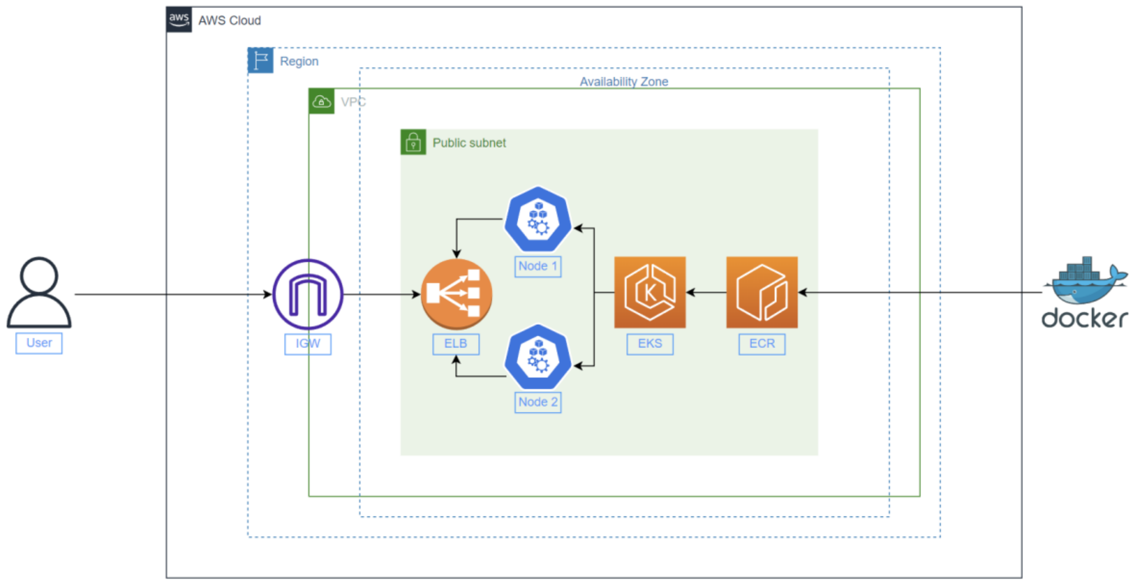
Project

Ref:

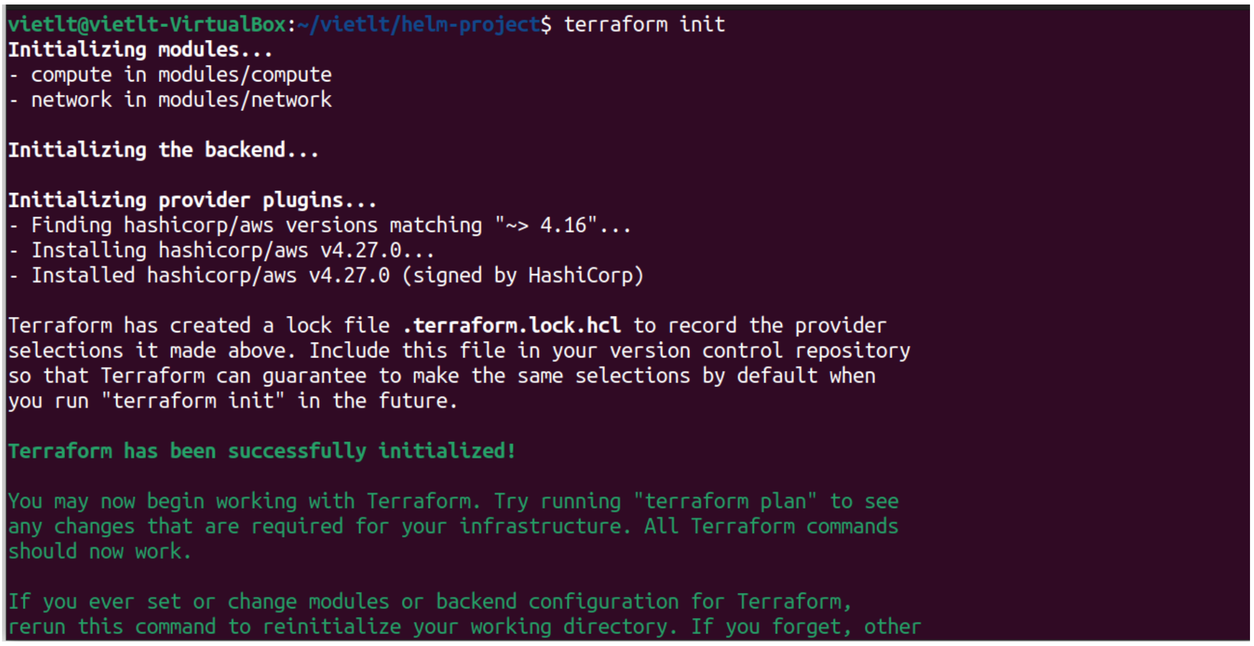
- gupta-aditya333.medium.com (remember to use vpn since this is a medium link)
- Installing the Kubernetes Metrics Server - Amazon EKS
- Control plane metrics with Prometheus - Amazon EKS

