PROMETHEUS BASICS

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

Features

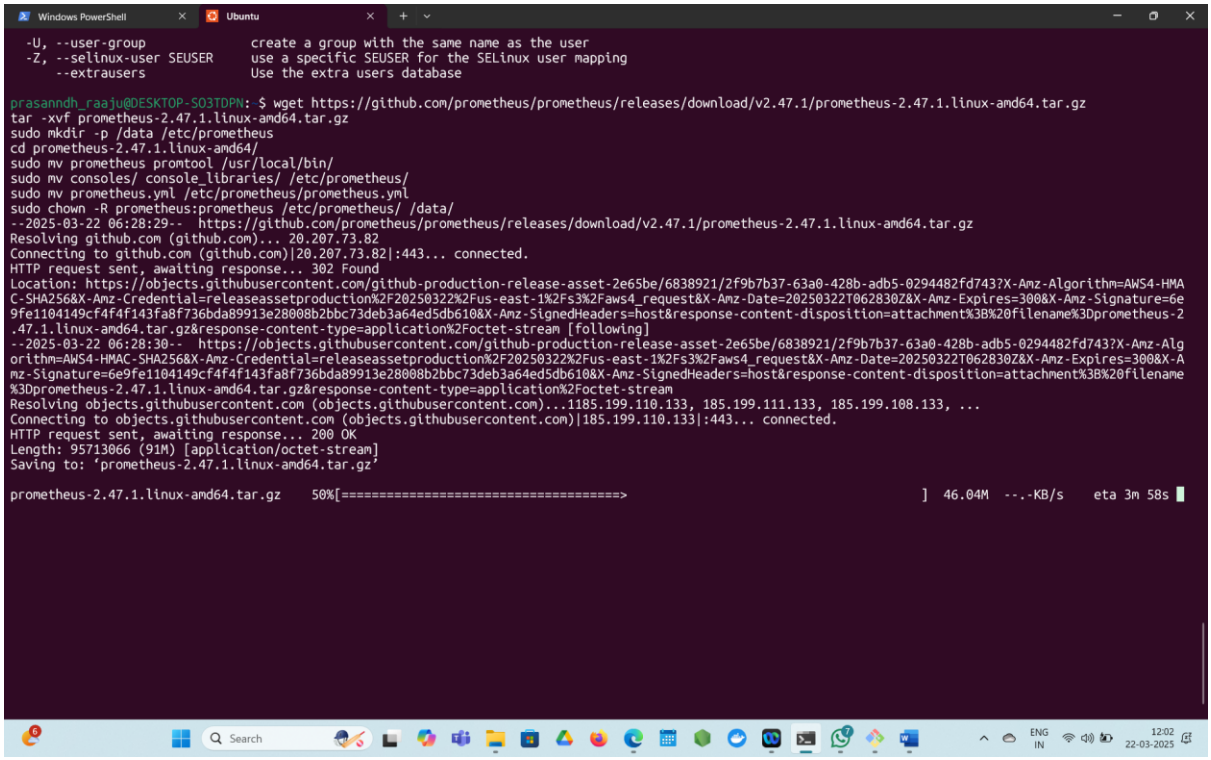
1. A multi-dimensional data model with time series data identified by metric name and key/value pairs
2. PromQL, a flexible query language to leverage this dimensionality
3. No reliance on distributed storage; single server nodes are autonomous
4. Time series collection happens via a pull model over 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

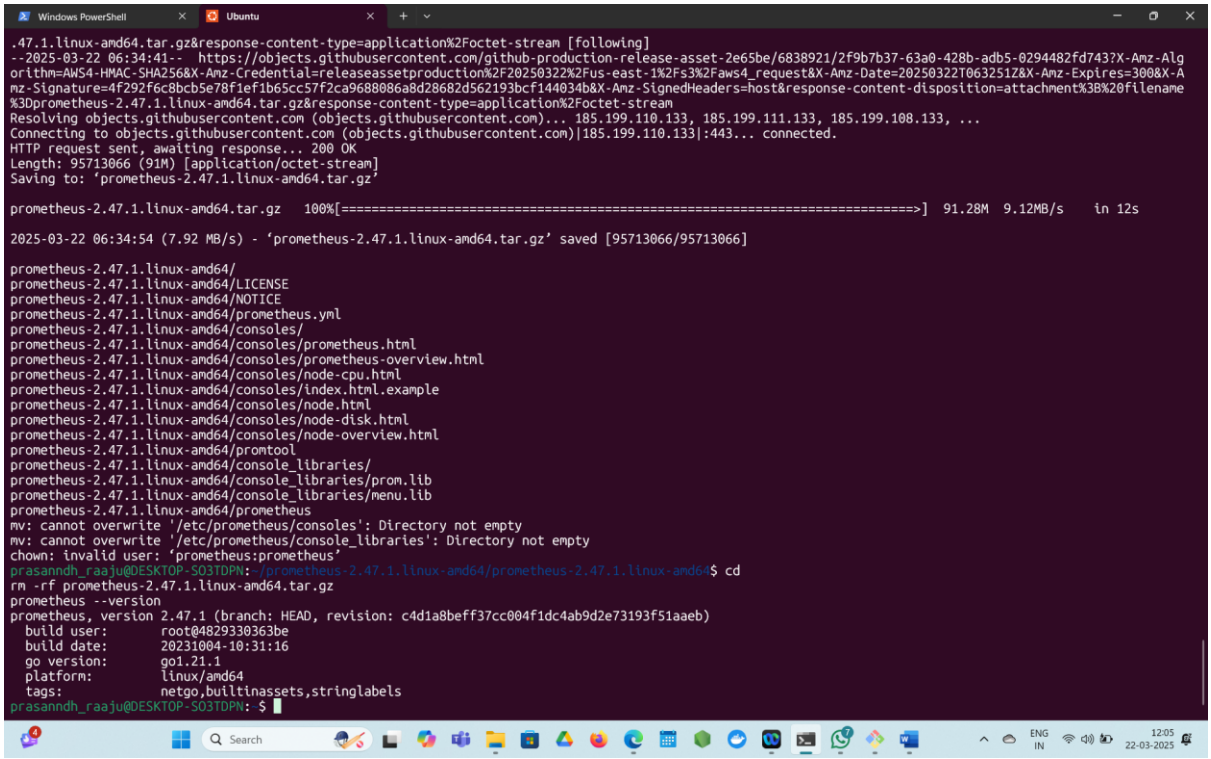
Prometheus Installation: (Commands with output)

