

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/
```

```

praha@PJK: ~$ sudo vim /etc/prometheus/prometheus.yml
[sudo] password for praha:
Sorry, try again.
[sudo] password for praha:
praha@PJK:~$ sudo vim /etc/prometheus/prometheus.services
praha@PJK:~$ sudo systemctl enable prometheus
praha@PJK:~$ sudo start prometheus
sudo: start: command not found
praha@PJK:~$ sudo systemctl enable prometheus
praha@PJK:~$ sudo systemctl start prometheus
praha@PJK:~$ sudo systemctl status prometheus
● prometheus.service - Prometheus
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; preset: enabled)
   Active: active (running) since Sat 2025-03-22 12:23:15 UTC; 7min ago
     Main PID: 202 (prometheus)
        Tasks: 14 (limit: 9370)
      Memory: 105.1M (-)
     CGroup: /system.slice/prometheus.service
             └─202 /usr/local/bin/prometheus --config.file=/etc/prometheus/prometheus.yml --storage.tsdb.path=/data --storage.tsdb.retention.time=15d --web.console.templates=/etc/prometheus/consoles --web.console.libraries=/etc/prometheus/console_libraries --web.enable-lifecycle
Mar 22 12:23:15 PJK prometheus[202]: ts=2025-03-22T12:23:15.855Z caller=main.go:1045 level=info fs_type=EXT4_SUPER_MAGIC
Mar 22 12:23:15 PJK prometheus[202]: ts=2025-03-22T12:23:15.855Z caller=main.go:1048 level=info msg="TSDB started"
Mar 22 12:23:15 PJK prometheus[202]: ts=2025-03-22T12:23:15.855Z caller=main.go:1229 level=info msg="Loading configuration file"
Mar 22 12:23:15 PJK prometheus[202]: ts=2025-03-22T12:23:15.857Z caller=main.go:1266 level=info msg="Completed loading of configuration"
Mar 22 12:23:15 PJK prometheus[202]: ts=2025-03-22T12:23:15.857Z caller=main.go:1009 level=info msg="Server is ready to receive clients"
Mar 22 12:23:15 PJK prometheus[202]: ts=2025-03-22T12:23:15.857Z caller=manager.go:1009 level=info component="rule manager" msg="Starting rule manager"
Mar 22 12:23:22 PJK prometheus[202]: ts=2025-03-22T12:23:22.209Z caller=compact.go:523 level=info component=tsdb msg="WAL segment loaded"
Mar 22 12:23:22 PJK prometheus[202]: ts=2025-03-22T12:23:22.212Z caller=head.go:1298 level=info component=tsdb msg="Head is ready"
Mar 22 12:23:22 PJK prometheus[202]: ts=2025-03-22T12:23:22.213Z caller=checkpointer.go:100 level=info component=tsdb msg="WAL segment loaded"
Mar 22 12:23:22 PJK prometheus[202]: ts=2025-03-22T12:23:22.244Z caller=head.go:1266 level=info component=tsdb msg="WAL segment loaded"
..skipping...
● prometheus.service - Prometheus
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; preset: enabled)
   Active: active (running) since Sat 2025-03-22 12:23:15 UTC; 7min ago

```

Prometheus.sevice:

[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 \

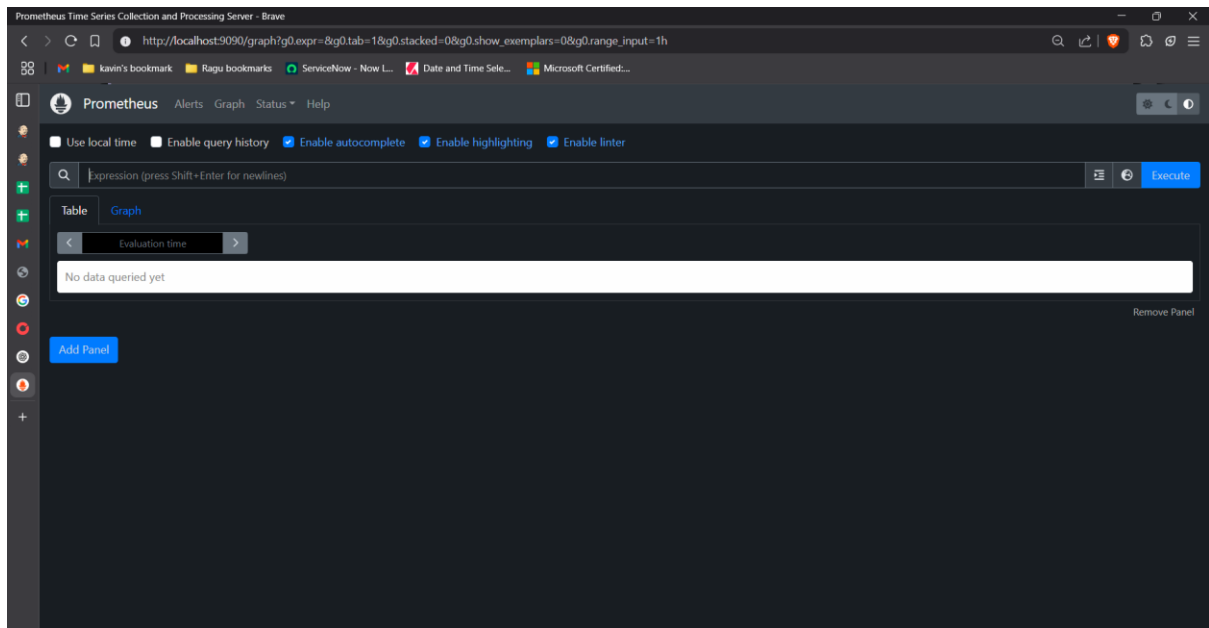
--web.console.libraries=/etc/prometheus/console_libraries \

--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]

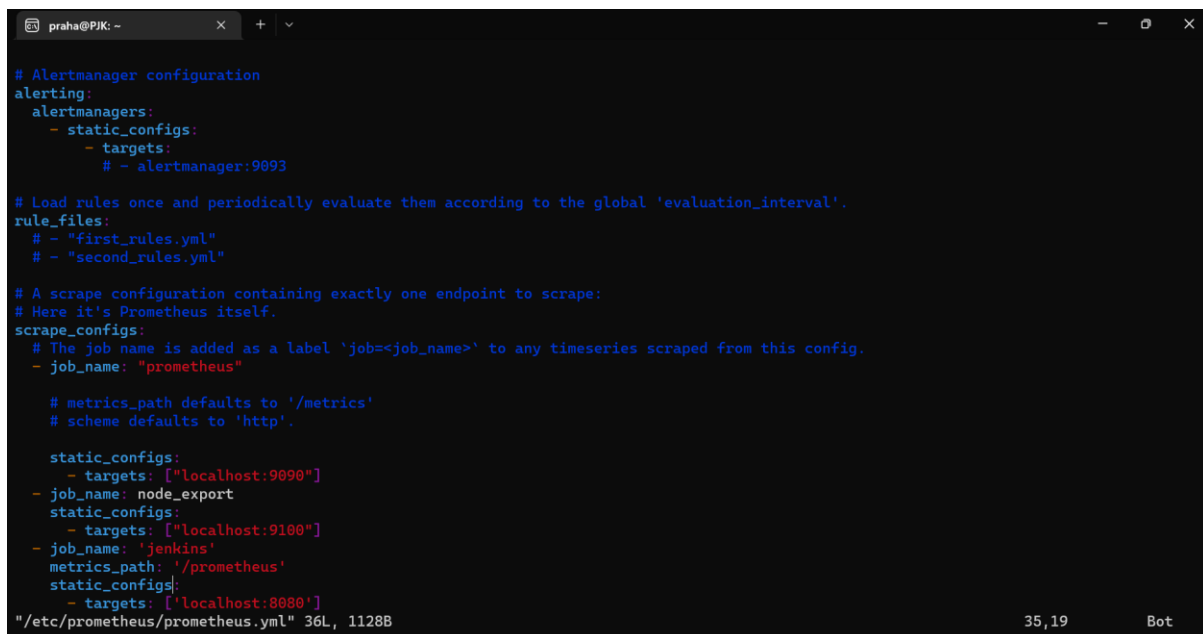
WantedBy=multi-user.target

Service check : sudo systemctl enable node_exporter

sudo systemctl start node_exporter

sudo systemctl status node_exporter

journalctl -u node_exporter -f --no-pager

A terminal window titled 'praha@PJK: ~' with standard window controls. It displays the content of a Prometheus configuration file. The configuration includes sections for alerting, rule_files, scrape_configs, and static_configs. The static_configs section lists three targets: localhost:9090 (node_export), localhost:9100 (jenkins), and localhost:8080. The terminal output shows the file path as '/etc/prometheus/prometheus.yml' with a size of 36L and 1128B. The status bar at the bottom right indicates '35,19' and 'Bot'.

