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22CSR158

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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

```

```

Checking /etc/prometheus/prometheus.yml
SUCCESS: /etc/prometheus/prometheus.yml is valid prometheus config file syntax

rahulsiddharthdh@DHRS:~$ curl -X POST http://localhost:9090/-/reload
curl: (7) Failed to connect to localhost port 9090 after 0 ms: Couldn't connect to server
rahulsiddharthdh@DHRS:~$ sudo systemctl restart prometheus
rahulsiddharthdh@DHRS:~$ curl -X POST http://localhost:9090/-/reload
curl: (7) Failed to connect to localhost port 9090 after 0 ms: Couldn't connect to server
rahulsiddharthdh@DHRS:~$ sudo systemctl restart prometheus
rahulsiddharthdh@DHRS:~$ promtool check config /etc/prometheus/prometheus.yml
Checking /etc/prometheus/prometheus.yml
SUCCESS: /etc/prometheus/prometheus.yml is valid prometheus config file syntax

rahulsiddharthdh@DHRS:~$ |

```

```

rahulsiddharthdh@DHRS:~$ rm -rf node_exporter*
rahulsiddharthdh@DHRS:~$ node_exporter --version
node_exporter, version 1.6.1 (branch: HEAD, revision: 4a1b7760c1873a8233f3fffb55afcedbb63b8d84)
  build user:      root@586879db11e5
  build date:      20230717-12:10:52
  go version:      go1.20.6
  platform:        linux/amd64
  tags:            netgo osusergo static_build
rahulsiddharthdh@DHRS:~$ sudo vim /etc/systemd/system/node_exporter.service
rahulsiddharthdh@DHRS:~$ sudo systemctl enable node_exporter
sudo systemctl start node_exporter
journalctl -u node_exporter -f --no-pager
Created symlink /etc/systemd/system/multi-user.target.wants/node_exporter.service → /etc/systemd/system/node_exporter.service.
● node_exporter.service - Node Exporter
   Loaded: loaded (/etc/systemd/system/node_exporter.service; enabled; preset: enabled)
   Active: activating (auto-restart) (Result: exit-code) since Sat 2025-03-22 06:44:27 UTC; 5ms ago
 Process: 36745 ExecStart=/usr/local/bin/node_exporter --collector.logind (code=exited, status=217/USER)
    Main PID: 36745 (code=exited, status=217/USER)
Invalid unit name "node_exporter -f --no-pager" escaped as "node_exporter\x2c\xa0-f\x2c\xa0--no-pager" (maybe you should use systemd-escape?).
-- No entries --
rahulsiddharthdh@DHRS:~$ sudo vim /etc/prometheus/prometheus.yml
rahulsiddharthdh@DHRS:~$ curl -X POST http://localhost:9090/-/reload
curl: (7) Failed to connect to localhost port 9090 after 0 ms: Couldn't connect to server
rahulsiddharthdh@DHRS:~$ promtool check config /etc/prometheus/prometheus.yml
Checking /etc/prometheus/prometheus.yml
FAILED: parsing YAML file /etc/prometheus/prometheus.yml: yaml: unmarshal errors:
  line 1: field alertmanagers not found in type config.plain
rahulsiddharthdh@DHRS:~$ sudo vim /etc/prometheus/prometheus.yml
rahulsiddharthdh@DHRS:~$ sudo vim /etc/prometheus/prometheus.yml
rahulsiddharthdh@DHRS:~$ sudo vim /etc/prometheus/prometheus.yml
rahulsiddharthdh@DHRS:~$ promtool check config /etc/prometheus/prometheus.yml
Checking /etc/prometheus/prometheus.yml
SUCCESS: /etc/prometheus/prometheus.yml is valid prometheus config file syntax

