporter

Version: (version=1.6.1, branch=HEAD, revision=4a1b77600c1873a8233f3ffb55afcedbb63b8d84)

- Metrics

As this page appears, you have successfully installed node_exporter.

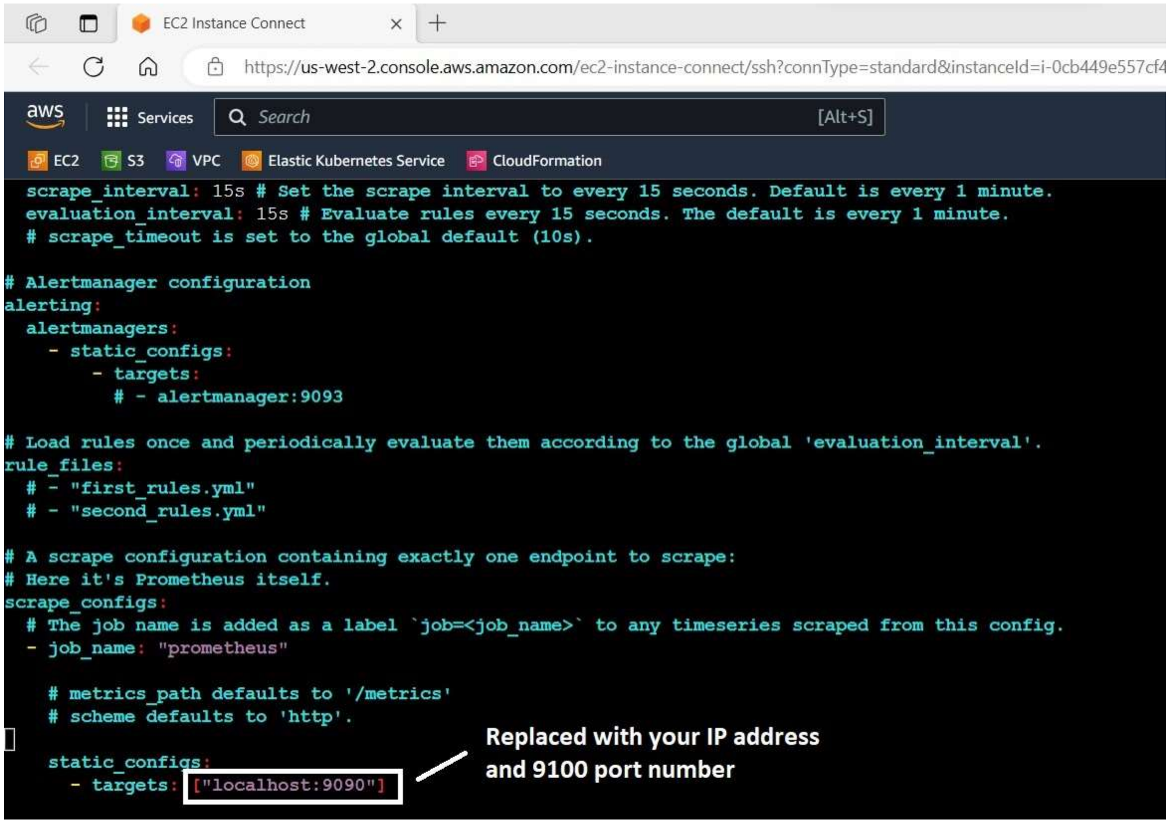
Integration of prometheus and node_exporter

For collecting linux system metrics, we need node_exporter and it have to be integrated with prometheus server. For collecting metrics.

Follow the below steps, for integrating both

vi /etc/prometheus/prometheus.yml

After opening that file, you will see the following screen.


EC2 Instance Connect
https://us-west-2.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-0cb449e557cf4
aws
Services
Search
[Alt+S]
EC2
S3
VPC
Elastic Kubernetes Service
CloudFormation
Replaced with your IP address and 9100 port number

```
  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"]
```

At the bottom, you will find the following lines, there you have to edit those. In place of localhost IP address shall be given and in place of 9090 port, you have to give 9100

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

After replacing the IP and port number, save the file and restart the prometheus.service by using the following commands.

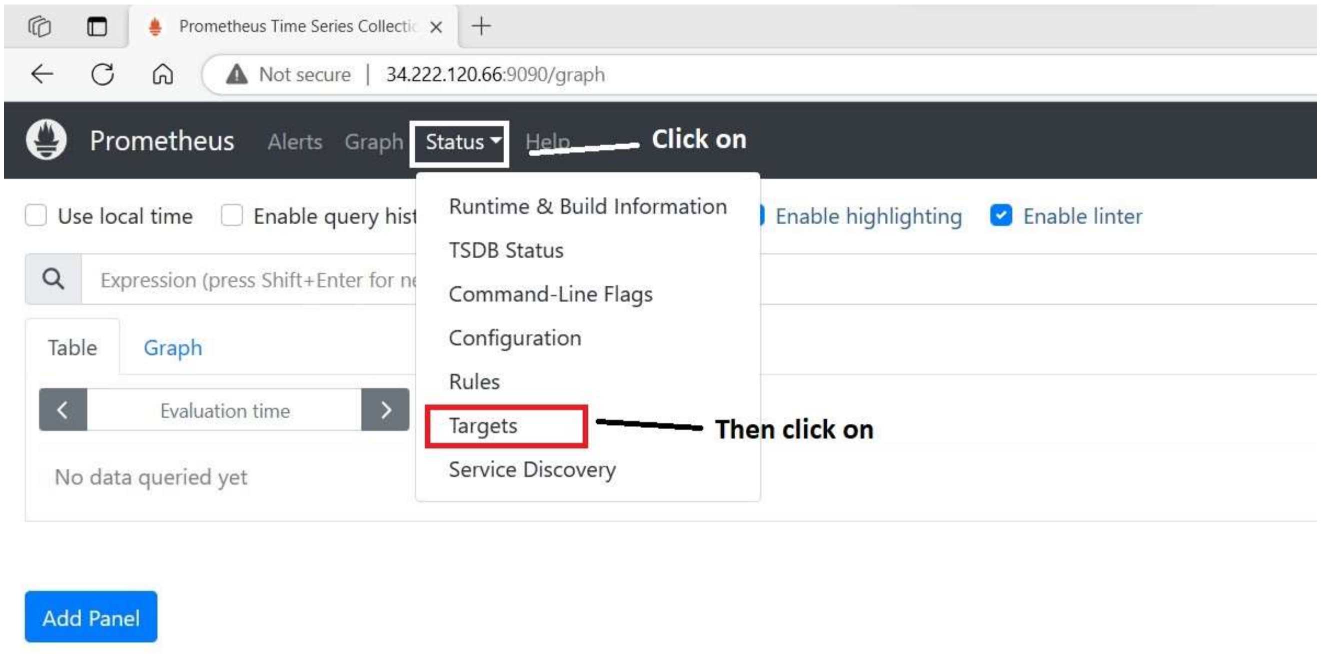
```
    - targets: ["34.222.120.66:9100"]
```

sudo systemctl restart prometheus.service

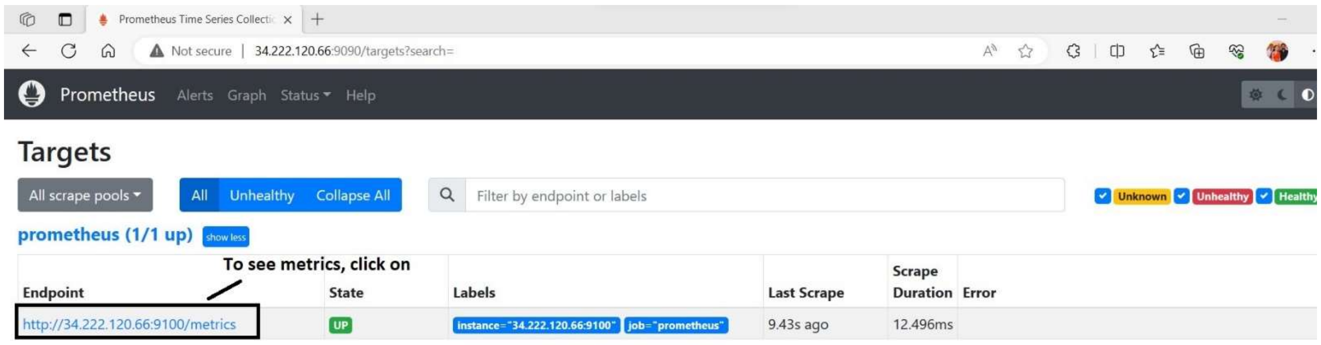
Now, prometheus and node_exporter had integrated. We can view that in web UI, as shown below.