```
# 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"

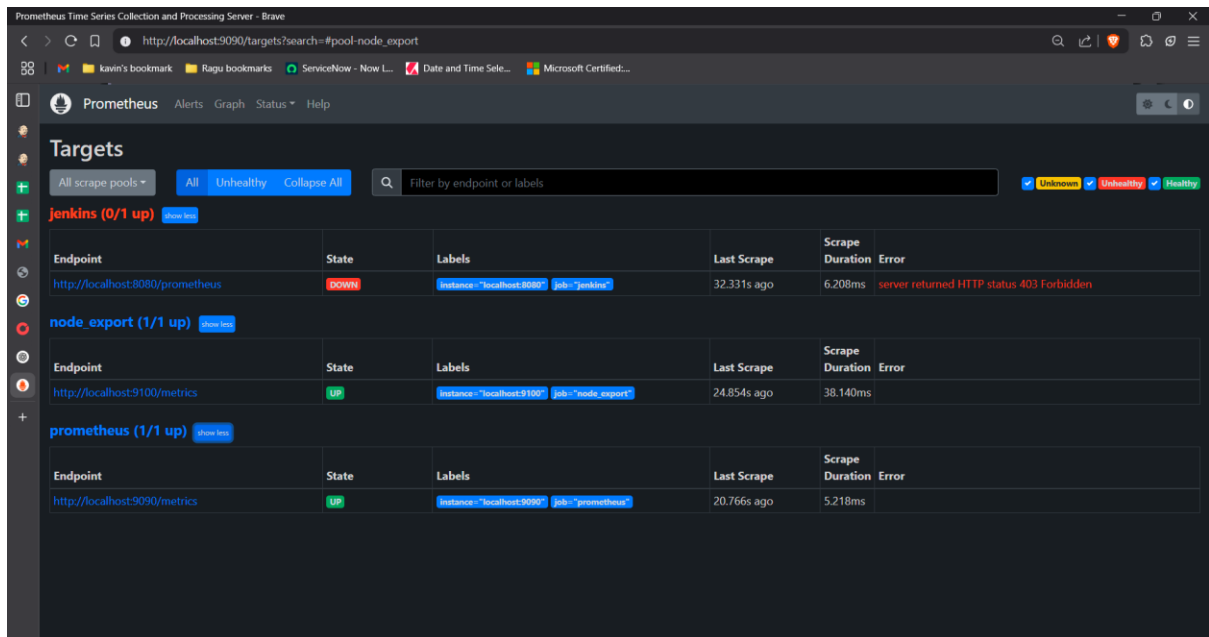
# A scrape configuration containing exactly one endpoint to scrape:
# Here it's Prometheus itself.
scrape_configs:
  # The job name is added as a label 'job=<job_name>' to any timeseries scraped from this config.
  - job_name: "prometheus"