rahulsiddharthdh@DHRS:~$ curl -X POST http://localhost:9090/-/reload
curl: (7) Failed to connect to localhost port 9090 after 0 ms: Couldn't connect to server
rahulsiddharthdh@DHRS:~$ sudo systemctl status prometheus
● prometheus.service - Prometheus
   Loaded: loaded (/etc/systemd/system/prometheus.service; disabled; preset: enabled)

```

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 \

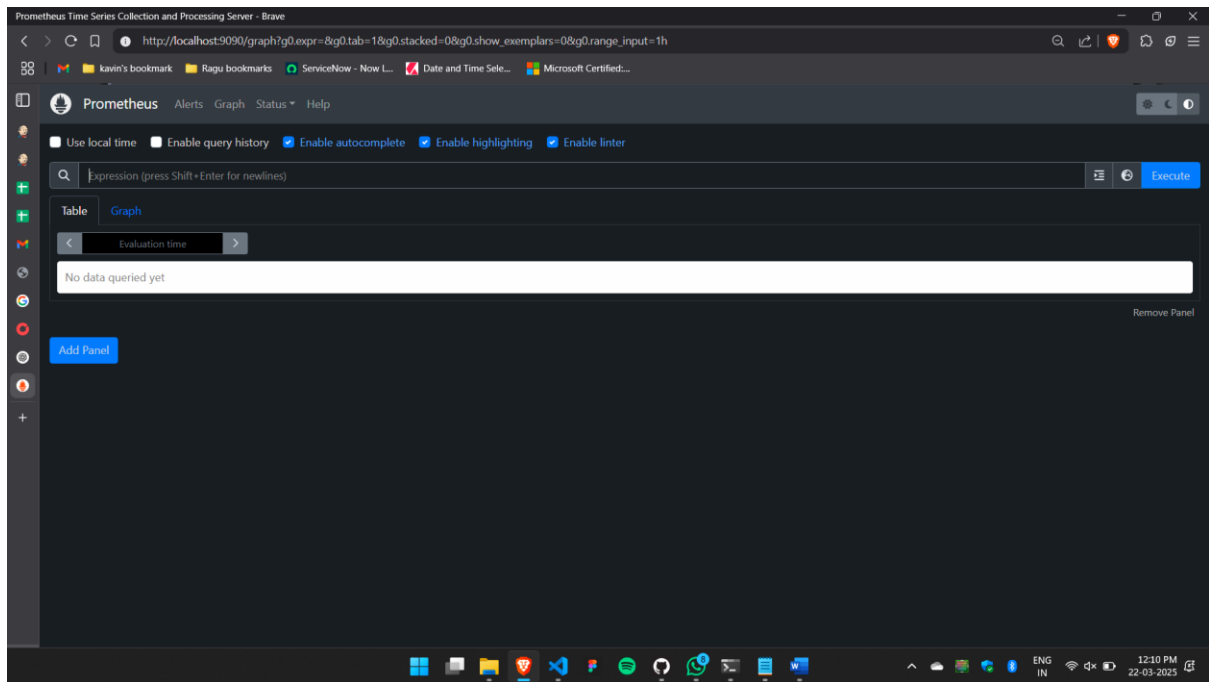
--web.console.libraries=/etc/prometheus/console_libraries \

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

--web.enable-lifecycle

[Install]

WantedBy=multi-user.target



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

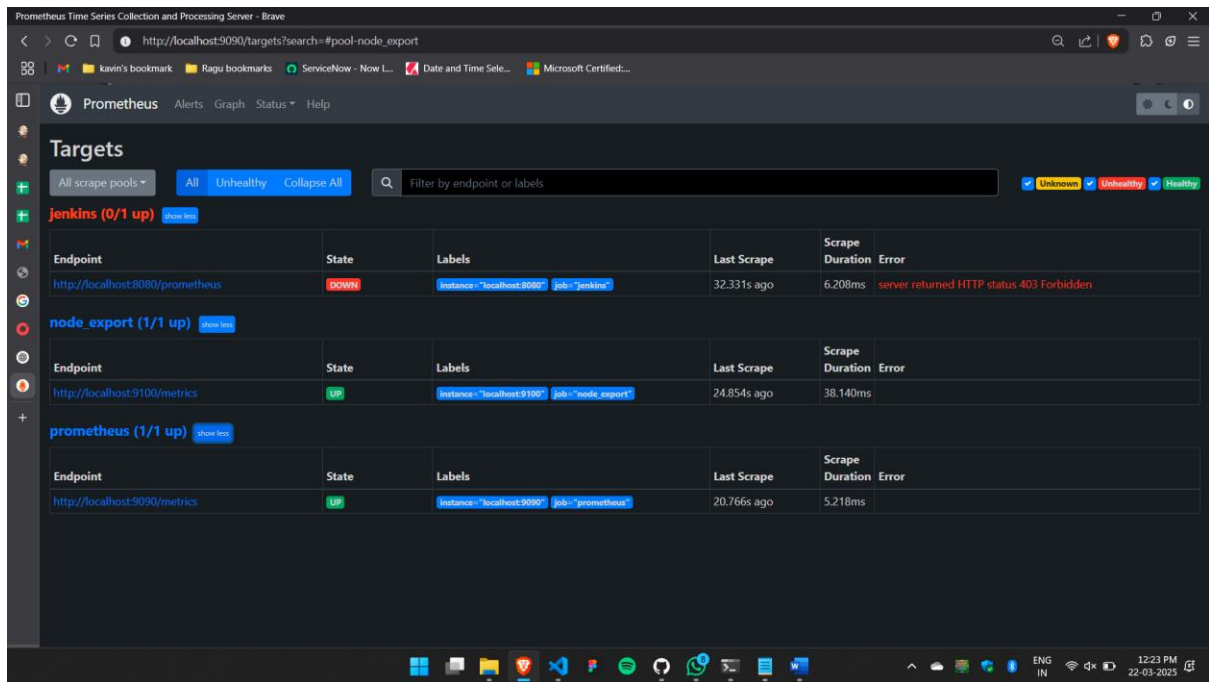
sudo systemctl start node_exporter

sudo systemctl status node_exporter

journalctl -u node_exporter -f --no-pager

```
rahulidharthdh@DHRS: ~  
# 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: ['<jenkins-ip>:8080']  
~  
"/etc/prometheus/prometheus.yml" 38L, 1131B  
1,18 All
```

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



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
```

