

Prometheus is an open-source system monitoring and alerting toolkit originally built at SoundCloud. It is now a standalone open source project . Prometheus joined the Cloud Native Computing Foundation in 2016 as the second hosted project, after Kubernetes.

Features,

1. a multi-dimensional data model with time series data identified by metric name and key/value pairs
2. PromQL, a flexible query language to leverage this dimensionality
3. no reliance on distributed storage; single server nodes are autonomous
4. time series collection happens via a pull model over HTTP
5. pushing time series is supported via an intermediary gateway
6. targets are discovered via service discovery or static configuration
7. multiple modes of graphing and dashboarding support

Prometheus Installation:

Username Creation:

```
sudo useradd \  
--system \  
--no-create-home \  
--shell /bin/false Prometheus
```

Commands:

```
wget  
https://github.com/prometheus/prometheus/releases/download/v2.47.1/prometheus-  
2.47.1.linux-amd64.tar.gz  
  
tar -xvf prometheus-2.47.1.linux-amd64.tar.gz  
  
sudo mkdir -p /data /etc/prometheus  
  
cd prometheus-2.47.1.linux-amd64/  
  
sudo mv prometheus promtool /usr/local/bin/
```

```
sudo mv consoles/ console_libraries/ /etc/prometheus/
```

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

```
sudo chown -R prometheus:prometheus /etc/prometheus/ /data/
```

```
cd
```

```
rm -rf prometheus-2.47.1.linux-amd64.tar.gz
```

```
prometheus --version
```

```
sudo vim /etc/systemd/system/prometheus.service
```

```
ragu_ubuntu@Kavin: ~/prom
prometheus-2.47.1.linux-amd64/consoles/prometheus.html
prometheus-2.47.1.linux-amd64/consoles/prometheus-overview.html
prometheus-2.47.1.linux-amd64/consoles/node-cpu.html
prometheus-2.47.1.linux-amd64/consoles/index.html.example
prometheus-2.47.1.linux-amd64/consoles/node.html
prometheus-2.47.1.linux-amd64/consoles/node-disk.html
prometheus-2.47.1.linux-amd64/consoles/node-overview.html
prometheus-2.47.1.linux-amd64/promtool
^[[A
gzip: stdin: unexpected end of file
tar: Unexpected EOF in archive
tar: Unexpected EOF in archive
tar: Error is not recoverable: exiting now
^[[Amv: cannot stat 'prometheus': No such file or directory
mv: cannot stat 'console_libraries/': No such file or directory
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64$ wget https://github.com/prometheus/prometheus/releases/download/v2.47.1/prometheus-2.47.1.linux-amd64.tar.gz
tar -xvf prometheus-2.47.1.linux-amd64.tar.gz
sudo mkdir -p /data /etc/prometheus
cd prometheus-2.47.1.linux-amd64/
sudo mv prometheus promtool /usr/local/bin/
sudo mv consoles/ console_libraries/ /etc/prometheus/
sudo mv prometheus.yml /etc/prometheus/prometheus.yml
sudo chown -R prometheus:prometheus /etc/prometheus/ /data/
--2025-03-22 06:31:46-- https://github.com/prometheus/prometheus/releases/download/v2.47.1/prometheus-2.47.1.linux-amd64.tar.gz
Resolving github.com (github.com)... 20.207.73.82
Connecting to github.com (github.com)|20.207.73.82|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://objects.githubusercontent.com/github-production-release-asset-2e65be/6838921/2f9b7b37-63a0-428b-adb5-0294482fd743?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20250322%2Fus-east-1%2F%3%2Faws4_request&X-Amz-Date=20250322T063045Z&X-Amz-Expires=300&X-Amz-Signature=ed575488b40968463d4d5aa828b8b4c87cbfe8c835d5f52ce11c05389b4809d96X-Amz-SignedHeaders=host&response-content-disposition=attachment%3B%20filename%3Dprometheus-2.47.1.linux-amd64.tar.gz&response-content-type=application%2Foctet-stream [following]
--2025-03-22 06:31:46-- https://objects.githubusercontent.com/github-production-release-asset-2e65be/6838921/2f9b7b37-63a0-428b-adb5-0294482fd743?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20250322%2Fus-east-1%2F%3%2Faws4_request&X-Amz-Date=20250322T063045Z&X-Amz-Expires=300&X-Amz-Signature=ed575488b40968463d4d5aa828b8b4c87cbfe8c835d5f52ce11c05389b4809d96X-Amz-SignedHeaders=host&response-content-disposition=attachment%3B%20filename%3Dprometheus-2.47.1.linux-amd64.tar.gz&response-content-type=application%2Foctet-stream
Resolving objects.githubusercontent.com (objects.githubusercontent.com)... 185.199.110.133, 185.199.111.133, 185.199.108.133, ...
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)|185.199.110.133|:443... connected.
```

```
ragu_ubuntu@Kavin: ~/prom
rm -rf prometheus-2.47.1.linux-amd64.tar.gz
prometheus --version
sudo vim /etc/systemd/system/prometheus.service
prometheus, version 2.47.1 (branch: HEAD, revision: c4d1a8beff37cc004f1dc4ab9d2e73193f51aaeb)
  build user: root@4829330363be
  build date: 20231004-10:31:16
  go version: go1.21.1
  platform: linux/amd64
  tags: netgo,builtinassets,stringlabels
ragu_ubuntu@Kavin: $ ls
deploy.yaml docker-compose.yaml ns.yaml pod.yaml prometheus-2.47.1.linux-amd64 rs.yaml
ragu_ubuntu@Kavin: $ cd
.raws/ .docker/ .landscape/ prometheus-2.47.1.linux-amd64/
.azure/ .jenkins/ .local/
.cache/ .kube/ .minikube/
ragu_ubuntu@Kavin: $ cd prometheus-2.47.1.linux-amd64/
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64$ ld
ld: no input files
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64$ ls
LICENSE NOTICE prometheus-2.47.1.linux-amd64 prometheus-2.47.1.linux-amd64.tar.gz
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64$ rm prometheus-2.47.1.linux-amd64/
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64$ rm prometheus-2.47.1.linux-amd64.tar.gz
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64$ rm prometheus-2.47.1.linux-amd64
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64$ rm prometheus-2.47.1.linux-amd64.tar.gz
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64$ ls
LICENSE NOTICE prometheus-2.47.1.linux-amd64
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64$ cd prometheus-2.47.1.linux-amd64/
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64/prometheus-2.47.1.linux-amd64$ prometheus --version
prometheus, version 2.47.1 (branch: HEAD, revision: c4d1a8beff37cc004f1dc4ab9d2e73193f51aaeb)
  build user: root@4829330363be
  build date: 20231004-10:31:16
  go version: go1.21.1
  platform: linux/amd64
  tags: netgo,builtinassets,stringlabels
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64/prometheus-2.47.1.linux-amd64$ sudo vim /etc/systemd/system/prometheus.service
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64/prometheus-2.47.1.linux-amd64$
```

