Python app generating logs & metrics and pushing them to Grafana

######## Pod manifest file

```
rahees_khan@cloudshell:~ (prj-dh-n-qa-os-01)$ kubectl get po
NAME                  READY   STATUS    RESTARTS   AGE
python-app-log-metric   1/1     Running   0          4h14m
rahees_khan@cloudshell:~ (prj-dh-n-qa-os-01)$ kubectl get po --show-labels
NAME                  READY   STATUS    RESTARTS   AGE     LABELS
python-app-log-metric   1/1     Running   0          4h14m   run=python-app-log-
metric

rahees_khan@cloudshell:~ (prj-dh-n-qa-os-01)$ kubectl get po python-app-
log-metric -oyaml
apiVersion: v1
kind: Pod
metadata:
  labels:
    run: python-app-log-metric
  name: python-app-log-metric
  namespace: rk-poc
spec:
  containers:
  - image: rahees9983/poc-loki:v4
    imagePullPolicy: IfNotPresent
    name: python-app-log-metric
```

##############PodMonitor

```
rahees_khan@cloudshell:~ (prj-dh-n-qa-os-01)$ cat python-app-log-metric-
Podmonitor.yaml

apiVersion: monitoring.googleapis.com/v1
kind: PodMonitoring
metadata:
  labels:
    app.kubernetes.io/name: prom-example
  name: python-app-log-metric-monitor
  namespace: rk-poc
spec:
  endpoints:
  - interval: 30s
    port: 5000
  selector:
    matchLabels:
      run: python-app-log-metric
```

```
  targetLabels:
    metadata:
    - pod
    - container
```

##############

apt update && apt install -y iputils-ping curl net-tools vim procps

curl -X POST http://localhost:5000/cars

curl -X POST http://localhost:5000/boats

curl http://localhost:5000/cars

curl http://localhost:5000/boats

curl -X POST http://localhost:5000/update_strings -H "Content-Type: application/json" -d '{"strings": ["apple", "banana", "apple", "cherry"]}'

root@python-app-log-metric:/app# curl -X POST http://localhost:5000/update_strings -H "Content-Type: application/json" -d '{"strings": ["apple", "banana", "apple", "cherry"]}'
{"message":"Unique string count updated based on the provided list"}

$ ssh -o ServerAliveInterval=60 -o ServerAliveCountMax=3 -i ~/.ssh/ec2-ssh-key-pair.pem ubuntu@18.222.157.116

$ source /home/ubuntu/python-prometheus/url_health_check_venv/bin/activate

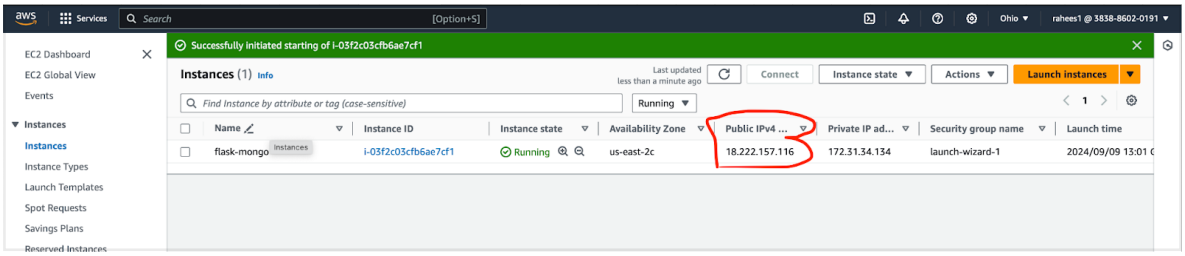
(url_health_check_venv) root@ip-172-31-34-134:/home/ubuntu/python-prometheus# ls
app.py app.py.bck2 requirements.txt unique-string-flask-summary.py unique-strings.py
app.py.bck devops-batch1 strings.txt unique-string-flask.py
url_health_check_venv

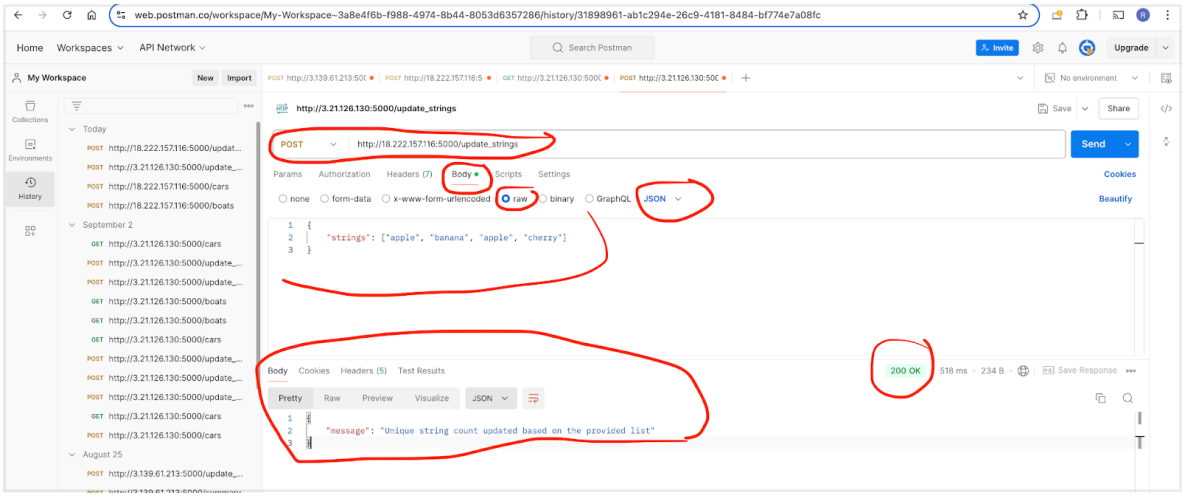
Final source code is available at /home/ubuntu/url_health_python_script/logs-metrics-grafana-loki-poc

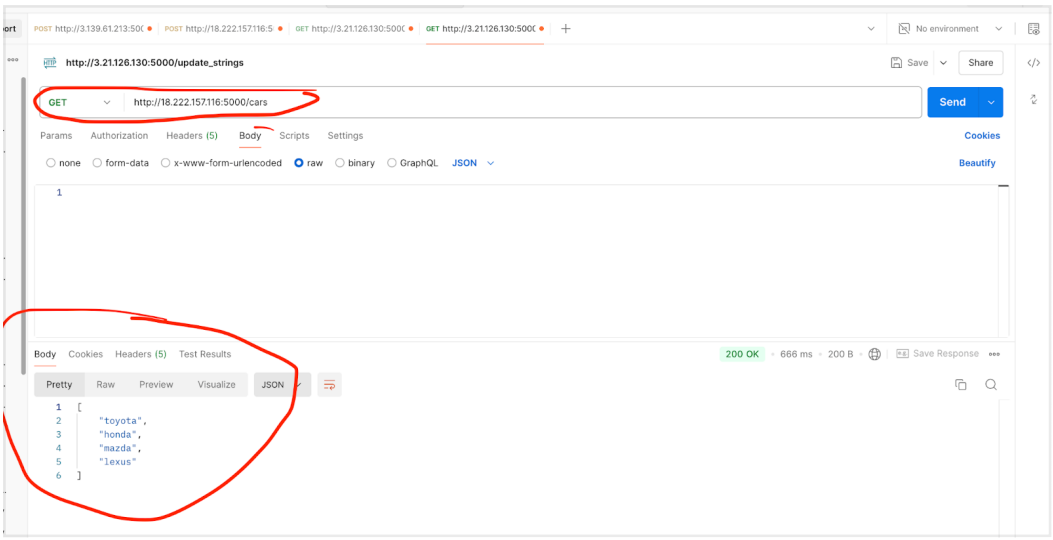
Folder file name is final-code.py

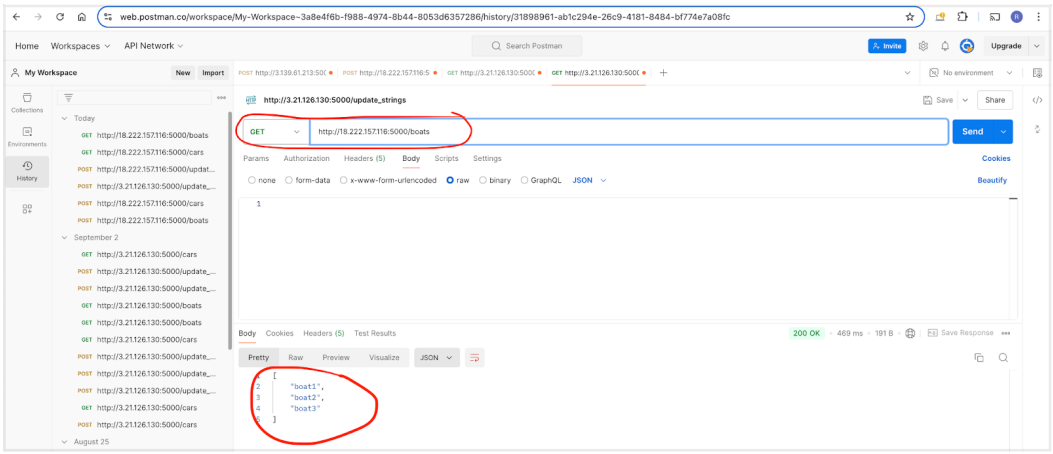
NOTE: 18.222.157.116 is PUBLIC IP of my AWS INSTANCE