    # 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" 36L, 1128B                                     35,19                                     Bot
```

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
```

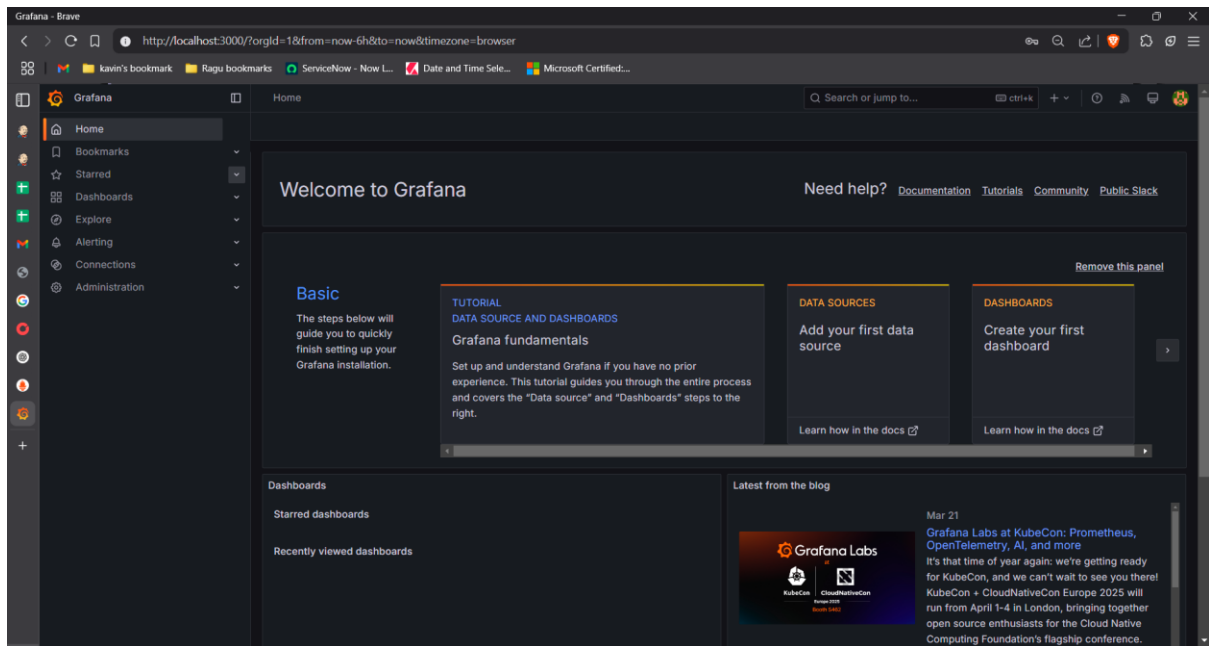
```
sudo apt-get -y install grafana
```

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

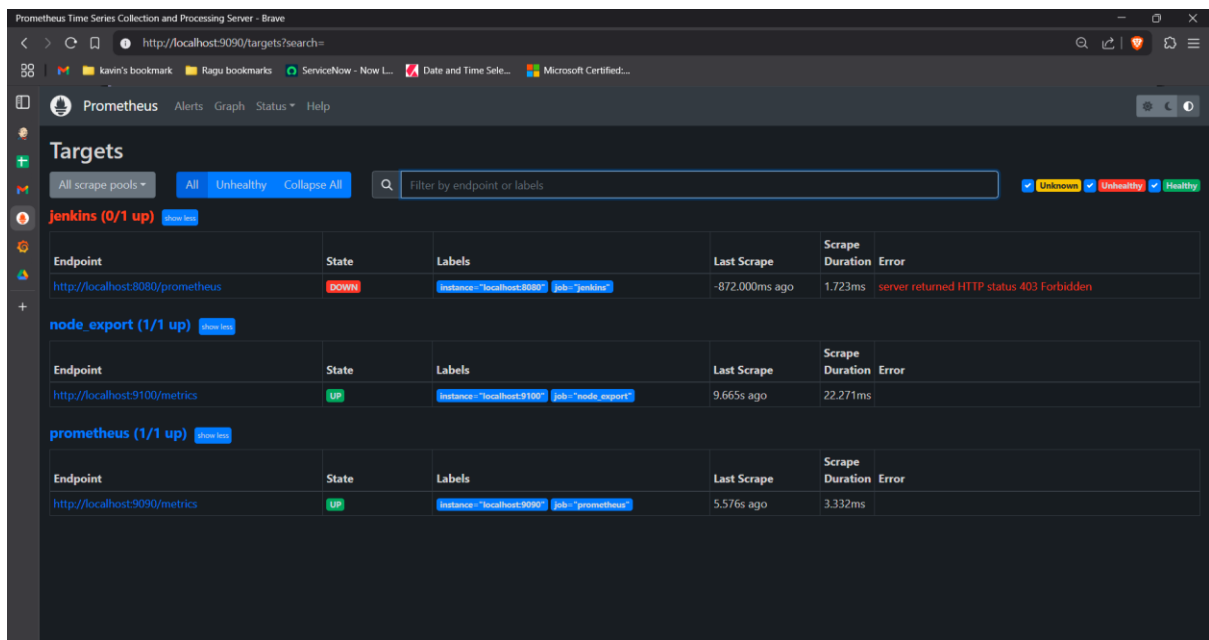
```
sudo systemctl start grafana-server
```