Prometheus.service:

[Unit]

Description=Prometheus

Wants=network-online.target

After=network-online.target

StartLimitIntervalSec=500

StartLimitBurst=5

[Service]

User=prometheus

Group=prometheus

Type=simple

Restart=on-failure

RestartSec=5s

ExecStart=/usr/local/bin/prometheus \

--config.file=/etc/prometheus/prometheus.yml \

--storage.tsdb.path=/data \

--web.console.templates=/etc/prometheus/consoles \

--web.console.libraries=/etc/prometheus/console_libraries \

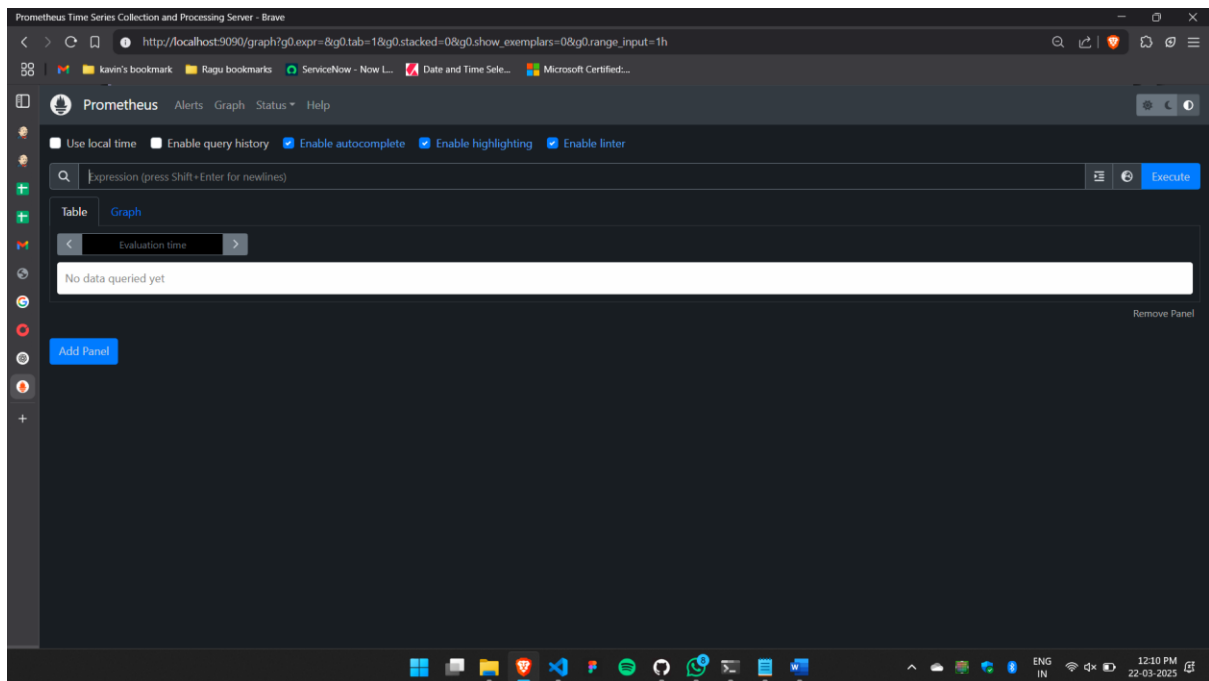
--web.listen-address=0.0.0.0:9090 \

--web.enable-lifecycle

[Install]

WantedBy=multi-user.target

```
ragu_ubuntu@Kavin: ~  
platform: linux/amd64  
tags: netgo,builtinassets,stringlabels  
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64/prometheus-2.47.1.linux-amd64$ sudo vim /etc/systemd/system/prometheus.service  
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64/prometheus-2.47.1.linux-amd64$ sudo vim /etc/systemd/system/prometheus.service  
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64/prometheus-2.47.1.linux-amd64$ ls  
LICENSE NOTICE consoles  
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64/prometheus-2.47.1.linux-amd64$ sudo vim /etc/systemd/system/prometheus.service  
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64/prometheus-2.47.1.linux-amd64$ ls  
LICENSE NOTICE consoles  
ragu_ubuntu@Kavin: ~/prometheus-2.47.1.linux-amd64/prometheus-2.47.1.linux-amd64$ cd  
ragu_ubuntu@Kavin: $ ls  
deploy.yaml docker-compose.yaml ns.yaml pod-ns.yaml pod.yaml prometheus-2.47.1.linux-amd64 rs.yaml  
ragu_ubuntu@Kavin: $  
ragu_ubuntu@Kavin: $ sudo systemctl enable prometheus  
sudo systemctl start prometheus  
sudo systemctl status prometheus  
journalctl -u prometheus -f --no-pager  
Created symlink /etc/systemd/system/multi-user.target.wants/prometheus.service → /etc/systemd/system/prometheus.service.  
● prometheus.service - Prometheus  
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; preset: enabled)  
   Active: active (running) since Sat 2025-03-22 06:40:03 UTC; 21ms ago  
     Main PID: 53900 (prometheus)  
       Tasks: 5 (limit: 9423)  
      Memory: 4.9M (-)  
     CGroup: /system.slice/prometheus.service  
             └─53900 /usr/local/bin/prometheus --config.file=/etc/prometheus/prometheus.yml --storage.tsdb.path=/data --web.console.templates=/data/webconsole/templates --storage.tsdb.retention.time=15d --storage.tsdb.min-block-duration=2m --storage.tsdb.max-block-duration=2m  
  
Mar 22 06:40:03 Kavin prometheus[53900]: ts=2025-03-22T06:40:03.365Z caller=head.go:681 level=info component=tsdb msg="On-disk memory mappable"  
Mar 22 06:40:03 Kavin prometheus[53900]: ts=2025-03-22T06:40:03.365Z caller=head.go:689 level=info component=tsdb msg="Replaying WAL, this may take a while"  
Mar 22 06:40:03 Kavin prometheus[53900]: ts=2025-03-22T06:40:03.365Z caller=head.go:760 level=info component=tsdb msg="WAL segment loaded" segment=1  
Mar 22 06:40:03 Kavin prometheus[53900]: ts=2025-03-22T06:40:03.365Z caller=head.go:797 level=info component=tsdb msg="WAL replay completed" chunk=1  
Mar 22 06:40:03 Kavin prometheus[53900]: ts=2025-03-22T06:40:03.367Z caller=main.go:1045 level=info fs_type=EXT4_SUPER_MAGIC  
Mar 22 06:40:03 Kavin prometheus[53900]: ts=2025-03-22T06:40:03.367Z caller=main.go:1048 level=info msg="TSDB started"  
Mar 22 06:40:03 Kavin prometheus[53900]: ts=2025-03-22T06:40:03.367Z caller=main.go:1229 level=info msg="Loading configuration file" filename=/etc/prometheus/prometheus.yml  
Mar 22 06:40:03 Kavin prometheus[53900]: ts=2025-03-22T06:40:03.368Z caller=main.go:1266 level=info msg="Completed loading of configuration file" filename=/etc/prometheus/prometheus.yml  
Mar 22 06:40:03 Kavin prometheus[53900]: ts=2025-03-22T06:40:03.368Z caller=main.go:1009 level=info msg="Server is ready to receive web requests"  
Mar 22 06:40:03 Kavin prometheus[53900]: ts=2025-03-22T06:40:03.368Z caller=manager.go:1009 level=info component="rule manager" msg="Starting rule manager"  
lines 1-19/19 (END)
```