Architecture



Provision the infrastructure with Terraform

‘terraform init’



```
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$ terraform init
Initializing modules...
- compute in modules/compute
- network in modules/network

Initializing the backend...

Initializing provider plugins...
- Finding hashicorp/aws versions matching "~> 4.16"...
- Installing hashicorp/aws v4.27.0...
- Installed hashicorp/aws v4.27.0 (signed by HashiCorp)

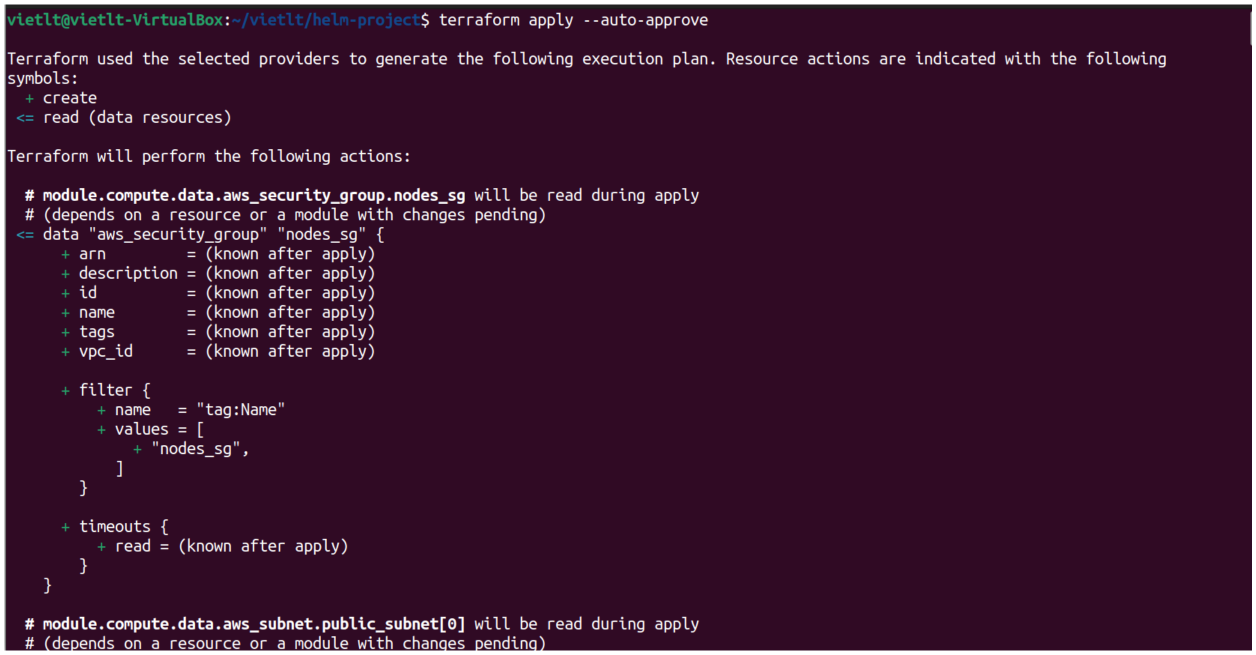
Terraform has created a lock file .terraform.lock.hcl to record the provider
selections it made above. Include this file in your version control repository
so that Terraform can guarantee to make the same selections by default when
you run "terraform init" in the future.

Terraform has been successfully initialized!

You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.

If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
```