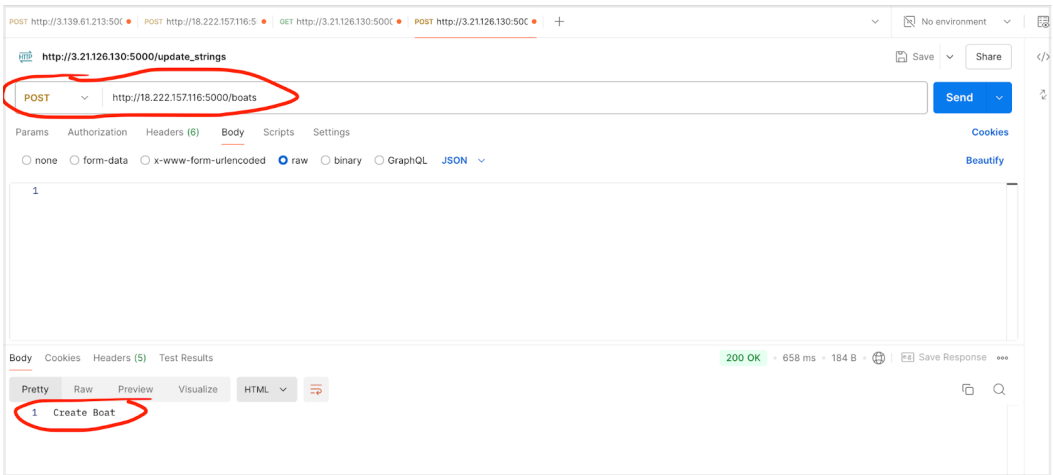
```
(url_health_check_venv) root@ip-172-31-34-134:/home/ubuntu/python-prometheus# pwd
/home/ubuntu/python-prometheus
(url_health_check_venv) root@ip-172-31-34-134:/home/ubuntu/python-prometheus# ls -ll
total 40
-rw-r--r-- 1 root root 2724 Aug 25 17:26 app.py
-rw-r--r-- 1 root root  912 Aug 25 10:20 app.py.bck
-rw-r--r-- 1 root root 1702 Aug 25 17:24 app.py.bck2
drwxr-xr-x 9 root root 4096 Aug 25 17:31 devops-batch1
-rw-r--r-- 1 root root   34 Aug 25 09:44 requirements.txt
-rw-r--r-- 1 root root   76 Aug 25 16:52 strings.txt
-rw-r--r-- 1 root root 2189 Aug 25 17:51 unique-string-flask-summary.py
-rw-r--r-- 1 root root 1648 Aug 25 17:17 unique-string-flask.py
-rw-r--r-- 1 root root 1436 Aug 25 16:59 unique-strings.py
drwxr-xr-x 5 root root 4096 Aug 25 09:44 url_health_check_venv
(url_health_check_venv) root@ip-172-31-34-134:/home/ubuntu/python-prometheus# source /home/ubuntu/python-prometheus/url_health_check_venv/bin/activate
(url_health_check_venv) root@ip-172-31-34-134:/home/ubuntu/python-prometheus# python app.py
 * Serving Flask app 'app'
 * Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:5000
 * Running on http://172.31.34.134:5000
Press CTRL+C to quit
42.105.85.89 - - [09/Sep/2024 07:45:46] "GET /cars HTTP/1.1" 200 -
42.105.85.89 - - [09/Sep/2024 07:45:48] "GET /boats HTTP/1.1" 200 -
54.86.50.139 - - [09/Sep/2024 07:46:20] "POST /boats HTTP/1.1" 200 -
54.86.50.139 - - [09/Sep/2024 07:46:28] "POST /cars HTTP/1.1" 200 -
54.86.50.139 - - [09/Sep/2024 07:47:29] "POST /update_strings HTTP/1.1" 200 -
```

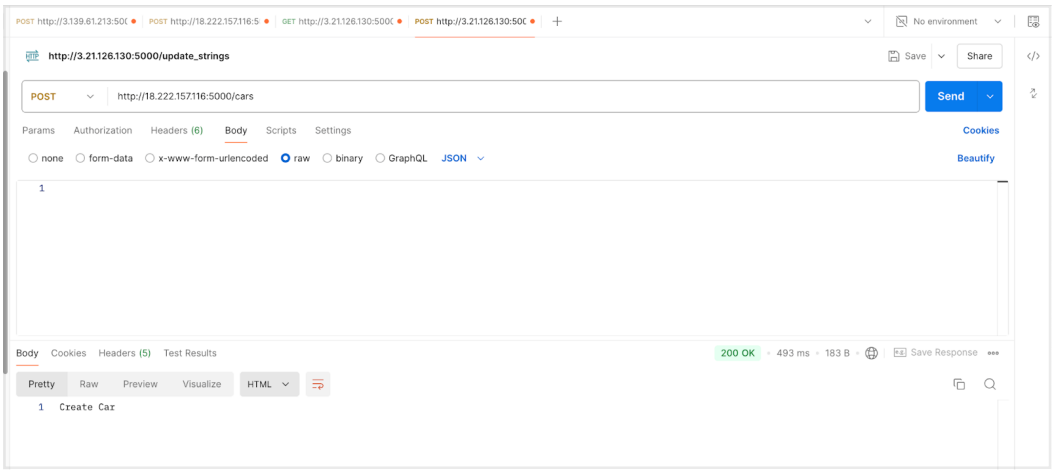





http://3.21.126.130:5000/update_strings
GET
http://18.222.157.116:5000/cars
Send
Params
Authorization
Headers (5)
Body
Scripts
Settings
Cookies
none
form-data
x-www-form-urlencoded
raw
binary
GraphQL
JSON
Beautify
Body
Cookies
Headers (5)
Test Results
200 OK
666 ms
200 B
Save Response
Pretty
Raw
Preview
Visualize
JSON
[
"toyota",
"honda",
"mazda",
"lexus"
]


web.postman.co/workspace/My-Workspace~3a8e4f6b-f988-4974-8b44-8053d6357286/history/31898961-ab1c294e-26c9-4181-8484-bf774e7a08fc
Home
Workspaces
API Network
Search Postman
My Workspace
New
Import
http://3.21.126.130:5000/update_strings
GET
http://18.222.157.116:5000/boats
Send
Params
Authorization
Headers (5)
Body
Scripts
Settings
Cookies
Beautify
Body
Cookies
Headers (5)
Test Results
200 OK
469 ms
191 B
Save Response
Pretty
Raw
Preview
Visualize
JSON
[
"boat1",
"boat2",
"boat3"
]


http://3.21.126.130:5000/update_strings
POST
http://18.222.157.116:5000/boats
Send
Params
Authorization
Headers (6)
Body
Scripts
Settings
Cookies
none
form-data
x-www-form-urlencoded
raw
binary
GraphQL
JSON
Beautify
Body
Cookies
Headers (5)
Test Results
200 OK
658 ms
184 B
Save Response
Pretty
Raw
Preview
Visualize
HTML
Create Boat



kubectl exec -it python-app -- bash

apt update && apt install -y iputils-ping curl net-tools vim procps

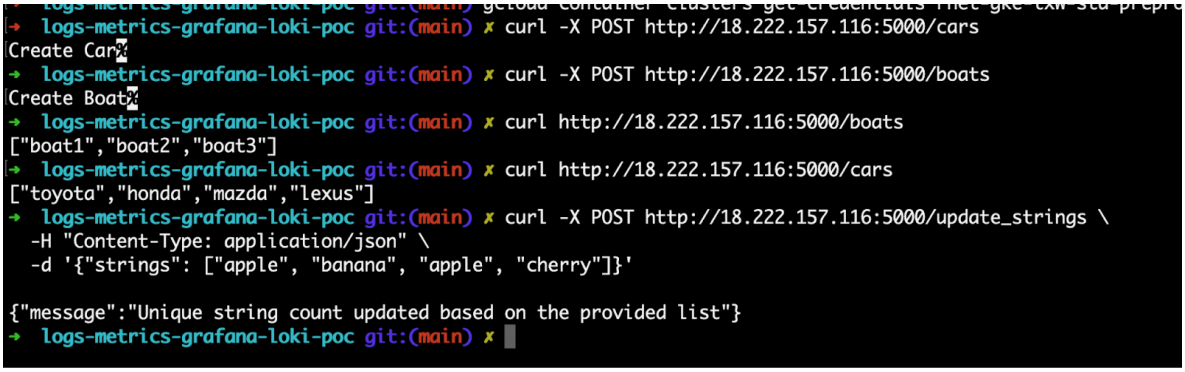
curl -X POST http://18.222.157.116:5000/cars

curl -X POST http://18.222.157.116:5000/boats

curl http://18.222.157.116:5000/cars

curl http://18.222.157.116:5000/boats

curl -X POST http://18.217.114.153:5000/count_unique_strings \
  -H "Content-Type: application/json" \
  -d '{"strings": ["apple", "banana", "apple", "cherry"]}'



curl -X POST http://127.0.0.1:5000/start -H "Content-Type: application/json" -d '{"config_file": "env-config.json",