http://Your_IP:9090

The following page will appear

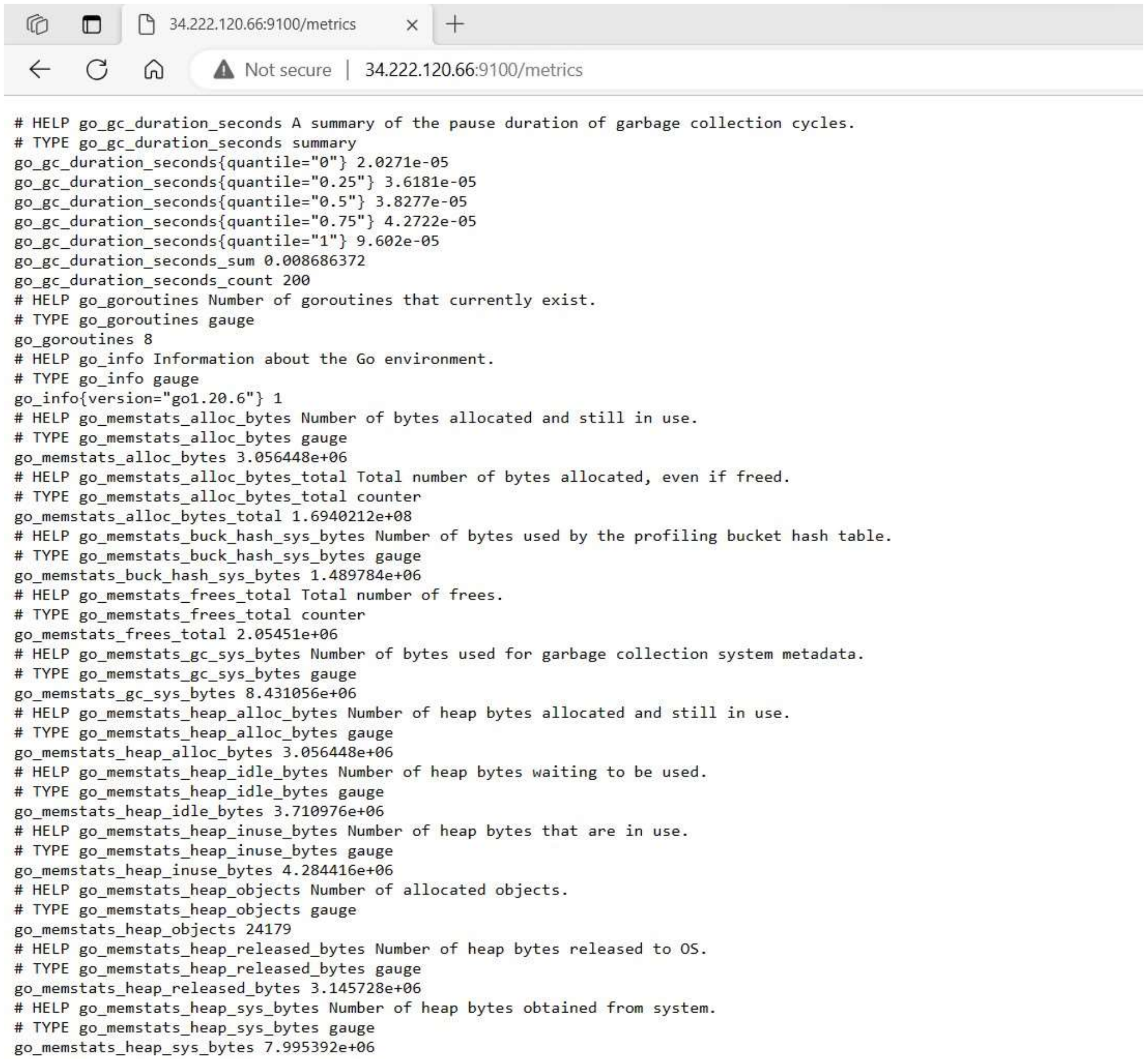


After clicking on targets option, the following page will appear.



Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://34.222.120.66:9100/metrics	UP	instance="34.222.120.66:9100" job="prometheus"	9.43s ago	12.496ms	

After clicking on that link, to see metrics the following page will appear.


34.222.120.66:9100/metrics
Not secure | 34.222.120.66:9100/metrics

```
# HELP go_gc_duration_seconds A summary of the pause duration of garbage collection cycles.
# TYPE go_gc_duration_seconds summary
go_gc_duration_seconds{quantile="0"} 2.0271e-05
go_gc_duration_seconds{quantile="0.25"} 3.6181e-05
go_gc_duration_seconds{quantile="0.5"} 3.8277e-05
go_gc_duration_seconds{quantile="0.75"} 4.2722e-05
go_gc_duration_seconds{quantile="1"} 9.602e-05
go_gc_duration_seconds_sum 0.008686372
go_gc_duration_seconds_count 200
# HELP go_goroutines Number of goroutines that currently exist.
# TYPE go_goroutines gauge
go_goroutines 8
# HELP go_info Information about the Go environment.
# TYPE go_info gauge
go_info{version="go1.20.6"} 1
# HELP go_memstats_alloc_bytes Number of bytes allocated and still in use.
# TYPE go_memstats_alloc_bytes gauge
go_memstats_alloc_bytes 3.056448e+06
# HELP go_memstats_alloc_bytes_total Total number of bytes allocated, even if freed.
# TYPE go_memstats_alloc_bytes_total counter
go_memstats_alloc_bytes_total 1.6940212e+08
# HELP go_memstats_buck_hash_sys_bytes Number of bytes used by the profiling bucket hash table.
# TYPE go_memstats_buck_hash_sys_bytes gauge
go_memstats_buck_hash_sys_bytes 1.489784e+06
# HELP go_memstats_frees_total Total number of frees.
# TYPE go_memstats_frees_total counter
go_memstats_frees_total 2.05451e+06
# HELP go_memstats_gc_sys_bytes Number of bytes used for garbage collection system metadata.
# TYPE go_memstats_gc_sys_bytes gauge
go_memstats_gc_sys_bytes 8.431056e+06
# HELP go_memstats_heap_alloc_bytes Number of heap bytes allocated and still in use.
# TYPE go_memstats_heap_alloc_bytes gauge
go_memstats_heap_alloc_bytes 3.056448e+06
# HELP go_memstats_heap_idle_bytes Number of heap bytes waiting to be used.
# TYPE go_memstats_heap_idle_bytes gauge
go_memstats_heap_idle_bytes 3.710976e+06
# HELP go_memstats_heap_inuse_bytes Number of heap bytes that are in use.
# TYPE go_memstats_heap_inuse_bytes gauge
go_memstats_heap_inuse_bytes 4.284416e+06
# HELP go_memstats_heap_objects Number of allocated objects.
# TYPE go_memstats_heap_objects gauge
go_memstats_heap_objects 24179
# HELP go_memstats_heap_released_bytes Number of heap bytes released to OS.
# TYPE go_memstats_heap_released_bytes gauge
go_memstats_heap_released_bytes 3.145728e+06
# HELP go_memstats_heap_sys_bytes Number of heap bytes obtained from system.
# TYPE go_memstats_heap_sys_bytes gauge
go_memstats_heap_sys_bytes 7.995392e+06
```

You can see the logs and metrics, but we cannot understand those metrics. To visualize the data received from node_exporter. We have to install Grafana and it shall be integrated.

Grafana Installation

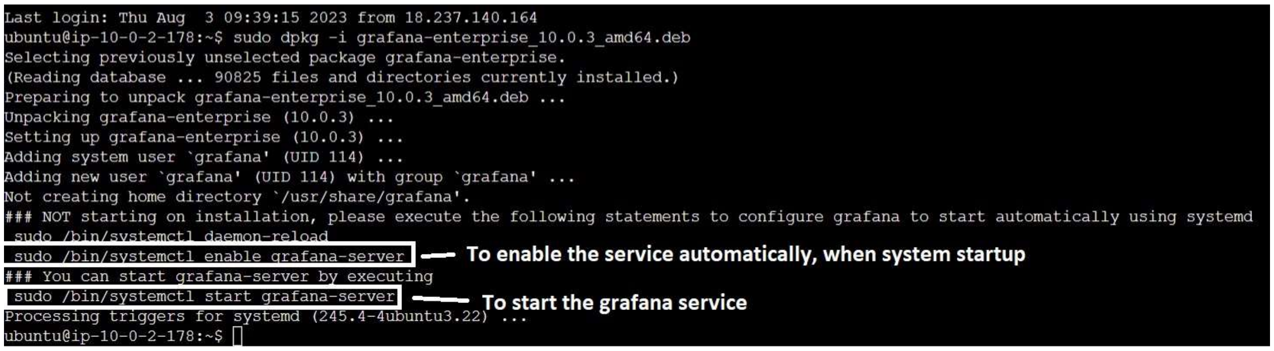
To install the grafana, you have to execute the following commands in UBUNTU.

