

1- what are the different http status codes ?

1XX - Informational responses

2XX - success response

3XX - Redirection message

4XX - client error response

5XX - server error response

2- What database is used by prometheus ?

Time series database

3- What is the difference between different metric types (counter, gauge, histogram)

Metric types are differentiated in the client libraries and the apis exposed for each but they are all stored as untyped time series data in the prometheus side

The counter is a cumulative metric its used for increasing metrics only and cant be used for in-time metrics or decreasing metrics

The gauge is used for in-time metrics to show the current state which is variable increasingly or decreasingly across time periods

The histogram is bucketing metrics exposing several features such as quantiles and sums and counts and upper bounds applicable for a specific bucket exposed under the metric's basename

4- Installing prometheus on a local vm

```
[root@192 vomato]# sudo useradd --no-create-home --shell /bin/false prometheus
useradd: user 'prometheus' already exists
[root@192 vomato]# sudo mkdir /etc/prometheus
sudo mkdir /var/lib/prometheus
[root@192 vomato]# sudo chown prometheus:prometheus /var/lib/prometheus
```

```
[root@192 prometheus-2.53.4.linux-amd64]# ls
console libraries consoles LICENSE NOTICE prometheus prometheus.yml promtool
[root@192 prometheus-2.53.4.linux-amd64]#
```

```
[root@192 ~]# cd prometheus-2.53.4.linux-amd64
[root@192 prometheus-2.53.4.linux-amd64]# ls
LICENSE NOTICE prometheus promtool
[root@192 prometheus-2.53.4.linux-amd64]# sudo mv prometheus /usr/local/bin/
sudo mv promtool /usr/local/bin/
sudo chown prometheus:prometheus /usr/local/bin/prometheus
sudo chown prometheus:prometheus /usr/local/bin/promtool
[root@192 prometheus-2.53.4.linux-amd64]#
```

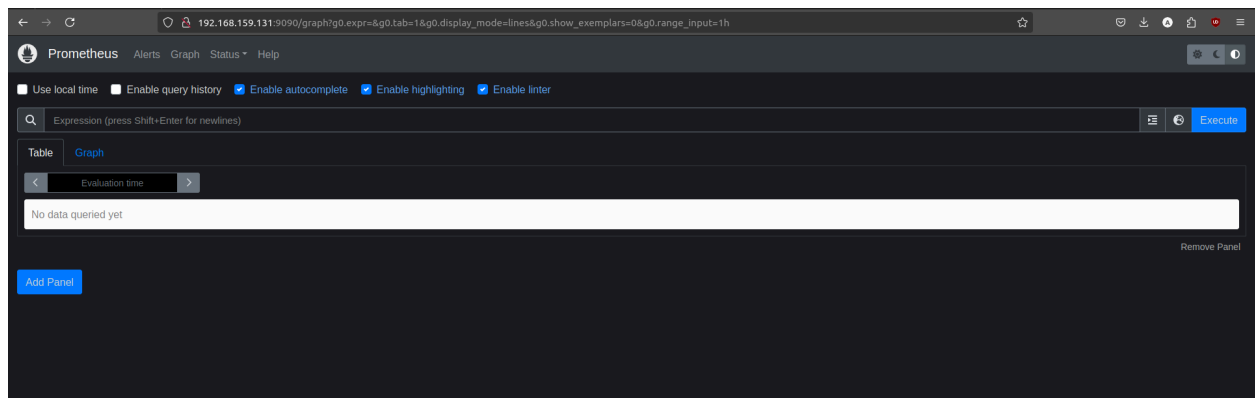
```
vomato@192:~/prometheus-2.53.4.linux-amd64
[Unit]
Description=Prometheus
Wants=network-online.target
After=network-online.target

[Service]
User=prometheus
Group=prometheus
Type=simple
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

[Install]
WantedBy=multi-user.target

~
~
~
~
~
~
~
```

```
too few arguments.
[root@192 prometheus-2.53.4.linux-amd64]# systemctl daemon-reload
[root@192 prometheus-2.53.4.linux-amd64]# systemctl enable --now prometheus.service
Created symlink /etc/systemd/system/multi-user.target.wants/prometheus.service → /etc/systemd/system/prometheus.service.
[root@192 prometheus-2.53.4.linux-amd64]#
```



