Continuous Monitoring Assignment – 3
Monitoring Kubernetes Cluster
By Swapnil Jadhav

A&B is a Leading Business Services & Solution Provider company in the market, for one of their clients is struggling with instability of the application environment, Downtime and poor performance of the application, The resolution also takes high time to identify, investigate and fix the issue.
The client would like to take help from continuous monitoring tools like Prometheus and Grafana for monitoring their infrastructure and visualizing dashboard.
You are required to do following tasks :

1. Setup the node as instructed in the Kubernetes Level2 Assignment.

2. Setup another node with Prometheus and Grafana.

3. Run the cadvisor and node-exporter containers on the Kubernetes cluster.

4. Collect metrics from Kubernetes node.

5. Generate the Grafana dashboard to display following matrices.

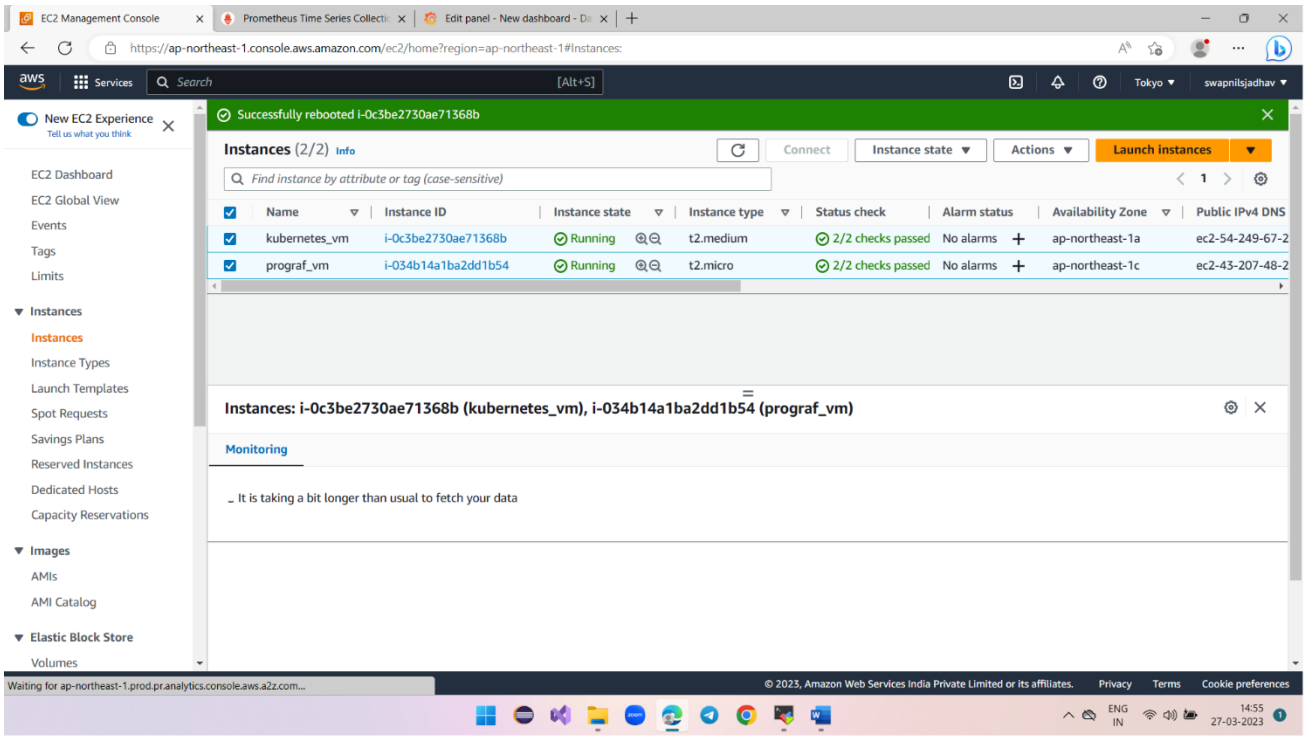
a. Node CPU utilization

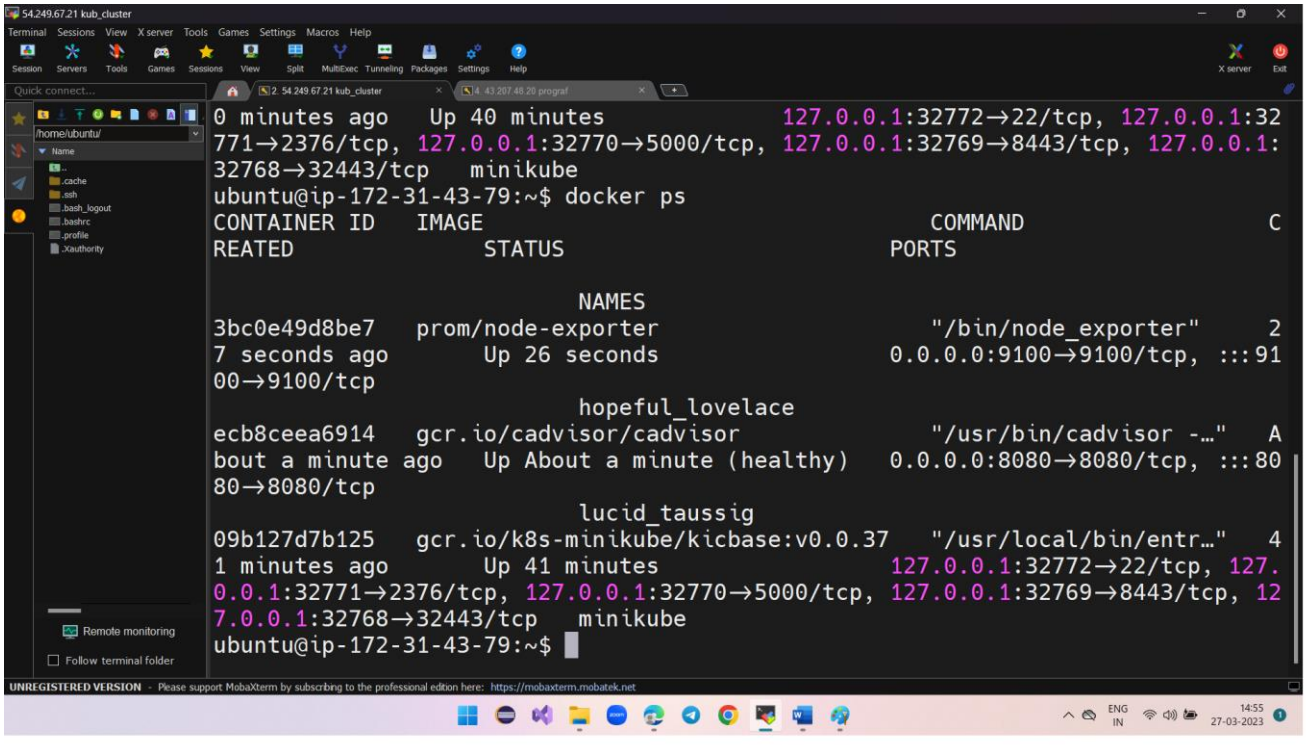
b. Memory Utilization

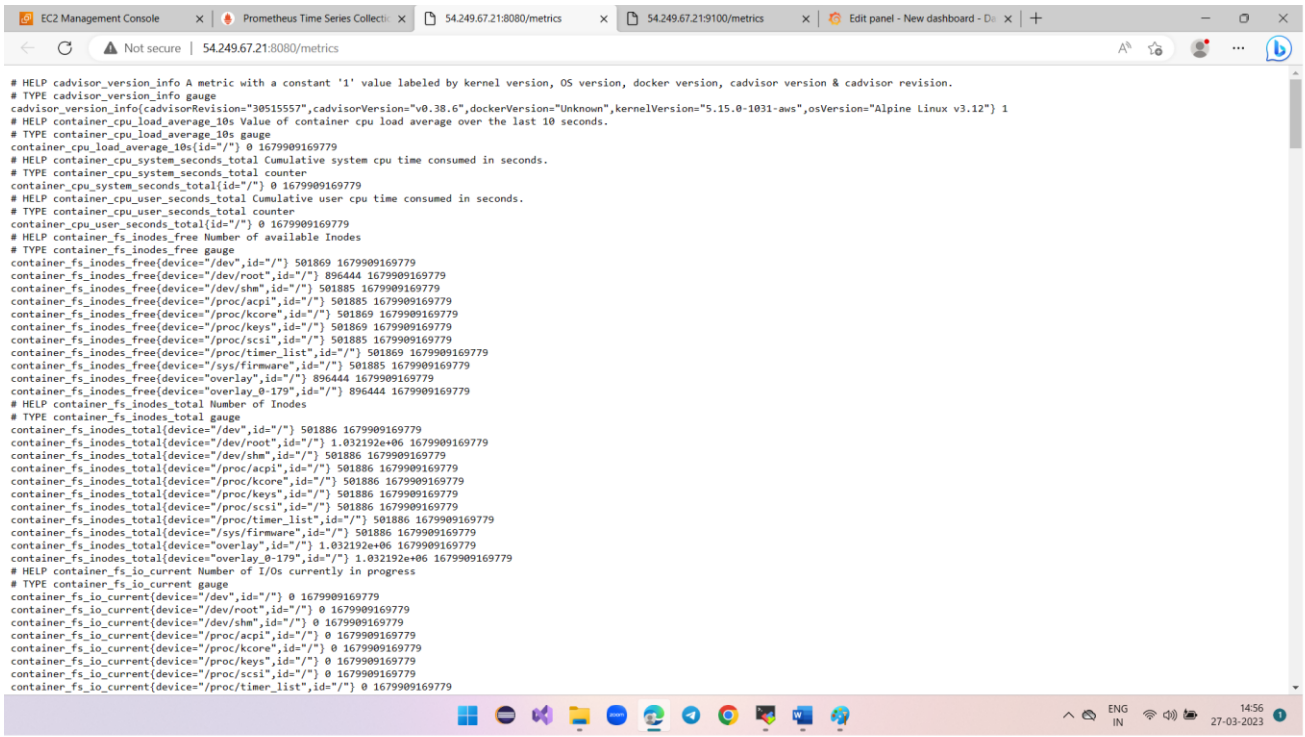
c. Disk Space Utilization

d. Container Memory Utilization

6. Configure an alert for Node CPU utilization going beyond 70%.


