

PROMETHEUS_LAB01

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

Answer:

- 1xx - Informational: The server has received the request and is continuing the process.
- 2xx - Successful: The request was successful and the browser has received the expected information.
- 3xx (Redirection): You have been redirected and the completion of the request requires further action.
- 4xx (Client Error): The website or the page could not be reached, either the page is unavailable or the request contains bad syntax.
- 5xx (Server Error): While the request appears to be valid, the server could not complete the request.

1xx – Informational:

The **100 Continue** status code means that the initial part of the request has been received by the server and that the client should proceed with the request or ignore the response if the request has already finished.

The **101 Switching protocols** status code means that the server understands the Upgrade header field request and indicates which protocol it is switching to.

The **102 Processing** status code means that the server has accepted the full request but has not yet completed it and no response is available as of yet.

The **103 Early hints** status code is intended to be used to allow the user agent to preload resources, while the server prepares a response. It is intended to be primarily used with the Link Header.

2xx - Successful:

The **200 OK** status code means that the request was successful, but the meaning of success depends on the request method used:

- GET: The requested resource has been fetched and transmitted to the message body.
- HEAD: The header fields from the requested resource are sent in without the message body.
- POST or PUT: A description of the result of the action is transmitted to the message body.
- TRACE: The request messages, as received by the server, will be included in the message body.

The **201 Created** status code means that the request was successfully fulfilled and resulted in one or possibly multiple new resources being created.

The **202 Accepted** status code means that the request has been accepted for processing, but the processing has not been finished yet. The request may or may not be completed when the processing eventually takes place.

The **203 Non-Authoritative Information** status code means that the request was successful. However, the meta-information that has been received is different from the one on the origin server and has instead been collected from a 3rd party or local copy. When not used for backups or mirrors of another resource a 200 OK response is preferable.

The **204 No Content** status code means that while the server has successfully fulfilled the request, there is no available content for this request. But the user agent might want to update its currently cached headers for this resource, for the new one.

The **205 Reset Content** status code means that the user should reset the document that sent this request.

The **206 Partial Content** response code is a response to a Range header sent from the client when requesting only a part of the resource.

The **207 Multi-Status** status code conveys information about multiple resources, in situation when multiple status codes are appropriate.

The **208 Already Reported** status code is used inside the response element *DAV: propstat*, in order to avoid enumerating the internal members of multiple bindings to the same collection repeatedly.

The **226 IM response** code means that the server has successfully fulfilled a *GET request* for the resource, and the response is a representation of the result of one or multiple instance-manipulations applied to the current instance.

3xx (Redirection):

The **300 Multiple Choices** status code means that the request has multiple possible responses and the user/user agent should choose one.

The **301 Moved Permanently** response code means that the target resource has been assigned a new permanent URL and any references to this resources in the future should use one of the URLs included in the response.

The **302 Found** status code, previously known as “Moved temporarily”, means that the URI of the request has been changed temporarily, and since changes can be made to the URI in the future, the effective request URI should be used for future requests.

The **303 See Other** response code is sent by the server in order to direct the client to get the requested resource at another URI with a GET request.

The **304 Not Modified** response code informs the client that the response has not been modified. This means that the client can continue to use the already present, cached version of the response.

The **305 Use Proxy** status code instructs a client that it should connect to a proxy and then repeat the same request there. This response code is deprecated due to security concerns.

The **306 Switch proxy** status code is no longer in use. It was used to inform the client that the subsequent requests should use the specified proxy.

The **307 Temporary Redirect** status code gets sent by the server in order to direct the client to the requested resource at another URI. The request method, however, must not be changed.

The **308 Permanent Redirect** status code means that the requested resource has been permanently assigned a new URI and future references to the resource should be made by using one of the enclosed URIs.

4xx (Client Error):

The **400 Bad Request** status code means that the server could not understand the request because of invalid syntax.

The **401 Unauthorized** status code means that the request has not been applied because the server requires user authentication.

The **402 Payment Required** status code is a response reserved for future use. It was originally created to be implemented in digital payment systems, however, it is rarely used and a standard convention of using it does not exist.

The **403 Forbidden** status code means that the client request has been rejected because the client does not have rights to access the content. Unlike a 401 error, the client's identity is known to the server, but since they are not authorized to view the content, giving the proper response is rejected by the server.

The **404 Not Found** status code means that the server either did not find a current representation for the requested resource or is trying to hide its existence from an unauthorized client.

The **405 Method Not Allowed** status code means that while the server knows the request method, the method has been disabled and can not be used.

The **406 Not Acceptable** status code is sent by the server when it does not find any content following the criteria given by the user agent.

The **407 Proxy Authentication Required** status code means that the client must first be authenticated by a proxy (similar to a 401).