sudo apt-get install -y adduser libfontconfig1

wget https://dl.grafana.com/enterprise/release/grafana-enterprise_10.0.3_amd64.deb

sudo dpkg -i grafana-enterprise_10.0.3_amd64.deb

After executing the above commands, the following message screen will appear.



```
Last login: Thu Aug  3 09:39:15 2023 from 18.237.140.164
ubuntu@ip-10-0-2-178:~$ sudo dpkg -i grafana-enterprise_10.0.3_amd64.deb
Selecting previously unselected package grafana-enterprise.
(Reading database ... 90825 files and directories currently installed.)
Preparing to unpack grafana-enterprise_10.0.3_amd64.deb ...
Unpacking grafana-enterprise (10.0.3) ...
Setting up grafana-enterprise (10.0.3) ...
Adding system user `grafana' (UID 114) ...
Adding new user `grafana' (UID 114) with group `grafana' ...
Not creating home directory `/usr/share/grafana'.
### NOT starting on installation, please execute the following statements to configure grafana to start automatically using systemd
 sudo /bin/systemctl daemon-reload
 sudo /bin/systemctl enable grafana-server
### You can start grafana-server by executing
 sudo /bin/systemctl start grafana-server
Processing triggers for systemd (245.4-4ubuntu3.22) ...
ubuntu@ip-10-0-2-178:~$ 
```

To enable the service automatically, when system startup
To start the grafana service

To enable the grafana server start automatically, when system start-up, we have to execute the following commands.

sudo systemctl enable grafana-server

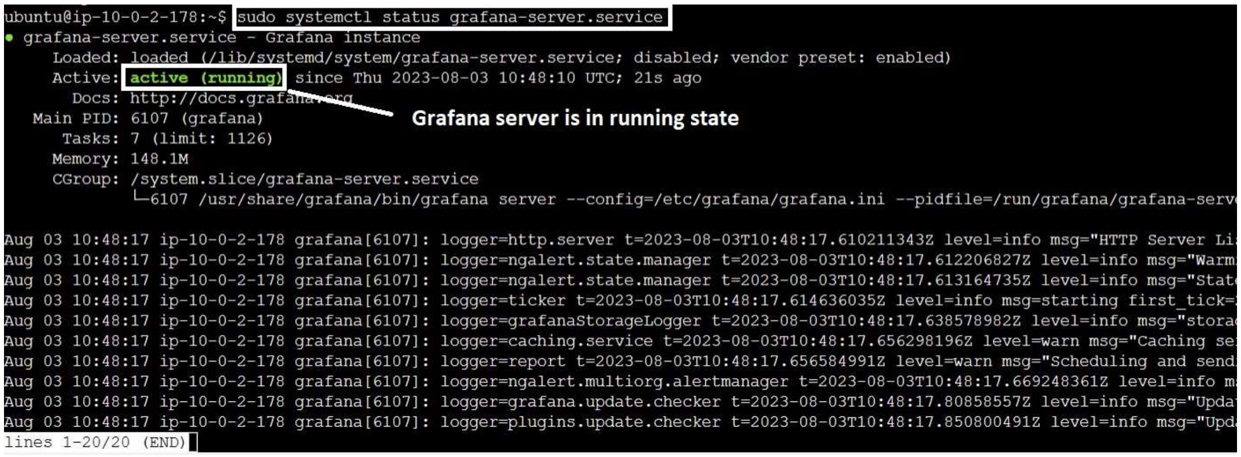
To start the grafana server, execute the following command.

sudo systemctl start grafana-server

To check the grafana server status, execute the following command.

sudo systemctl status grafana-server

After executing the above command, the following message will appear.



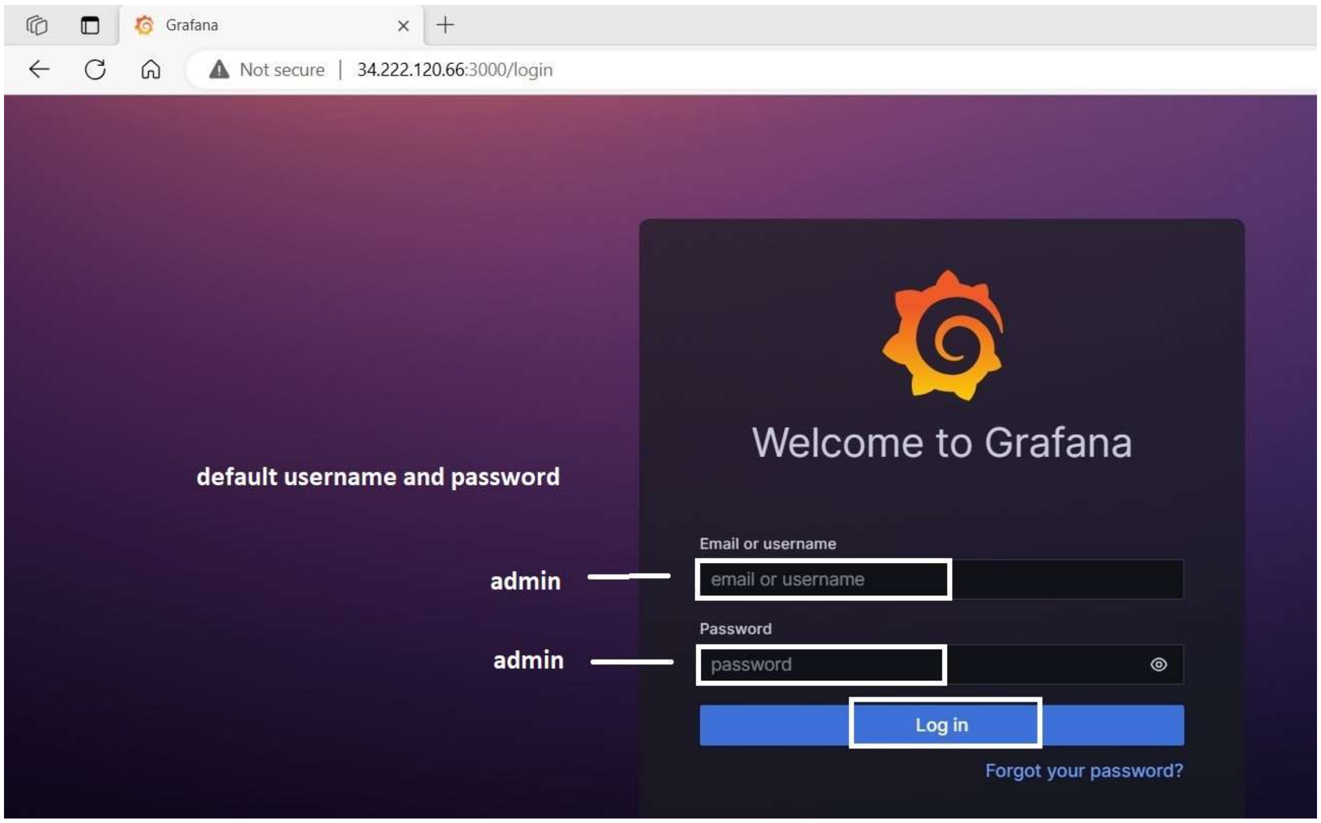
```
ubuntu@ip-10-0-2-178:~$ sudo systemctl status grafana-server.service
● grafana-server.service - Grafana instance
     Loaded: loaded (/lib/systemd/system/grafana-server.service; disabled; vendor preset: enabled)
     Active: active (running) since Thu 2023-08-03 10:48:10 UTC; 21s ago
       Docs: http://docs.grafana.org
   Main PID: 6107 (grafana)
      Tasks: 7 (limit: 1126)
     Memory: 148.1M
     CGroup: /system.slice/grafana-server.service
             └─6107 /usr/share/grafana/bin/grafana server --config=/etc/grafana/grafana.ini --pidfile=/run/grafana/grafana-serv

Aug 03 10:48:17 ip-10-0-2-178 grafana[6107]: logger=http.server t=2023-08-03T10:48:17.610211343Z level=info msg="HTTP Server Li
Aug 03 10:48:17 ip-10-0-2-178 grafana[6107]: logger=ngalert.state.manager t=2023-08-03T10:48:17.612206827Z level=info msg="Warm
Aug 03 10:48:17 ip-10-0-2-178 grafana[6107]: logger=ngalert.state.manager t=2023-08-03T10:48:17.613164735Z level=info msg="Stat
Aug 03 10:48:17 ip-10-0-2-178 grafana[6107]: logger=ticker t=2023-08-03T10:48:17.614636035Z level=info msg=starting first_tick=
Aug 03 10:48:17 ip-10-0-2-178 grafana[6107]: logger=grafanaStorageLogger t=2023-08-03T10:48:17.638578982Z level=info msg="storа
Aug 03 10:48:17 ip-10-0-2-178 grafana[6107]: logger=caching.service t=2023-08-03T10:48:17.656298196Z level=warn msg="Caching se
Aug 03 10:48:17 ip-10-0-2-178 grafana[6107]: logger=report t=2023-08-03T10:48:17.656584991Z level=warn msg="Scheduling and send
Aug 03 10:48:17 ip-10-0-2-178 grafana[6107]: logger=ngalert.multiorg.alertmanager t=2023-08-03T10:48:17.669248361Z level=info m
Aug 03 10:48:17 ip-10-0-2-178 grafana[6107]: logger=grafana.update.checker t=2023-08-03T10:48:17.80858557Z level=info msg="Upda
Aug 03 10:48:17 ip-10-0-2-178 grafana[6107]: logger=plugins.update.checker t=2023-08-03T10:48:17.850800491Z level=info msg="Upd
lines 1-20/20 (END)
```

As, it shows the server in active state. We have to open the following URL in browser, to view web UI. Grafana server port number is 3000.