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

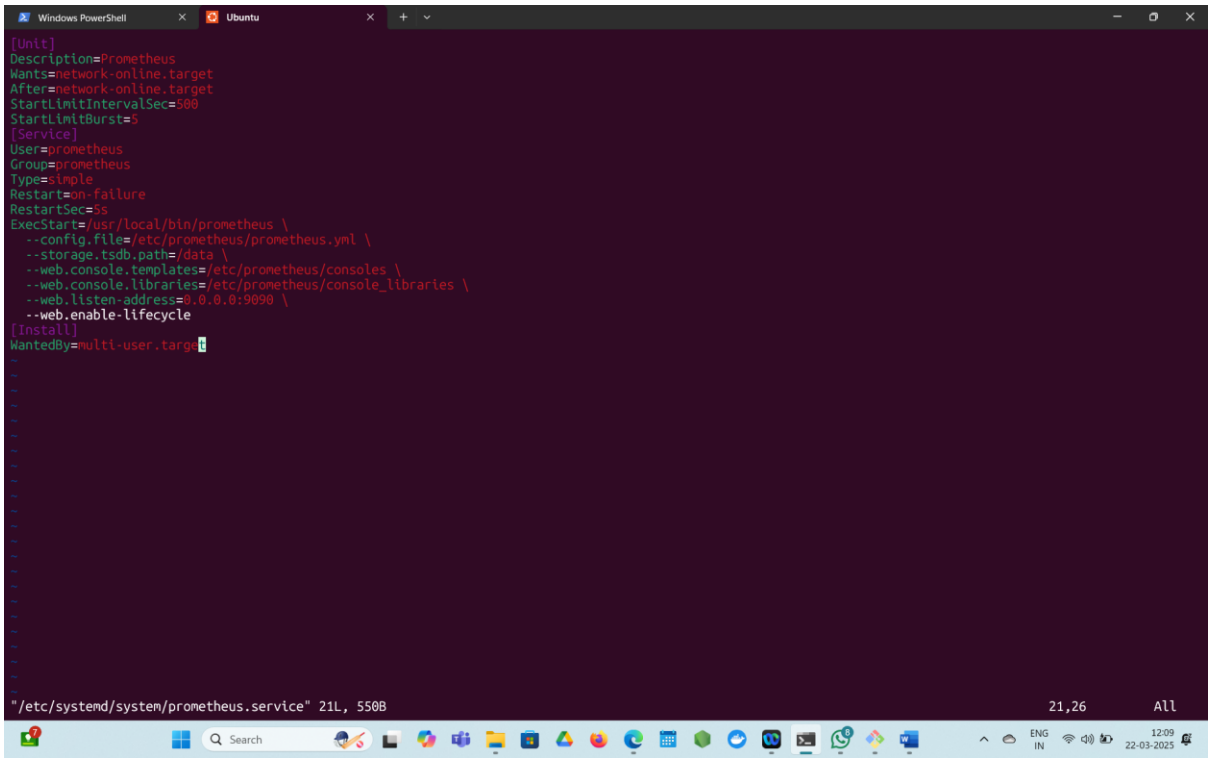
```
wget https://github.com/prometheus/prometheus/releases/download/v2.47.1/prometheus-2.47.1.linux-amd64.tar.gz
tar -xvf prometheus-2.47.1.linux-amd64.tar.gz
sudo mkdir -p /data /etc/prometheus
cd prometheus-2.47.1.linux-amd64/
sudo mv prometheus promtool /usr/local/bin/
sudo mv consoles/ console_libraries/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

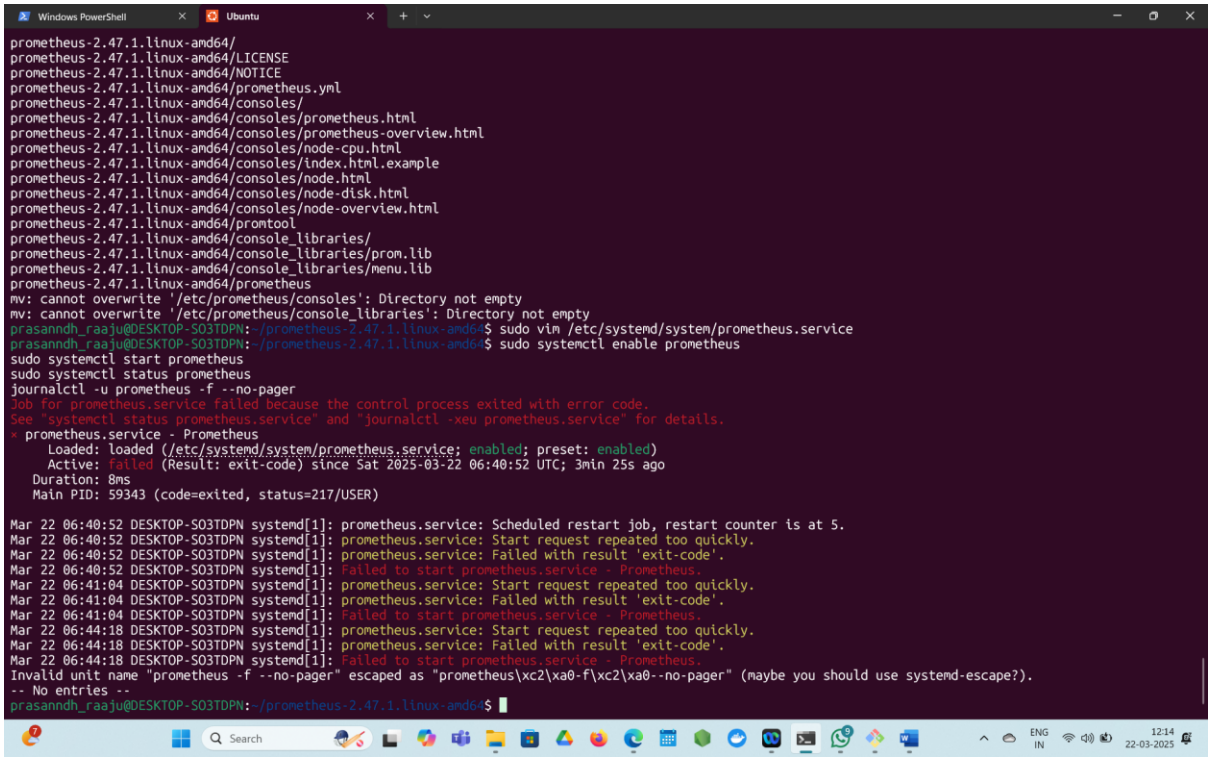

Windows PowerShell
Ubuntu
-U, --user-group create a group with the same name as the user
-Z, --selinux-user SEUSER use a specific SEUSER for the SELinux user mapping
--extrausers Use the extra users database
prasanndh_raaju@DESKTOP-SO3TDPN: $ wget https://github.com/prometheus/prometheus/releases/download/v2.47.1/prometheus-2.47.1.linux-amd64.tar.gz
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 06:28:29-- 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%2Fs3%2Faws4_request&X-Amz-Date=20250322T062830Z&X-Amz-Expires=300&X-Amz-Signature=6e9fe1104149cf4f4f143fa8f736bda89913e28008b2bbc73deb3a64ed5db610&X-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 06:28:30-- 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%2Fs3%2Faws4_request&X-Amz-Date=20250322T062830Z&X-Amz-Expires=300&X-Amz-Signature=6e9fe1104149cf4f4f143fa8f736bda89913e28008b2bbc73deb3a64ed5db610&X-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)...1185.199.110.133, 185.199.111.133, 185.199.108.133, ...
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)|185.199.110.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 95713066 (91M) [application/octet-stream]
Saving to: 'prometheus-2.47.1.linux-amd64.tar.gz'
prometheus-2.47.1.linux-amd64.tar.gz 50%[==========>] 46.04M --.-KB/s eta 3m 58s
Search
ENG IN
12:02 22-03-2025


Windows PowerShell
Ubuntu
.47.1.linux-amd64.tar.gz&response-content-type=application%2Foctet-stream [following]
--2025-03-22 06:34:41-- 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%2Fs3%2Faws4_request&X-Amz-Date=20250322T063251Z&X-Amz-Expires=300&X-Amz-Signature=4f292f6c8bcb5e78f1ef1b65cc57f2ca9688086a8d28682d562193bcf144034b&X-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.
HTTP request sent, awaiting response... 200 OK
Length: 95713066 (91M) [application/octet-stream]
Saving to: 'prometheus-2.47.1.linux-amd64.tar.gz'
prometheus-2.47.1.linux-amd64.tar.gz 100%[==========>] 91.28M 9.12MB/s in 12s
2025-03-22 06:34:54 (7.92 MB/s) - 'prometheus-2.47.1.linux-amd64.tar.gz' saved [95713066/95713066]
prometheus-2.47.1.linux-amd64/
prometheus-2.47.1.linux-amd64/LICENSE
prometheus-2.47.1.linux-amd64/NOTICE
prometheus-2.47.1.linux-amd64/prometheus.yml
prometheus-2.47.1.linux-amd64/consoles/
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
prometheus-2.47.1.linux-amd64/console_libraries/
prometheus-2.47.1.linux-amd64/console_libraries/prom.lib
prometheus-2.47.1.linux-amd64/console_libraries/menu.lib
prometheus-2.47.1.linux-amd64/prometheus
mv: cannot overwrite '/etc/prometheus/consoles': Directory not empty
mv: cannot overwrite '/etc/prometheus/console_libraries': Directory not empty
chown: invalid user: 'prometheus:prometheus'
prasanndh_raaju@DESKTOP-SO3TDPN:~/prometheus-2.47.1.linux-amd64/prometheus-2.47.1.linux-amd64$ cd
rm -rf prometheus-2.47.1.linux-amd64.tar.gz
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
prasanndh_raaju@DESKTOP-SO3TDPN: $
Search
ENG IN
12:05 22-03-2025

