

Monitoring (Prometheus) Task 1

- 1-what is different http status code and explain meaning of each of them?
- 2-What database is used by Prometheus?
- 3-what is the difference between different metrics types (counter, gauge, histogram)?
- 4-install Prometheus on your localhost or on server in any cloud provider
- 5-add any new target to prometheus.yaml file and apply any query on it using promql language

The Solution

1-what is different http status code and explain meaning of each of them?

HTTP status codes are three-digit numbers returned by a server in response to a client's request made to the server. They indicate the status of the request and response and can be broadly categorized into five classes:

1 - Informational: The request was received, and the server continues to process it.

A - 100 Continue: The server has received the initial part of the request, and the client should proceed with the rest of the request.

B - 101 Switching Protocols: The server is changing protocols per the client's request.

2 - Successful: The request was successfully received, understood, and accepted.

A - 200 OK: The request was successful, and the server has returned the requested data.

B - 201 Created: The request was successful, and a new resource was created as a result.

C - 204 No Content: The request was successful, but there is no additional content to send in the response.

3 - Redirection: The client must take additional action to complete the request.

A - 300 Multiple Choices: The requested resource corresponds to multiple choices, each with different locations.

B - 301 Moved Permanently: The requested resource has permanently moved to a new location.

C - 304 Not Modified: The client's cached version of the requested resource is still valid, and the server has not modified it.

4 - Client Errors: The client's request contains bad syntax or cannot be fulfilled.

A - 400 Bad Request: The server could not understand the request due to bad syntax or other client-side errors.

B - 401 Unauthorized: The client must authenticate itself to get the requested response.

C - 403 Forbidden: The client does not have the necessary permissions to access the requested resource.

D - 404 Not Found: The requested resource could not be found on the server.

5 - Server Errors: The server failed to fulfill a valid request.

- A - 500 Internal Server Error: The server encountered an error while processing the request.
- B - 502 Bad Gateway: The server, while acting as a gateway or proxy, received an invalid response from the upstream server.
- C - 503 Service Unavailable: The server is not ready to handle the request. Commonly used during server maintenance or when the server is overloaded.
- D - 504 Gateway Timeout: The server, while acting as a gateway or proxy, did not receive a timely response from the upstream server.

2-What database is used by Prometheus?

Prometheus uses its custom time-series database to store and handle metrics data. The database is designed to efficiently handle time-series data with high cardinality.

3 - what is the difference between different metrics types (counter, gauge, histogram)?

- 1 - Counter: A counter is a monotonically increasing value that represents a cumulative count. It is useful for tracking events or occurrences.
- 2 - Gauge: A gauge is a metric that represents a single numerical value that can arbitrarily go up or down. It is useful for measuring values like temperature, memory usage, etc.
- 3 - Histogram: A histogram samples observations and counts them into configurable buckets. It is useful for measuring distributions of values, like request durations or response sizes.