EC2 Management Console
Prometheus Time Series Collecti
Edit panel - New dashboard - Da
https://ap-northeast-1.console.aws.amazon.com/ec2/home?region=ap-northeast-1#Instances:
aws
Services
Search
[Alt+S]
Tokyo
swapnilsjadhav
New EC2 Experience
Tell us what you think
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
Images
AMIs
AMI Catalog
Elastic Block Store
Volumes
Successfully rebooted i-0c3be2730ae71368b
Instances (2/2) Info
Connect
Instance state
Actions
Launch instances
Find instance by attribute or tag (case-sensitive)
Name
Instance ID
Instance state
Instance type
Status check
Alarm status
Availability Zone
Public IPv4 DNS
kubernetes_vm
i-0c3be2730ae71368b
Running
t2.medium
2/2 checks passed
No alarms
ap-northeast-1a
ec2-54-249-67-2
prograf_vm
i-034b14a1ba2dd1b54
Running
t2.micro
2/2 checks passed
No alarms
ap-northeast-1c
ec2-43-207-48-2
Instances: i-0c3be2730ae71368b (kubernetes_vm), i-034b14a1ba2dd1b54 (prograf_vm)
Monitoring
It is taking a bit longer than usual to fetch your data
Waiting for ap-northeast-1.prod.pr.analytics.console.aws.a2z.com...
© 2023, Amazon Web Services India Private Limited or its affiliates.
Privacy
Terms
Cookie preferences
ENG
IN
14:55
27-03-2023