```
[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
```




```
sudo systemctl enable prometheus
sudo systemctl start prometheus
sudo systemctl status prometheus
journalctl -u prometheus -f --no-pager
```




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

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

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

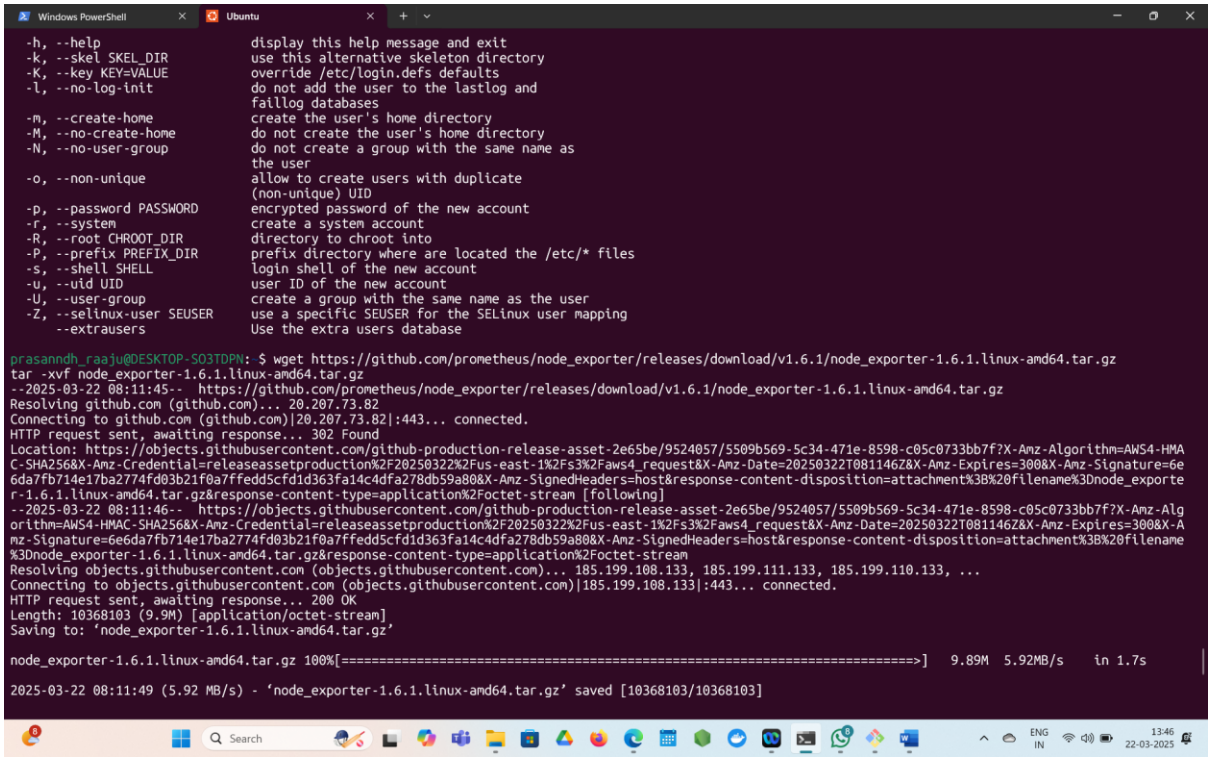
```
rm -rf node_exporter*
```