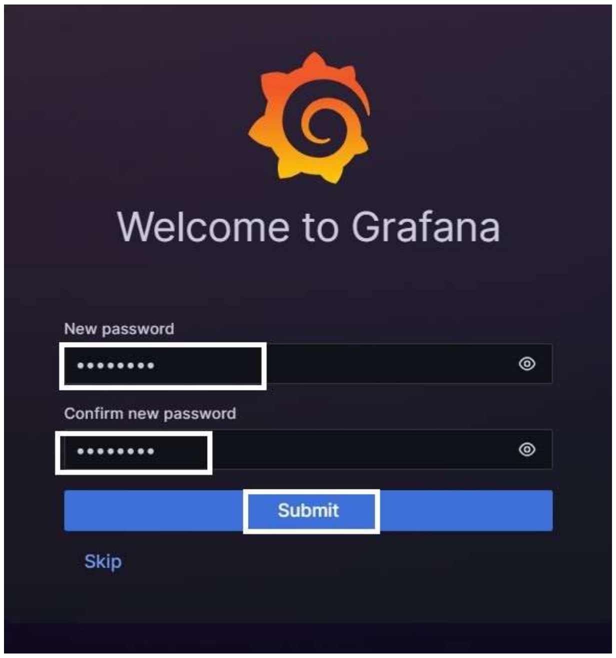
http://your_ip:3000/

The following page will display.



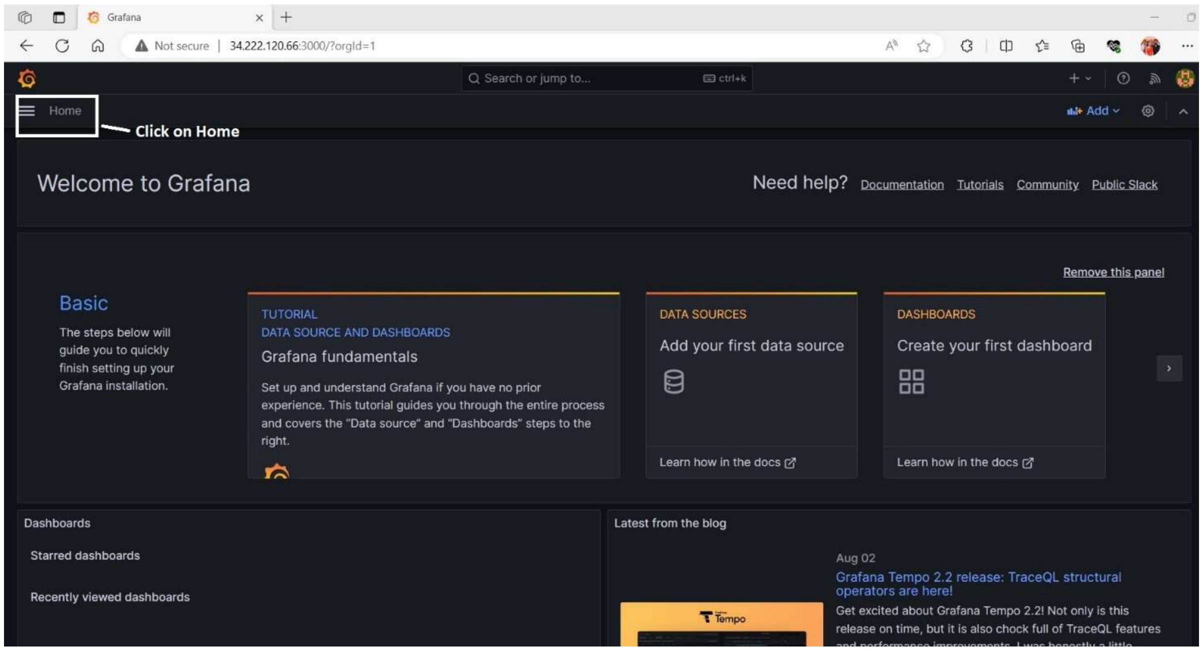
You have to enter username- **admin** and password- **admin**, after entering those click on '**log in**' button.

After clicking on that log in button. The following page will appear.



We have to set new password for grafana server and click on submit button.

After clicking on submit button, the following page will appear.



Welcome to Grafana

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Basic

The steps below will guide you to quickly finish setting up your Grafana installation.

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DATA SOURCES
Add your first data source
Learn how in the docs

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Create your first dashboard
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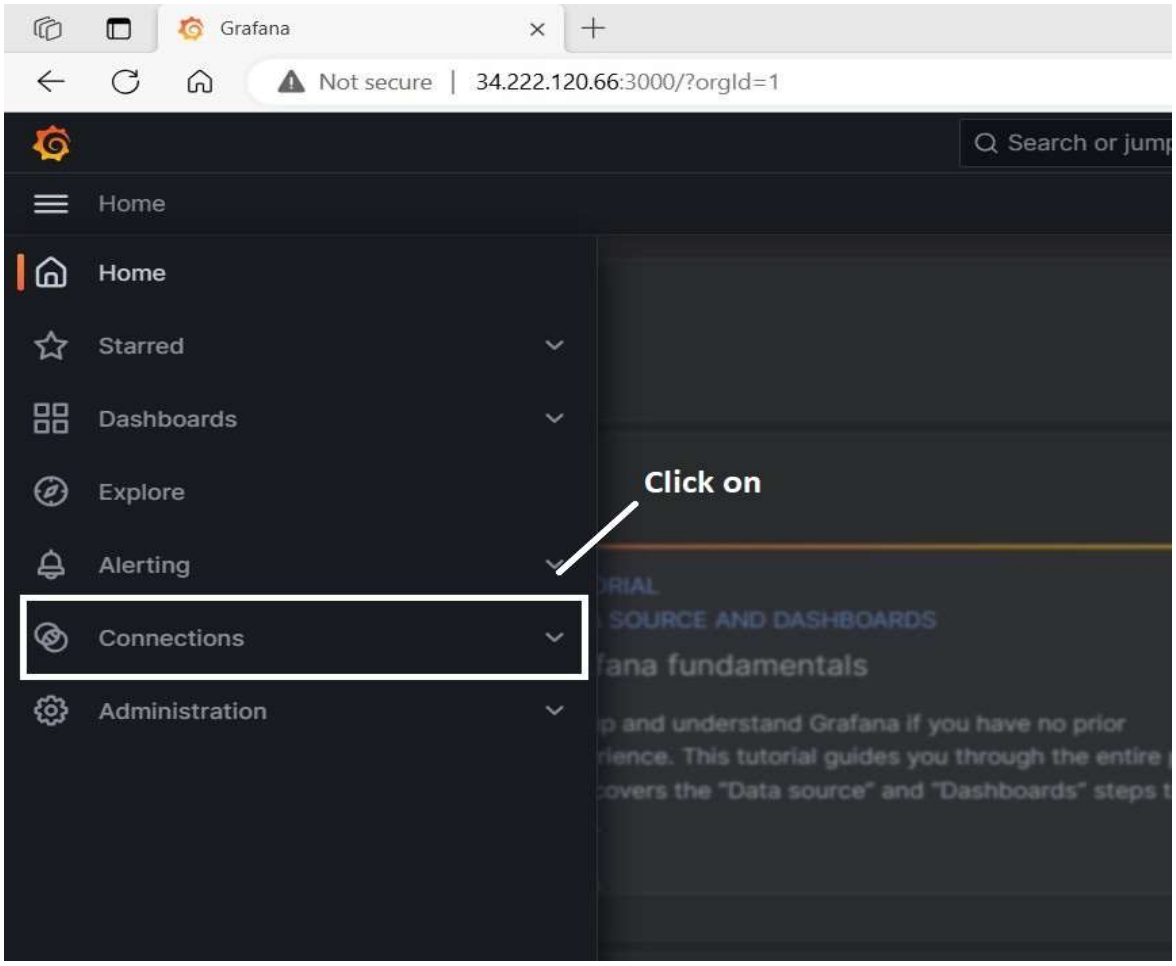
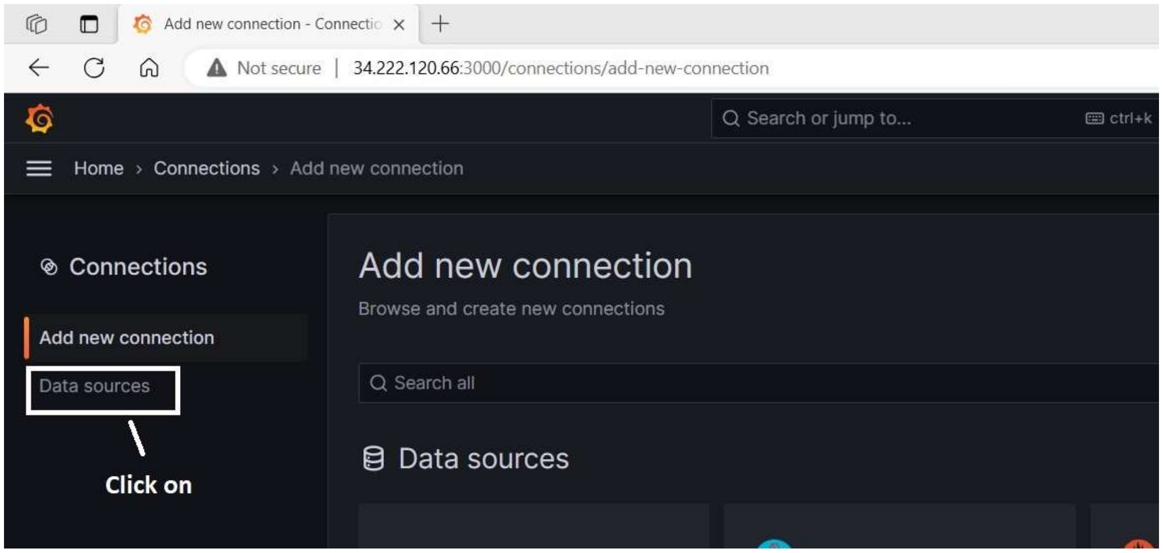
Starred dashboards
Recently viewed dashboards