Node Exporter:

Commands for installation:

```
sudo mv \  
node_exporter-1.6.1.linux-amd64/node_exporter \  
/usr/local/bin/
```

```
rm -rf node_exporter*
```

Node exporter file:

[Unit]

Description=Node Exporter

Wants=network-online.target

After=network-online.target

StartLimitIntervalSec=500

StartLimitBurst=5

[Service]

User=node_exporter

Group=node_exporter

Type=simple

Restart=on-failure

RestartSec=5s

ExecStart=/usr/local/bin/node_exporter \

 --collector.logind

[Install]

WantedBy=multi-user.target

Service check : sudo systemctl enable node_exporter

sudo systemctl start node_exporter

sudo systemctl status node_exporter

journalctl -u node_exporter -f --no-pager

```
ragu_ubuntu@Kavin: ~$ cat /etc/prometheus/prometheus.yml
# 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_export"
    static_configs:
      - targets: ["localhost:9100"]

  - job_name: "jenkins"
    metrics_path: "/prometheus"
    static_configs:
      - targets: ["localhost:8080"]

# /etc/prometheus/prometheus.yml 38L, 1132B
```

Reload Prometheus: `curl -X POST http://localhost:9090/-/reload`

Prometheus Time Series Collection and Processing Server - Brave

http://localhost:9090/targets?search=#pool-node_export

Prometheus Alerts Graph Status Help

Targets

All scrape pools: All Unhealthy Collapse All Filter by endpoint or labels Unknown Unhealthy Healthy

jenkins (0/1 up) [show less](#)

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://localhost:8080/prometheus	DOWN	instance="localhost:8080" job="jenkins"	32.331s ago	6.208ms	server returned HTTP status 403 Forbidden

node_export (1/1 up) [show less](#)

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://localhost:9100/metrics	UP	instance="localhost:9100" job="node_export"	24.854s ago	38.140ms	

prometheus (1/1 up) [show less](#)

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://localhost:9090/metrics	UP	instance="localhost:9090" job="prometheus"	20.766s ago	5.218ms	

Grafana:

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

```
wget -q -O - https://packages.grafana.com/gpg.key | sudo apt-key add -
```

```
echo "deb https://packages.grafana.com/oss/deb stable main" | sudo tee -a  
/etc/apt/sources.list.d/grafana.list
```

```
sudo apt-get update
```