```
node_exporter –version
```

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

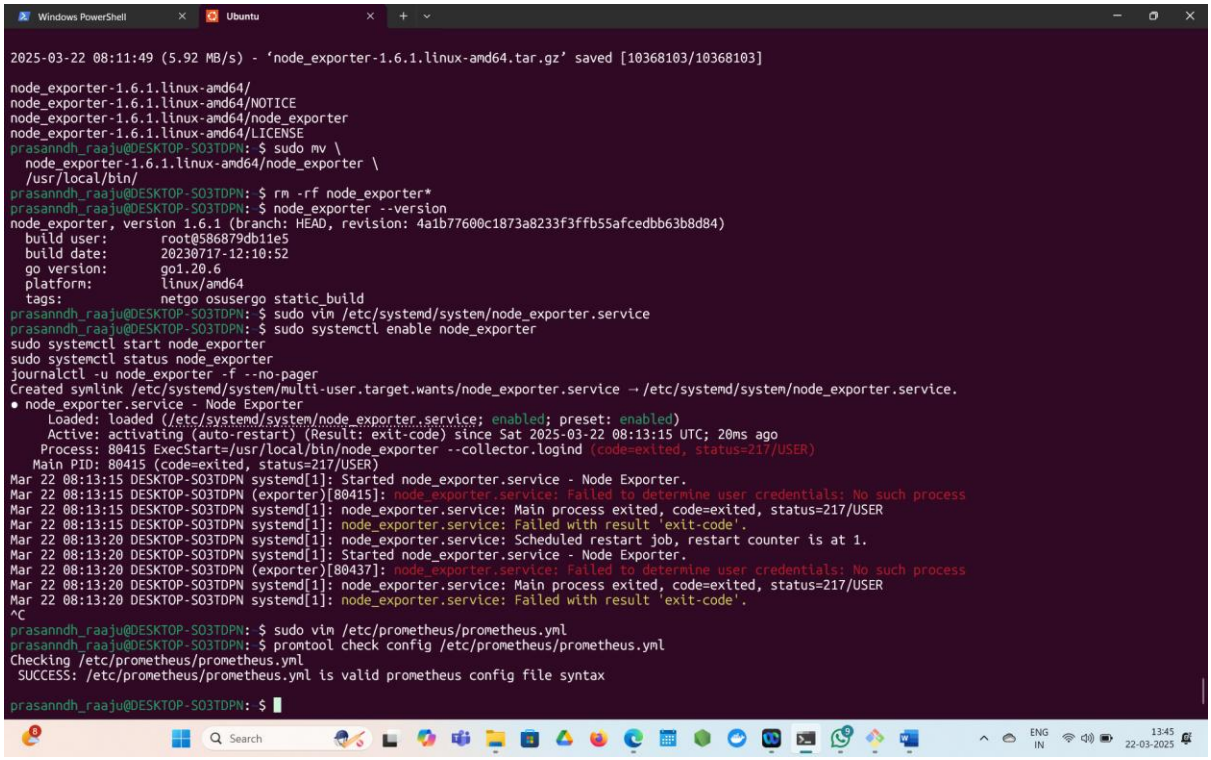
```
[Unit]
Description=Node Exporter
Wants=network-online.target
After=network-online.target
StartLimitIntervalSec=500
StartLimitBurst=5
[Service]
```

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