Latest from the blog
Aug 02
Grafana Tempo 2.2 release: TraceQL structural operators are here!
Get excited about Grafana Tempo 2.2! Not only is this release on time, but it is also chock full of TraceQL features

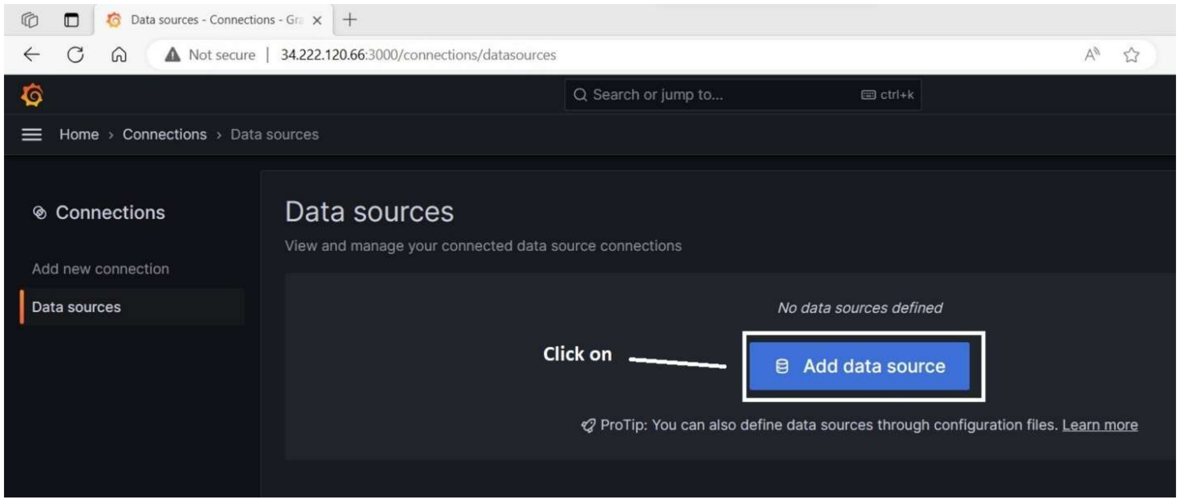
After clicking on home button, the following options screen will display.



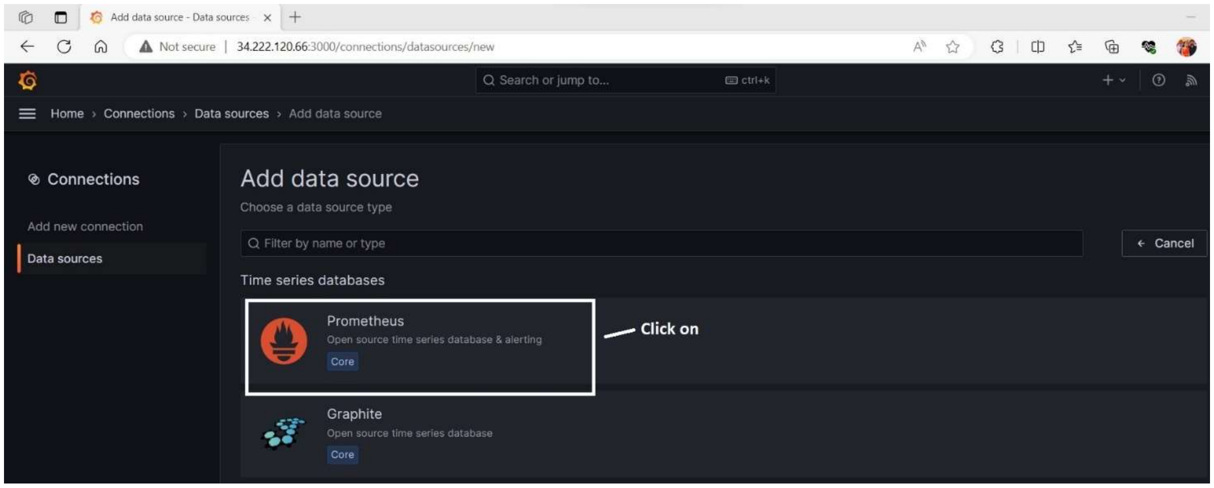
After clicking on connections button, the following page will display.


Add new connection - Connectio
Not secure | 34.222.120.66:3000/connections/add-new-connection
Search or jump to...
ctrl+k
Home › Connections › Add new connection
Connections
Add new connection
Data sources
Click on
Add new connection
Browse and create new connections
Search all
Data sources

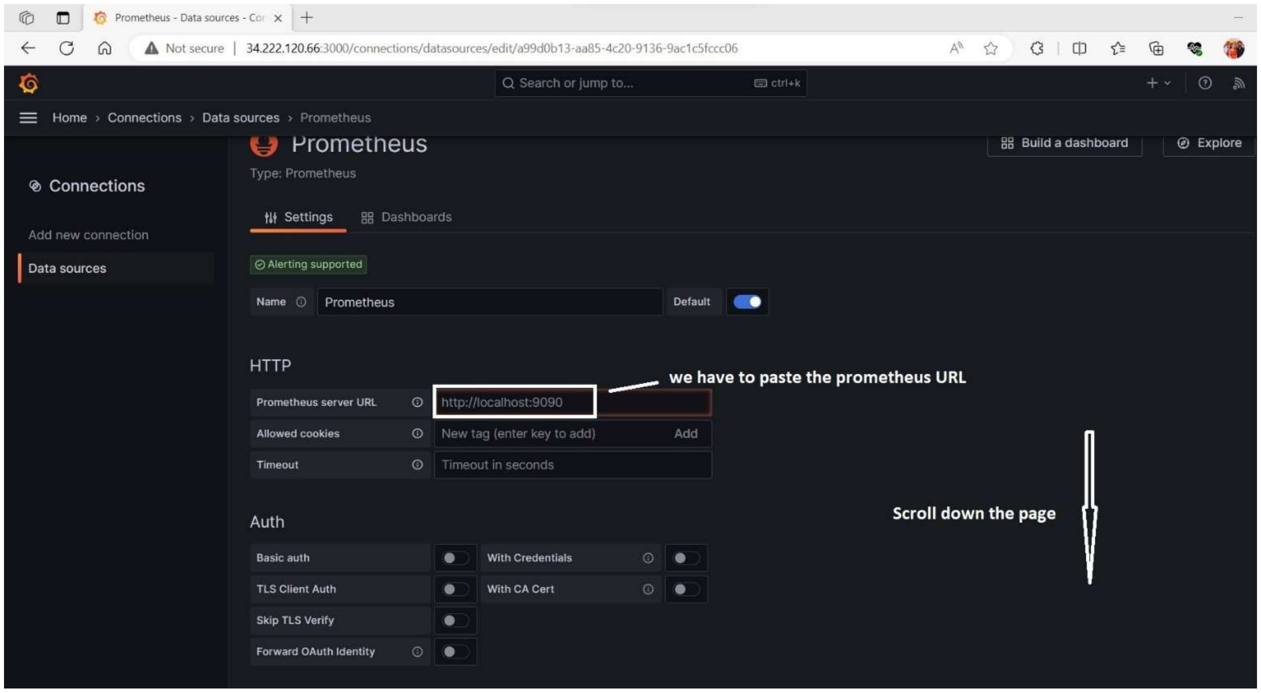
After clicking on '**data sources**' button, the following page will be appeared.