"interval": 60}'

curl -X POST http://18.222.157.116:5000/stop

curl http://18.222.157.116:5000/status

kubectl -n rk-poc delete pod/rk-logs-in-table-form

Cluster details

gcloud container clusters get-credentials dh-gke-os-std-qa-cluster --zone northamerica-northeast1-a --project prj-dh-n-qa-os-01

kubectl -n rk-poc run python-app-log-metric --image=rahees9983/poc-loki:v3

kubectl -n rk-poc exec -it python-app-log-metric bash

curl http://localhost:5000/status

curl -X POST http://127.0.0.1:5000/start -H "Content-Type: application/json" -d '{"config_file": "env-config.json", "interval": 60}'

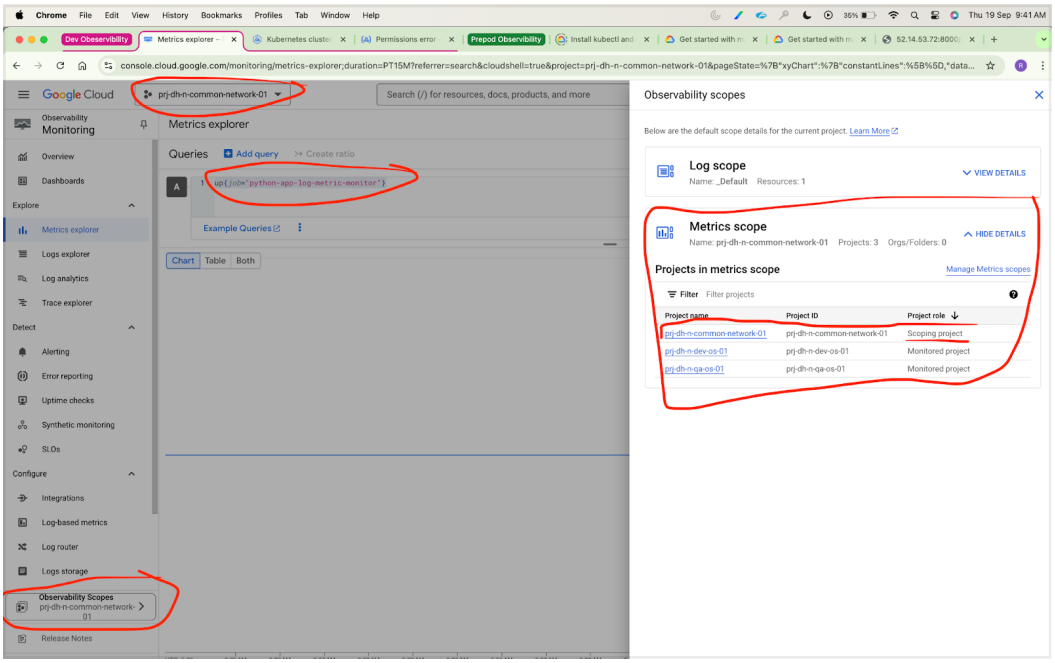