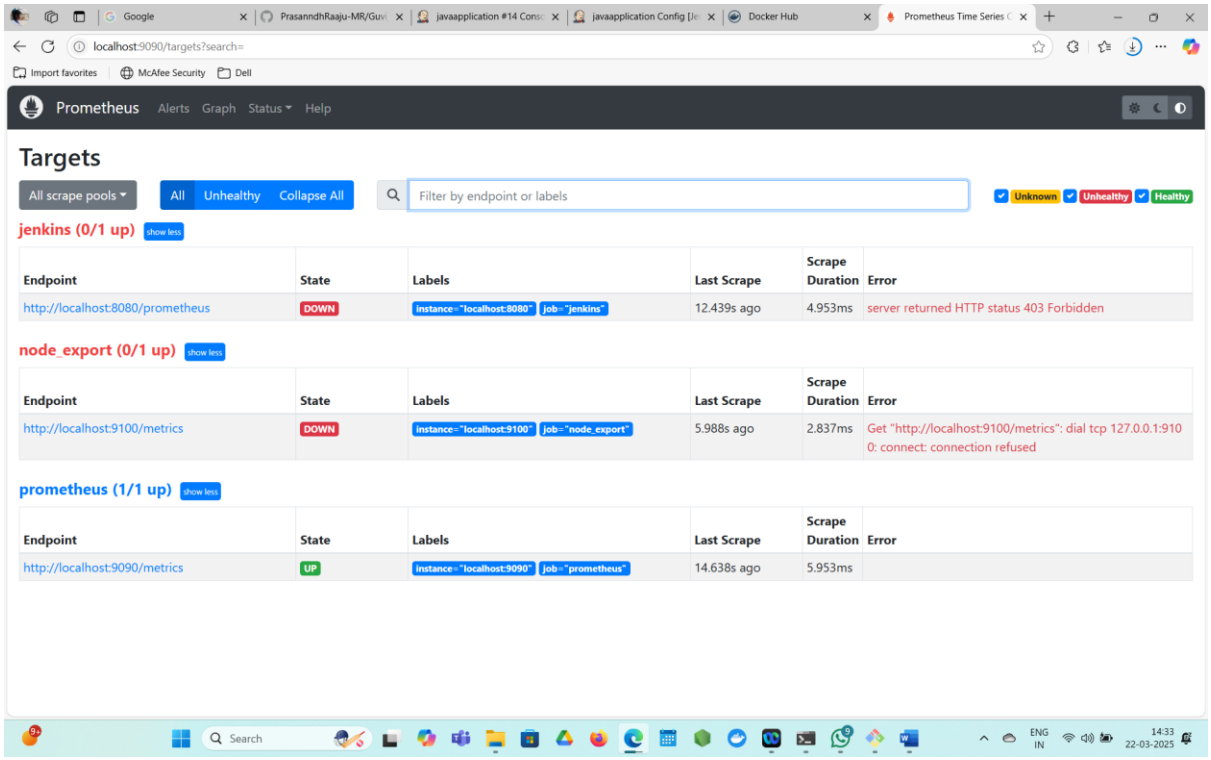


sudo systemctl enable node_exporter
sudo systemctl start node_exporter
sudo systemctl status node_exporter
journalctl -u node_exporter -f --no-pager

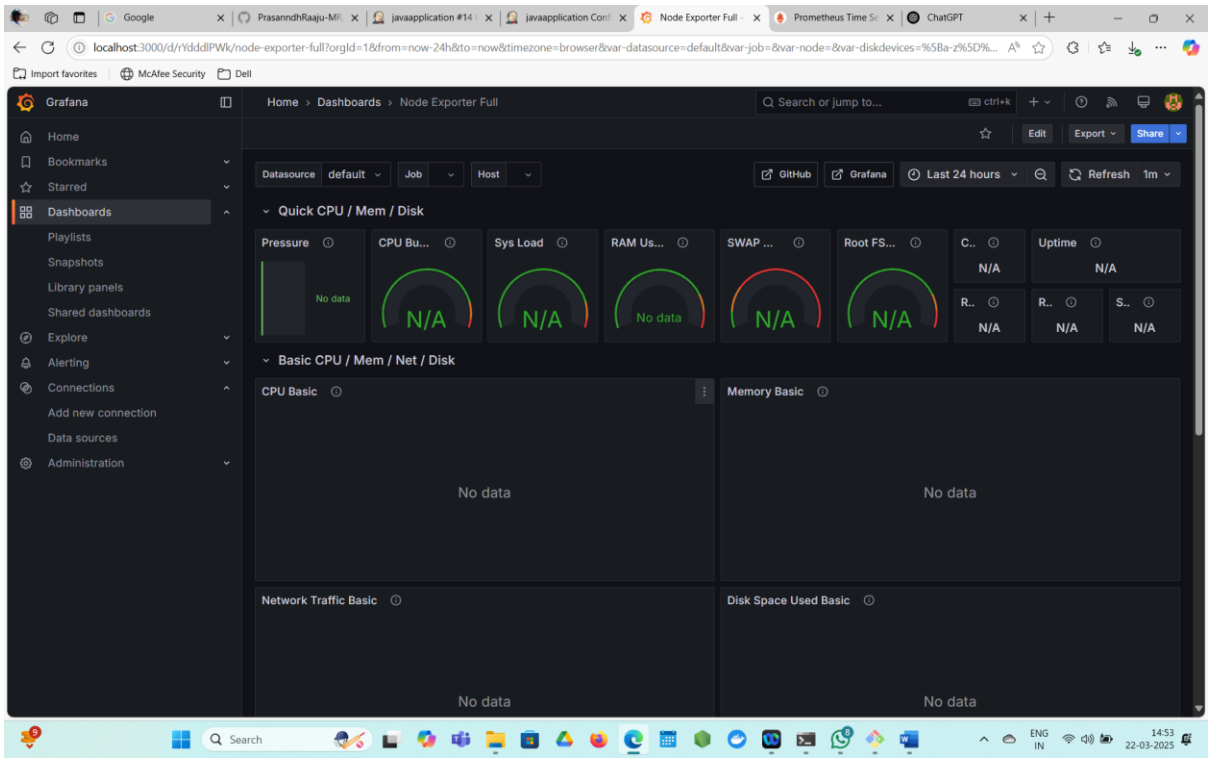
sudo vim /etc/prometheus/prometheus.yml

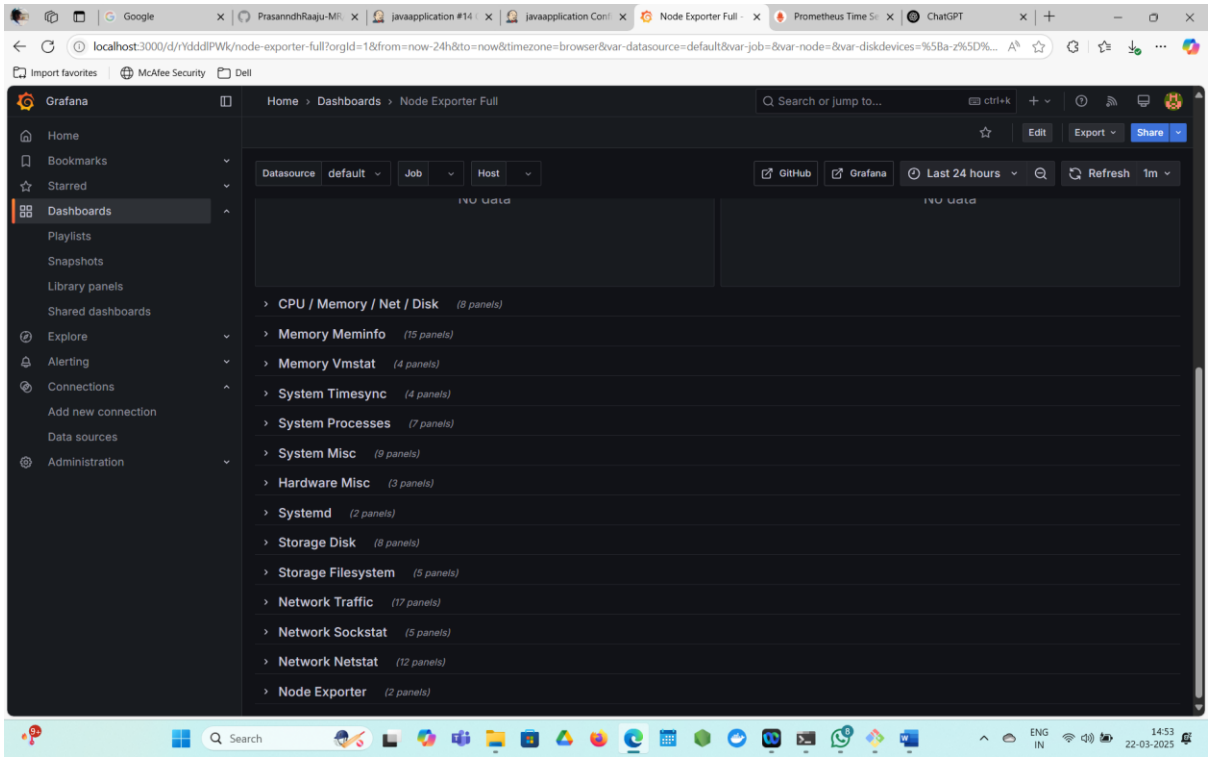


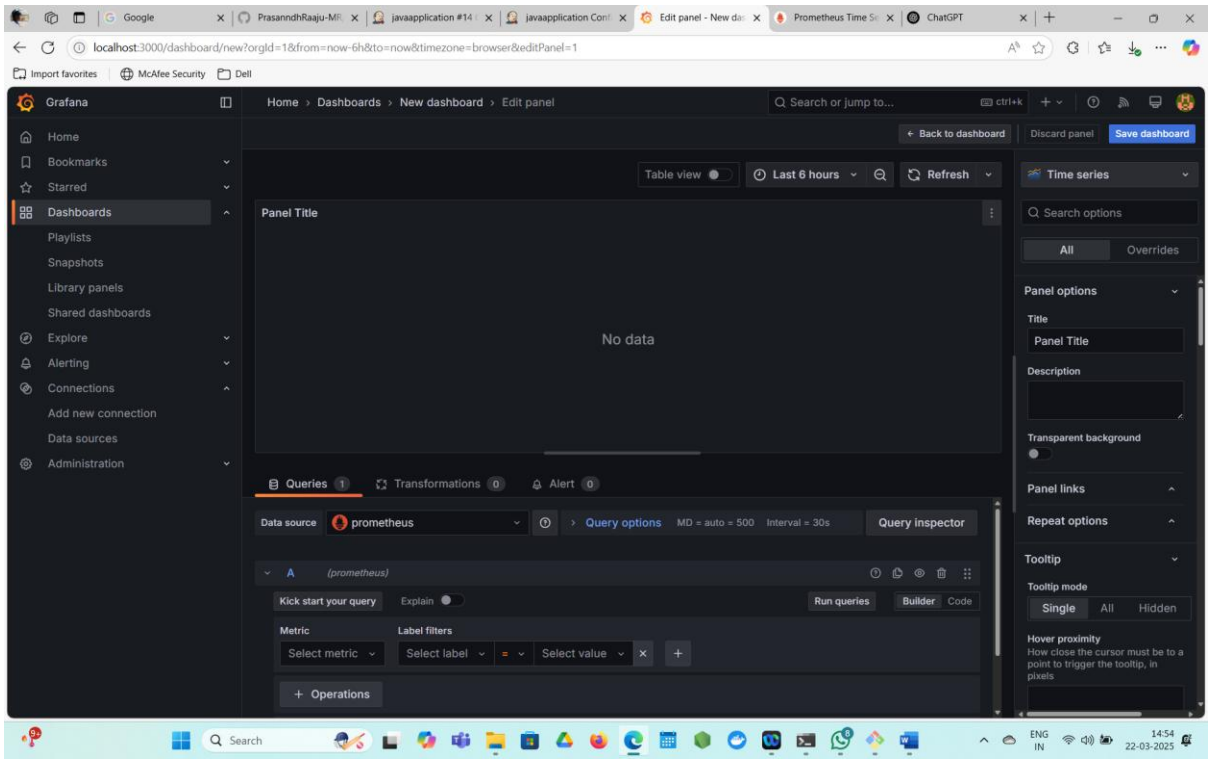