5- Add a target to the prometheus targets and download its exporter on the machine

```
1 - job_name: node_exporter
2   static_configs:
3     - targets: ["localhost:9100"]
4   "/etc/prometheus/prometheus.yml" 30L, 1016B 30,
```

```
[root@localhost node_exporter-1.9.0.linux-amd64]# wget https://github.com/prometheus/node_exporter/releases/download/v1.9.0/node_exporter-1.9.0.linux-amd64.tar.gz
```

```
[root@localhost node_exporter-1.9.0.linux-amd64]# tar -xvf node_exporter-1.9.0.linux-amd64.tar.gz
```

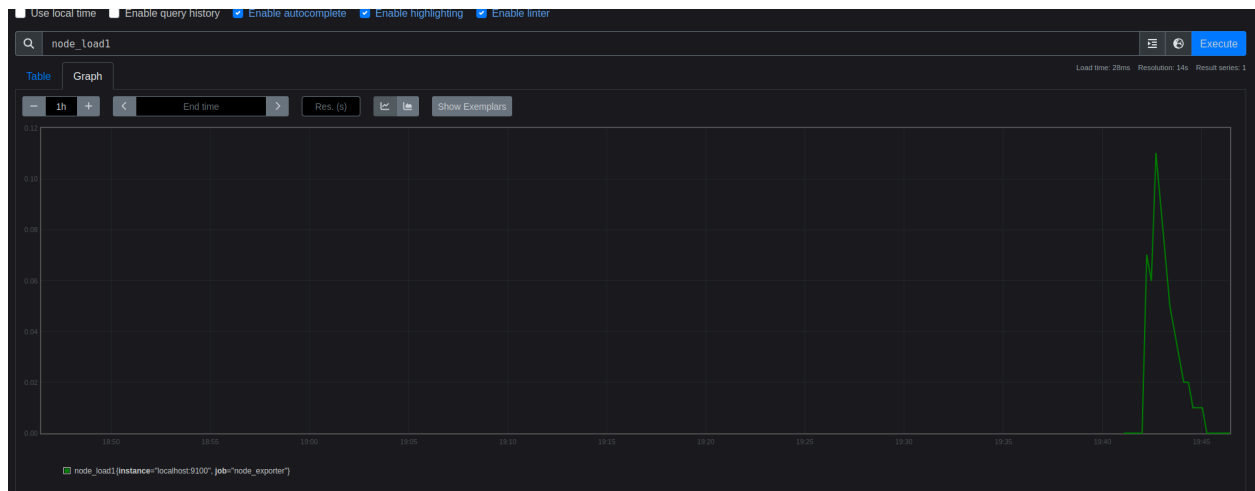
```
[root@localhost node_exporter-1.9.0.linux-amd64]# cd node_exporter-1.9.0.linux-amd64/
```

Running the node exporter

```
[root@localhost node_exporter-1.9.0.linux-amd64]# ./node_exporter
```

Can be configured as a service locally but the configuration would be for later
We can see that the state is up for the node_exporter

node_exporter (1/1 up) show logs					
Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://localhost:9100/metrics	UP	instance="localhost:9100" job="node_exporter" ▼	10.462s ago	21.648ms	



6- configuring a target on a container on the local machine instead of the vm

```
tomato@tomato:~/CS/devops/ITIextra/docker_k8s/containerd$ docker run --network name=host -it --name=prone
theus_node fedora
[root@tomato /]# ls
```

Checking to see if the host is pingable from the virtual machine

```
[root@localhost node_exporter-1.9.0.linux-amd64]# ping 192.198.1.12
PING 192.198.1.12 (192.198.1.12) 56(84) bytes of data.
64 bytes from 192.198.1.12: icmp_seq=1 ttl=128 time=324 ms
64 bytes from 192.198.1.12: icmp_seq=2 ttl=128 time=367 ms
64 bytes from 192.198.1.12: icmp_seq=3 ttl=128 time=195 ms
^C
--- 192.198.1.12 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 195.424/295.312/366.849/72.798 ms
[root@localhost node_exporter-1.9.0.linux-amd64]# ~
```