Data sources - Connections - Gr
Not secure | 34.222.120.66:3000/connections/datasources
Search or jump to...
ctrl+k
Home › Connections › Data sources
Connections
Add new connection
Data sources
Data sources
View and manage your connected data source connections
No data sources defined
Click on
Add data source
ProTip: You can also define data sources through configuration files. Learn more

After clicking on '**Add data source**' button, the following page will be appeared.


Add data source - Data sources
Not secure | 34.222.120.66:3000/connections/datasources/new
Search or jump to...
ctrl+k
Home › Connections › Data sources › Add data source
Connections
Add new connection
Data sources
Add data source
Choose a data source type
Filter by name or type
Cancel
Time series databases
Prometheus
Open source time series database & alerting
Core
Click on
Graphite
Open source time series database
Core

After clicking on 'prometheus' button, the following page will display.



34.222.120.66:3000/connections/datasources/edit/a99d0b13-aa85-4c20-9136-9ac1c5fccc06

Home › Connections › Data sources › Prometheus

Prometheus

Type: Prometheus

Alerting supported

Name: Prometheus — Default: on

HTTP

Prometheus server URL: http://localhost:9090

Allowed cookies: New tag (enter key to add)

Timeout: Timeout in seconds

Auth

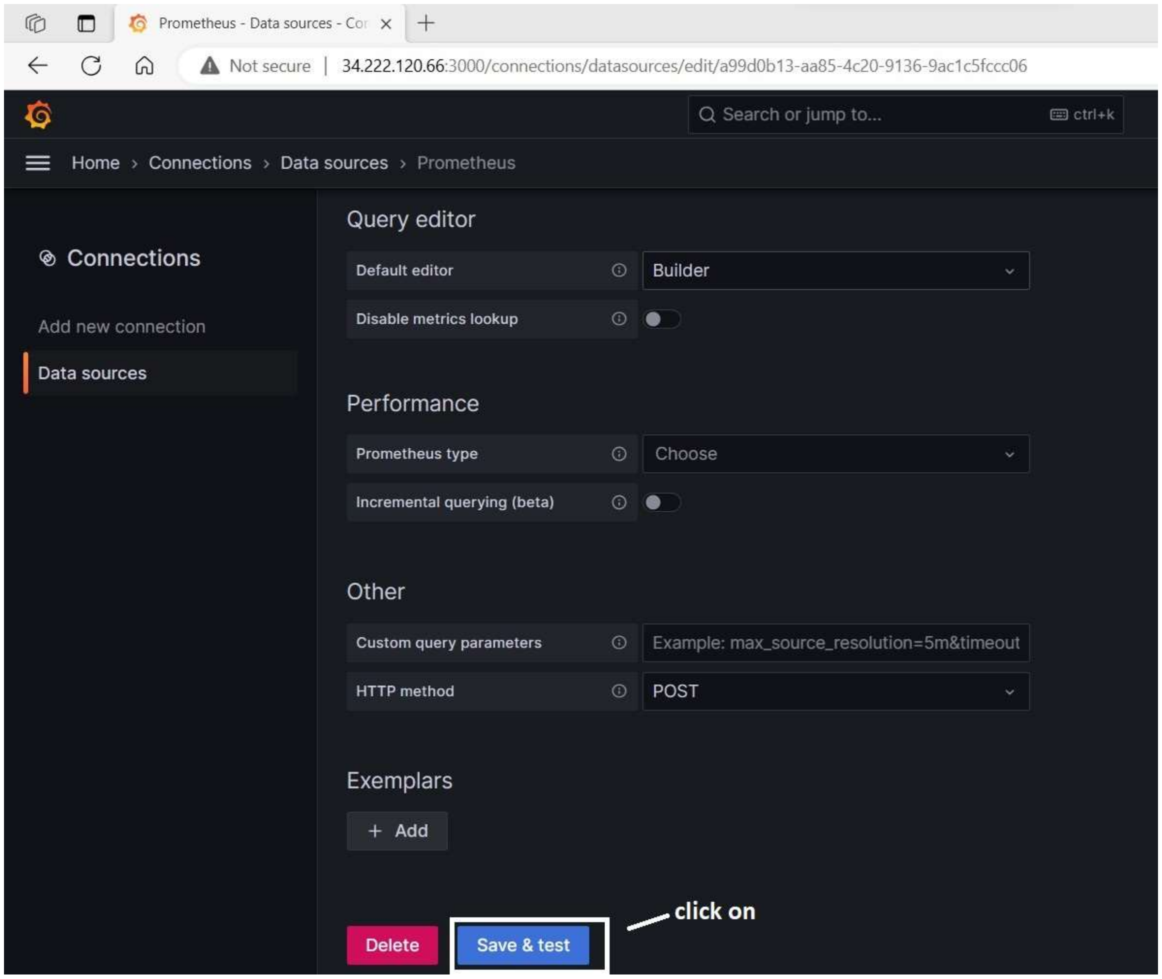
Basic auth: off — With Credentials: off

TLS Client Auth: off — With CA Cert: off

Skip TLS Verify: off

Forward OAuth Identity: off

After scrolling down the above page, the following page will appear.



34.222.120.66:3000/connections/datasources/edit/a99d0b13-aa85-4c20-9136-9ac1c5fccc06