```
- job_name: node_export
    static_configs:
      - targets: ["localhost:9100"]


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


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"
12.439s ago
4.953ms
server returned HTTP status 403 Forbidden
node_export (0/1 up)
show less
Endpoint
State
Labels
Last Scrape
Scrape Duration
Error
http://localhost:9100/metrics
DOWN
instance="localhost:9100"
job="node_export"
5.988s ago
2.837ms
Get "http://localhost:9100/metrics": dial tcp 127.0.0.1:910 0: connect: connection refused
prometheus (1/1 up)
show less
Endpoint
State
Labels
Last Scrape
Scrape Duration
Error
http://localhost:9090/metrics
UP
instance="localhost:9090"
job="prometheus"
14.638s ago
5.953ms

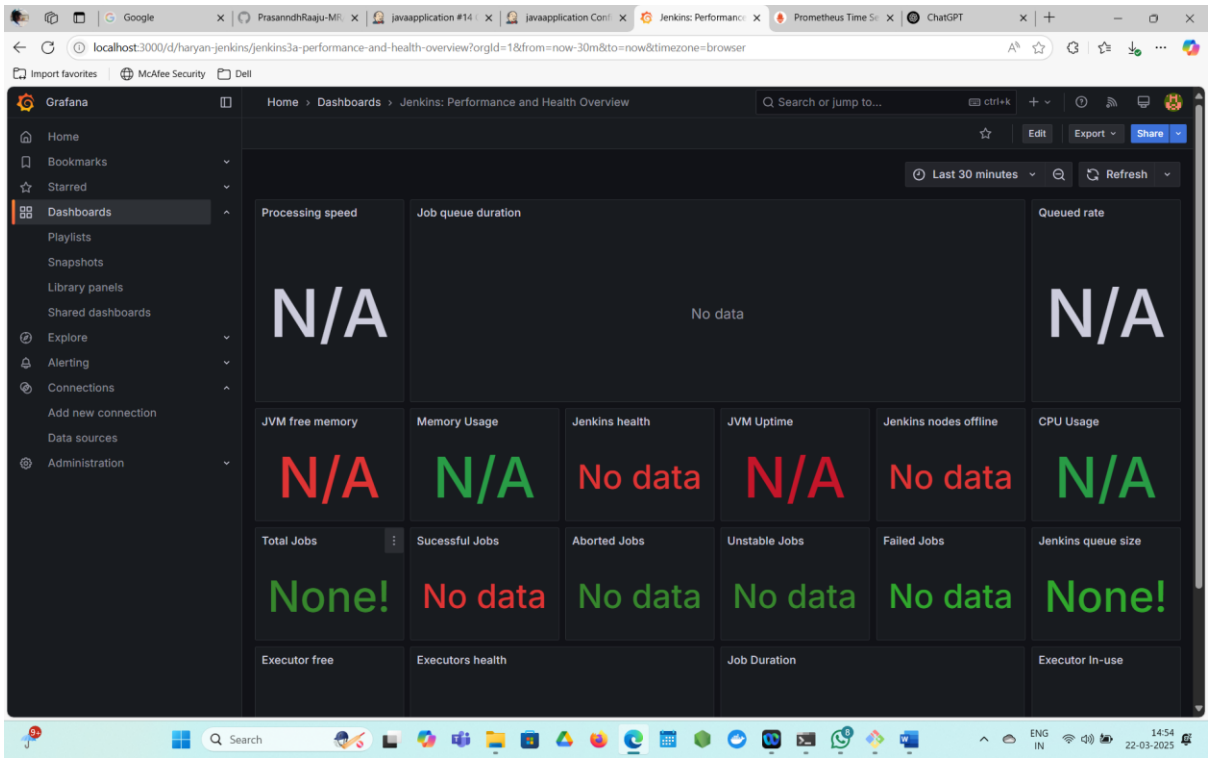
1860

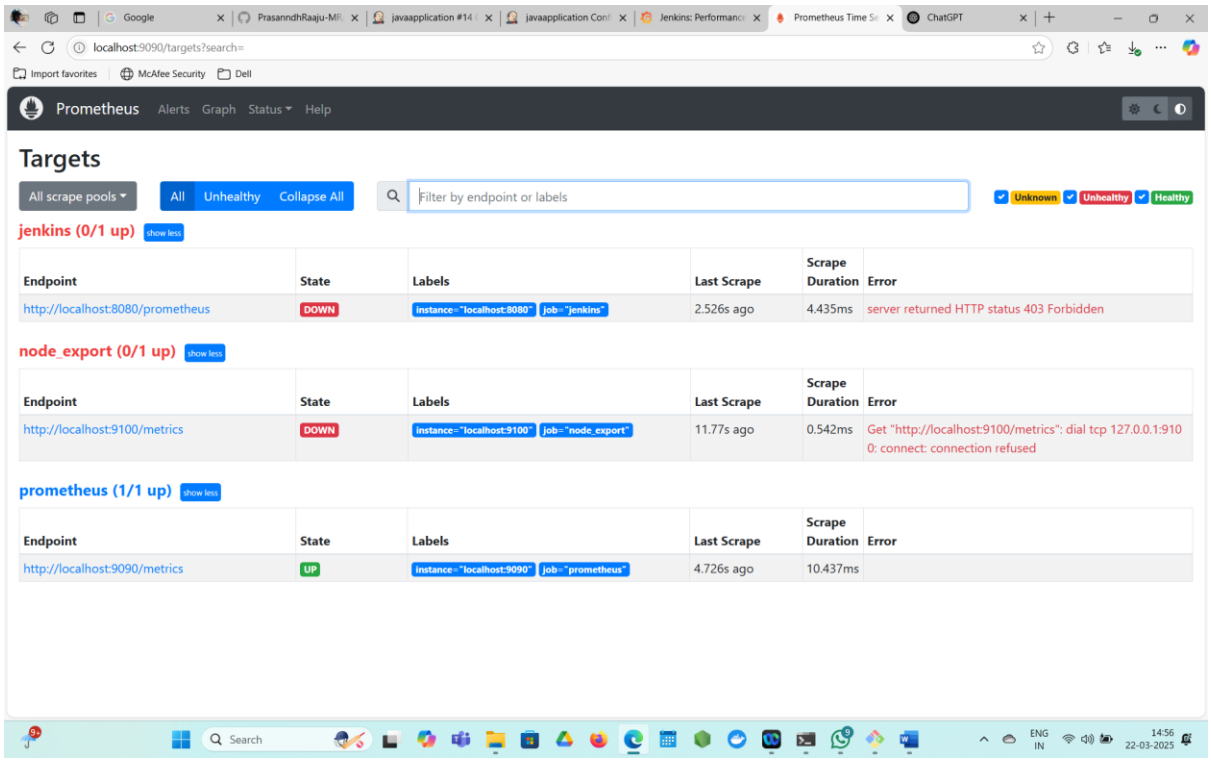

Grafana
Home
Dashboards
Node Exporter Full
Search or jump to...
Edit
Export
Share
Datasource
default
Job
Host
GitHub
Grafana
Last 24 hours
Refresh
1m
Quick CPU / Mem / Disk
Pressure
No data
CPU Bu...
N/A
Sys Load
N/A
RAM Us...
No data
SWAP ...
N/A
Root FS...
N/A
C..
N/A
Uptime
N/A
R..
N/A
R..
N/A
S..
N/A
Basic CPU / Mem / Net / Disk
CPU Basic
No data
Memory Basic
No data
Network Traffic Basic
No data
Disk Space Used Basic
No data
Home
Bookmarks
Starred
Dashboards
Playlists
Snapshots
Library panels
Shared dashboards
Explore
Alerting
Connections
Add new connection
Data sources
Administration