curl -X POST http://localhost:5000/stop

My AWS Prometheus console

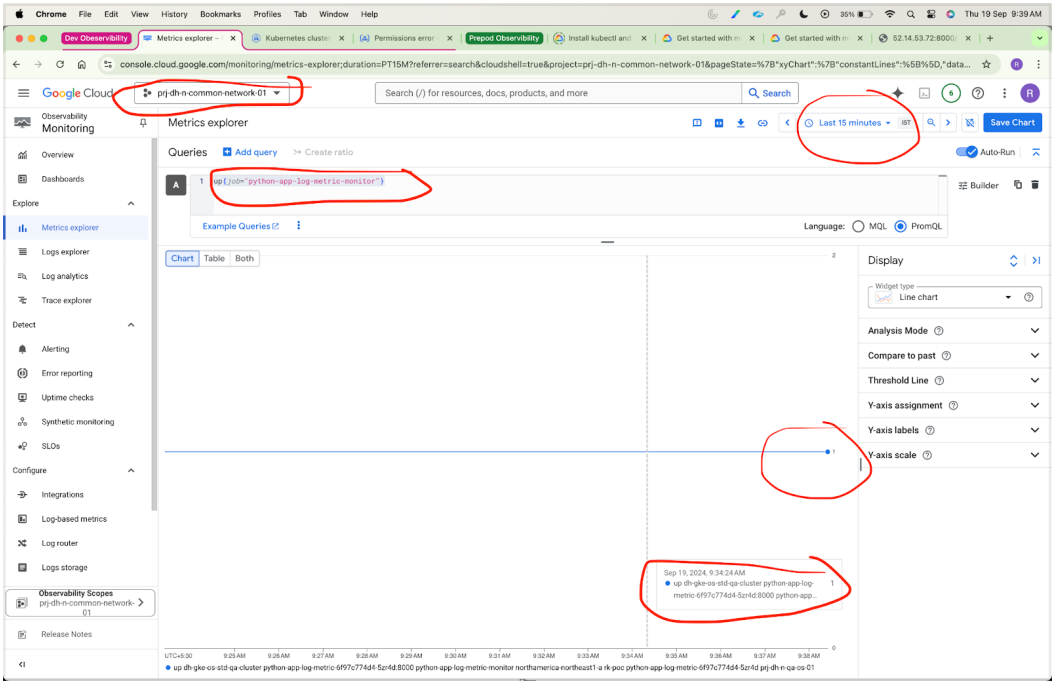
http://<AWS-PUBLIC-IP>:9090/

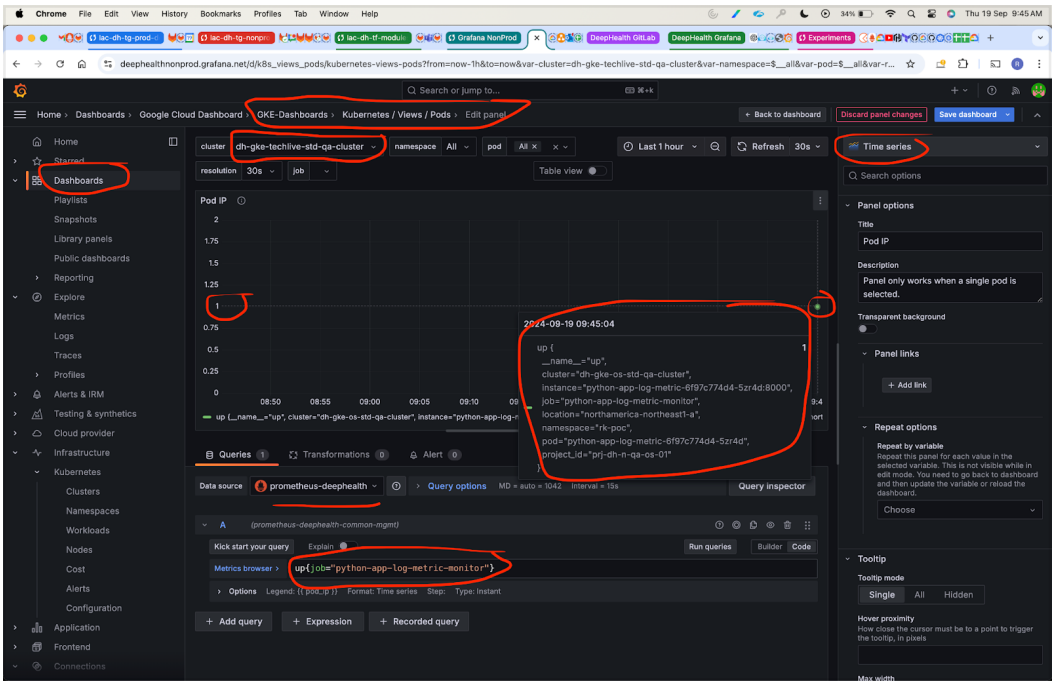
MY GCP monitoring console

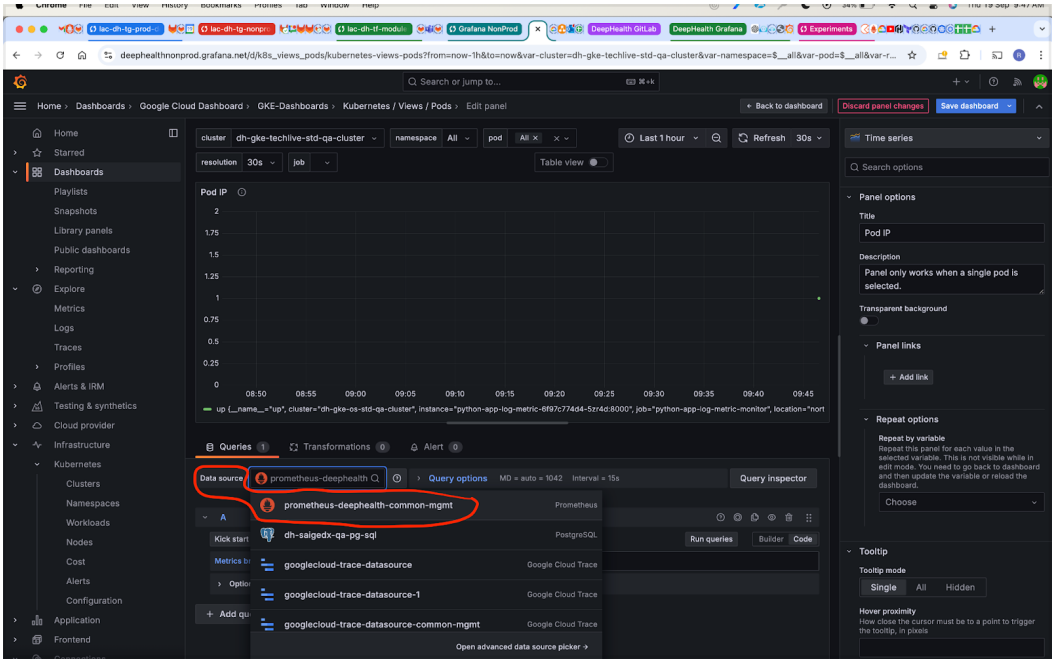
Project ID: prj-dh-n-common-network-01

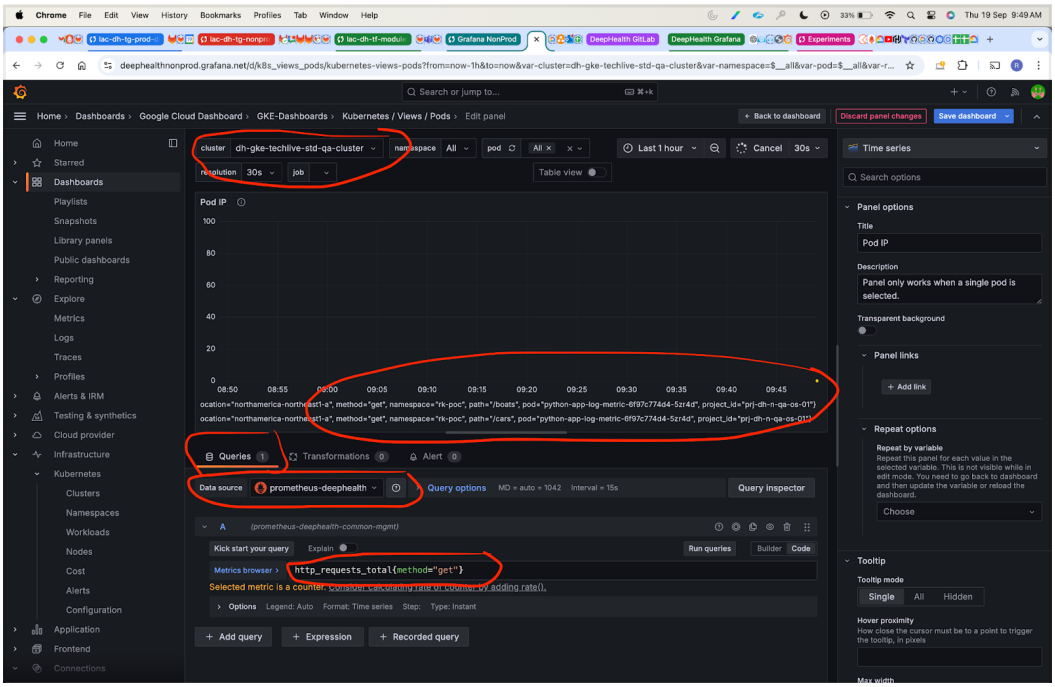


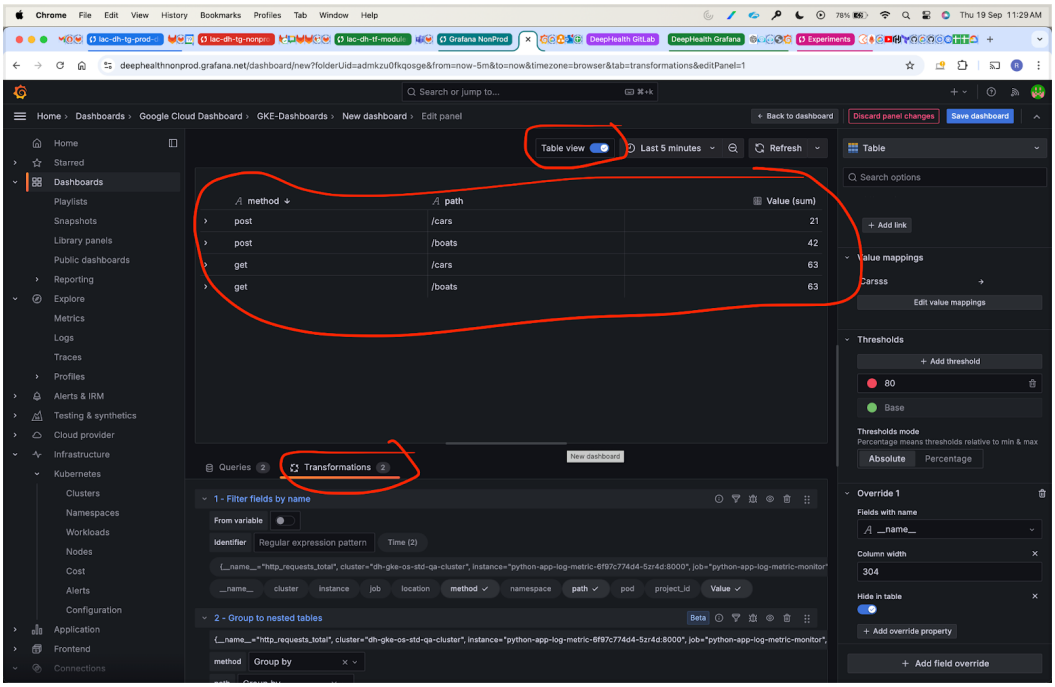
up{*job*="python-app-log-metric-monitor"}

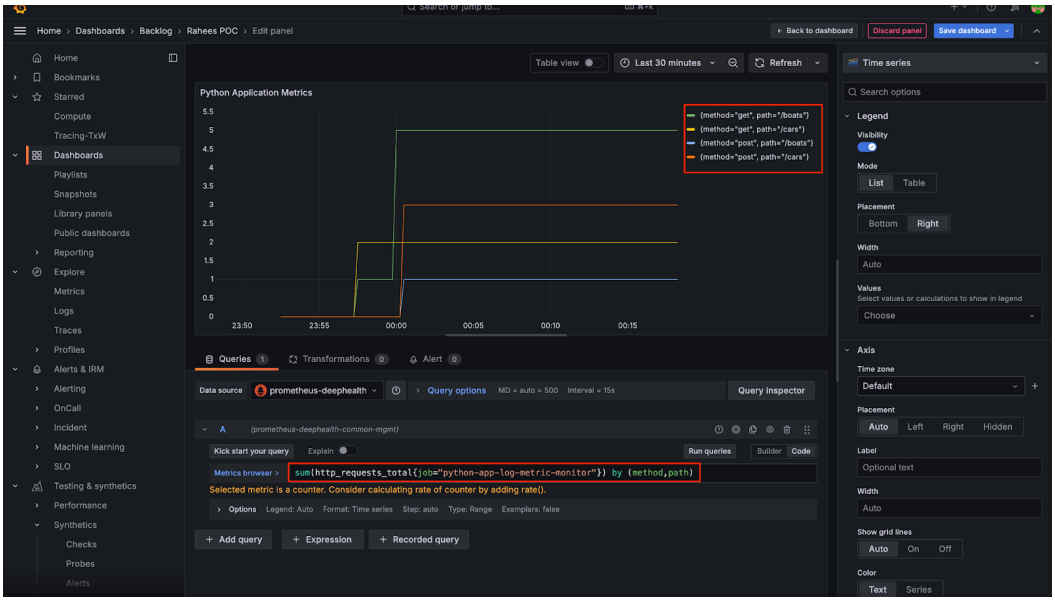


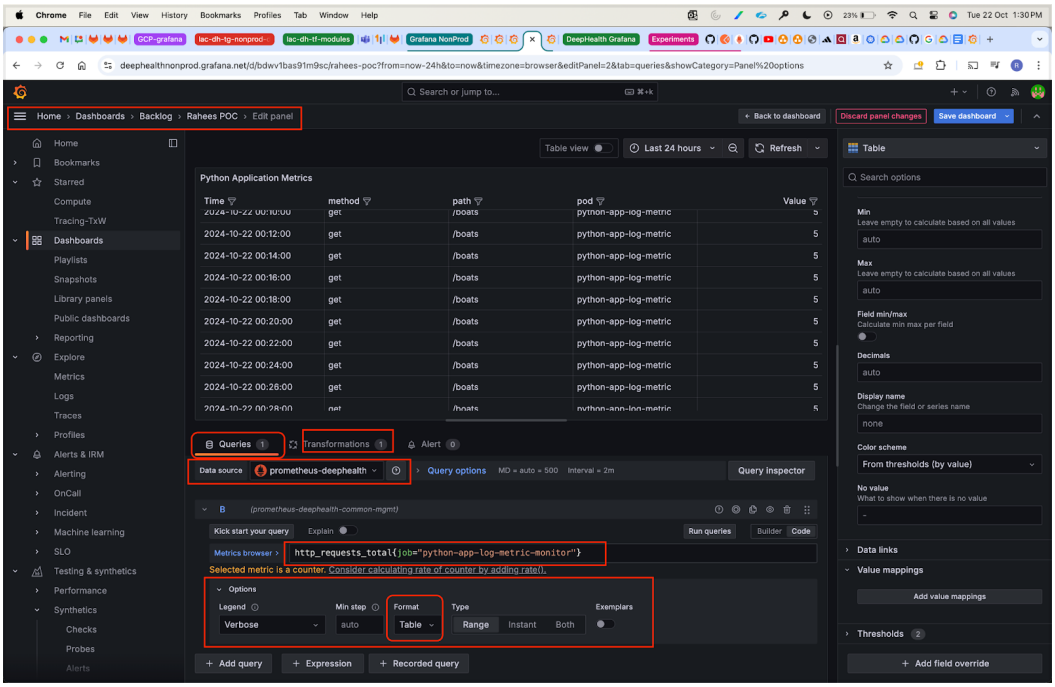

Pod IP
Panel only works when a single pod is selected.
2024-09-19 09:45:04
up{job="python-app-log-metric-monitor"}
Add query
Expression
Recorded query