The **408 Request Timeout** status code means that the server did not receive a complete request in the time that it prepared to wait.

The **409 Conflict** status code means that the request could not be fulfilled due to a conflict with the current state of the target resource and is used in situations where the user might be able to resubmit the request after resolving the conflict.

The **410 Gone** status code means that the target resource has been deleted and the condition seems to be permanent.

The **411 Length Required** status code means that the server has rejected the request because it requires the Content-Length header field to be defined.

The **412 Precondition Failed** status code means the server does not meet one or multiple preconditions that were indicated in the request header fields.

The **413 Payload Too Large** status code means the server refuses to process the request because the request payload is larger than the server is able or willing to process. While the server may close the connection to prevent the client from continuing the request, it should generate a Retry-After header field and after how long can the client retry.

The **414 URI Too Long** status code means that the server is refusing to service the request because the request-target was longer than the server was willing to interpret.

The **415 Unsupported Media Type** status code means that the server is rejecting the request because it does not support the media format of the requested data.

The **416 Range Not Satisfiable** status code means that the range specified in the Range header field of the request can't be fulfilled. The reason might be that the given range is outside the size of the target URI's data.

The **417 Expectation Failed** status code means that the Expectation indicated by the Expect request-header field could not be met by the server.

The **418 I'm a Teapot** status code means that the server refuses to brew coffee because it is, in fact, a teapot. (It is a reference to a 1998 April Fools' joke called "Hyper Text Coffee Pot Control Protocol").

The **421 Misdirected Request** status code means that the client request was directed at a server that is not configured to produce a response.

The **422 Unprocessable Entity** status code means that while the request was well-formed, the server was unable to follow it, due to semantic errors.

The **423 Locked** status code means that the resource that is being accessed is locked.

The **424 Failed Dependency** status code means that the request failed due to the failure of a previous request.

The **425 Too Early** status code means that the server is not willing to risk processing a request that might be replayed.

The **426 Upgrade Required** status code means that while the server refuses to perform the given request using the current protocol, it might be willing to do so after the client has been upgraded to a different protocol.

The **428 Precondition Required** status code means that the origin server requires the request to be conditional.

The **429 Too Many Requests** response code means that in the given time, the user has sent too many requests.

The **431 Request Header Fields Too Large** means that the server is not willing to process the request because its header fields are indeed too large, however, the request may be submitted again once the size of the

request header fields is reduced.

The **451 Unavailable For Legal Reasons** response code means that the user has requested an illegal resource (such as pages and sites blocked by the government).

5xx (Server Error):

The **500 Internal Server Error** status code means that the server has encountered a situation that it does not know how to handle.

The **501 Not Implemented** response code means that the request can not be handled because it is not supported by the server.

The **502 Bad Gateway** response code means that the server received an invalid response while working as a gateway to handle the response.

The **503 Service Unavailable** response code means that the server is currently not ready to handle the request. This is a common occurrence when the server is down for maintenance or is overloaded.

The **504 Gateway Timeout** response code means that the server acting as a gateway could not get a response time.

The **505 HTTP Version Not Supported** response code means that the version of HTTP used in the request is not supported by the server.

The **506 Variant Also Negotiates** response code means that the server has the following internal configuration error: The chosen variant resource is configured to engage in transparent negotiation itself, therefore it cannot be a proper endpoint in the negotiation process.

The **507 Insufficient Storage** status code means that the method could not be performed on the resource because the server is not able to store the representation that would be needed to complete the request successfully.

The **508 Loop Detected** response code means that the server has detected an infinite loop while processing the request.

The **510 Not Extended** response code means that further extensions are required for the server to be able to fulfil the request.

The **511 Network Authentication Required** response code indicates that the client needs to authenticate to gain network access.

2-What database is used by Prometheus?

Answer:

Prometheus has a sophisticated local storage subsystem. For indexes, it uses **LevelDB**. For the bulk sample data, it has its own custom storage layer, which organizes sample data in chunks of constant size

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

Answer:

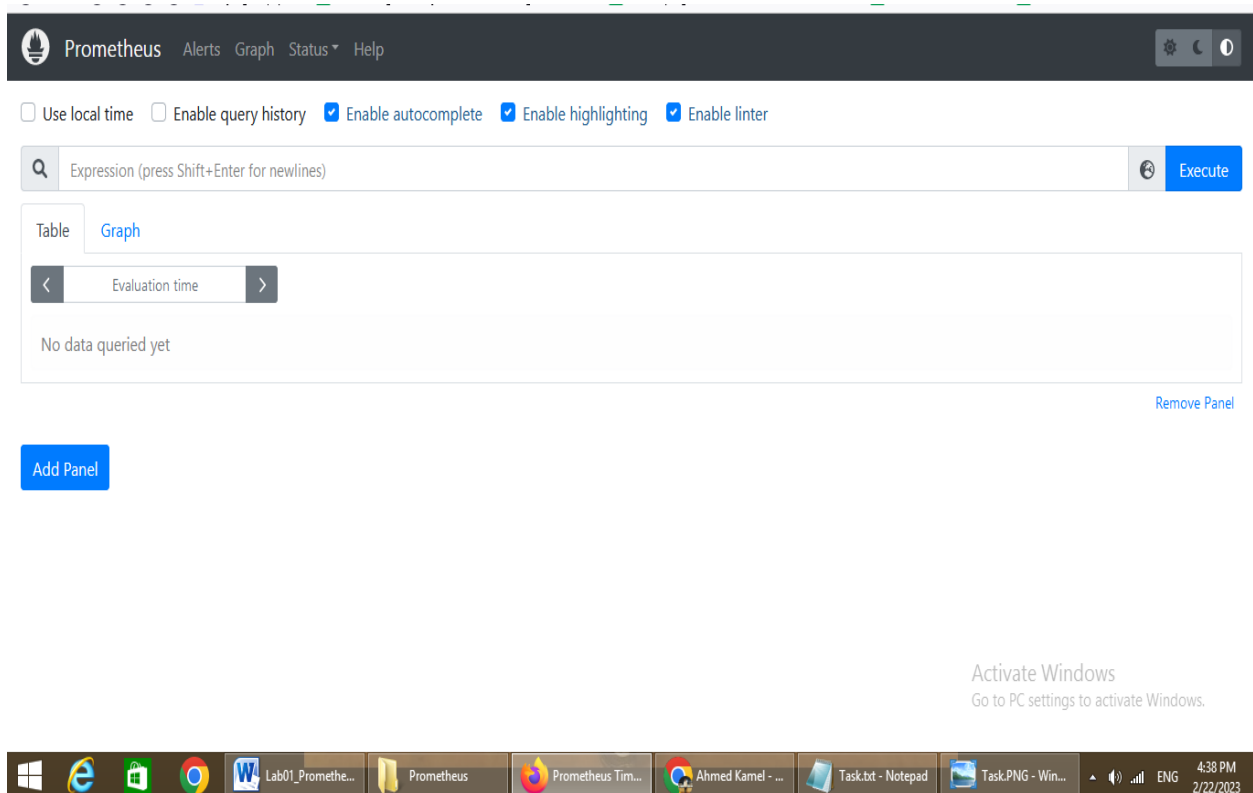
Counters are used for tracking continually increasing counts of events, and are queried using the `rate()` function to measure how often an event occurs over a given time per second.

Gauges are used to provide the current state of a metric that can arbitrarily increase or decrease over time, such as CPU utilization.

Histograms are used for measuring the distribution of observations and putting them into pre-defined buckets. They are highly performant, and values can be accurately aggregated across both windows of time and numerous time series.

4-install prometheus on your localhost or on server in any cloud provider

Answer:



Browser window showing AWS console terminal output for Prometheus service status and logs.

```
Last login: Wed Feb 22 16:19:39 2023 from 18.206.107.29
ubuntu@ip-172-31-8-44:~$ sudo systemctl status prometheus
● prometheus.service - Prometheus
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2023-02-22 16:52:12 UTC; 34min ago
   Main PID: 8232 (prometheus)
     Tasks: 8 (limit: 1143)
    Memory: 40.8M
       CPU: 3.638s
   CGroup: /system.slice/prometheus.service
           └─8232 /usr/local/bin/prometheus --config.file /etc/prometheus/prometheus.yml --storage.tsdb.path /var/lib/prometheus/ --web.console.templates=/etc/prometheus/consoles --web.external-url https://localhost:9090/

Feb 22 16:52:13 ip-172-31-8-44 prometheus[8232]: ts=2023-02-22T16:52:13.592Z caller=head.go:619 level=info component=tsdb msg="WAL replay completed"
Feb 22 16:52:13 ip-172-31-8-44 prometheus[8232]: ts=2023-02-22T16:52:13.594Z caller=main.go:978 level=info fs_type=EXT4_SUPER_MAGIC
Feb 22 16:52:13 ip-172-31-8-44 prometheus[8232]: ts=2023-02-22T16:52:13.594Z caller=main.go:981 level=info msg="TSDB started"
Feb 22 16:52:13 ip-172-31-8-44 prometheus[8232]: ts=2023-02-22T16:52:13.595Z caller=main.go:1162 level=info msg="Loading configuration file" filename=/etc/prometheus/prometheus.yml
Feb 22 16:52:13 ip-172-31-8-44 prometheus[8232]: ts=2023-02-22T16:52:13.598Z caller=main.go:1199 level=info msg="Completed loading of configuration file" filename=/etc/prometheus/prometheus.yml
Feb 22 16:52:13 ip-172-31-8-44 prometheus[8232]: ts=2023-02-22T16:52:13.599Z caller=main.go:930 level=info msg="Server is ready to receive web requests"
Feb 22 17:00:04 ip-172-31-8-44 prometheus[8232]: ts=2023-02-22T17:00:04.613Z caller=compact.go:519 level=info component=tsdb msg="write block" mint=1674480000 maxt=1674480000 dur=1s
Feb 22 17:00:04 ip-172-31-8-44 prometheus[8232]: ts=2023-02-22T17:00:04.618Z caller=head.go:840 level=info component=tsdb msg="Head GC completed" dur=1s
Feb 22 17:00:04 ip-172-31-8-44 prometheus[8232]: ts=2023-02-22T17:00:04.618Z caller=checkpoint.go:98 level=info component=tsdb msg="Creating checkpoint"
Feb 22 17:00:04 ip-172-31-8-44 prometheus[8232]: ts=2023-02-22T17:00:04.669Z caller=head.go:1009 level=info component=tsdb msg="WAL checkpoint completed"

lines 1-20/20 (END)
```