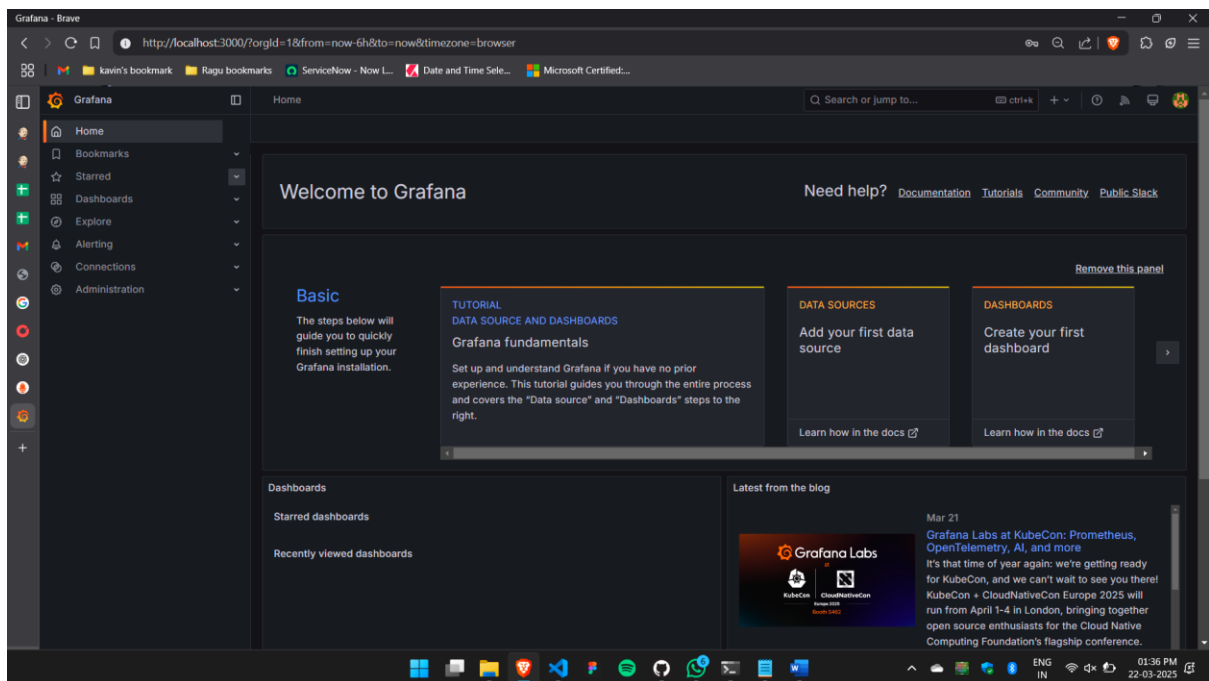
```
sudo apt-get -y install grafana
```

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

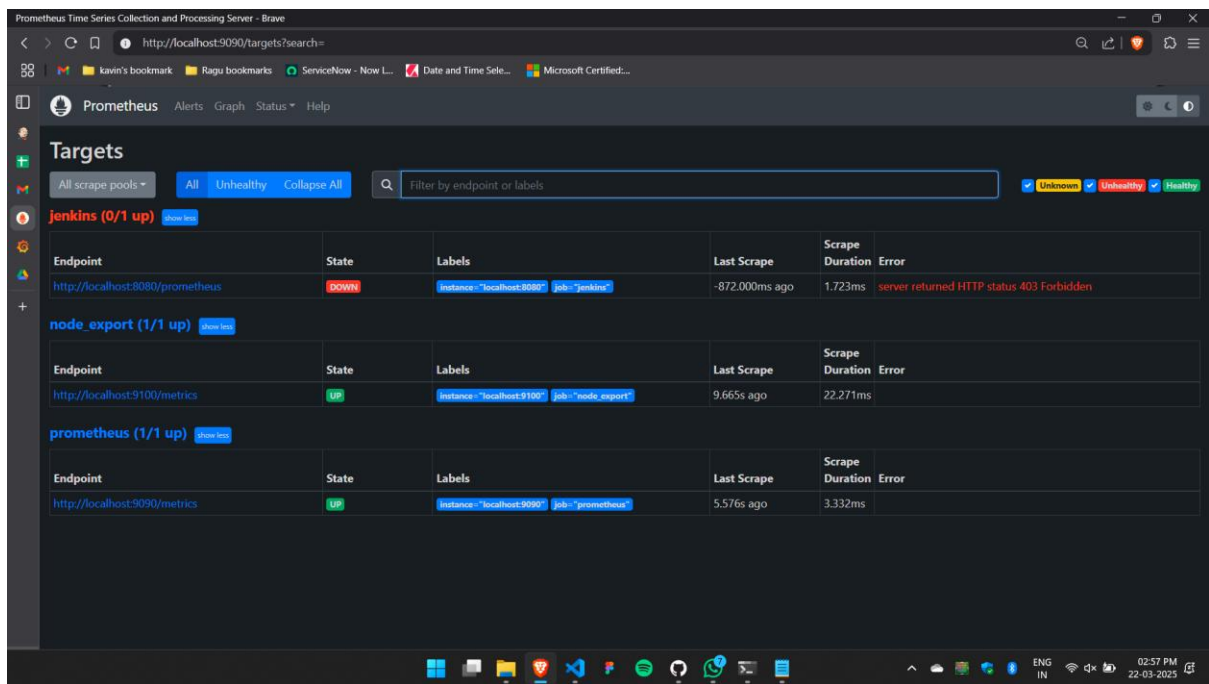
```
sudo systemctl start grafana-server
```

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

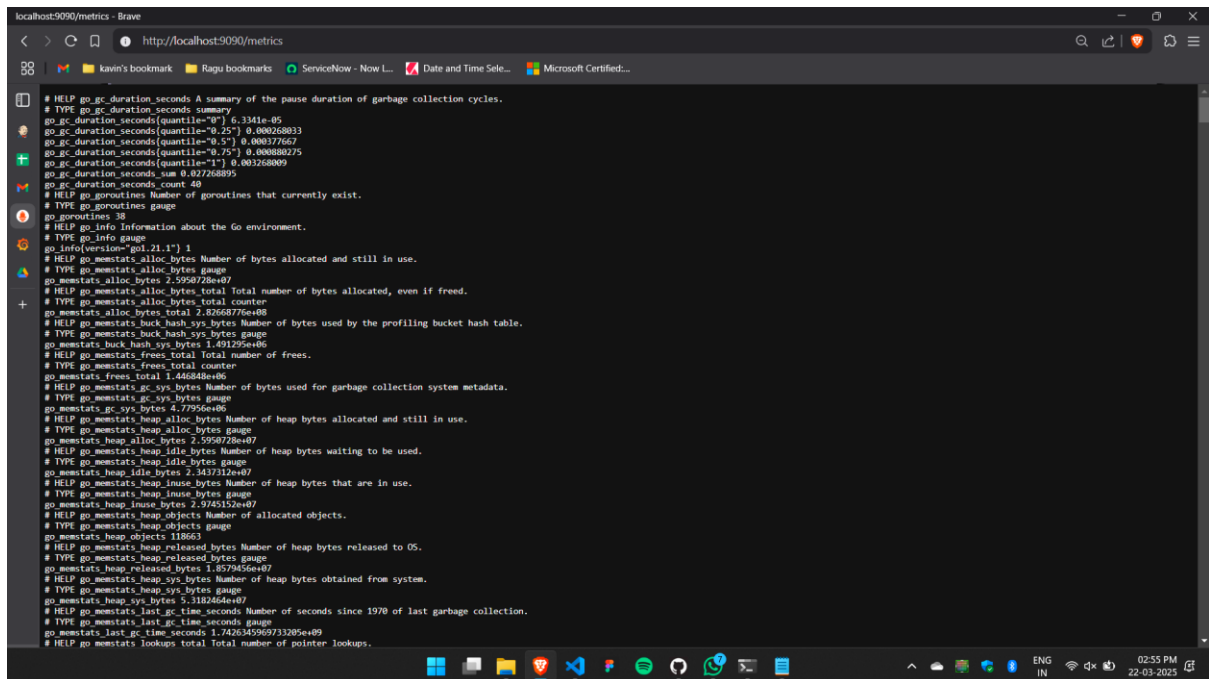
Grafana UI:



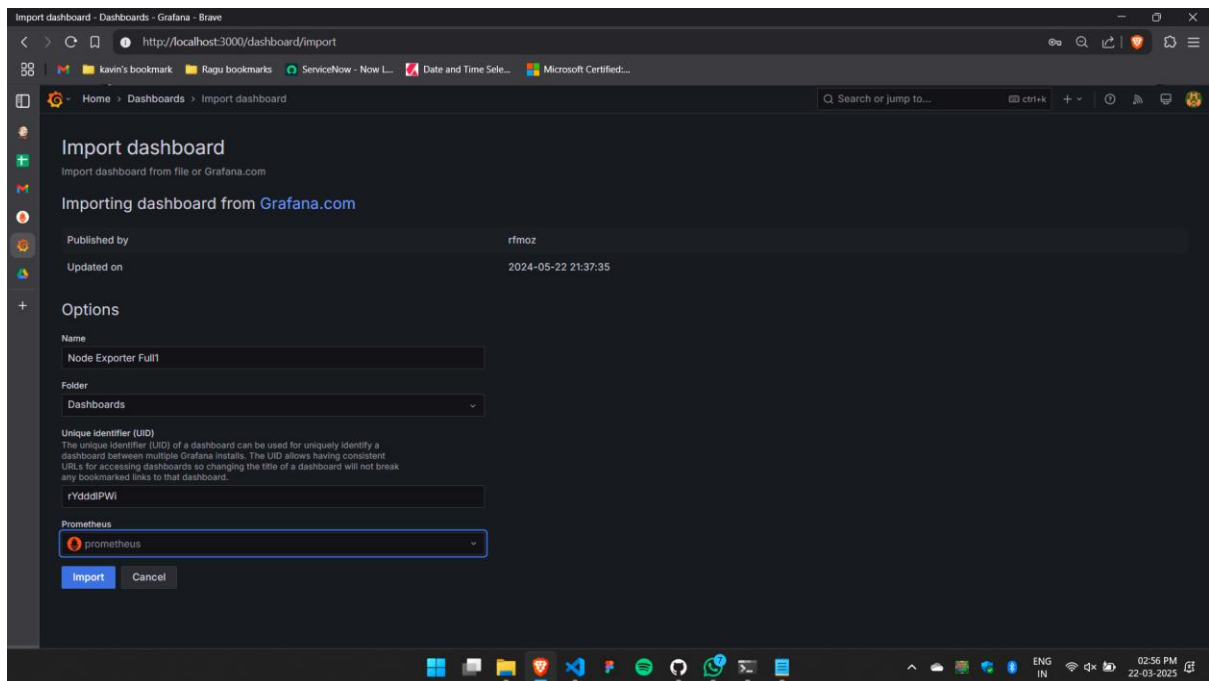
Status in promethues:



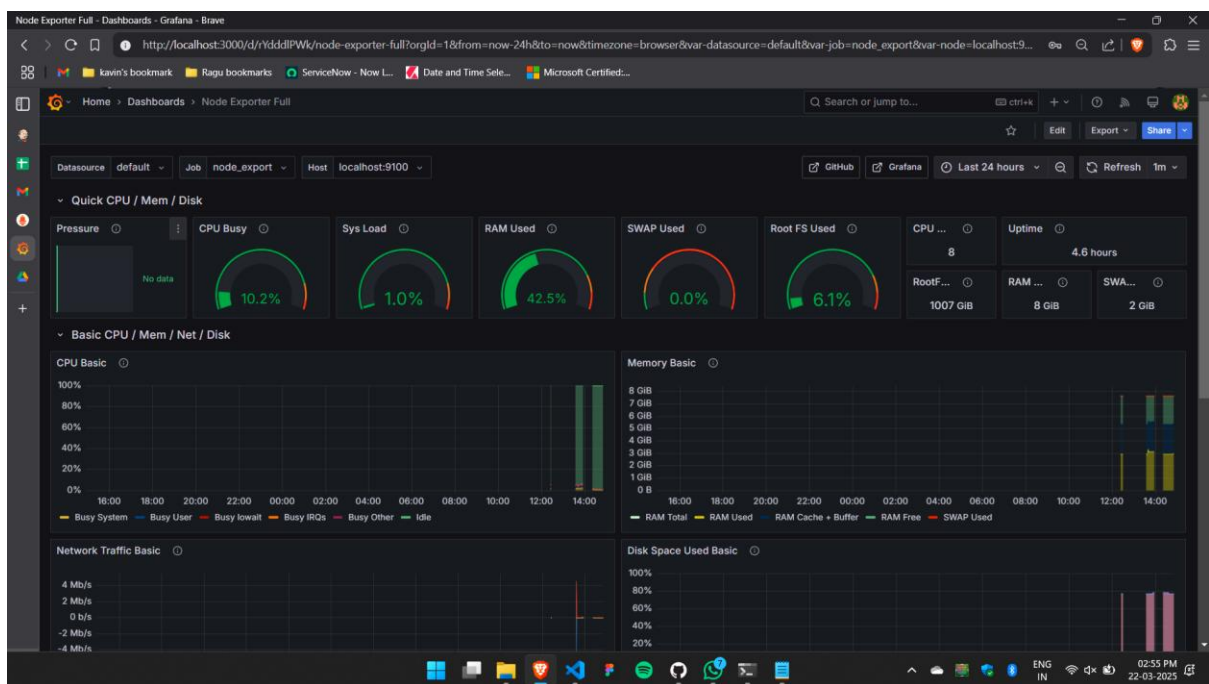
Metrics in Prometheus:

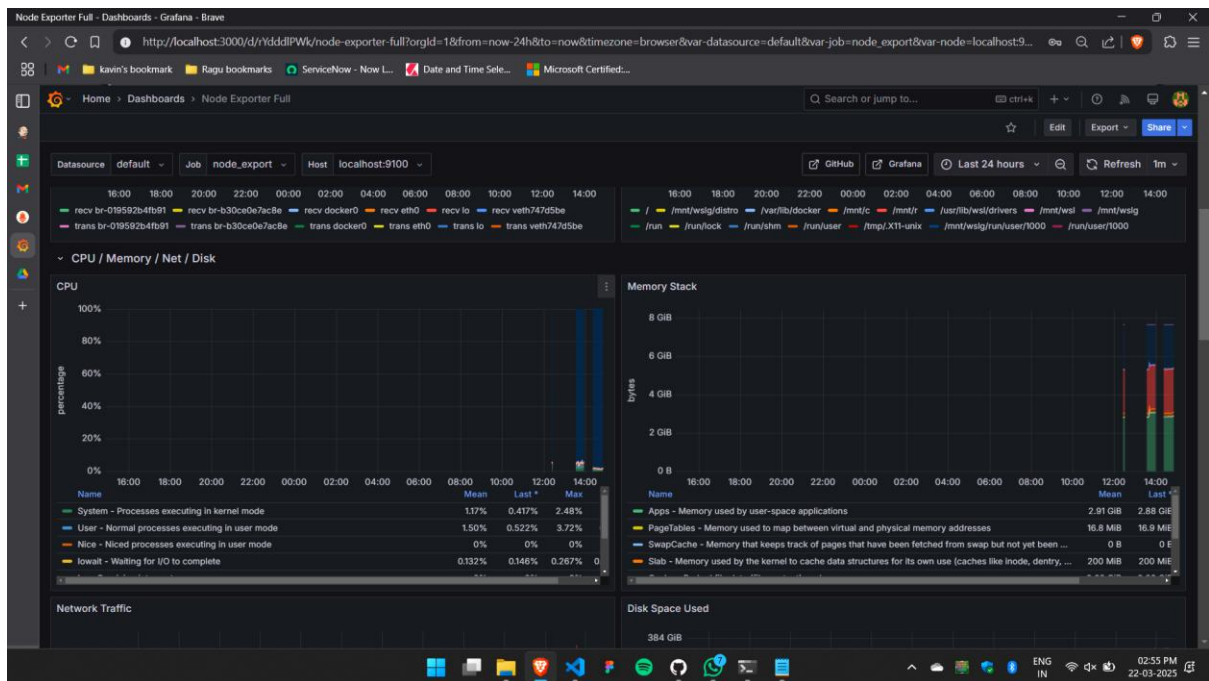


Node Exporter:



Dashboard:



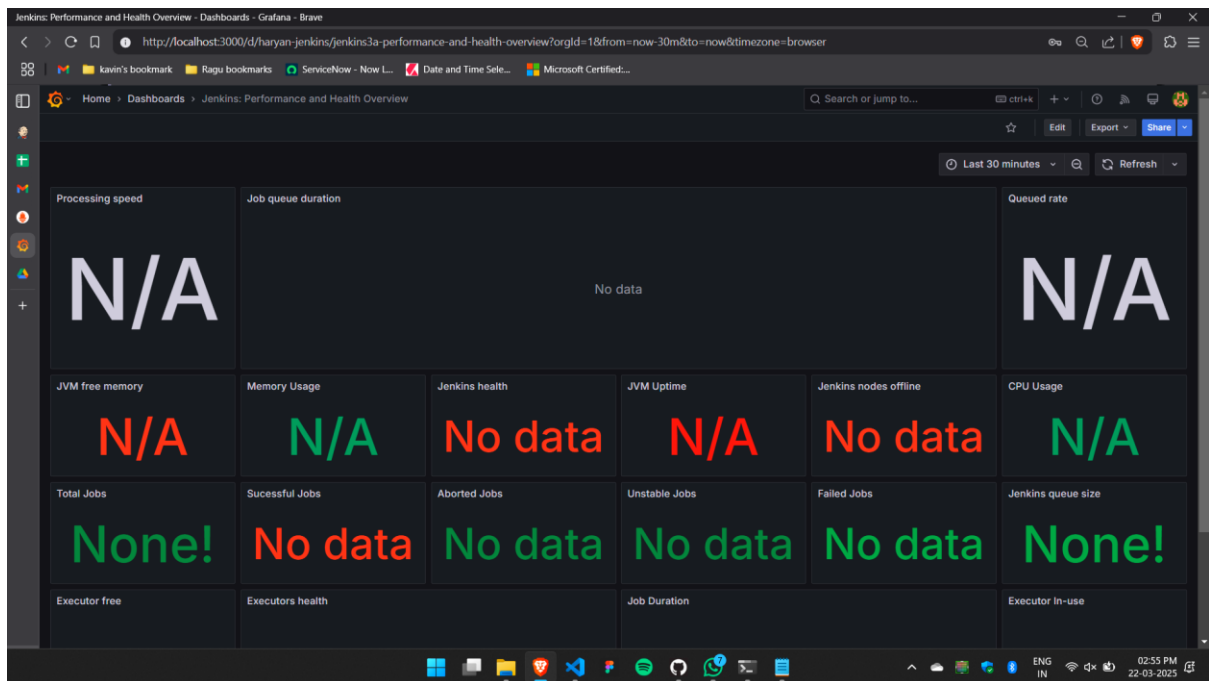


Jenkins Overview:

The image shows the "Import dashboard" form in Grafana. The form is titled "Import dashboard" and "Importing dashboard from Grafana.com". It includes the following fields and options:

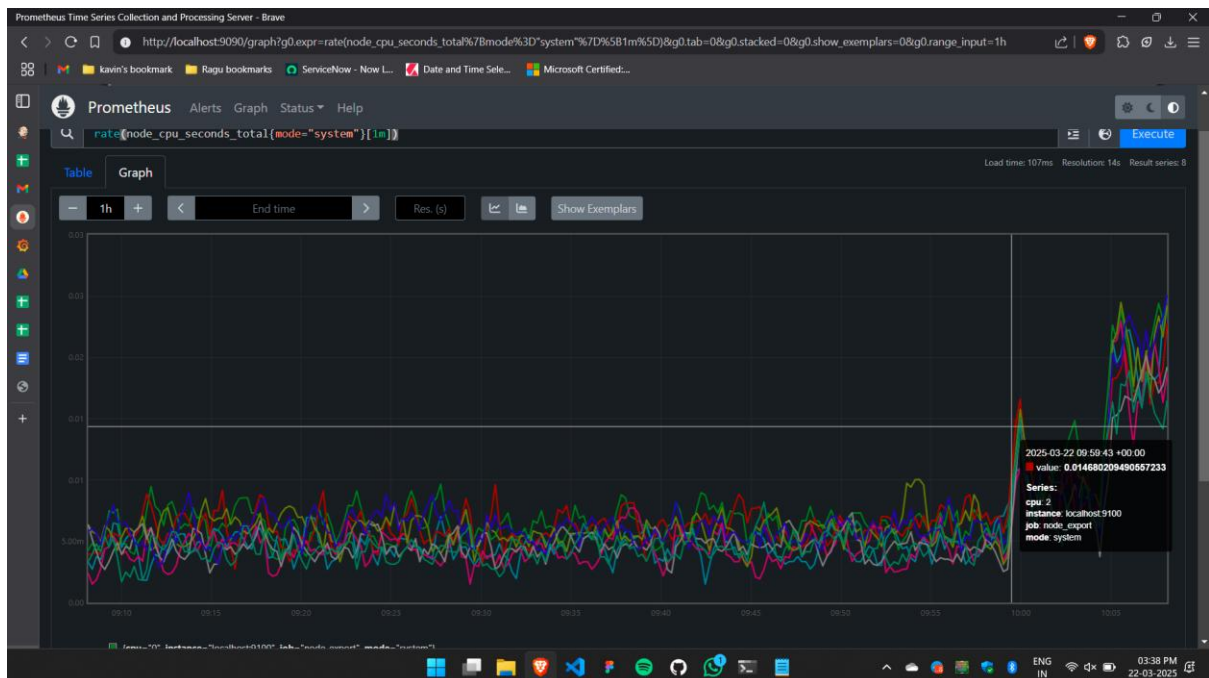
- Published by**: haryan
- Updated on**: 2023-08-24 15:04:53
- Options**:
 - Name**: Jenkins: Performance and Health Overview1
 - Folder**: Dashboards
 - Unique Identifier (UID)**: haryan-jenkin
 - Prometheus**: prometheus
- Buttons**: Import, Cancel