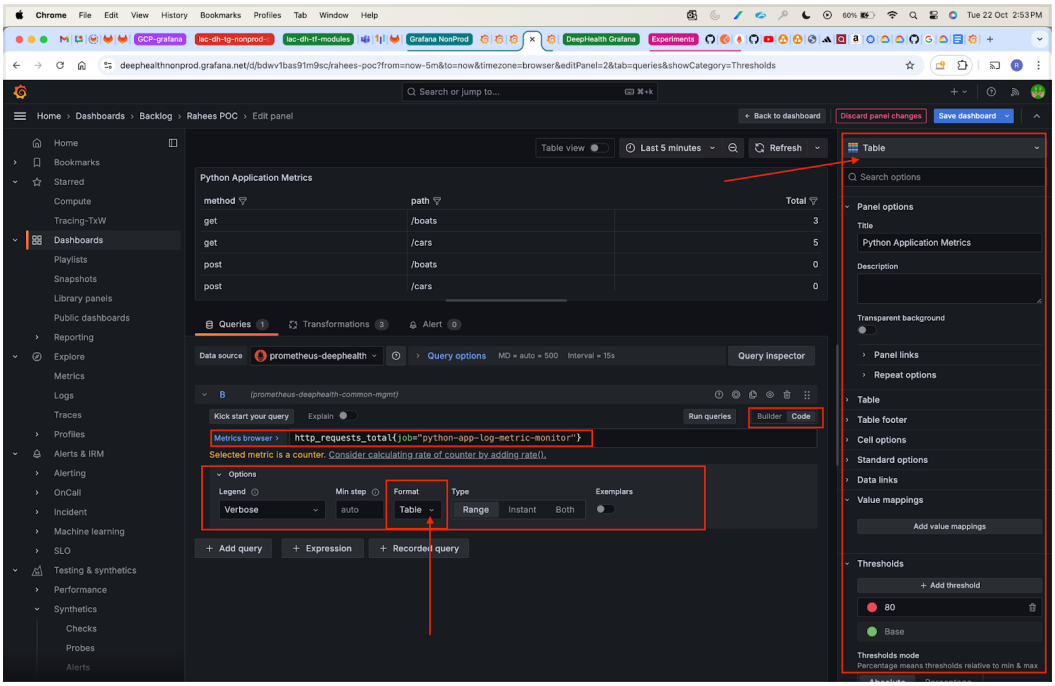

Pod IP
Panel only works when a single pod is selected.
prometheus-deephealth-common-mgmt
dh-saigedx-qa-pg-sql
googlecloud-trace-datasource
googlecloud-trace-datasource-1
googlecloud-trace-datasource-common-mgmt

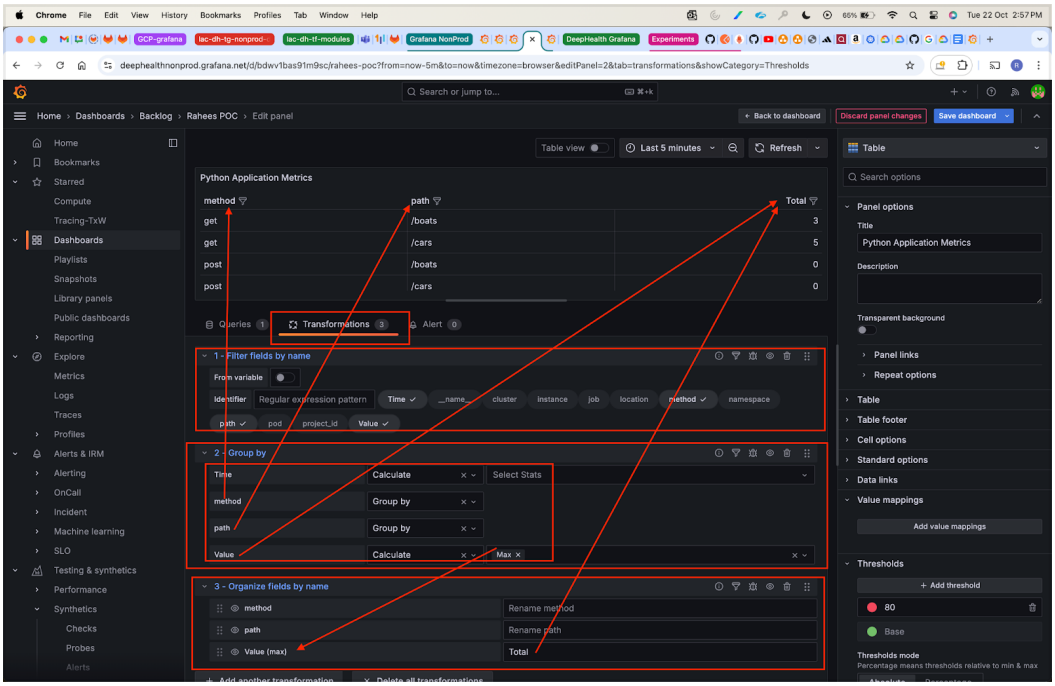

Home > Dashboards > Google Cloud Dashboard > GKE-Dashboards > Kubernetes / Views / Pods > Edit panel
Back to dashboard
Discard panel changes
Save dashboard
cluster dh-gke-techlive-std-qa-cluster
namespace All
pod All
Last 1 hour
Cancel
30s
resolution 30s
job
Table view
Pod IP
Time series
Panel options
Title
Pod IP
Description
Panel only works when a single pod is selected.
Transparent background
Panel links
Add link
Repeat options
Repeat by variable
Repeat this panel for each value in the selected variable. This is not visible while in edit mode. You need to go back to dashboard and then update the variable or reload the dashboard.
Choose
Tooltip
Tooltip mode
Single
All
Hidden
Hover proximity
How close the cursor must be to a point to trigger the tooltip, in pixels
Max width
Queries 1
Transformations 0
Alert 0
Data source prometheus-deephealth
Query options
MD = auto = 1042
Interval = 15s
Query inspector
A
(prometheus-deephealth-common-mgmt)
Kick start your query
Explain
Run queries
Builder
Code
Metrics browser
http_requests_total{method="get"}
Selected metric is a counter. Consider calculating rate() of counter by adding rate(),
Options
Legend: Auto
Format: Time series
Step:
Type: Instant
Add query
Expression
Recorded query


Home > Dashboards > Google Cloud Dashboard > GKE-Dashboards > New dashboard > Edit panel
Back to dashboard
Discard panel changes
Save dashboard
Table view
Last 5 minutes
Refresh
Table
method
path
Value (sum)
post /cars 21
post /boats 42
get /cars 63
get /boats 63
Add link
Value mappings
Carsss
Edit value mappings
Thresholds
Add threshold
80
Base
Thresholds mode
Percentage means thresholds relative to min & max
Absolute
Percentage
Override 1
Fields with name
__name__
Column width
304
Hide in table
Add override property
Add field override
New dashboard
Queries 2
Transformations 2
1 - Filter fields by name
From variable
Identifier
Regular expression pattern
Time (2)
__name__ cluster instance job location method namespace path pod project_id Value
2 - Group to nested tables
Beta
method
Group by


Home › Dashboards › Backlog › Rahees POC › Edit panel
Back to dashboard
Discard panel
Save dashboard
Table view
Last 30 minutes
Refresh
Time series
Python Application Metrics
{method="get", path="/boats"}
{method="get", path="/cars"}
{method="post", path="/boats"}
{method="post", path="/cars"}
Queries 1
Transformations 0
Alert 0
Data source
prometheus-deephealth
Query options
Query inspector
Kick start your query
Explain
Run queries
Builder
Code
Metrics browser
sum(http_requests_total{job="python-app-log-metric-monitor"}) by (method,path)
Selected metric is a counter. Consider calculating rate of counter by adding rate().
Options
Add query
Expression
Recorded query
Legend
Visibility
Mode
List
Table
Placement
Bottom
Right
Width
Auto
Values
Select values or calculations to show in legend
Choose
Axis
Time zone
Default
Placement
Auto
Left
Right
Hidden
Label
Optional text
Width
Auto
Show grid lines
Auto
On
Off
Color
Text
Series