Configuring the host in the targets in prometheus.yml

```
- job_name: "host_node"
  # metrics_path defaults to '/metrics'
  # scheme defaults to 'http'.
  static_configs:
    - targets: ["192.168.1.12:9100"]
```

Installing and starting the node exporter on the container

```

[root@tomato /]# yum install nodejs npm -y
Updating and loading repositories:
  Fedora 41 - x86_64                                100%
  Fedora 41 - x86_64 - Updates                      100%
  Fedora 41 openh264 (From Cisco) - x86_64          100%
Repositories loaded.
Package Arch Version
Installing:
nodejs x86_64 1:22.14.0-2.fc41
nodejs-npm x86_64 1:10.9.2-1.22.14.0.2.fc41
Installing dependencies:
libuv x86_64 1:1.50.0-1.fc41
nodejs-libs x86_64 1:22.14.0-2.fc41
Installing weak dependencies:

```

```

Complete!
[root@tomato tmp]# wget https://github.com/prometheus/node_exporter/releases/download/v1.9.0/node_exporter-1.9.0.linux-amd64.tar.gz

```

```

[root@tomato ~]# cd node_exporter-1.9.0.linux-amd64/
[root@tomato node_exporter-1.9.0.linux-amd64]# ls
LICENSE NOTICE node_exporter
[root@tomato node_exporter-1.9.0.linux-amd64]# ./node_exporter
time=2025-03-25T20:02:44.616Z level=INFO source=node_exporter.go:216 msg="Starting node_exporter (version=1.9.0, branch=HEAD, revision=02afa5c53c36123611533f2defea6ccd4546a9bb)"
time=2025-03-25T20:02:44.616Z level=INFO source=node_exporter.go:217 msg="Build context" buildContext="go1.23.6, platform=linux/amd64, user=root@745e986f4d3a, date=20250217-07:22:48, tags=unk

```

Running the node_exporter

Checking in prometheus configuration

```

--- 192.168.1.12 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 195.424/295.312/366.849/72.798 ms
[root@localhost node_exporter-1.9.0.linux-amd64]# vi /etc/prometheus/
[root@localhost node_exporter-1.9.0.linux-amd64]# systemctl restart prometheus.service
[root@localhost node_exporter-1.9.0.linux-amd64]#

```

```

omato@tomato:~/CS/devops/ITIextra/docker_k8s/containerd$ docker container run -it --name=prom_node -p 9100:9100 prom:latest
root@07db47aa0ff525-13# cd /root

```

Exposing the port 9100 to 9100 on the host machine solved the issue of exposing the node_exporter inside the host to the virtual machine

host_node (1/1 up) Refresh					
Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://192.168.1.12:9100/metrics	Up	instance="192.168.1.12:9100" job="node_node" ▼	10.33s ago	112.378ms	

node_cpu_time

enable query history

enable auto complete

enable highlighting

enable auto

node_cpu_seconds_total

Execute

Table

Graph

Load time: 14ms

Resolution: 14s

Result series: 90

<

Evaluation time

>

node_cpu_seconds_total[cpu="0", instance="192.168.1.12:9100", job="host_node", mode="idle"]	268431.14
node_cpu_seconds_total[cpu="0", instance="192.168.1.12:9100", job="host_node", mode="iowait"]	323.31
node_cpu_seconds_total[cpu="0", instance="192.168.1.12:9100", job="host_node", mode="irq"]	0
node_cpu_seconds_total[cpu="0", instance="192.168.1.12:9100", job="host_node", mode="nice"]	27.64
node_cpu_seconds_total[cpu="0", instance="192.168.1.12:9100", job="host_node", mode="softirq"]	58.11
node_cpu_seconds_total[cpu="0", instance="192.168.1.12:9100", job="host_node", mode="steal"]	0
node_cpu_seconds_total[cpu="0", instance="192.168.1.12:9100", job="host_node", mode="system"]	5835.38
node_cpu_seconds_total[cpu="0", instance="192.168.1.12:9100", job="host_node", mode="user"]	13612.26
node_cpu_seconds_total[cpu="1", instance="192.168.1.12:9100", job="host_node", mode="idle"]	268455.72