54.249.67.21 kub_cluster
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
X server Exit
Quick connect...
/home/ubuntu/
Name
.cache
.ssh
.bash_logout
.bashrc
.profile
.Xauthority
Remote monitoring
Follow terminal folder
2. 54.249.67.21 kub_cluster
4. 43.207.48.20 prograf
0 minutes ago Up 40 minutes 127.0.0.1:32772→22/tcp, 127.0.0.1:32771→2376/tcp, 127.0.0.1:32770→5000/tcp, 127.0.0.1:32769→8443/tcp, 127.0.0.1:32768→32443/tcp minikube
ubuntu@ip-172-31-43-79:~$ docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
3bc0e49d8be7 prom/node-exporter "/bin/node_exporter" 27 seconds ago Up 26 seconds 0.0.0.0:9100→9100/tcp, :::9100→9100/tcp hopeful_lovelace
ecb8ceea6914 gcr.io/cadvisor/cadvisor "/usr/bin/cadvisor -…" About a minute ago Up About a minute (healthy) 0.0.0.0:8080→8080/tcp, :::8080→8080/tcp lucid_taussig
09b127d7b125 gcr.io/k8s-minikube/kicbase:v0.0.37 "/usr/local/bin/entr…" 41 minutes ago Up 41 minutes 127.0.0.1:32772→22/tcp, 127.0.0.1:32771→2376/tcp, 127.0.0.1:32770→5000/tcp, 127.0.0.1:32769→8443/tcp, 127.0.0.1:32768→32443/tcp minikube
ubuntu@ip-172-31-43-79:~$
UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: https://mobaxterm.mobatek.net
ENG
IN
14:55
27-03-2023