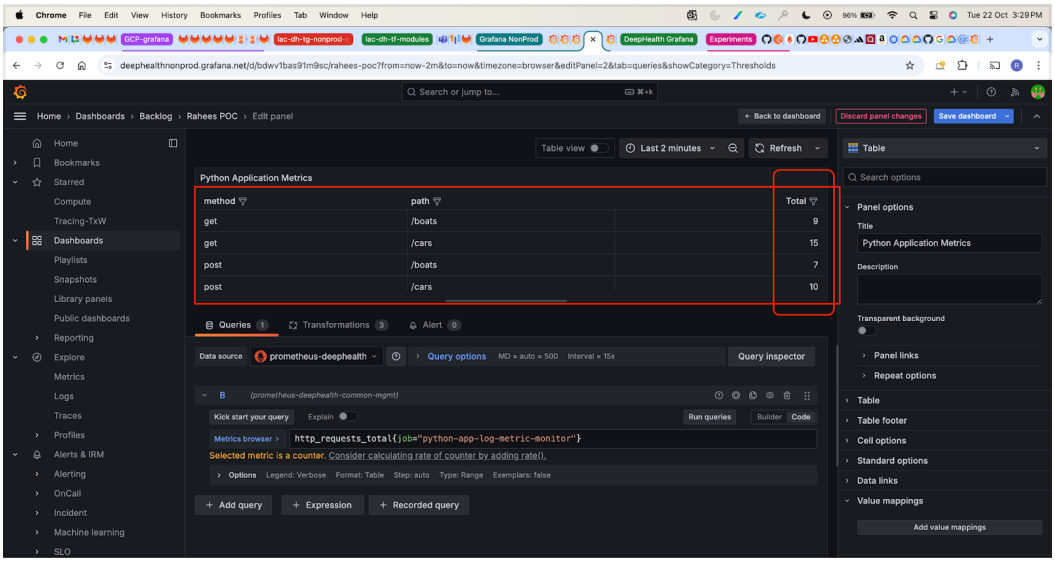

Home › Dashboards › Backlog › Rahees POC › Edit panel
Back to dashboard
Discard panel changes
Save dashboard
Table view
Last 24 hours
Refresh
Table
Python Application Metrics
Time
method
path
pod
Value
2024-10-22 00:12:00 get /boats python-app-log-metric 5
2024-10-22 00:14:00 get /boats python-app-log-metric 5
2024-10-22 00:16:00 get /boats python-app-log-metric 5
2024-10-22 00:18:00 get /boats python-app-log-metric 5
2024-10-22 00:20:00 get /boats python-app-log-metric 5
2024-10-22 00:22:00 get /boats python-app-log-metric 5
2024-10-22 00:24:00 get /boats python-app-log-metric 5
2024-10-22 00:26:00 get /boats python-app-log-metric 5
Queries 1
Transformations 1
Alert 0
Data source
prometheus-deephealth
Query options
Query inspector
Kick start your query
Explain
Run queries
Builder
Code
Metrics browser
http_requests_total{job="python-app-log-metric-monitor"}
Selected metric is a counter. Consider calculating rate of counter by adding rate().
Options
Legend
Verbose
Min step
auto
Format
Table
Type
Range
Instant
Both
Exemplars
Add query
Expression
Recorded query
Min
Leave empty to calculate based on all values
auto
Max
Leave empty to calculate based on all values
auto
Field min/max
Calculate min max per field
Decimals
auto
Display name
Change the field or series name
none
Color scheme
From thresholds (by value)
No value
What to show when there is no value
-
Data links
Value mappings
Add value mappings
Thresholds 2
Add field override






```
for i in {1..7}; do curl -X POST http://localhost:5000/boats && echo ""; done
for i in {1..10}; do curl -X POST http://localhost:5000/cars && echo ""; done
for i in {1..15}; do curl http://localhost:5000/cars && echo ""; done
for i in {1..9}; do curl http://localhost:5000/boats && echo ""; done
```

```
rahees_khan@cloudshell:~ (prj-dh-n-qa-os-01)$ kubectl get po -owide
NAME                    READY   STATUS    RESTARTS   AGE   IP            NODE
python-app-log-metric   1/1     Running   0          19h   172.19.8.54   gke-dh-gke-os-std-qa-c-dh-os-nodepool-fb070661-8822
rahees_khan@cloudshell:~ (prj-dh-n-qa-os-01)$ kubectl exec -it python-app-log-metric -- bash
root@python-app-log-metric:/app# history | tail -8
   39  for i in {1..7}; do curl -X POST http://localhost:5000/boats && echo ""; done
   40  for i in {1..10}; do curl -X POST http://localhost:5000/cars && echo ""; done
   41  for i in {1..15}; do curl http://localhost:5000/cars && echo ""; done
   42  for i in {1..9}; do curl http://localhost:5000/boats && echo ""; done
   43  exit
   44  history | tail -7
   45  exit
   46  history | tail -8
root@python-app-log-metric:/app#
```



curl -X POST http://18.217.114.153:5000/count_unique_strings \
  -H "Content-Type: application/json" \
  -d '{"strings": ["apple", "banana", "apple", "cherry"]}'

curl -X POST http://18.217.114.153:5000/start_logging \
-H "Content-Type: application/json" \
-d '{"config_file": "env-config.json", "interval": 60}'

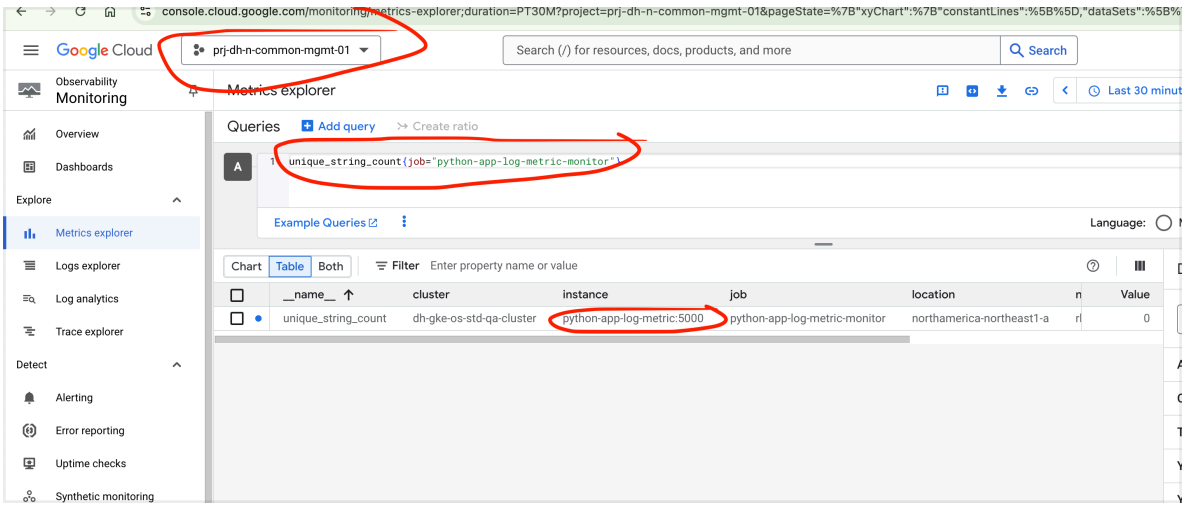
curl -X POST http://18.217.114.153:5000/stop_logging

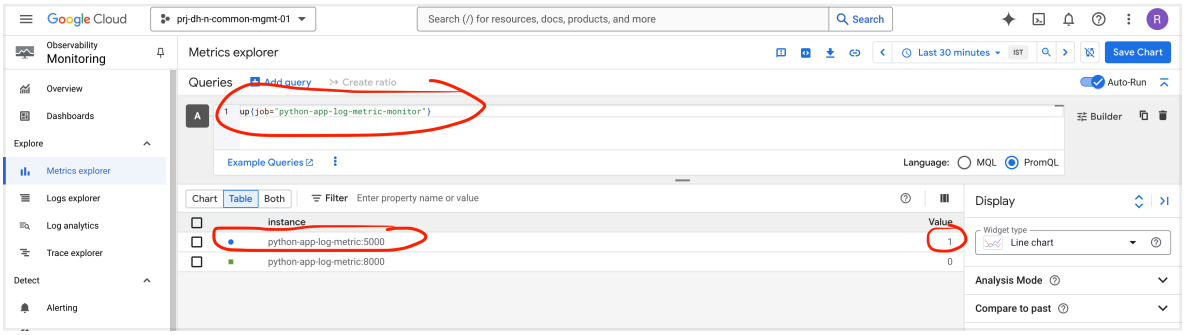
curl http://18.217.114.153:5000/logging_status

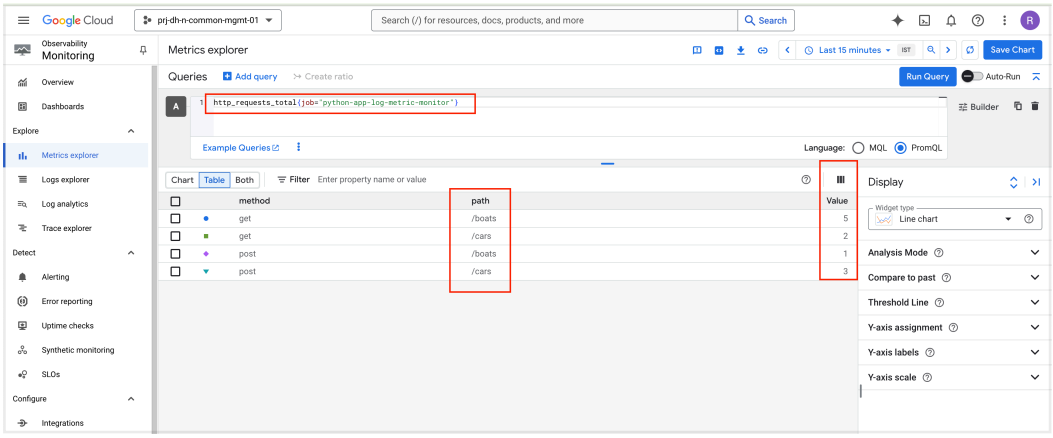
curl -X POST http://18.217.114.153:5000/cars