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

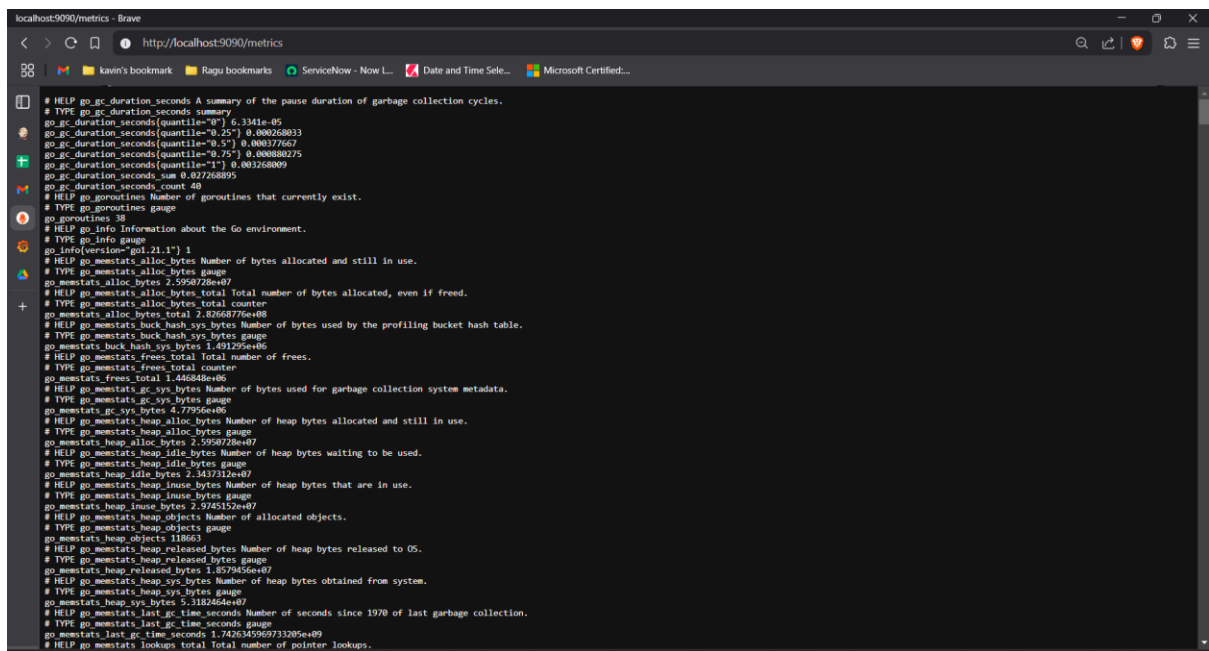
Grafana UI:



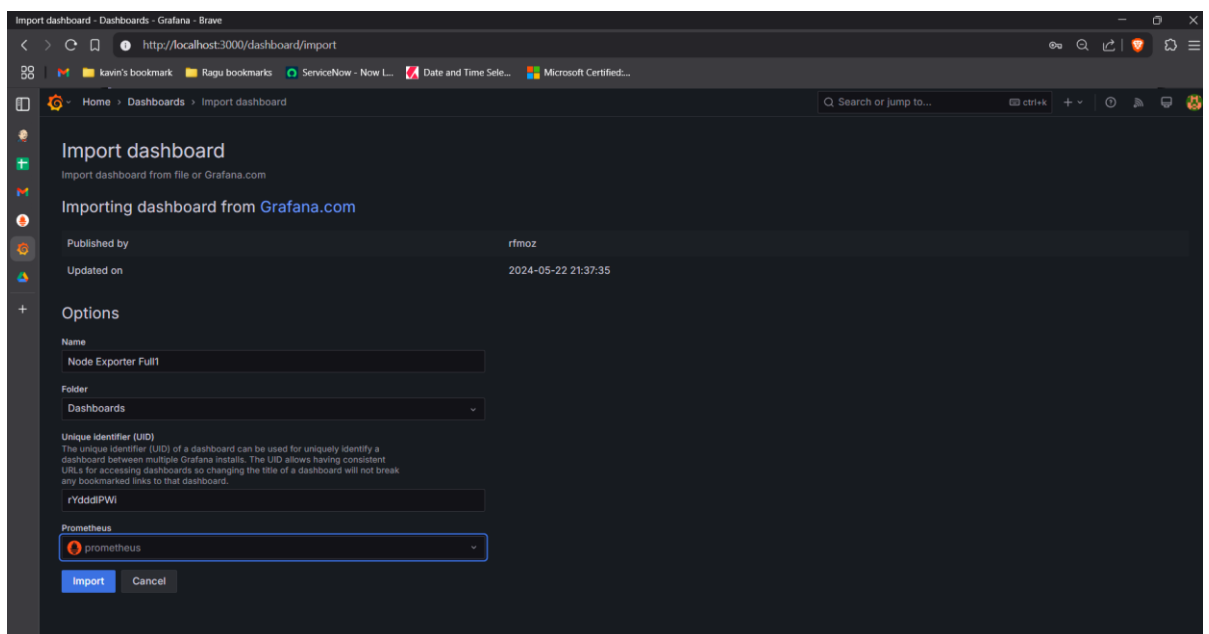
Status in promethues:



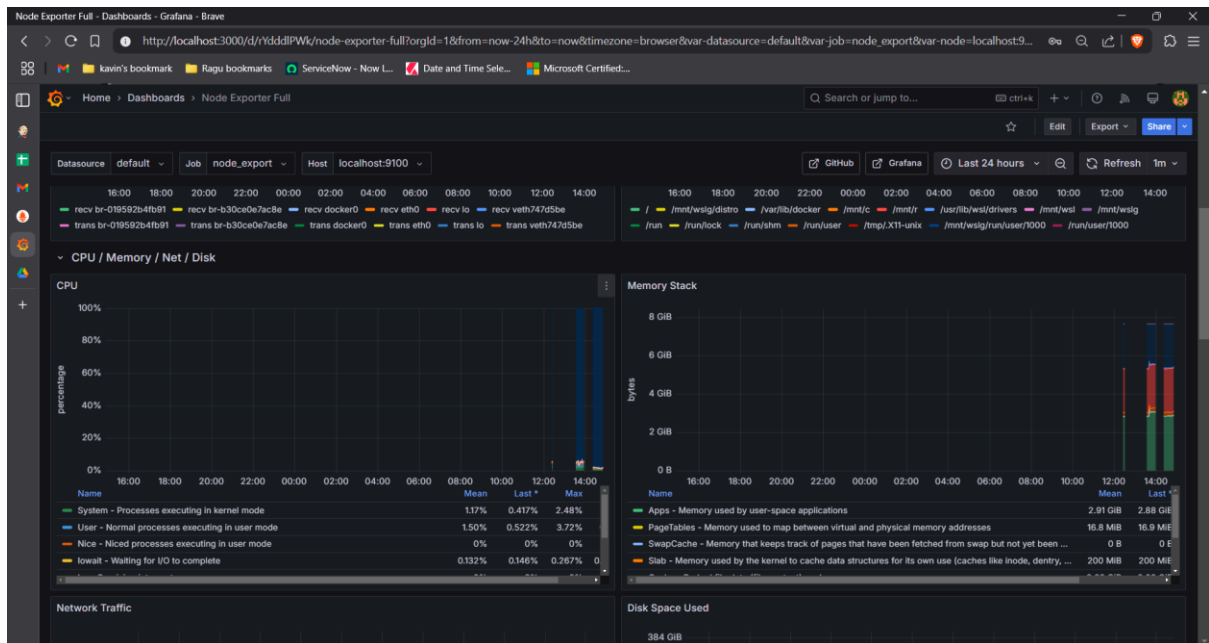
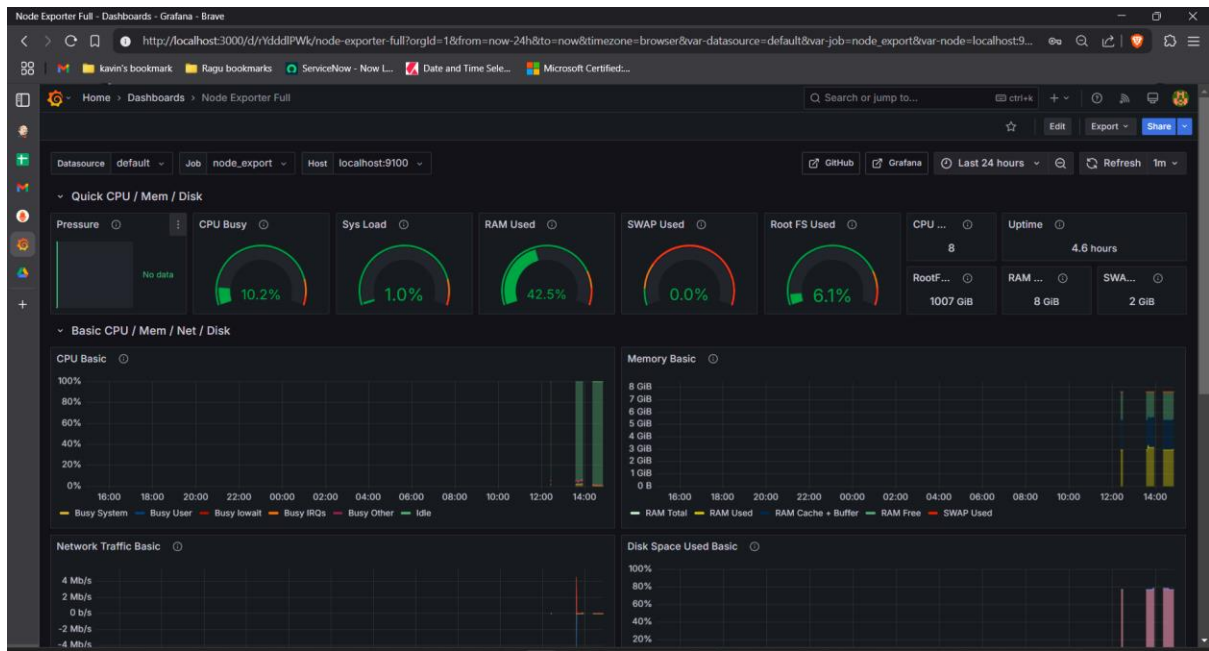
Metrics in Prometheus:



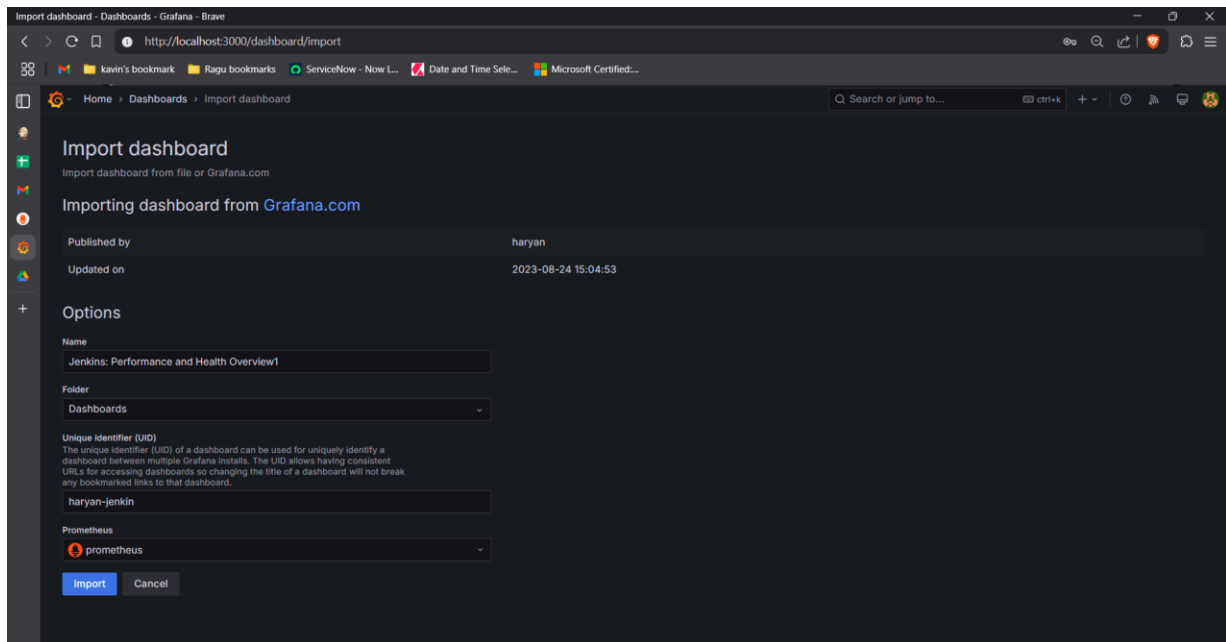
Node Exporter:



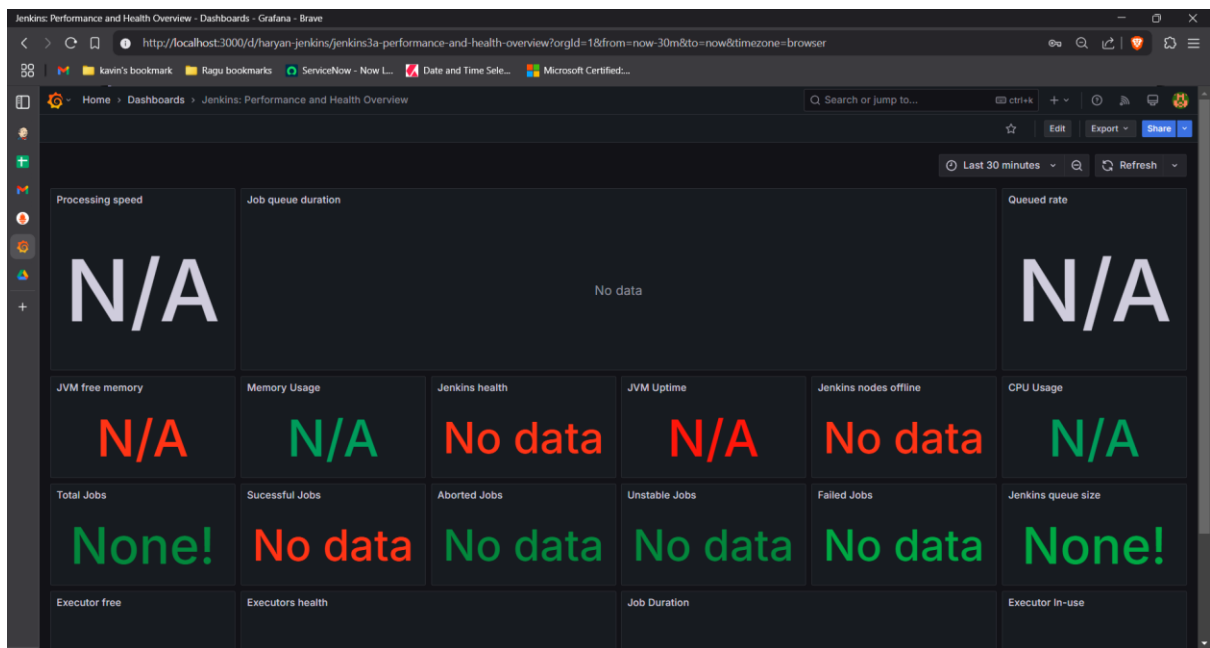
Dashboard:



Jenkins Overview:

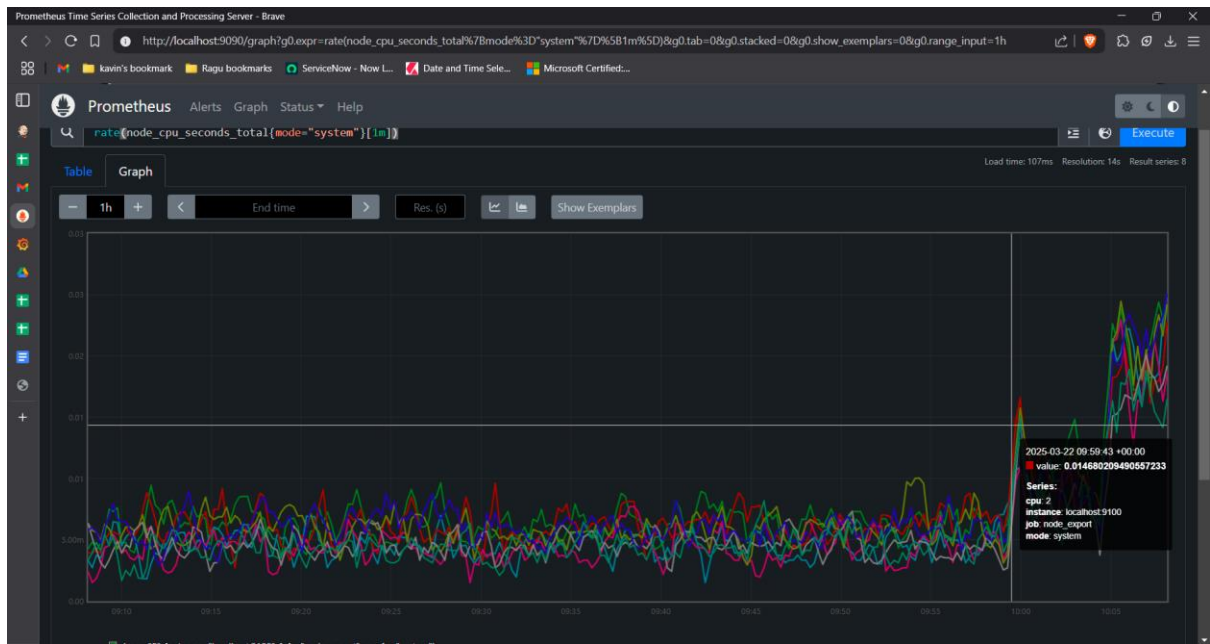


Dashboard:

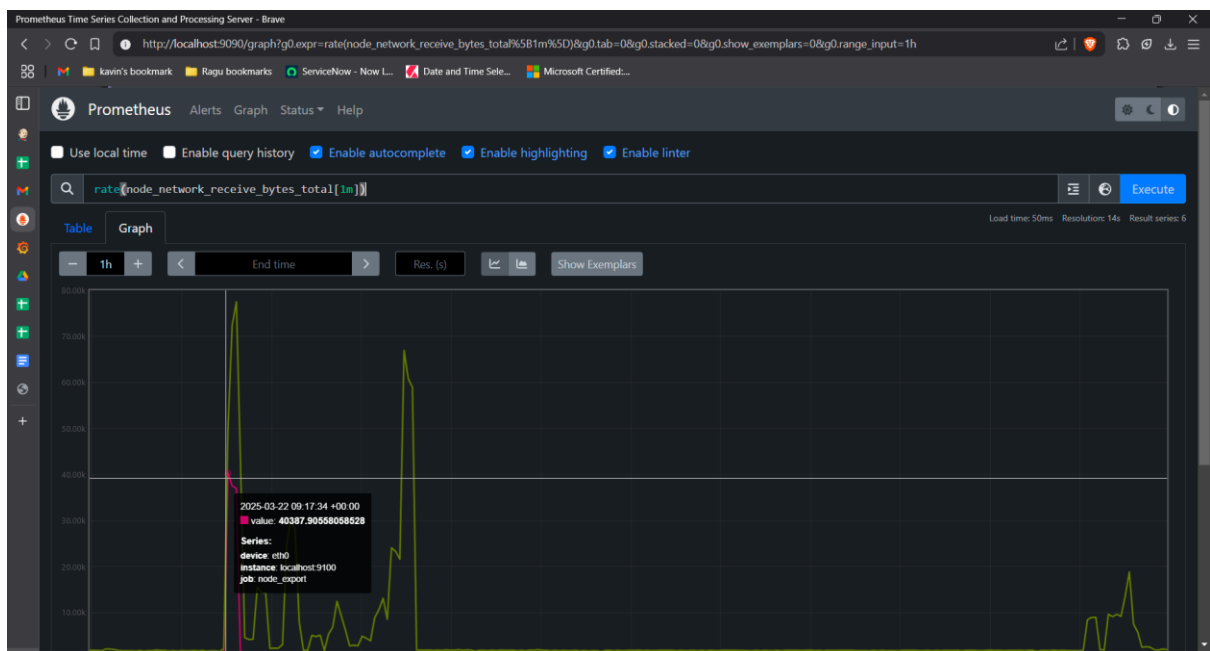


Prometheus analysis:

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



`rate(node_network_receive_bytes_total[1m])`

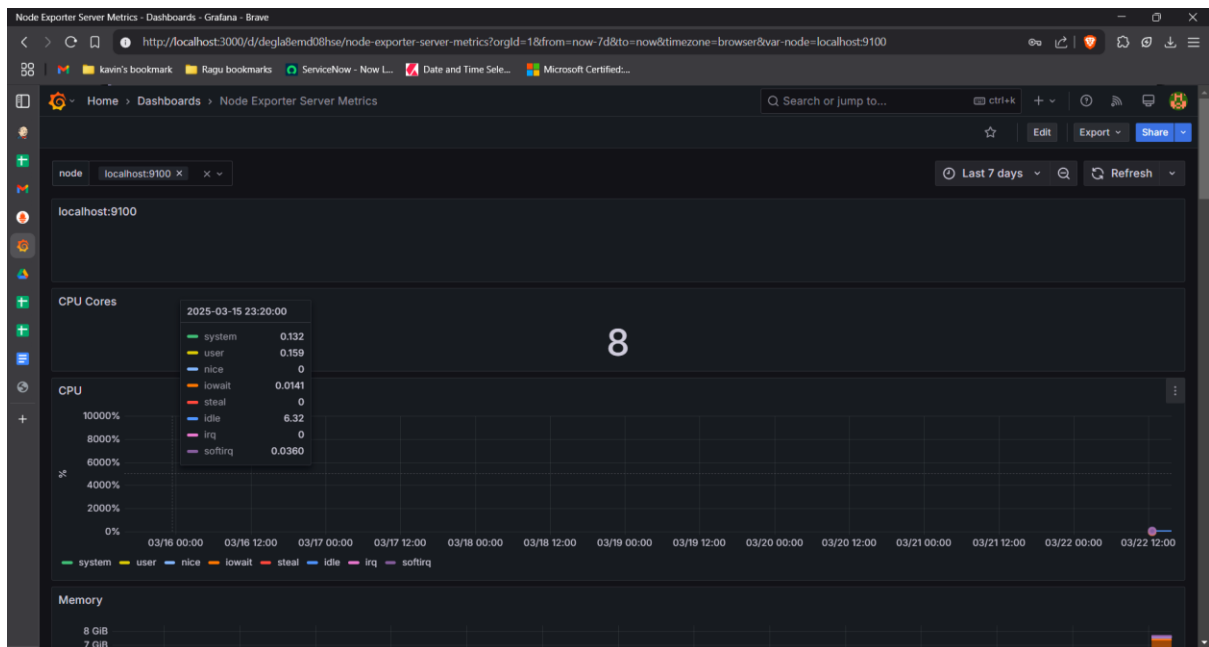


`node_load15`



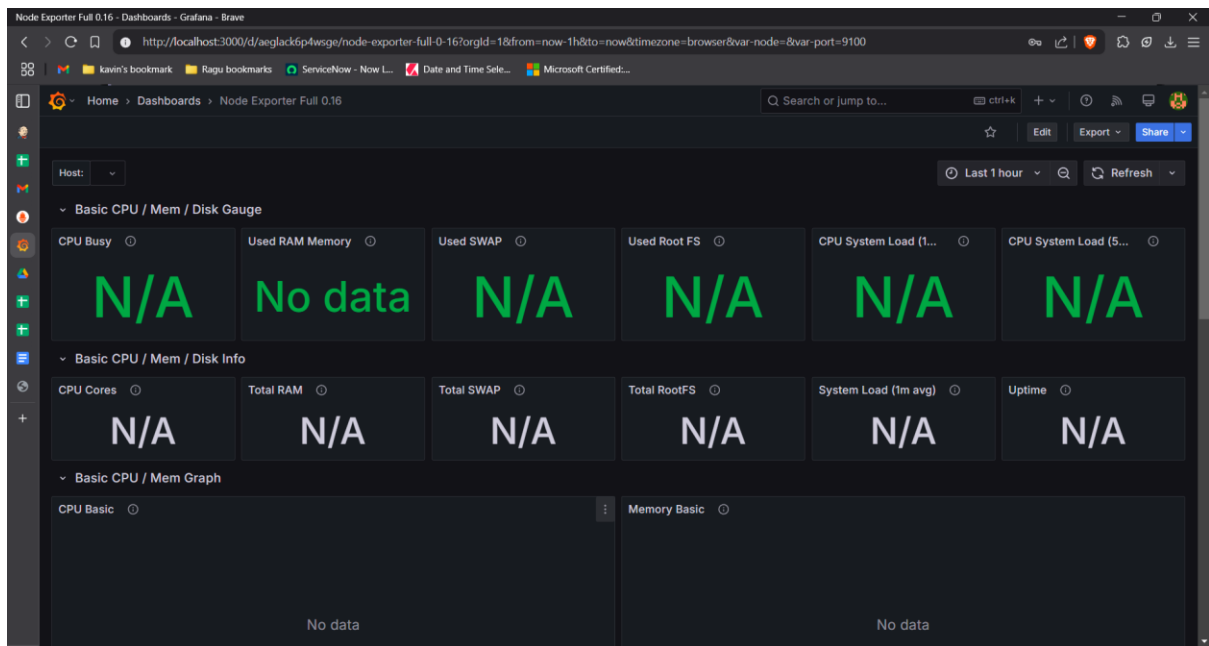
Dashboard: (405)

Node Exporter Service metrics,



Dashboard (5174):

Node Exporter Full 0.16,



Dashboard (9096):

1 Node Exporter 1.0.1