EC2 Management Console
Prometheus Time Series Collecti
54.249.67.21:8080/metrics
54.249.67.21:9100/metrics
Edit panel - New dashboard - Da
Not secure | 54.249.67.21:8080/metrics
HELP cadvisor_version_info A metric with a constant '1' value labeled by kernel version, OS version, docker version, cadvisor version & cadvisor revision.
TYPE cadvisor_version_info gauge
cadvisor_version_info{cadvisorRevision="30515557",cadvisorVersion="v0.38.6",dockerVersion="Unknown",kernelVersion="5.15.0-1031-aws",osVersion="Alpine Linux v3.12"} 1
HELP container_cpu_load_average_10s Value of container cpu load average over the last 10 seconds.
TYPE container_cpu_load_average_10s gauge
container_cpu_load_average_10s{id="/"} 0 1679909169779
HELP container_cpu_system_seconds_total Cumulative system cpu time consumed in seconds.
TYPE container_cpu_system_seconds_total counter
container_cpu_system_seconds_total{id="/"} 0 1679909169779
HELP container_cpu_user_seconds_total Cumulative user cpu time consumed in seconds.
TYPE container_cpu_user_seconds_total counter
container_cpu_user_seconds_total{id="/"} 0 1679909169779
HELP container_fs_inodes_free Number of available Inodes
TYPE container_fs_inodes_free gauge
container_fs_inodes_free{device="/dev",id="/"} 501869 1679909169779