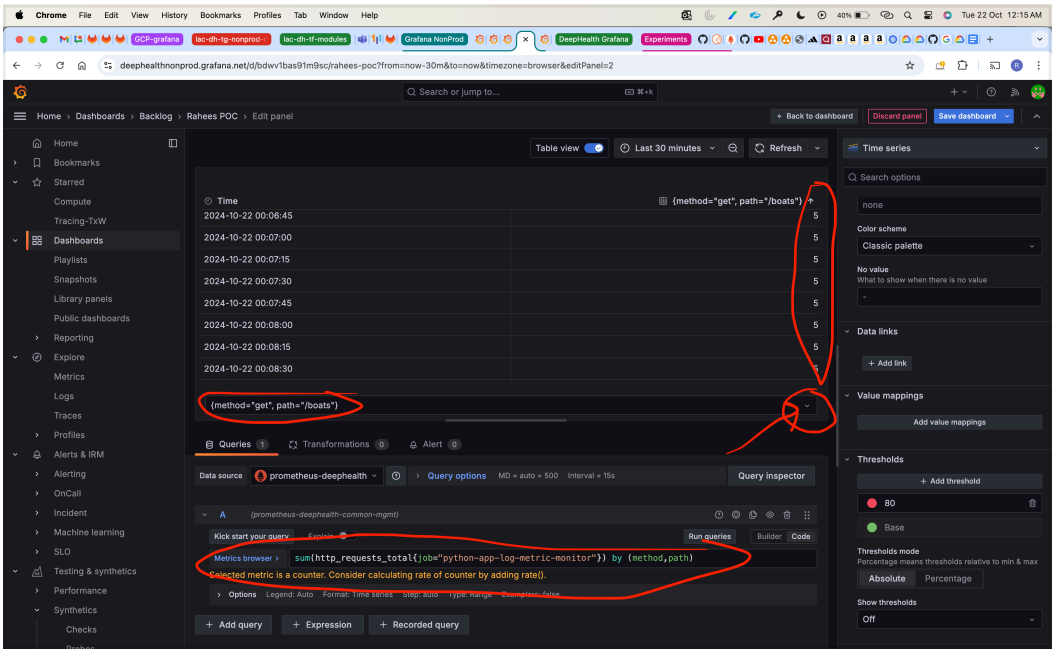
curl -X POST http://18.217.114.153:5000/boats

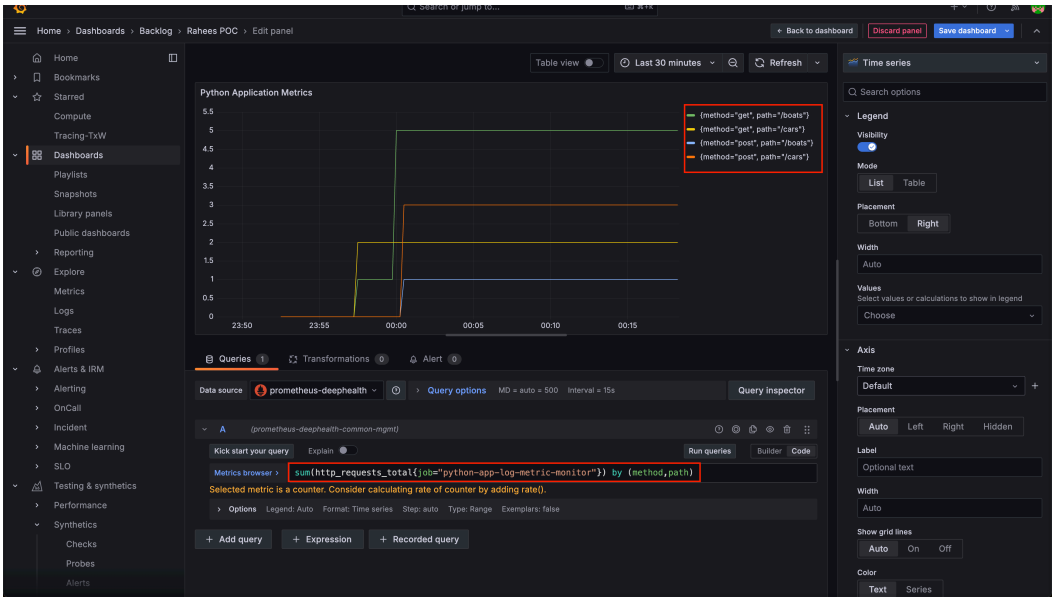
##################


Google Cloud
prj-dh-n-common-mgmt-01
Search (/) for resources, docs, products, and more
Search
Observability
Monitoring
Metrics explorer
Overview
Dashboards
Explore
Metrics explorer
Logs explorer
Log analytics
Trace explorer
Detect
Alerting
Error reporting
Uptime checks
Synthetic monitoring
Queries
Add query
Create ratio
A
unique_string_count{job="python-app-log-metric-monitor"}
Example Queries
Language:
Chart
Table
Both
Filter
Enter property name or value
__name__
cluster
instance
job
location
Value
unique_string_count
dh-gke-os-std-qa-cluster
python-app-log-metric:5000
python-app-log-metric-monitor
northamerica-northeast1-a
0


Google Cloud
prj-dh-n-common-mgmt-01
Search (/) for resources, docs, products, and more
Search
Observability
Monitoring
Metrics explorer
Last 30 minutes
Save Chart
Overview
Dashboards
Explore
Metrics explorer
Logs explorer
Log analytics
Trace explorer
Detect
Alerting
Queries
Add query
Create ratio
Auto-Run
A
up{job="python-app-log-metric-monitor"}
Builder
Example Queries
Language: MQL PromQL
Chart
Table
Both
Filter
Enter property name or value
Display
instance
Value
python-app-log-metric:5000
1
python-app-log-metric:8000
0
Widget type
Line chart
Analysis Mode
Compare to past


Google Cloud
prj-dh-n-common-mgmt-01
Search (/) for resources, docs, products, and more
Search
Observability
Monitoring
Metrics explorer
Last 15 minutes
Save Chart
Overview
Dashboards
Explore
Metrics explorer
Logs explorer
Log analytics
Trace explorer
Detect
Alerting
Error reporting
Uptime checks
Synthetic monitoring
SLOs
Configure
Integrations
Queries
Add query
Create ratio
Run Query
Auto-Run
A
http_requests_total{job="python-app-log-metric-monitor"}
Builder
Example Queries
Language: MQL PromQL
Chart
Table
Both
Filter
Enter property name or value
Display
method
path
Value
get
/boats
5
get
/cars
2
post
/boats
1
post
/cars
3
Widget type
Line chart
Analysis Mode
Compare to past
Threshold Line
Y-axis assignment
Y-axis labels
Y-axis scale






```
curl -X POST http://18.217.114.153:5000/count_unique_strings \
  -H "Content-Type: application/json" \
  -d '{"strings": ["apple", "banana", "apple", "cherry"]}'
```

```
curl -X POST http://localhost:5000/count_unique_strings  -H "Content-Type: application/json" -d '{"strings": ["apple", "banana", "apple", "cherry"]}'
```

```
curl -X POST http://18.217.114.153:5000/start_logging \
-H "Content-Type: application/json" \
-d '{"config_file": "env-config.json", "interval": 10}'
```

```
curl -X POST http://18.217.114.153:5000/stop_logging
```

curl http://18.217.114.153:5000/logging_status

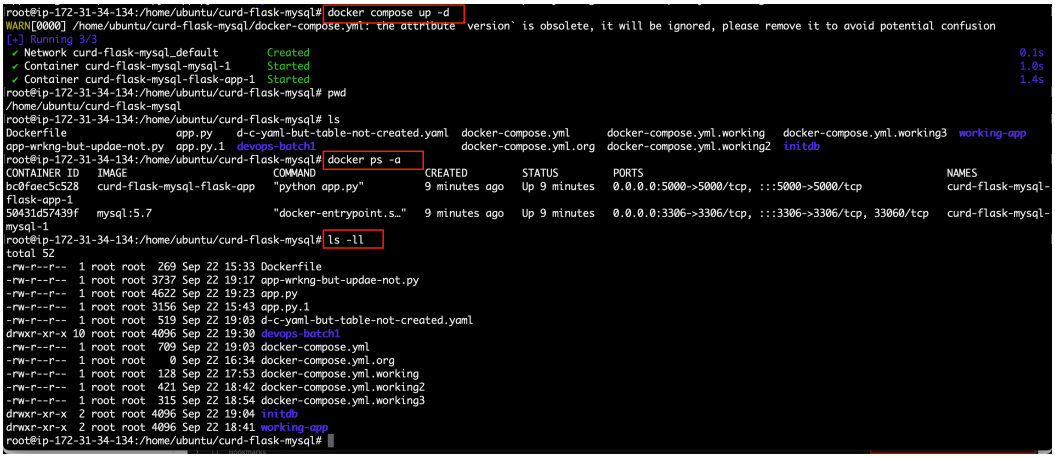
curl -X POST http://18.217.114.153:5000/cars
curl -X POST http://18.217.114.153:5000/boats