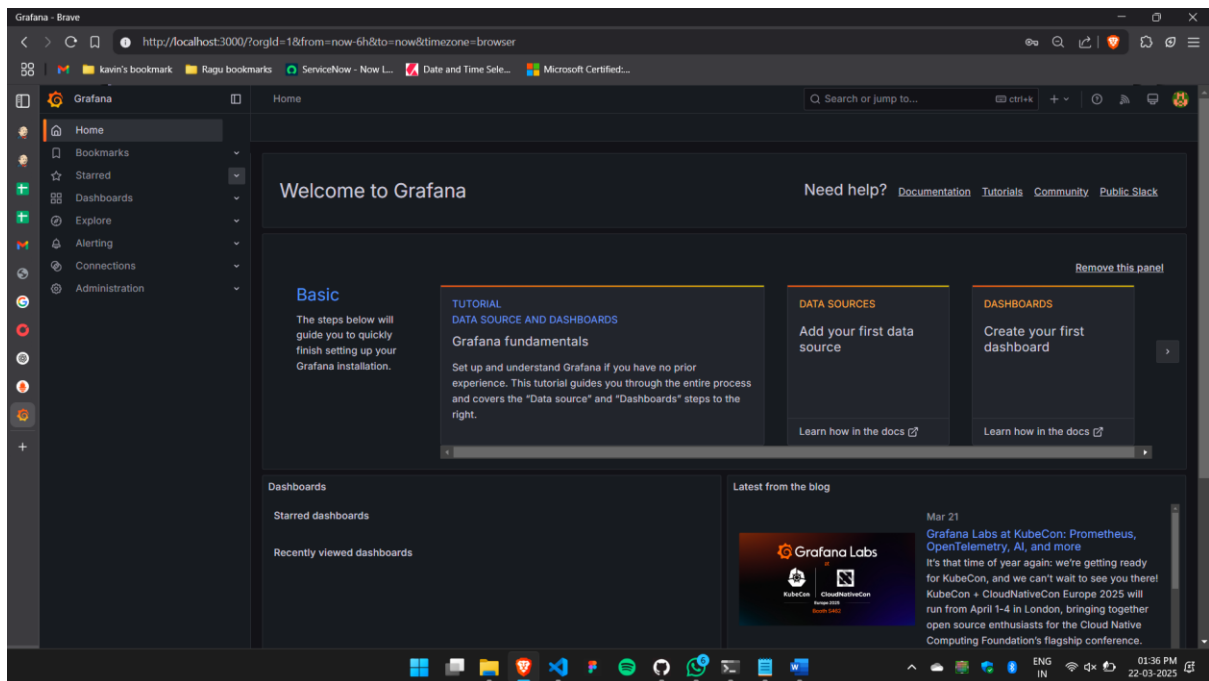
```
sudo apt-get -y install grafana
```

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

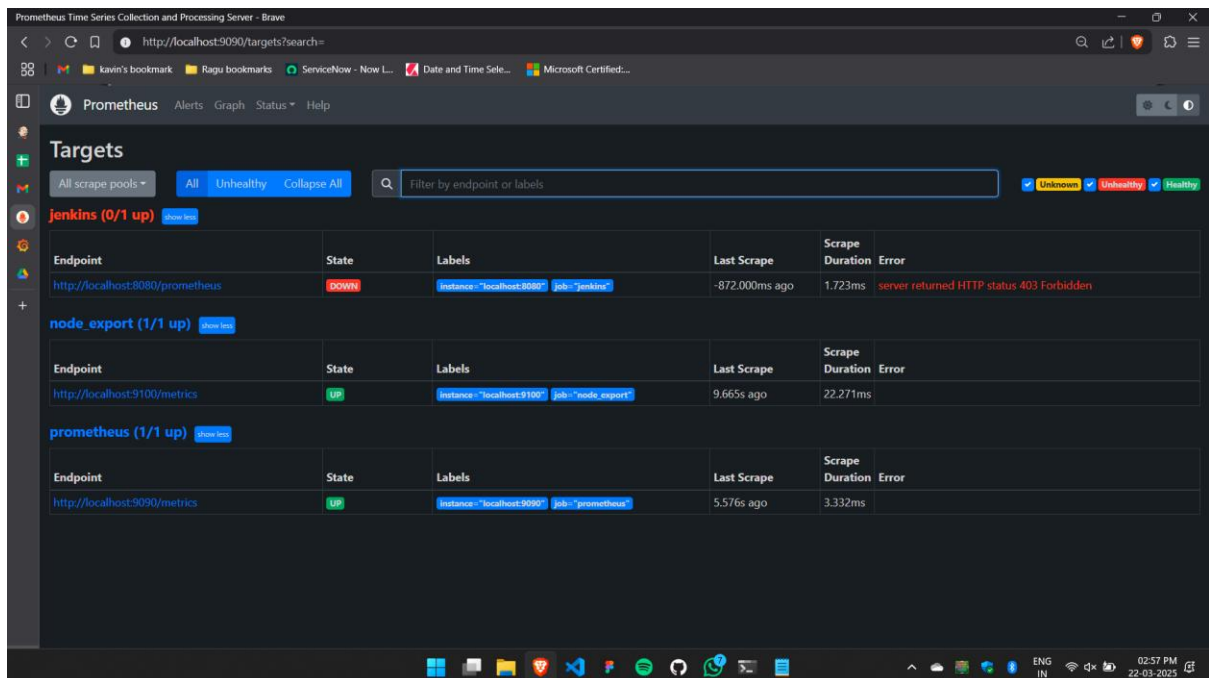
```
sudo systemctl start grafana-server
```

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

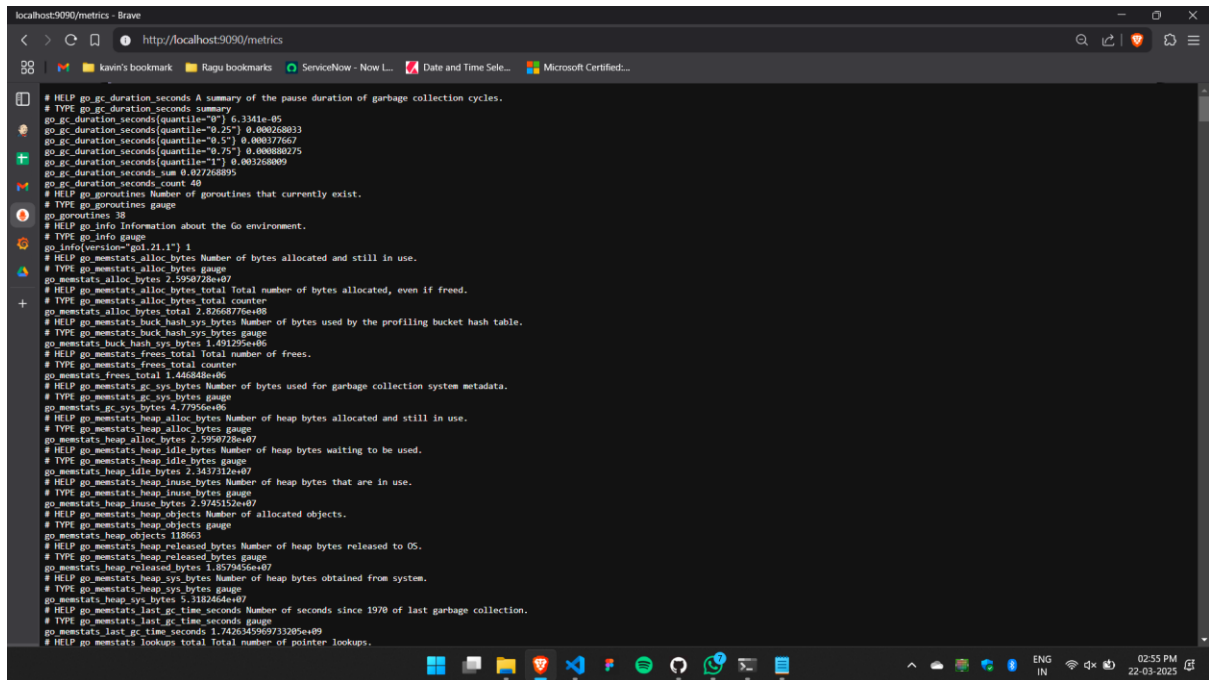
Grafana UI:



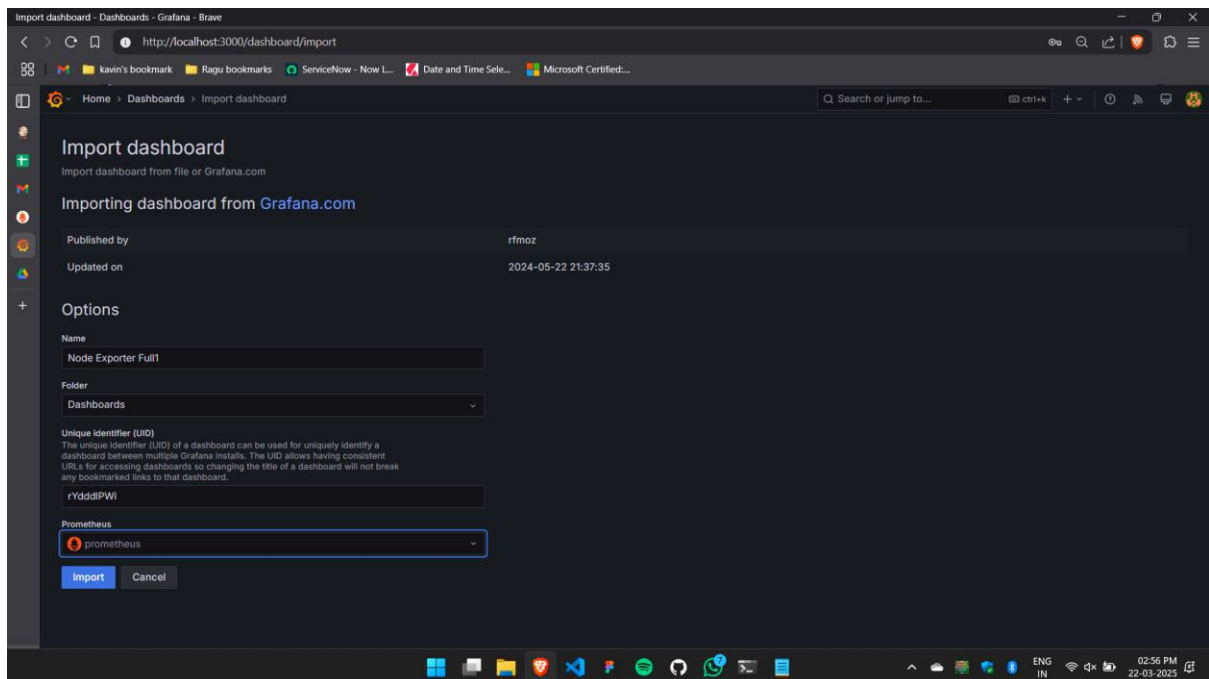
Status in promethues:



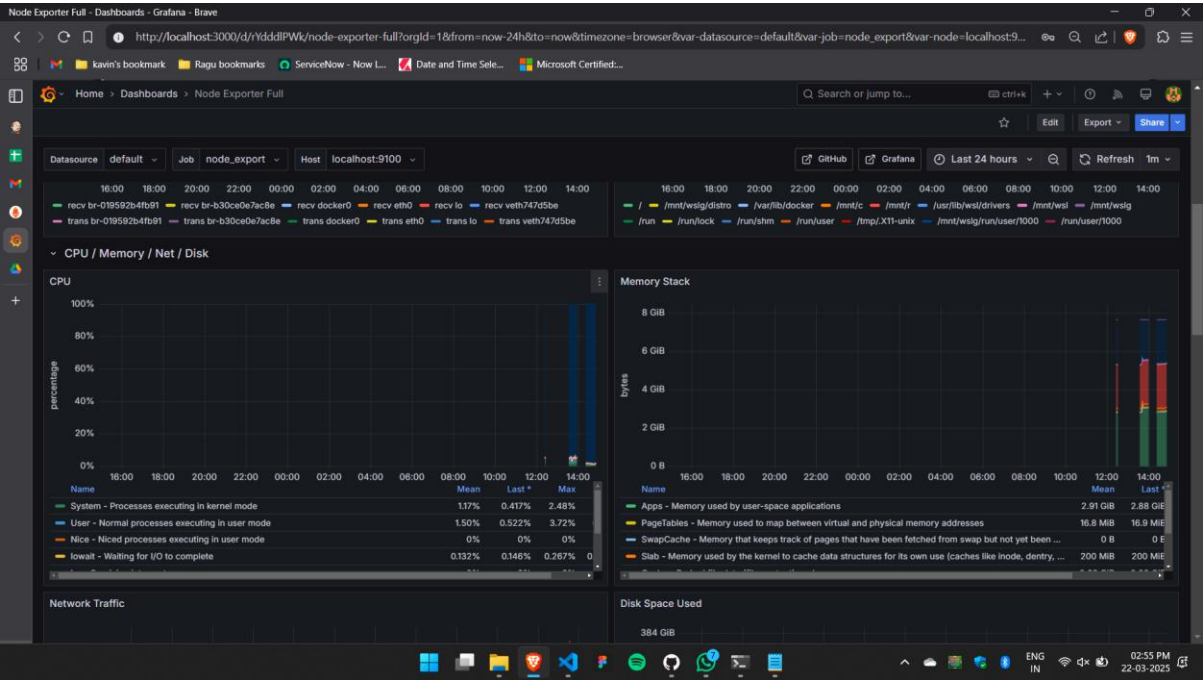
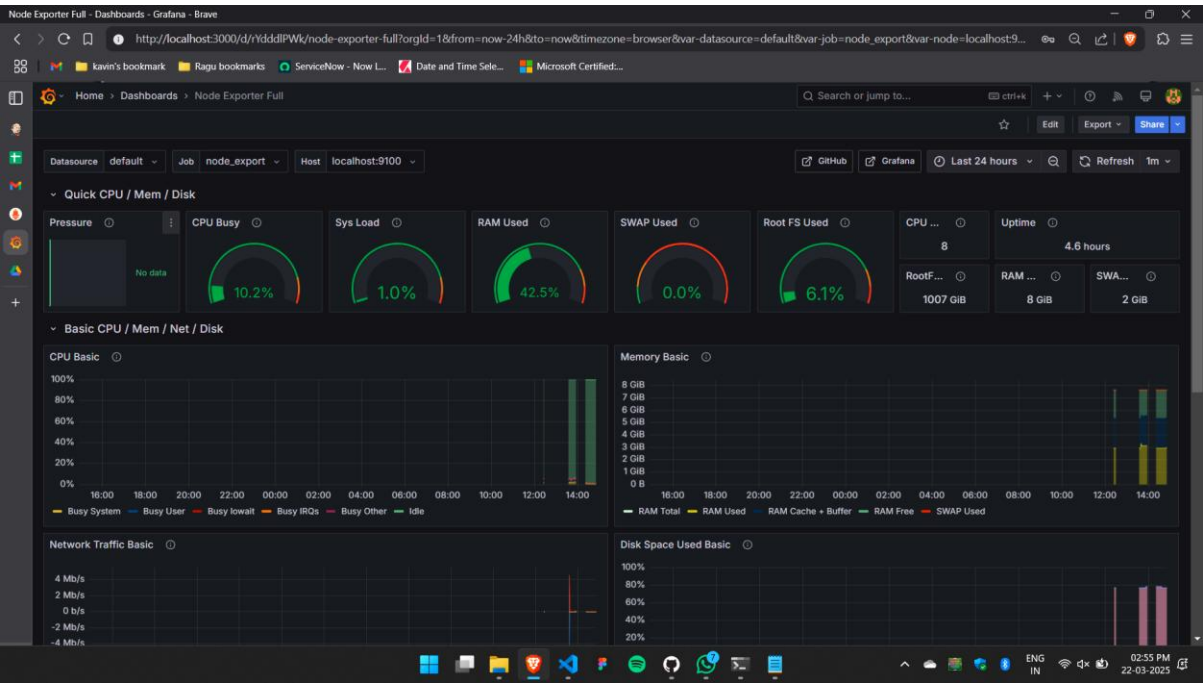
Metrics in Prometheus:



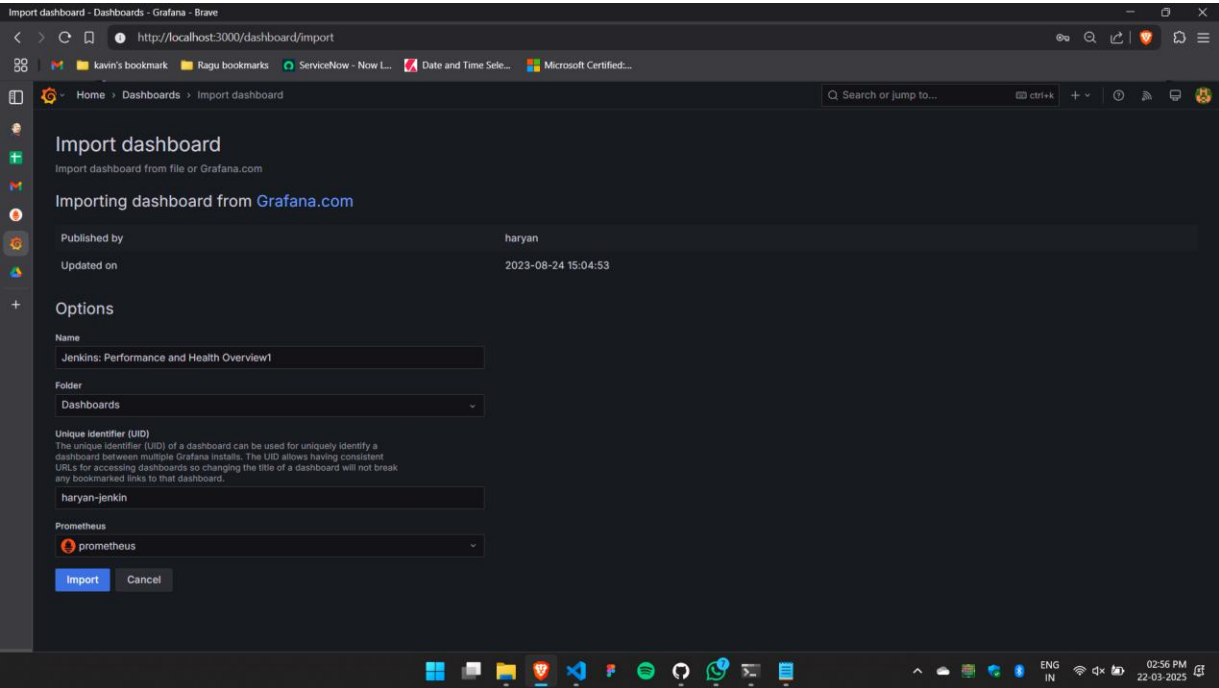
Node Exporter:



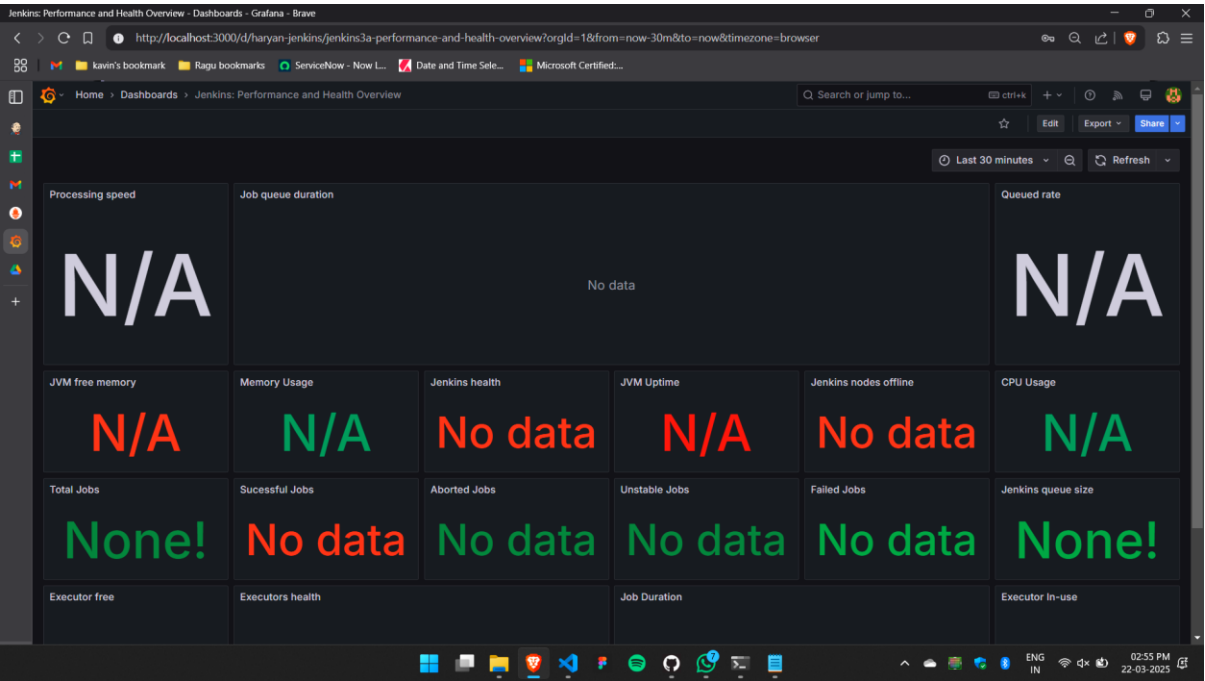
Dashboard:



Jenkins Overview:

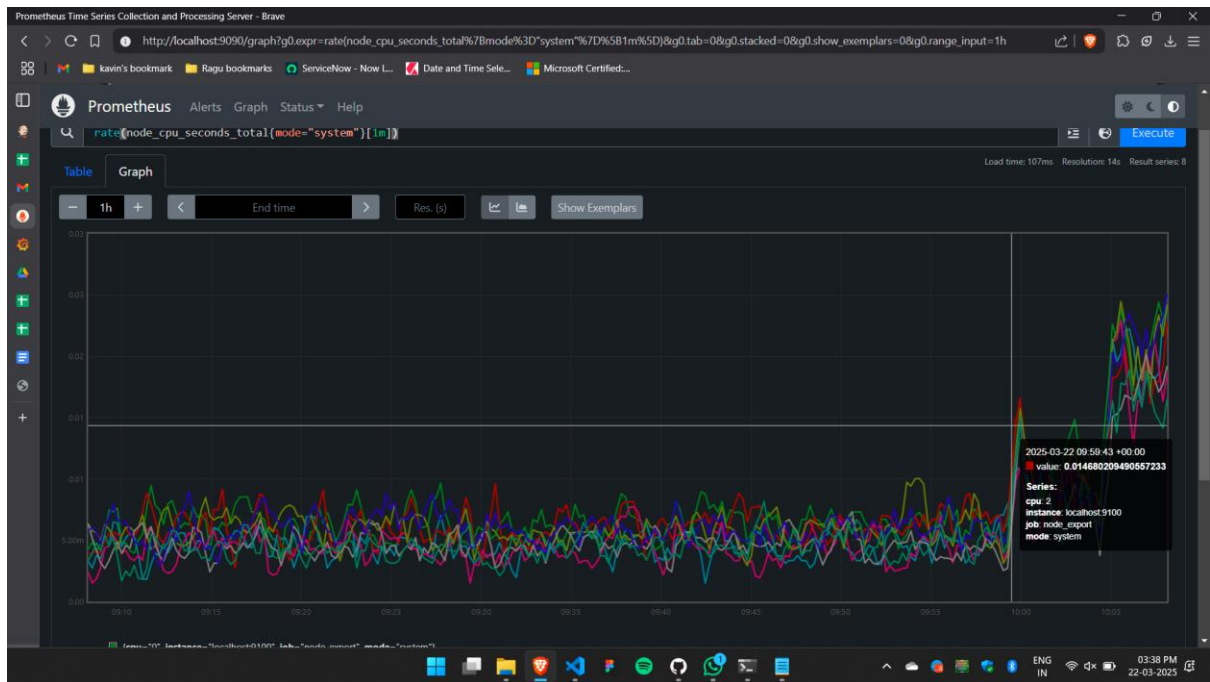


Dashboard:

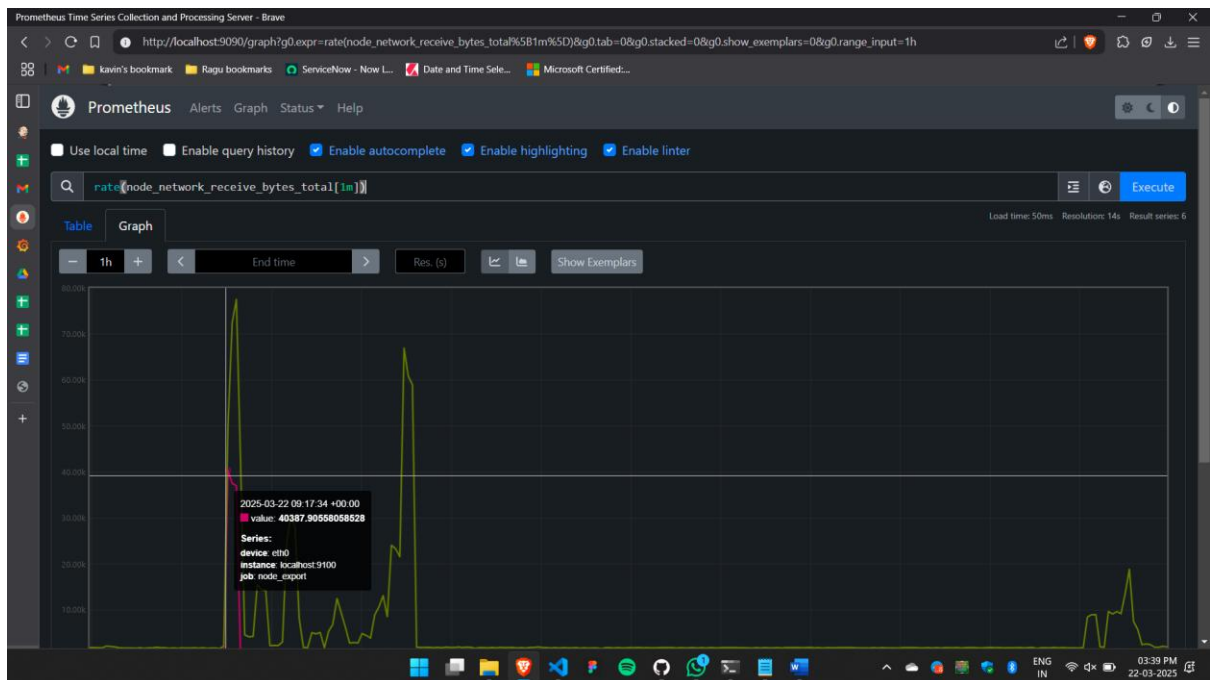


Prometheus analysis:

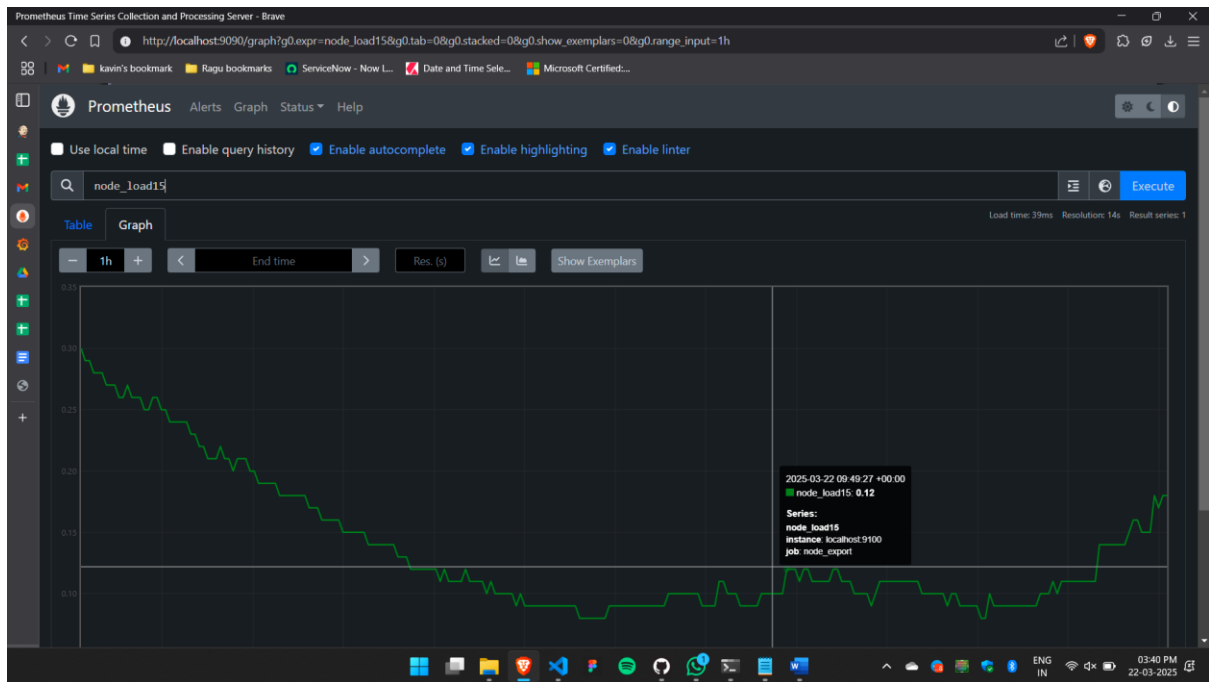
rate(node_cpu_seconds_total{mode="system"}[1m])