container_fs_inodes_free{device="/dev/root",id="/"} 896444 1679909169779
container_fs_inodes_free{device="/dev/shm",id="/"} 501885 1679909169779
container_fs_inodes_free{device="/proc/acpi",id="/"} 501885 1679909169779
container_fs_inodes_free{device="/proc/kcore",id="/"} 501869 1679909169779
container_fs_inodes_free{device="/proc/keys",id="/"} 501869 1679909169779
container_fs_inodes_free{device="/proc/scsi",id="/"} 501885 1679909169779
container_fs_inodes_free{device="/proc/timer_list",id="/"} 501869 1679909169779
container_fs_inodes_free{device="/sys/firmware",id="/"} 501885 1679909169779
container_fs_inodes_free{device="overlay",id="/"} 896444 1679909169779
container_fs_inodes_free{device="overlay_0-179",id="/"} 896444 1679909169779
HELP container_fs_inodes_total Number of Inodes
TYPE container_fs_inodes_total gauge
container_fs_inodes_total{device="/dev",id="/"} 501886 1679909169779
container_fs_inodes_total{device="/dev/root",id="/"} 1.032192e+06 1679909169779
container_fs_inodes_total{device="/dev/shm",id="/"} 501886 1679909169779
container_fs_inodes_total{device="/proc/acpi",id="/"} 501886 1679909169779
container_fs_inodes_total{device="/proc/kcore",id="/"} 501886 1679909169779
container_fs_inodes_total{device="/proc/keys",id="/"} 501886 1679909169779