4 - Install Prometheus on your localhost or on server in any cloud provider

Installation guide from this link: <https://github.com/swelams/prometheus-demo/tree/master/demo01/install-prometheus-as-a-service>

```
ubuntu@ip-172-31-91-78: /tmp/prometheus-2.35.0.linux-amd64$ sudo systemctl status prometheus
● prometheus.service - Prometheus
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; vendor preset: enabled)
   Active: active (running) since Tue 2023-07-25 11:02:48 UTC; 20s ago
     Main PID: 12572 (prometheus)
        Tasks: 8 (limit: 4618)
       Memory: 16.3M
          CPU: 167ms
      CGroup: /system.slice/prometheus.service
              └─12572 /usr/local/bin/prometheus --config.file /etc/prometheus/prometheus.yml --storage.tsdb.path /var/lib/pr>

Jul 25 11:02:48 ip-172-31-91-78 prometheus[12572]: ts=2023-07-25T11:02:48.829Z caller=head.go:536 level=info component=tsdb>
Jul 25 11:02:48 ip-172-31-91-78 prometheus[12572]: ts=2023-07-25T11:02:48.829Z caller=head.go:542 level=info component=tsdb>
Jul 25 11:02:48 ip-172-31-91-78 prometheus[12572]: ts=2023-07-25T11:02:48.831Z caller=tls_config.go:195 level=info componen>
Jul 25 11:02:48 ip-172-31-91-78 prometheus[12572]: ts=2023-07-25T11:02:48.831Z caller=head.go:613 level=info component=tsdb>
Jul 25 11:02:48 ip-172-31-91-78 prometheus[12572]: ts=2023-07-25T11:02:48.831Z caller=head.go:619 level=info component=tsdb>
Jul 25 11:02:48 ip-172-31-91-78 prometheus[12572]: ts=2023-07-25T11:02:48.833Z caller=main.go:978 level=info fs_type=EXT4_S>
Jul 25 11:02:48 ip-172-31-91-78 prometheus[12572]: ts=2023-07-25T11:02:48.833Z caller=main.go:981 level=info msg="TSDB star>
Jul 25 11:02:48 ip-172-31-91-78 prometheus[12572]: ts=2023-07-25T11:02:48.833Z caller=main.go:1162 level=info msg="Loading >
Jul 25 11:02:48 ip-172-31-91-78 prometheus[12572]: ts=2023-07-25T11:02:48.840Z caller=main.go:1199 level=info msg="Complete>
Jul 25 11:02:48 ip-172-31-91-78 prometheus[12572]: ts=2023-07-25T11:02:48.840Z caller=main.go:930 level=info msg="Server is>
lines 1-20/20 (END)
```

Not secure | 184.72.206.151:9090/graph?g0.expr=&g0.tab=1&g0.stacked=0&g0.show_exemplars=0&g0.range_input=1h

Prometheus Alerts Graph Status Help

☐ Use local time ☐ Enable query history ☒ Enable autocomplete ☒ Enable highlighting ☒ Enable linter

Expression (press Shift+Enter for newlines) Execute

Table Graph

Evaluation time

No data queried yet

Remove Panel

Add Panel

5-add any new target to prometheus.yaml file and apply any query on it using promql language

1 – install node exporter

```
ubuntu@ip-172-31-91-78: ~$ sudo systemctl status node_exporter
● node_exporter.service - Node Exporter
   Loaded: loaded (/etc/systemd/system/node_exporter.service; enabled; vendor preset: enabled)
   Active: active (running) since Tue 2023-07-25 11:05:26 UTC; 27s ago
     Main PID: 12722 (node_exporter)
        Tasks: 4 (limit: 4618)
       Memory: 2.1M
          CPU: 14ms
      CGroup: /system.slice/node_exporter.service
              └─12722 /usr/local/bin/node_exporter

Jul 25 11:05:26 ip-172-31-91-78 node_exporter[12722]: ts=2023-07-25T11:05:26.630Z caller=node_exporter.go:115 level=info co>
Jul 25 11:05:26 ip-172-31-91-78 node_exporter[12722]: ts=2023-07-25T11:05:26.630Z caller=node_exporter.go:115 level=info co>
Jul 25 11:05:26 ip-172-31-91-78 node_exporter[12722]: ts=2023-07-25T11:05:26.630Z caller=node_exporter.go:115 level=info co>
Jul 25 11:05:26 ip-172-31-91-78 node_exporter[12722]: ts=2023-07-25T11:05:26.630Z caller=node_exporter.go:115 level=info co>
Jul 25 11:05:26 ip-172-31-91-78 node_exporter[12722]: ts=2023-07-25T11:05:26.630Z caller=node_exporter.go:115 level=info co>
Jul 25 11:05:26 ip-172-31-91-78 node_exporter[12722]: ts=2023-07-25T11:05:26.630Z caller=node_exporter.go:115 level=info co>
Jul 25 11:05:26 ip-172-31-91-78 node_exporter[12722]: ts=2023-07-25T11:05:26.630Z caller=node_exporter.go:115 level=info co>
Jul 25 11:05:26 ip-172-31-91-78 node_exporter[12722]: ts=2023-07-25T11:05:26.630Z caller=node_exporter.go:199 level=info ms>
Jul 25 11:05:26 ip-172-31-91-78 node_exporter[12722]: ts=2023-07-25T11:05:26.630Z caller=ts_config.go:195 level=info msg=">
lines 1-20/20 (END)
```

```
# Here it's Prometheus itself.
scrape_configs:
  # The job name is added as a label 'job=<job_name>' to any timeseries scraped from
  - job_name: "prometheus"

    # metrics_path defaults to '/metrics'
    # scheme defaults to 'http'.

    static_configs:
      - targets: ["localhost:9090"]

  - job_name: 'test_target'
    static_configs:
      - targets: ['localhost:9100']

"/etc/prometheus/prometheus.yml" 35L, 1021B
```