Home › Connections › Data sources › Prometheus

Query editor

Default editor: Builder

Disable metrics lookup: off

Performance

Prometheus type: Choose

Incremental querying (beta): off

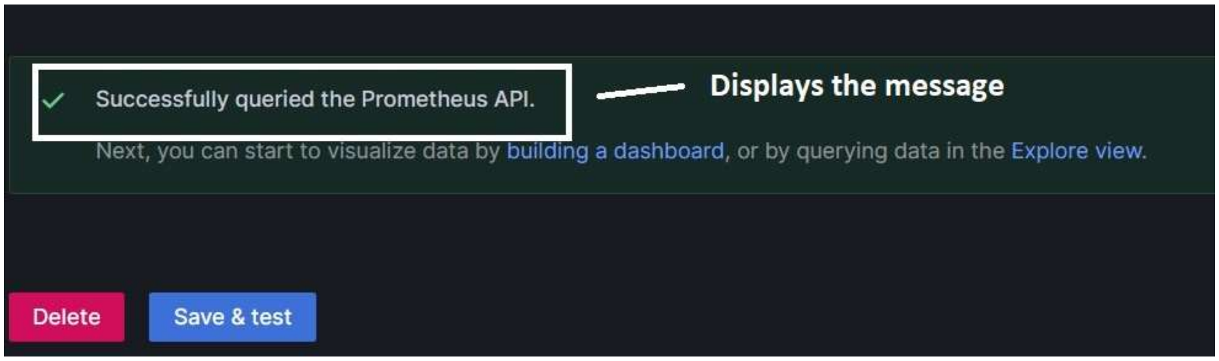
Other

Custom query parameters: Example: max_source_resolution=5m&timeout

HTTP method: POST

Exemplars

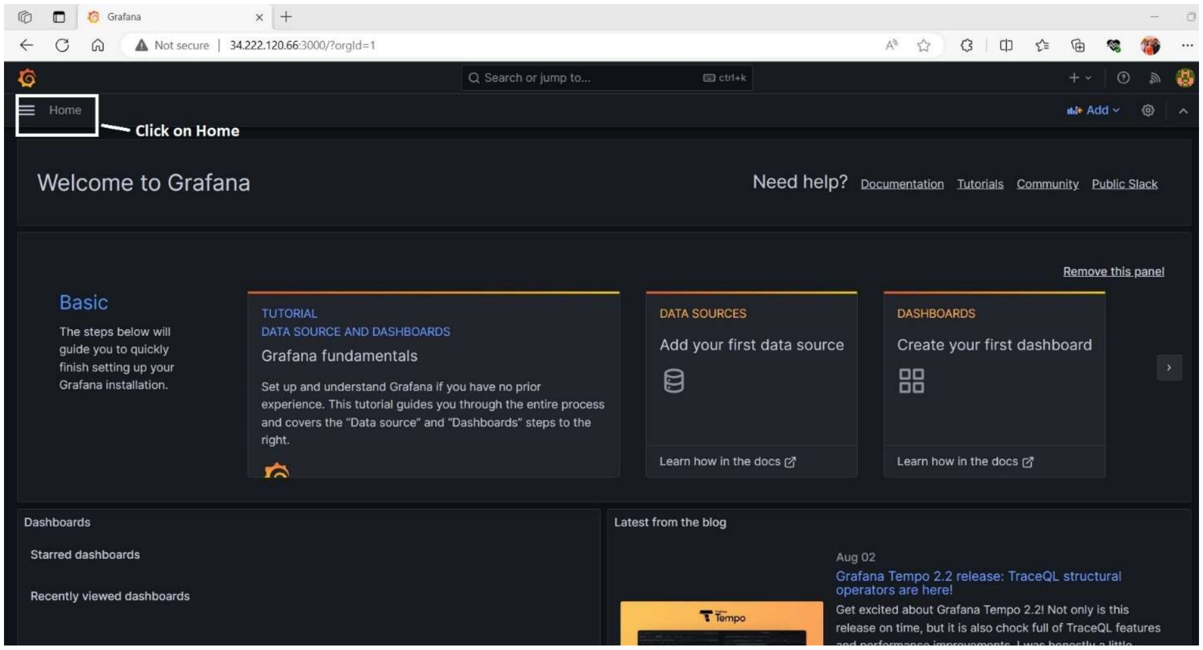
After clicking on '**save&test**' button the following message will appear.



Successfully queried the Prometheus API.

Next, you can start to visualize data by building a dashboard, or by querying data in the Explore view.

After that again click on home button, the following page will appear.



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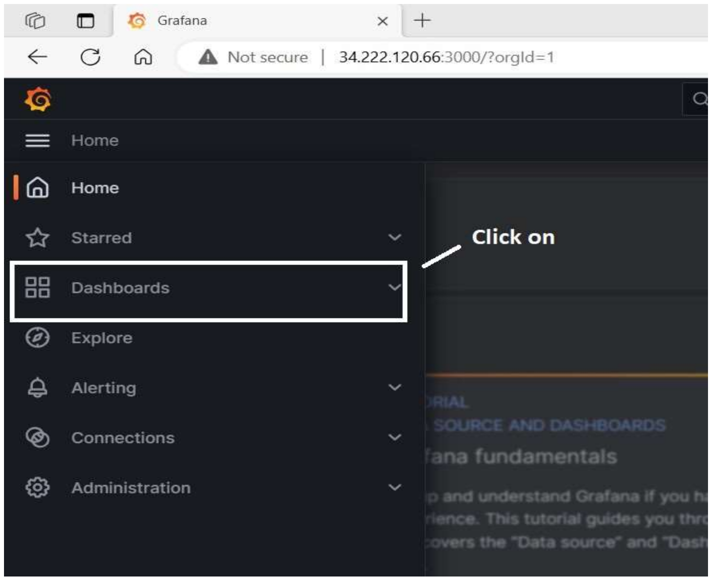
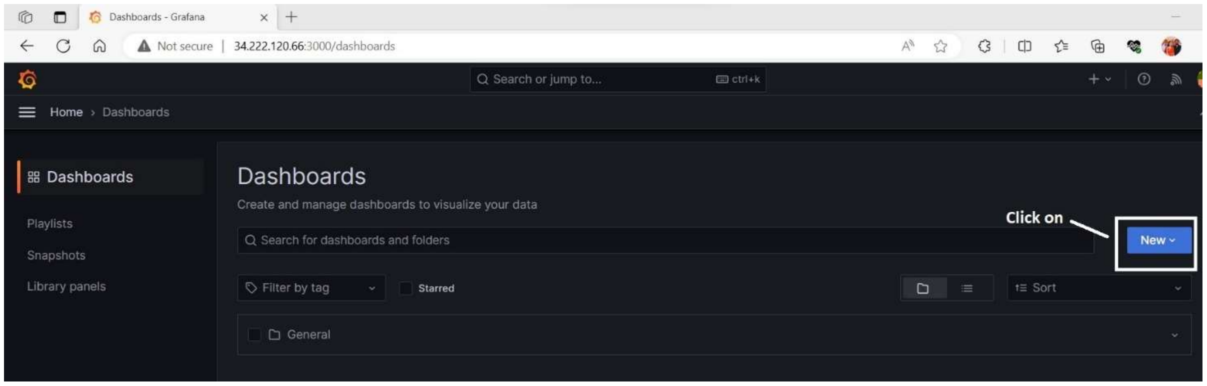
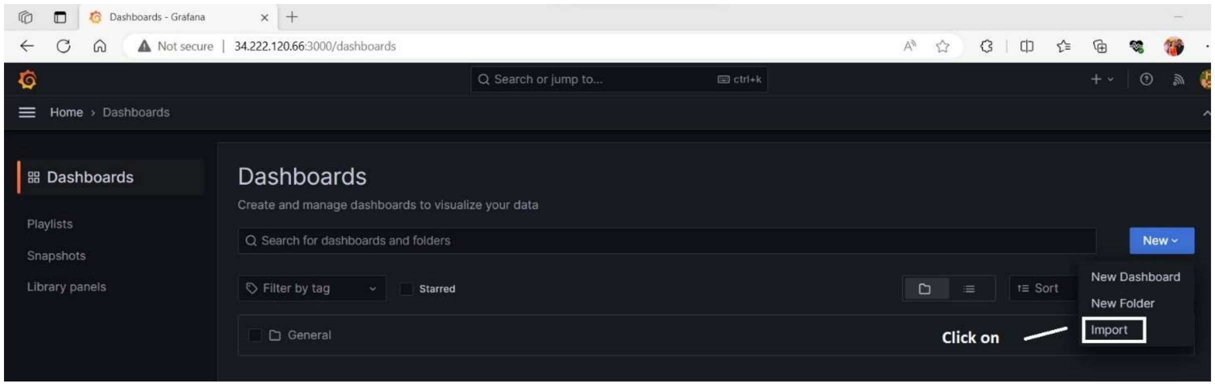
After that, clicking on home button. The following page will display.



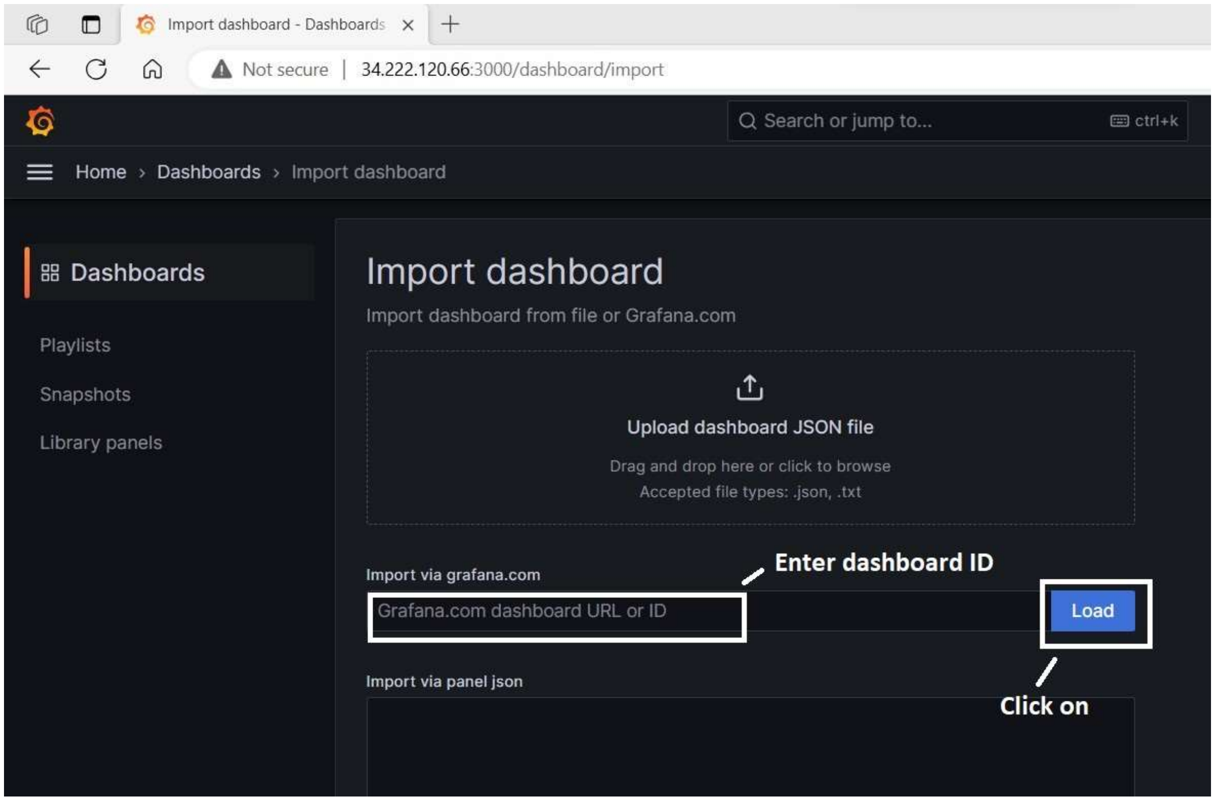
After clicking on ‘**dashboards**’ button, the following page will appear.