container_fs_inodes_total{device="/proc/scsi",id="/"} 501886 1679909169779
container_fs_inodes_total{device="/proc/timer_list",id="/"} 501886 1679909169779
container_fs_inodes_total{device="/sys/firmware",id="/"} 501886 1679909169779
container_fs_inodes_total{device="overlay",id="/"} 1.032192e+06 1679909169779
container_fs_inodes_total{device="overlay_0-179",id="/"} 1.032192e+06 1679909169779
HELP container_fs_io_current Number of I/Os currently in progress
TYPE container_fs_io_current gauge
container_fs_io_current{device="/dev",id="/"} 0 1679909169779
container_fs_io_current{device="/dev/root",id="/"} 0 1679909169779
container_fs_io_current{device="/dev/shm",id="/"} 0 1679909169779
container_fs_io_current{device="/proc/acpi",id="/"} 0 1679909169779
container_fs_io_current{device="/proc/kcore",id="/"} 0 1679909169779
container_fs_io_current{device="/proc/keys",id="/"} 0 1679909169779
container_fs_io_current{device="/proc/scsi",id="/"} 0 1679909169779
container_fs_io_current{device="/proc/timer_list",id="/"} 0 1679909169779
ENG
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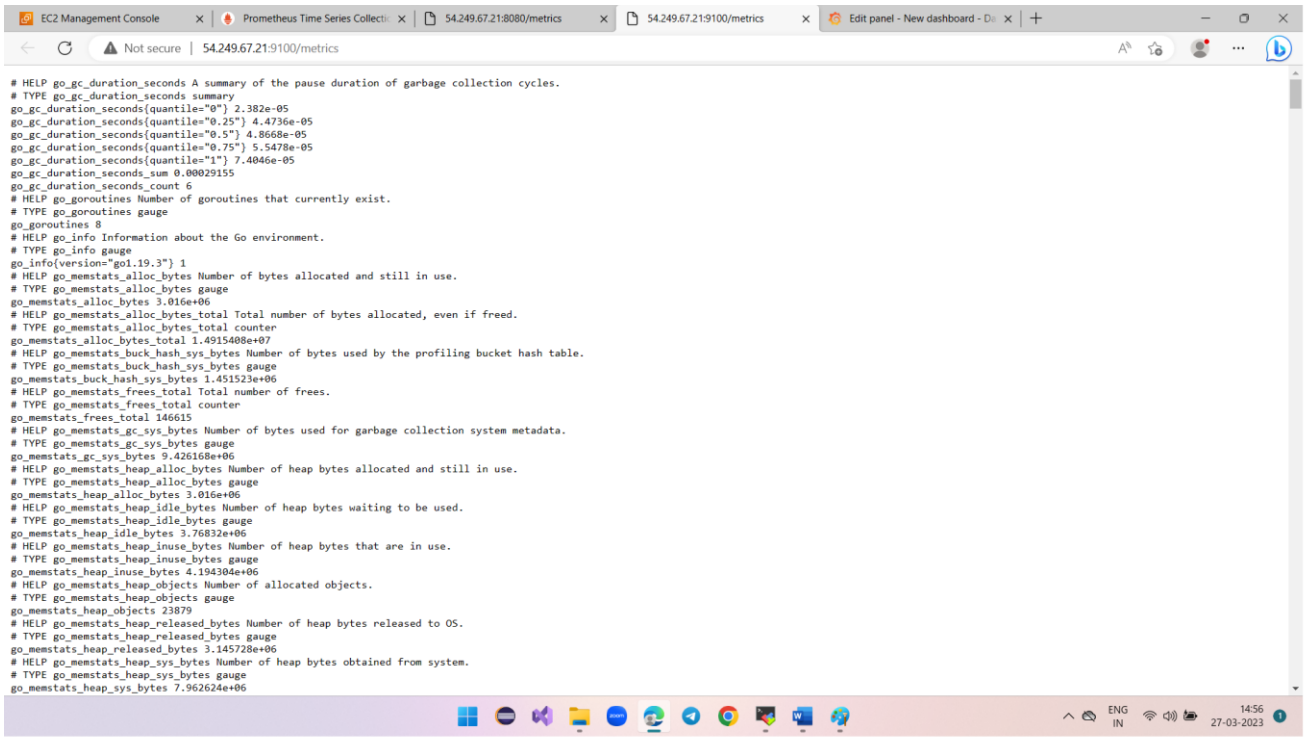
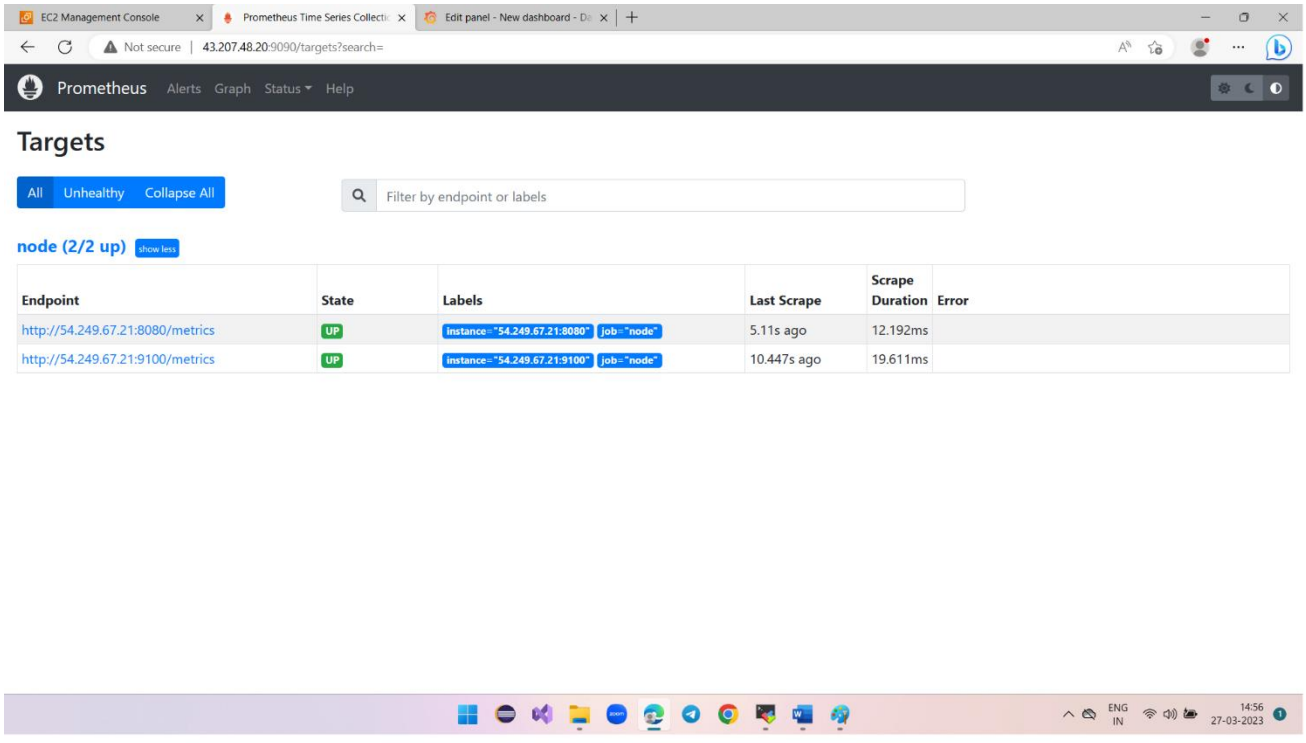
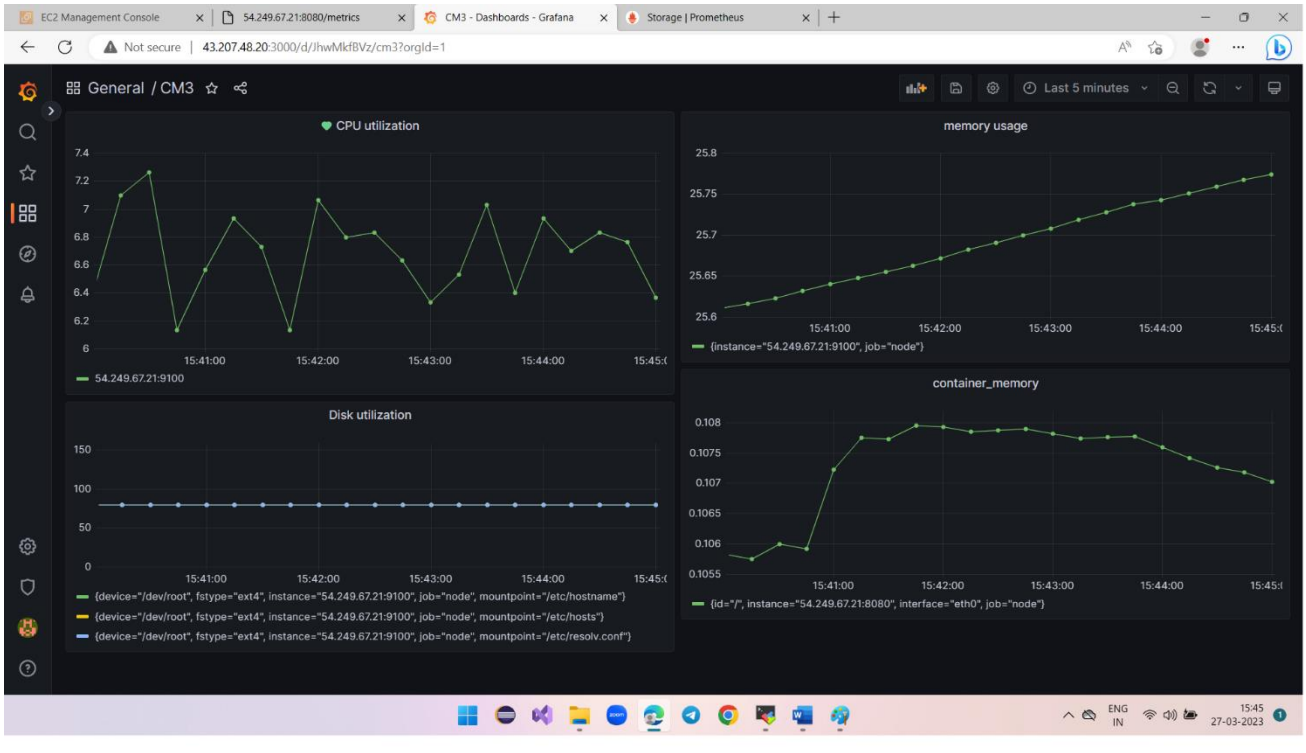
14:56
27-03-2023