Dashboard:

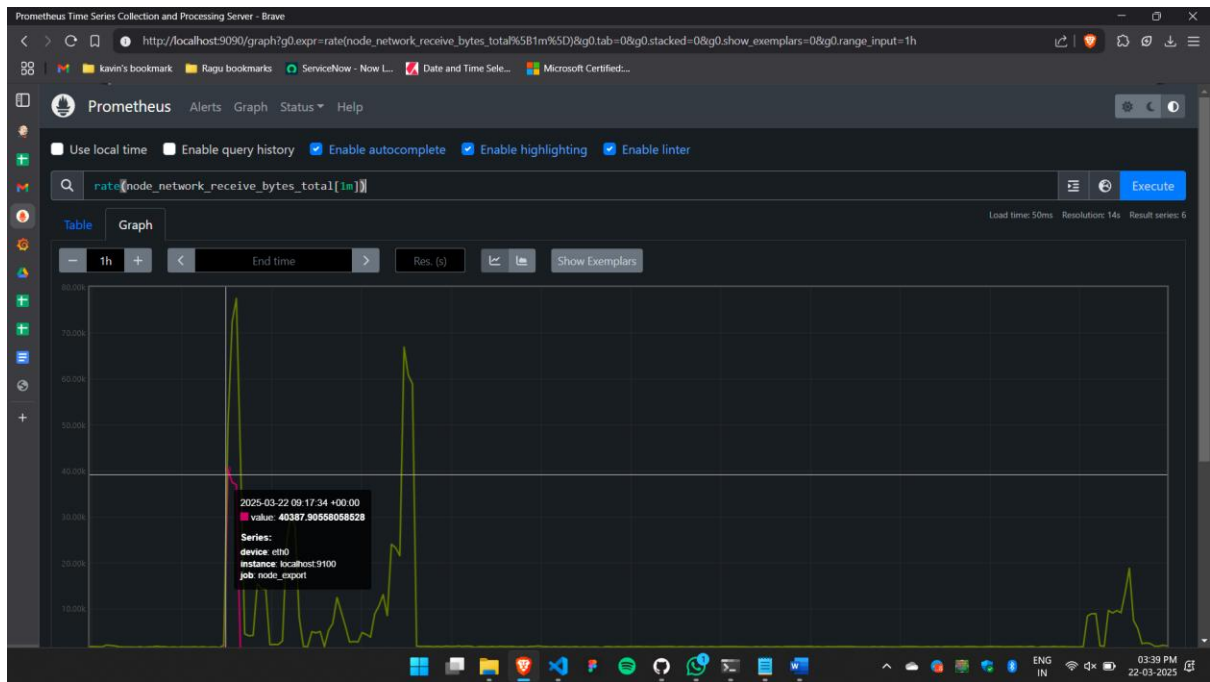


Prometheus analysis:

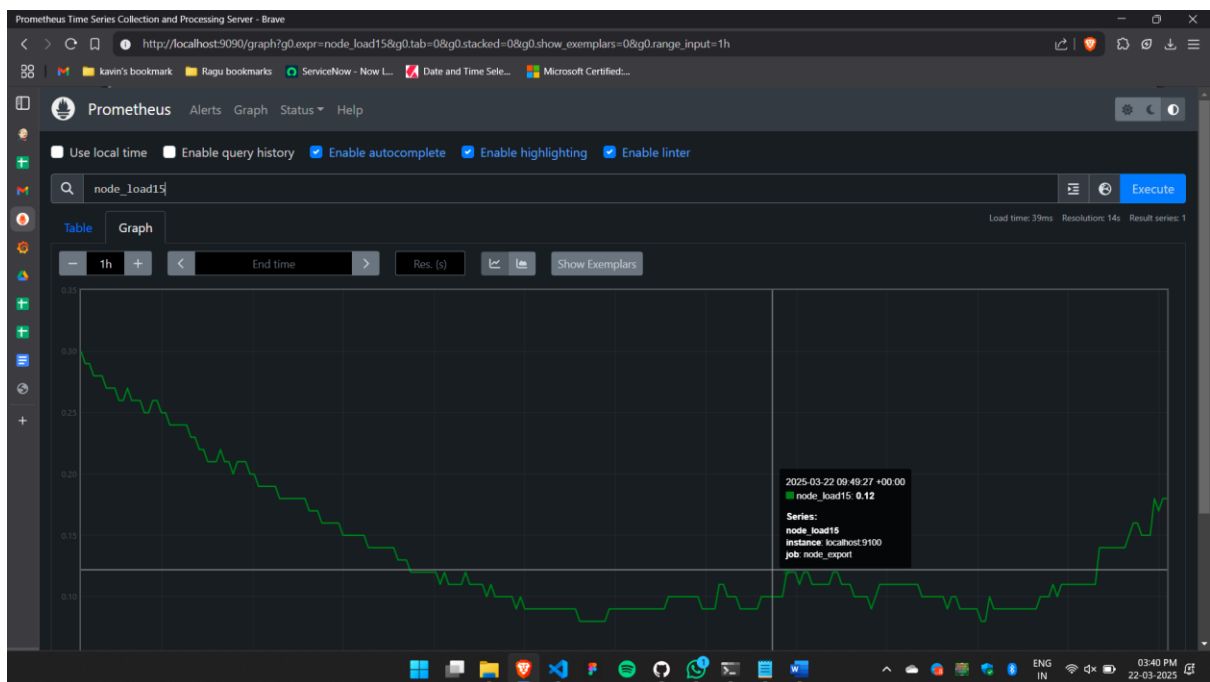
`rate(node_cpu_seconds_total{mode="system"}[1m])`