Dashboards
Create and manage dashboards to visualize your data
Search for dashboards and folders
Click on
New
Filter by tag
Starred
Sort
General
Playlists
Snapshots
Library panels

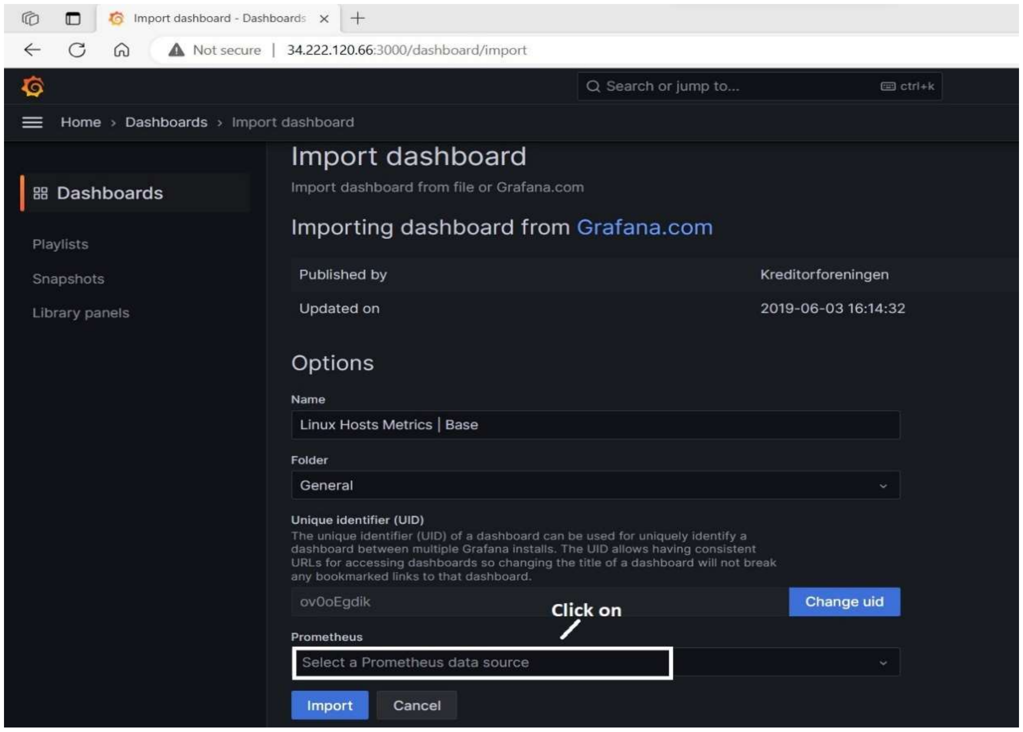
After clicking on, new dropdown menu. The following page will display.



After clicking on ‘**import**’ button, the following page will appear. **(Dashboard id-10180)**


Import dashboard
Import dashboard from file or Grafana.com
Upload dashboard JSON file
Drag and drop here or click to browse
Accepted file types: .json, .txt
Import via grafana.com
Enter dashboard ID
Grafana.com dashboard URL or ID
Load
Click on
Import via panel json

After clicking on ‘**Load**’ button, the following page will get display.



Import dashboard - Dashboards

Not secure | 34.222.120.66:3000/dashboard/import

Search or jump to... ctrl+k

Home › Dashboards › Import dashboard

Dashboards

Playlists

Snapshots

Library panels

Import dashboard

Import dashboard from file or Grafana.com

Importing dashboard from Grafana.com

Published by	Kreditorforeningen
Updated on	2019-06-03 16:14:32

Options

Name

Linux Hosts Metrics | Base

Folder

General

Unique identifier (UID)

The unique identifier (UID) of a dashboard can be used for uniquely identify a dashboard between multiple Grafana installs. The UID allows having consistent URLs for accessing dashboards so changing the title of a dashboard will not break any bookmarked links to that dashboard.

ov0oEgdik

Change uid

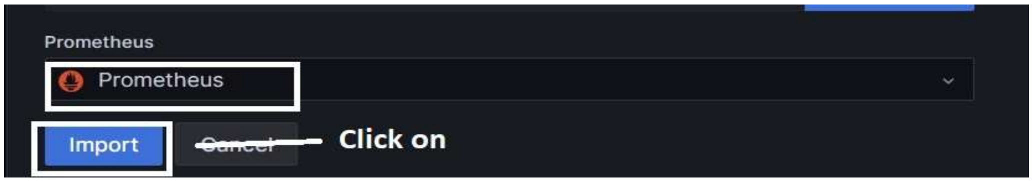
Click on

Prometheus

Select a Prometheus data source

Import Cancel

After clicking on that, the following options will get display.

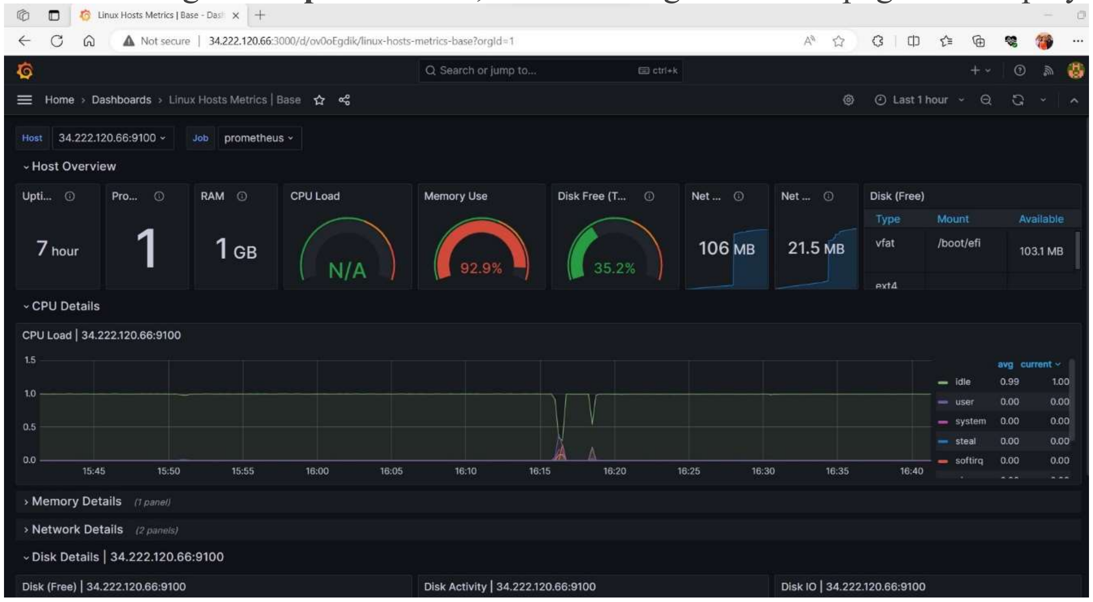


Prometheus

Prometheus

Import ~~Cancel~~ Click on

After clicking on ‘**import**’ button, the following dashboard page will display.



Linux Hosts Metrics | Base - Dash

Not secure | 34.222.120.66:3000/d/ov0oEgdik/linux-hosts-metrics-base?orgId=1

Search or jump to... ctrl+k

Home › Dashboards › Linux Hosts Metrics | Base

Last 1 hour

Host 34.222.120.66:9100 Job prometheus

Host Overview

Upti...	Pro...	RAM	CPU Load	Memory Use	Disk Free (T...	Net ...	Net ...
7 hour	1	1 GB	N/A	92.9%	35.2%	106 MB	21.5 MB

Disk (Free)

Type	Mount	Available
vfat	/boot/efi	103.1 MB
ext4		

CPU Details

CPU Load | 34.222.120.66:9100

	avg	current
idle	0.99	1.00
user	0.00	0.00
system	0.00	0.00
steal	0.00	0.00
softirq	0.00	0.00

Memory Details (1 panel)

Network Details (2 panels)

Disk Details | 34.222.120.66:9100

Disk (Free) | 34.222.120.66:9100

Disk Activity | 34.222.120.66:9100

Disk IO | 34.222.120.66:9100

Finally, standalone installation and configuration of prometheus, node_exporter and grafana was successfully completed.