Targets

All Unhealthy Collapse All

Q

Filter by endpoint or labels

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

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://localhost:9090/metrics	UP	instance="localhost:9090" job="prometheus"	4.183s ago	5.713ms	

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



Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
http://localhost:9100/metrics	UP	instance="localhost:9100" job="test_target"	7.106s ago	18.250ms	

☐ Use local time ☐ Enable query history ☒ Enable autocompleting ☒ Enable highlighting ☒ Enable linter

Q

node_cpu_seconds_total

⌵

Execute

Table Graph

Load time: 255ms Resolution: 14s Result series: 16

< Evaluation time >

node_cpu_seconds_total {cpu="0", instance="localhost:9100", job="test_target", mode="idle"}	4861.49
node_cpu_seconds_total {cpu="0", instance="localhost:9100", job="test_target", mode="iowait"}	13.45
node_cpu_seconds_total {cpu="0", instance="localhost:9100", job="test_target", mode="irq"}	0
node_cpu_seconds_total {cpu="0", instance="localhost:9100", job="test_target", mode="nice"}	5.01
node_cpu_seconds_total {cpu="0", instance="localhost:9100", job="test_target", mode="softirq"}	0.41
node_cpu_seconds_total {cpu="0", instance="localhost:9100", job="test_target", mode="steal"}	53.72
node_cpu_seconds_total {cpu="0", instance="localhost:9100", job="test_target", mode="system"}	24.77
node_cpu_seconds_total {cpu="0", instance="localhost:9100", job="test_target", mode="user"}	42.48
node_cpu_seconds_total {cpu="1", instance="localhost:9100", job="test_target", mode="idle"}	4872.69
node_cpu_seconds_total {cpu="1", instance="localhost:9100", job="test_target", mode="iowait"}	13.62
node_cpu_seconds_total {cpu="1", instance="localhost:9100", job="test_target", mode="irq"}	0
node_cpu_seconds_total {cpu="1", instance="localhost:9100", job="test_target", mode="nice"}	7.53
node_cpu_seconds_total {cpu="1", instance="localhost:9100", job="test_target", mode="softirq"}	0.71
node_cpu_seconds_total {cpu="1", instance="localhost:9100", job="test_target", mode="steal"}	49.72
node_cpu_seconds_total {cpu="1", instance="localhost:9100", job="test_target", mode="system"}	22.33

Q

node_cpu_seconds_total{job="test_target",mode="nice"}

⌵

Execute

Table Graph

Load time: 269ms Resolution: 14s Result series: 2

< Evaluation time >

node_cpu_seconds_total {cpu="0", instance="localhost:9100", job="test_target", mode="nice"}	5.01
node_cpu_seconds_total {cpu="1", instance="localhost:9100", job="test_target", mode="nice"}	7.53

Remove Panel

Add Panel