i-069b32299925acdf (prometheus)

PublicIPs: 44.200.119.105 PrivateIPs: 172.31.8.44

Activate Windows
Go to PC settings to activate Windows.

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

Browser window showing Prometheus web interface with a query executed.

44.200.119.105:9090/graph?g0.expr=container_cpu_load_average_10s{image%3Dredis}&g0.tab=1&g0.stacked=0&g0.s...

Prometheus Alerts Graph Status Help

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

Search: `container_cpu_load_average_10s{image="redis"}` Execute

Table Graph

Evaluation time

container_cpu_load_average_10s {id="/system.slice/docker-462f6ea730663d52c025ad374646d2e6aa13b309d7c3d83759a5631ab3c40bcc.scope", image="redis", instance="localhost:8080", job="c-advisor", name="crazy_neumann"} 0

Remove Panel

Add Panel

Activate Windows
Go to PC settings to activate Windows.

Windows taskbar showing various applications: Lab01_Promethe..., Prometheus, Prometheus Tim..., DevOps BootCa..., Task.txt - Notepad, Task.PNG - Win...

← → ↻ 44.200.119.105:9090/targets ☆

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Prometheus Alerts Graph Status ▾ Help

All Unhealthy Collapse All 🔍 Filter by endpoint or labels

c-advisor (1/1 up) [show less](#)

| Endpoint | State | Labels | Last Scrape | Scrape Duration | Error |
|-------------------------------|-------|---|-------------|-----------------|-------|
| http://localhost:8080/metrics | UP | instance="localhost:8080" job="c-advisor" | 6.602s ago | 71.796ms | |

node-exporter (1/1 up) [show less](#)

| Endpoint | State | Labels | Last Scrape | Scrape Duration | Error |
|-------------------------------|-------|---|-------------|-----------------|-------|
| http://localhost:9100/metrics | UP | instance="localhost:9100" job="node-exporter" | 3.607s ago | 15.730ms | |

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

| Endpoint | State | Labels | Last Scrape | Scrape Duration | Error |
|-------------------------------|-------|--|-------------|-----------------|-------|
| http://localhost:9090/metrics | UP | instance="localhost:9090" job="prometheus" | 5.759s ago | 6.208ms | |

Windows taskbar: Lab01_Promethe... Prometheus Prometheus Tim... DevOps BootCa... Task.txt - Notepad Task.PNG - Win... 7:29 PM 2/22/2023

← → ↻ https://us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-069b3229925acfd... ☆

🌐 New Tab 🌐 🌐 🌐 🌐 🌐 Why Agile? | Sprints 📅 Task Management Sys... 🚀 01-Getting Started - G... 📊 Team 8 progress.xlsx - ... 🧑 admin 1 lab finish 📺 linux videos and tasks ... 📺 linux videos and tasks ... >>

Services 🔍 Search [Alt+S] 📄 🔔 ⓘ N. Virginia ahmedabdelrhman2531997 ▾

```
# 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-exporter"
    static_configs:
      - targets: ["localhost:9100"]
  - job_name: "c-advisor"
    static_configs:
      - targets: ["localhost:8080"]

"/etc/prometheus/prometheus.yml" 35L, 1102B 35, 33 Bot
```

i-069b3229925acfd (prometheus) ✕

PublicIPs: 44.200.119.105 PrivateIPs: 172.31.8.44

Activate Windows
Go to PC settings to activate Windows.

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Windows taskbar: Lab01_Promethe... Prometheus EC2 Instance Co... DevOps BootCa... Task.txt - Notepad Task.PNG - Win... 7:30 PM 2/22/2023