`rate(node_network_receive_bytes_total[1m])`

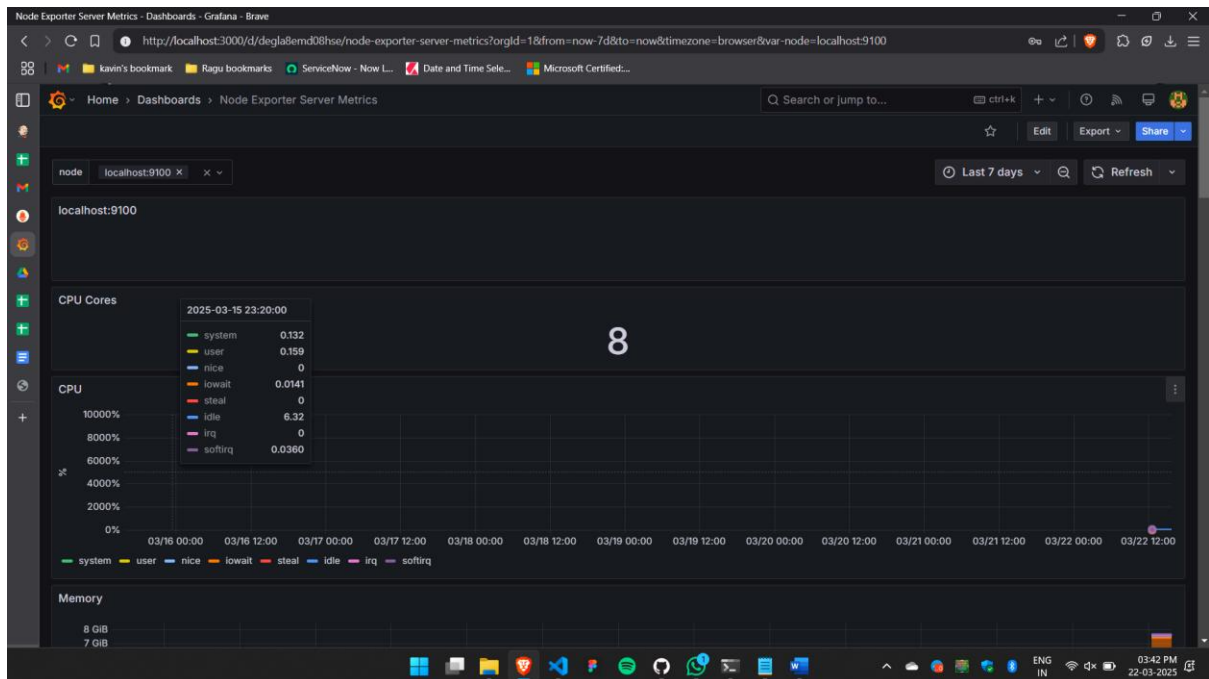


`node_load15`



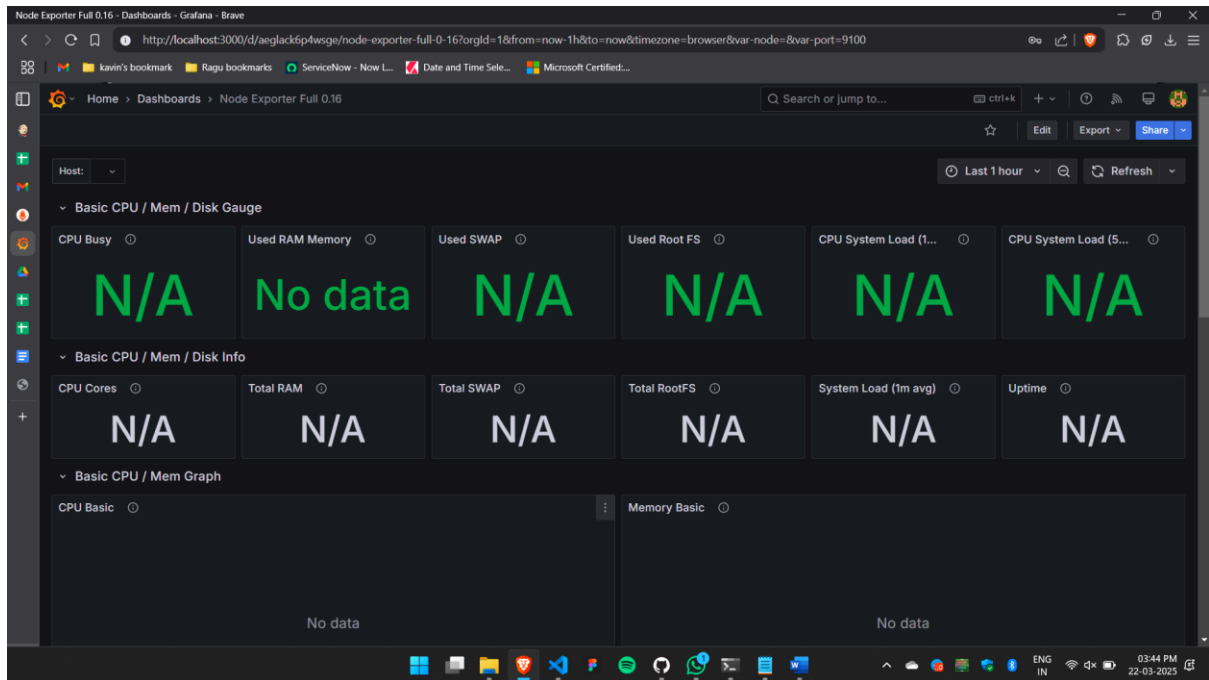
Dashboard: (405)

Node Exporter Service metrics,



Dashboard (5174):

Node Exporter Full 0.16,



Dashboard (9096):

1 Node Exporter 1.0.1