EC2 Management Console
Prometheus Time Series Collecti
54.249.67.21:8080/metrics
54.249.67.21:9100/metrics
Edit panel - New dashboard - Da
Not secure | 54.249.67.21:9100/metrics
HELP go_gc_duration_seconds A summary of the pause duration of garbage collection cycles.
TYPE go_gc_duration_seconds summary
go_gc_duration_seconds{quantile="0"} 2.382e-05
go_gc_duration_seconds{quantile="0.25"} 4.4736e-05
go_gc_duration_seconds{quantile="0.5"} 4.8668e-05
go_gc_duration_seconds{quantile="0.75"} 5.5478e-05
go_gc_duration_seconds{quantile="1"} 7.4046e-05
go_gc_duration_seconds_sum 0.00029155
go_gc_duration_seconds_count 6
HELP go_goroutines Number of goroutines that currently exist.
TYPE go_goroutines gauge
go_goroutines 8
HELP go_info Information about the Go environment.
TYPE go_info gauge
go_info{version="go1.19.3"} 1
HELP go_memstats_alloc_bytes Number of bytes allocated and still in use.
TYPE go_memstats_alloc_bytes gauge
go_memstats_alloc_bytes 3.016e+06
HELP go_memstats_alloc_bytes_total Total number of bytes allocated, even if freed.
TYPE go_memstats_alloc_bytes_total counter
go_memstats_alloc_bytes_total 1.4915408e+07
HELP go_memstats_buck_hash_sys_bytes Number of bytes used by the profiling bucket hash table.
TYPE go_memstats_buck_hash_sys_bytes gauge
go_memstats_buck_hash_sys_bytes 1.451523e+06
HELP go_memstats_frees_total Total number of frees.
TYPE go_memstats_frees_total counter
go_memstats_frees_total 146615
HELP go_memstats_gc_sys_bytes Number of bytes used for garbage collection system metadata.
TYPE go_memstats_gc_sys_bytes gauge
go_memstats_gc_sys_bytes 9.426168e+06
HELP go_memstats_heap_alloc_bytes Number of heap bytes allocated and still in use.
TYPE go_memstats_heap_alloc_bytes gauge
go_memstats_heap_alloc_bytes 3.016e+06
HELP go_memstats_heap_idle_bytes Number of heap bytes waiting to be used.
TYPE go_memstats_heap_idle_bytes gauge
go_memstats_heap_idle_bytes 3.76832e+06
HELP go_memstats_heap_inuse_bytes Number of heap bytes that are in use.
TYPE go_memstats_heap_inuse_bytes gauge
go_memstats_heap_inuse_bytes 4.194304e+06
HELP go_memstats_heap_objects Number of allocated objects.
TYPE go_memstats_heap_objects gauge
go_memstats_heap_objects 23879
HELP go_memstats_heap_released_bytes Number of heap bytes released to OS.
TYPE go_memstats_heap_released_bytes gauge
go_memstats_heap_released_bytes 3.145728e+06
HELP go_memstats_heap_sys_bytes Number of heap bytes obtained from system.
TYPE go_memstats_heap_sys_bytes gauge
go_memstats_heap_sys_bytes 7.962624e+06
ENG
IN
14:56
27-03-2023