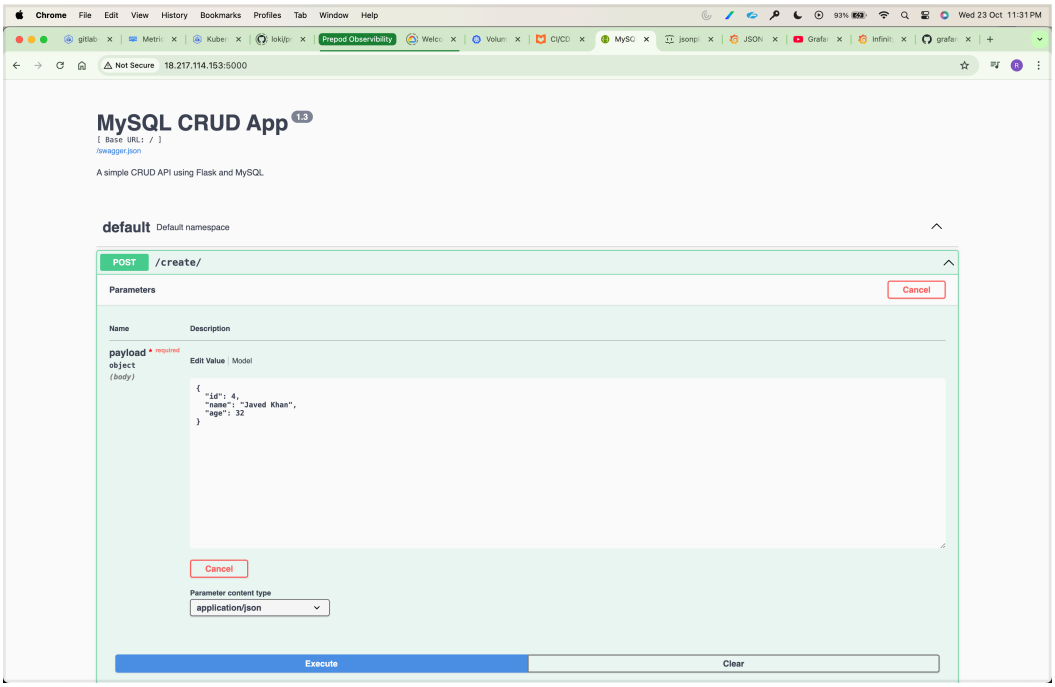
Render MySql database table into Grafana dashboard as a Table

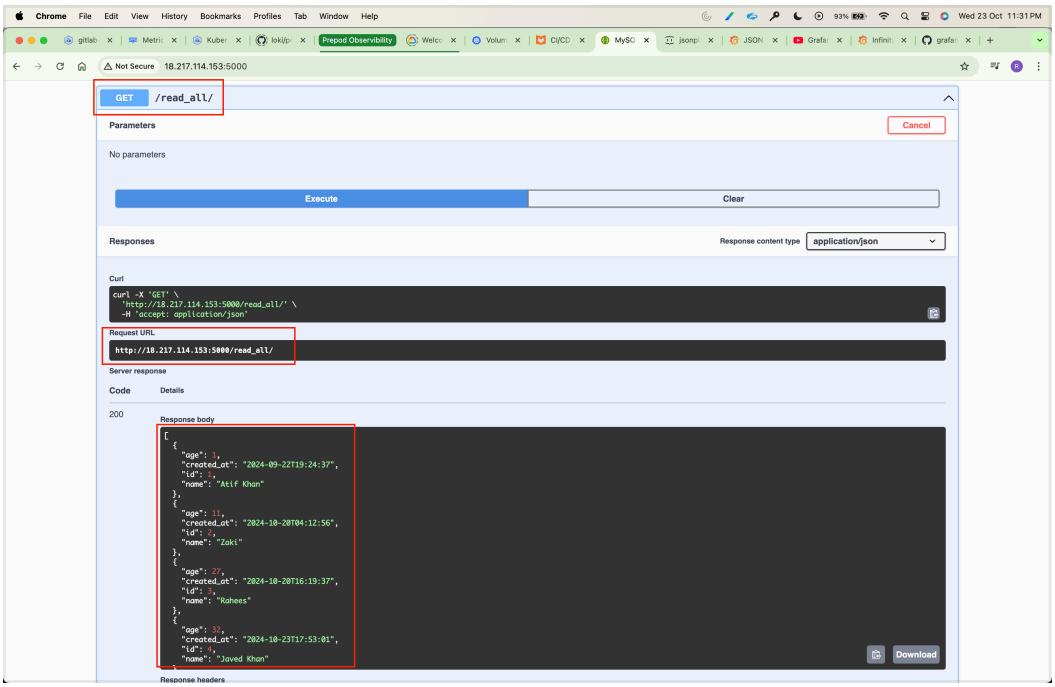
ssh -o ServerAliveInterval=60 -o ServerAliveCountMax=3 -i ~/.ssh/ec2-ssh-key-pair.pem ubuntu@18.217.114.153

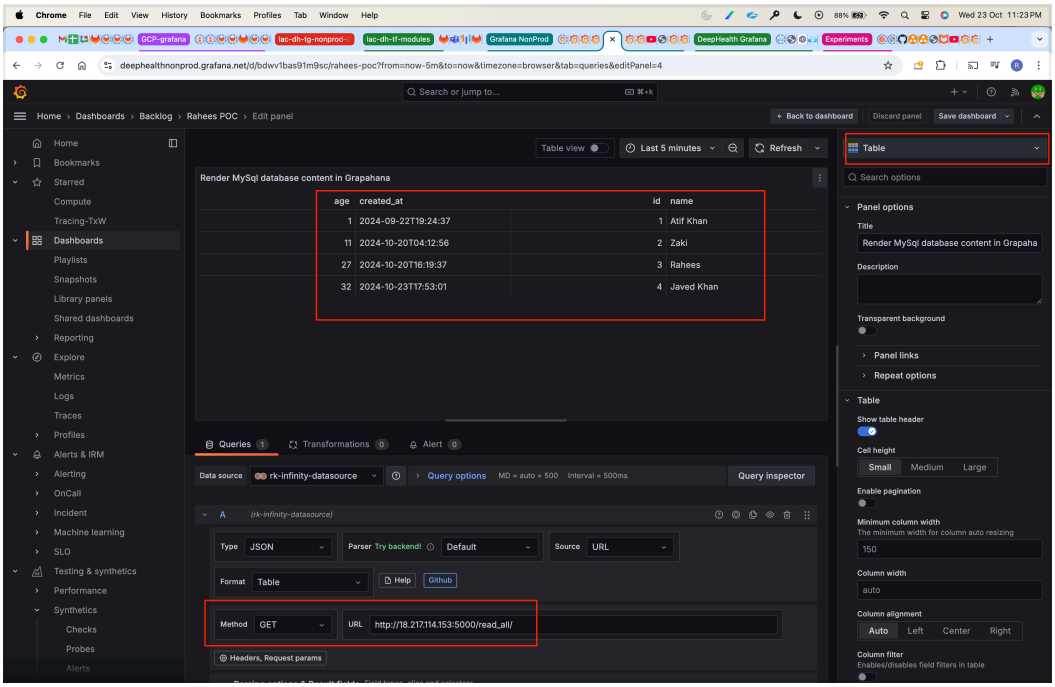
cd /home/ubuntu/curd-flask-mysql

docker compose up -d




Not Secure 18.217.114.153:5000
MySQL CRUD App 1.3
[Base URL: /]
/swagger.json
A simple CRUD API using Flask and MySQL
default Default namespace
POST /create/
Parameters
Cancel
Name
Description
payload * required
object
(body)
Edit Value | Model
{
"id": 4,
"name": "Javed Khan",
"age": 32
}
Cancel
Parameter content type
application/json
Execute
Clear


Not Secure 18.217.114.153:5000
GET /read_all/
Parameters
Cancel
No parameters
Execute
Clear
Responses
Response content type
application/json
Curl
curl -X 'GET' \
'http://18.217.114.153:5000/read_all/' \
-H 'accept: application/json'
Request URL
http://18.217.114.153:5000/read_all/
Server response
Code
Details
200
Response body
[
{
"age": 3,
"created_at": "2024-09-22T19:24:37",
"id": 1,
"name": "Atif Khan"
},
{
"age": 11,
"created_at": "2024-10-20T04:12:56",
"id": 2,
"name": "Zaki"
},
{
"age": 27,
"created_at": "2024-10-20T16:19:37",
"id": 3,
"name": "Rahees"
},
{
"age": 32,
"created_at": "2024-10-23T17:53:01",
"id": 4,
"name": "Javed Khan"
}
Download
Response headers



https://grafana.com/docs/plugins/yesoreyeram-infinity-datasource/latest/

https://play.grafana.org/d/infinity-json/json-with-infinity?from=now-24h&to=now

https://github.com/grafana/grafana-infinity-datasource/blob/main/testdata/users.json

https://jsonplaceholder.typicode.com/users