Grafana
Home
Bookmarks
Starred
Dashboards
Playlists
Snapshots
Library panels
Shared dashboards
Explore
Alerting
Connections
Add new connection
Data sources
Administration
Home › Dashboards › Node Exporter Full
Search or jump to...
Edit
Export
Share
Datasource default
Job
Host
GitHub
Grafana
Last 24 hours
Refresh 1m
CPU / Memory / Net / Disk (8 panels)
Memory Meminfo (15 panels)
Memory Vmstat (4 panels)
System Timesync (4 panels)
System Processes (7 panels)
System Misc (9 panels)
Hardware Misc (3 panels)
Systemd (2 panels)
Storage Disk (8 panels)
Storage Filesystem (5 panels)
Network Traffic (17 panels)
Network Sockstat (5 panels)
Network Netstat (12 panels)
Node Exporter (2 panels)


Grafana
Home
Bookmarks
Starred
Dashboards
Playlists
Snapshots
Library panels
Shared dashboards
Explore
Alerting
Connections
Add new connection
Data sources
Administration
Home › Dashboards › New dashboard › Edit panel
Search or jump to...
Back to dashboard
Discard panel
Save dashboard
Table view
Last 6 hours
Refresh
Time series
Panel Title
No data
Search options
All
Overrides
Panel options
Title
Panel Title
Description
Transparent background
Queries 1
Transformations 0
Alert 0
Data source prometheus
Query options MD = auto = 500 Interval = 30s
Query inspector
A (prometheus)
Kick start your query
Explain
Run queries
Builder Code
Metric
Label filters
Select metric
Select label
Select value
Operations
Panel links
Repeat options
Tooltip
Tooltip mode
Single All Hidden
Hover proximity
How close the cursor must be to a point to trigger the tooltip, in pixels

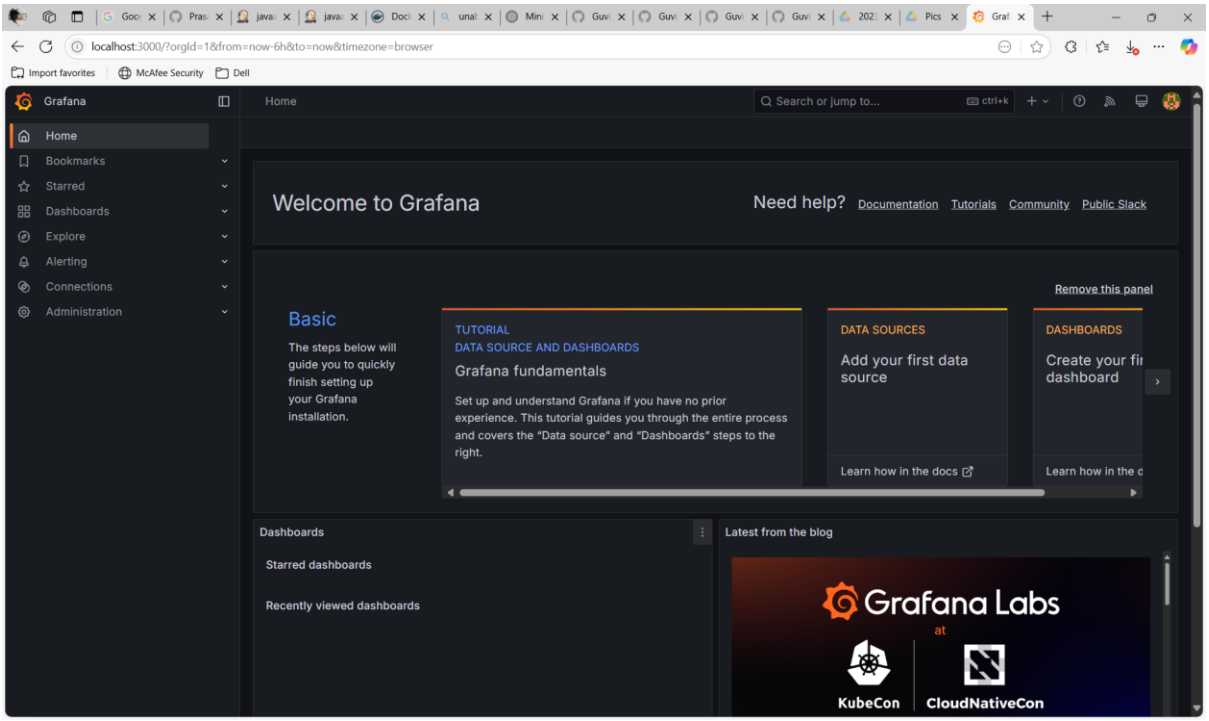
9964


localhost:3000/d/haryan-jenkins/jenkins3a-performance-and-health-overview?orgId=1&from=now-30m&to=now&timezone=browser
Grafana
Home › Dashboards › Jenkins: Performance and Health Overview
Search or jump to...
Edit
Export
Share
Last 30 minutes
Refresh
Home
Bookmarks
Starred
Dashboards
Playlists
Snapshots
Library panels
Shared dashboards
Explore
Alerting
Connections
Add new connection
Data sources
Administration
Processing speed
N/A
Job queue duration
No data
Queued rate
N/A
JVM free memory
N/A
Memory Usage
N/A
Jenkins health
No data
JVM Uptime
N/A
Jenkins nodes offline
No data
CPU Usage
N/A
Total Jobs
None!
Sucessful Jobs
No data
Aborted Jobs
No data
Unstable Jobs
No data
Failed Jobs
No data
Jenkins queue size
None!
Executor free
Executors health
Job Duration
Executor In-use


localhost:9090/targets?search=
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"
2.526s ago
4.435ms
server returned HTTP status 403 Forbidden
node_export (0/1 up)
show less
Endpoint
State
Labels
Last Scrape
Scrape Duration
Error
http://localhost:9100/metrics
DOWN
instance="localhost:9100"
job="node_export"
11.77s ago
0.542ms
Get "http://localhost:9100/metrics": dial tcp 127.0.0.1:9100: connect: connection refused
prometheus (1/1 up)
show less
Endpoint
State
Labels
Last Scrape
Scrape Duration
Error
http://localhost:9090/metrics
UP
instance="localhost:9090"
job="prometheus"
4.726s ago
10.437ms