`rate(node_network_receive_bytes_total[1m])`

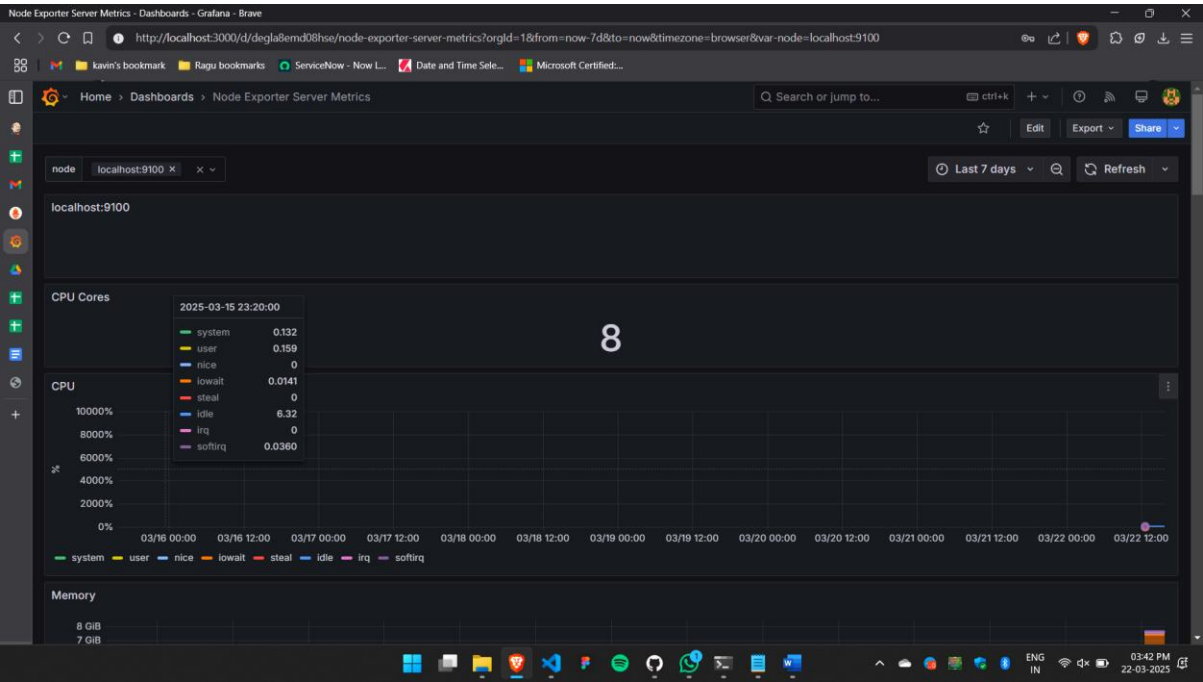


node_load15



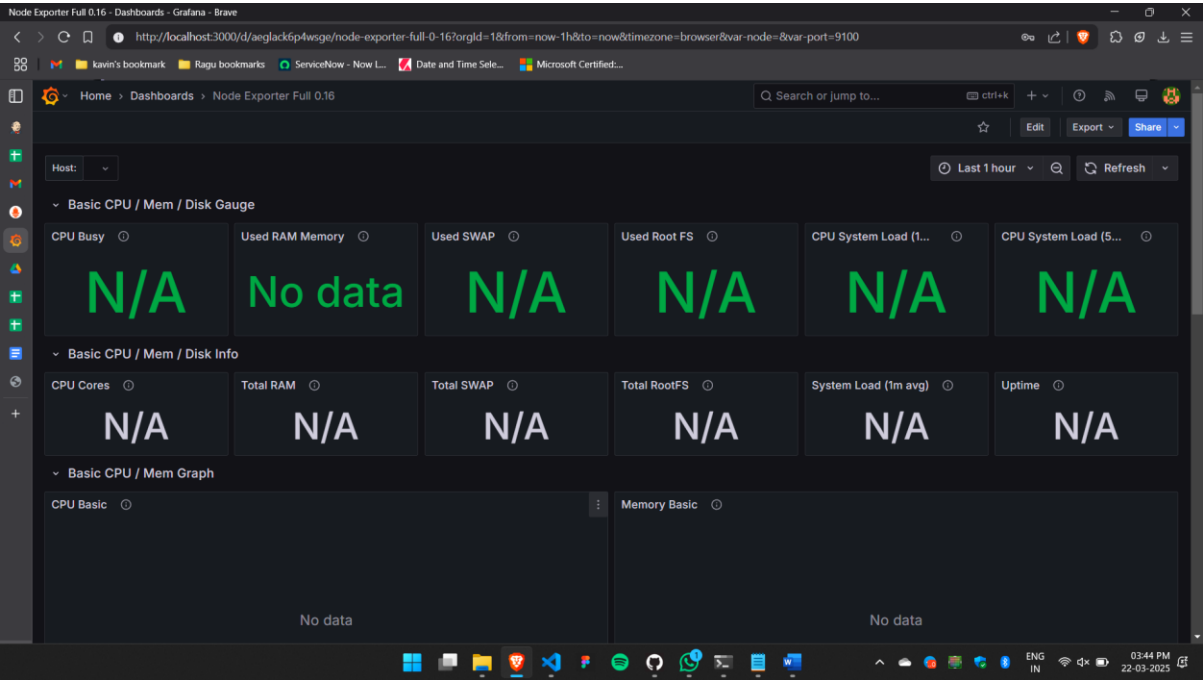
Dashboard: (405)

Node Exporter Service metrics,



Dashboard (5174):

Node Exporter Full 0.16,



Dashboard (9096):

1 Node Exporter 1.0.1