EC2 Management Console
Prometheus Time Series Collecti
Edit panel - New dashboard - Da
Not secure | 43.207.48.20:9090/targets?search=
Prometheus
Alerts
Graph
Status
Help
Targets
All
Unhealthy
Collapse All
Filter by endpoint or labels
node (2/2 up)
show less
Endpoint
State
Labels
Last Scrape
Scrape Duration
Error
http://54.249.67.21:8080/metrics
UP
instance="54.249.67.21:8080"
job="node"
5.11s ago
12.192ms
http://54.249.67.21:9100/metrics
UP
instance="54.249.67.21:9100"
job="node"
10.447s ago
19.611ms

ENG
IN
14:56
27-03-2023


EC2 Management Console
54.249.67.21:8080/metrics
CM3 - Dashboards - Grafana
Storage | Prometheus
Not secure | 43.207.48.20:3000/d/JhwMkfBVz/cm3?orgId=1
General / CM3
Last 5 minutes
CPU utilization
54.249.67.21:9100
memory usage
{instance="54.249.67.21:9100", job="node"}
Disk utilization
{device="/dev/root", fstype="ext4", instance="54.249.67.21:9100", job="node", mountpoint="/etc/hostname"}
{device="/dev/root", fstype="ext4", instance="54.249.67.21:9100", job="node", mountpoint="/etc/hosts"}
{device="/dev/root", fstype="ext4", instance="54.249.67.21:9100", job="node", mountpoint="/etc/resolv.conf"}
container_memory
{id="/", instance="54.249.67.21:8080", interface="eth0", job="node"}

ENG
IN
15:45
27-03-2023