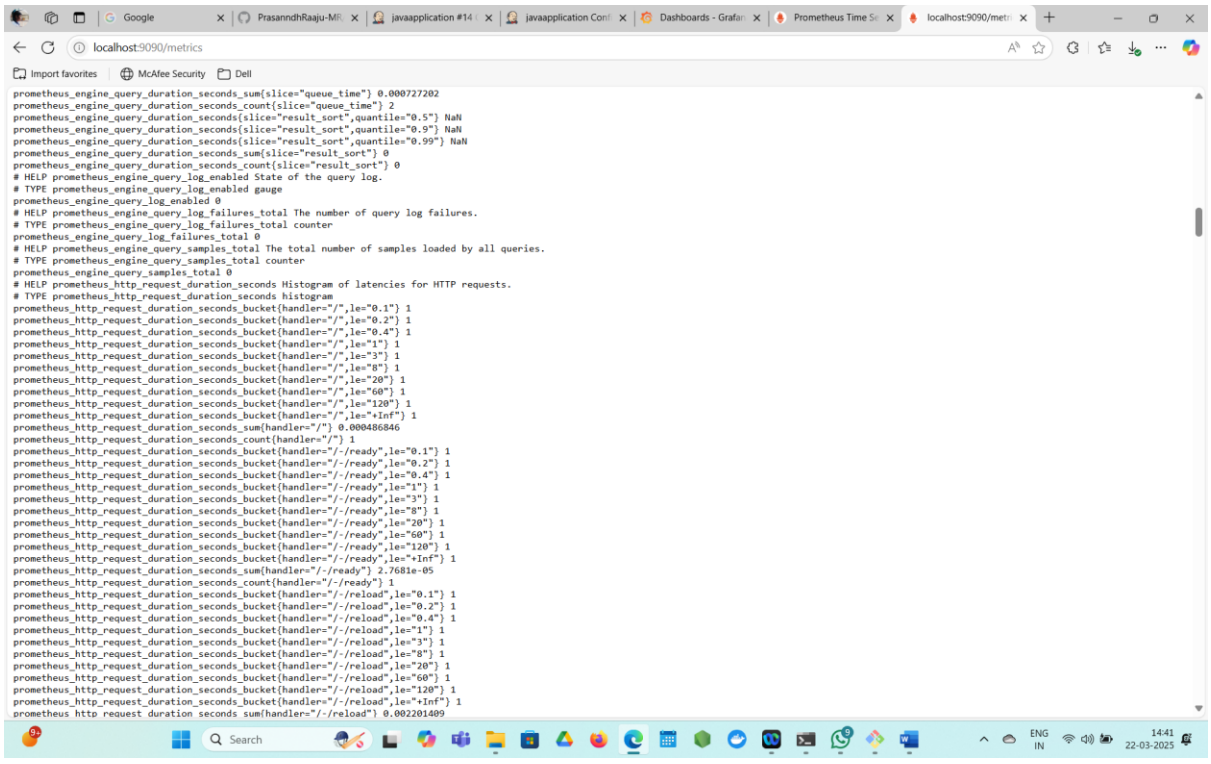
Grafana: (Commands & Output)

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



Metrics Running and Verifying:

- http://localhost:9090/metrics



Google
PrasanndhRaaju-MR
javaapplication #14
javaapplication Conf
Dashboards - Grafan
Prometheus Time Se
localhost:9090/metri
localhost:9090/metrics
Import favorites
McAfee Security
Dell
HELP prometheus_tsdb_vertical_compactions_total Total number of compactions done on overlapping blocks.
TYPE prometheus_tsdb_vertical_compactions_total counter
prometheus_tsdb_vertical_compactions_total 0
HELP prometheus_tsdb_wal_completed_pages_total Total number of completed pages.
TYPE prometheus_tsdb_wal_completed_pages_total counter
prometheus_tsdb_wal_completed_pages_total 20
HELP prometheus_tsdb_wal_corruptions_total Total number of WAL corruptions.
TYPE prometheus_tsdb_wal_corruptions_total counter
prometheus_tsdb_wal_corruptions_total 0
HELP prometheus_tsdb_wal_fsync_duration_seconds Duration of write log fsync.
TYPE prometheus_tsdb_wal_fsync_duration_seconds summary
prometheus_tsdb_wal_fsync_duration_seconds{quantile="0.5"} NaN
prometheus_tsdb_wal_fsync_duration_seconds{quantile="0.9"} NaN
prometheus_tsdb_wal_fsync_duration_seconds{quantile="0.99"} NaN
prometheus_tsdb_wal_fsync_duration_seconds_sum 0
prometheus_tsdb_wal_fsync_duration_seconds_count 0
HELP prometheus_tsdb_wal_page_flushes_total Total number of page flushes.
TYPE prometheus_tsdb_wal_page_flushes_total counter
prometheus_tsdb_wal_page_flushes_total 685
HELP prometheus_tsdb_wal_segment_current Write log segment index that TSDB is currently writing to.
TYPE prometheus_tsdb_wal_segment_current gauge
prometheus_tsdb_wal_segment_current 0
HELP prometheus_tsdb_wal_storage_size_bytes Size of the write log directory.
TYPE prometheus_tsdb_wal_storage_size_bytes gauge
prometheus_tsdb_wal_storage_size_bytes 662878
HELP prometheus_tsdb_wal_truncate_duration_seconds Duration of WAL truncation.
TYPE prometheus_tsdb_wal_truncate_duration_seconds summary
prometheus_tsdb_wal_truncate_duration_seconds_sum 0
prometheus_tsdb_wal_truncate_duration_seconds_count 0
HELP prometheus_tsdb_wal_truncations_failed_total Total number of write log truncations that failed.
TYPE prometheus_tsdb_wal_truncations_failed_total counter
prometheus_tsdb_wal_truncations_failed_total 0
HELP prometheus_tsdb_wal_truncations_total Total number of write log truncations attempted.
TYPE prometheus_tsdb_wal_truncations_total counter
prometheus_tsdb_wal_truncations_total 0
HELP prometheus_tsdb_wal_writes_failed_total Total number of write log writes that failed.
TYPE prometheus_tsdb_wal_writes_failed_total counter
prometheus_tsdb_wal_writes_failed_total 0
HELP prometheus_web_federation_errors_total Total number of errors that occurred while sending federation responses.
TYPE prometheus_web_federation_errors_total counter
prometheus_web_federation_errors_total 0
HELP prometheus_web_federation_warnings_total Total number of warnings that occurred while sending federation responses.
TYPE prometheus_web_federation_warnings_total counter
prometheus_web_federation_warnings_total 0
HELP promhttp_metric_handler_requests_in_flight Current number of scrapes being served.
TYPE promhttp_metric_handler_requests_in_flight gauge
promhttp_metric_handler_requests_in_flight 1
HELP promhttp_metric_handler_requests_total Total number of scrapes by HTTP status code.
TYPE promhttp_metric_handler_requests_total counter
promhttp_metric_handler_requests_total{code="200"} 235
promhttp_metric_handler_requests_total{code="500"} 0
promhttp_metric_handler_requests_total{code="503"} 0
Search
ENG
IN
14:42
22-03-2025