‘terraform apply’



```
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$ terraform apply --auto-approve

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following
symbols:
  + create
 <= read (data resources)

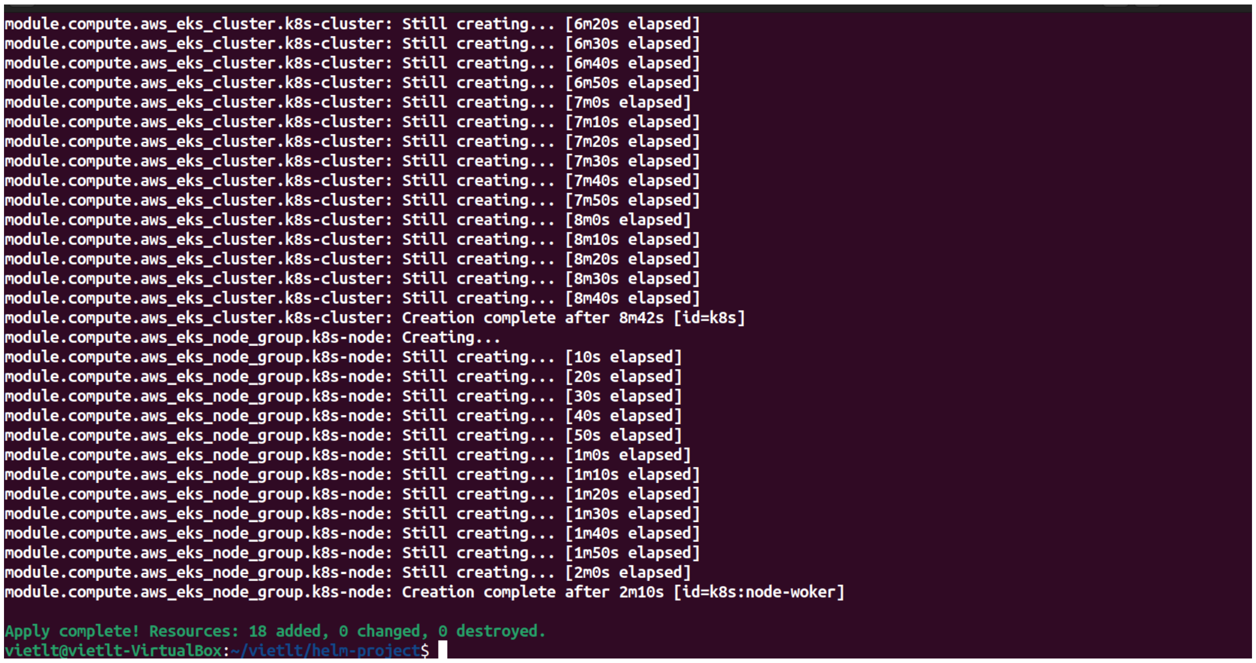
Terraform will perform the following actions:

  # module.compute.data.aws_security_group.nodes_sg will be read during apply
  # (depends on a resource or a module with changes pending)
 <= data "aws_security_group" "nodes_sg" {
      + arn         = (known after apply)
      + description = (known after apply)
      + id          = (known after apply)
      + name        = (known after apply)
      + tags        = (known after apply)
      + vpc_id      = (known after apply)

      + filter {
          + name   = "tag:Name"
          + values = [
              + "nodes_sg",
            ]
        }

      + timeouts {
          + read = (known after apply)
        }
    }

  # module.compute.data.aws_subnet.public_subnet[0] will be read during apply
  # (depends on a resource or a module with changes pending)
```

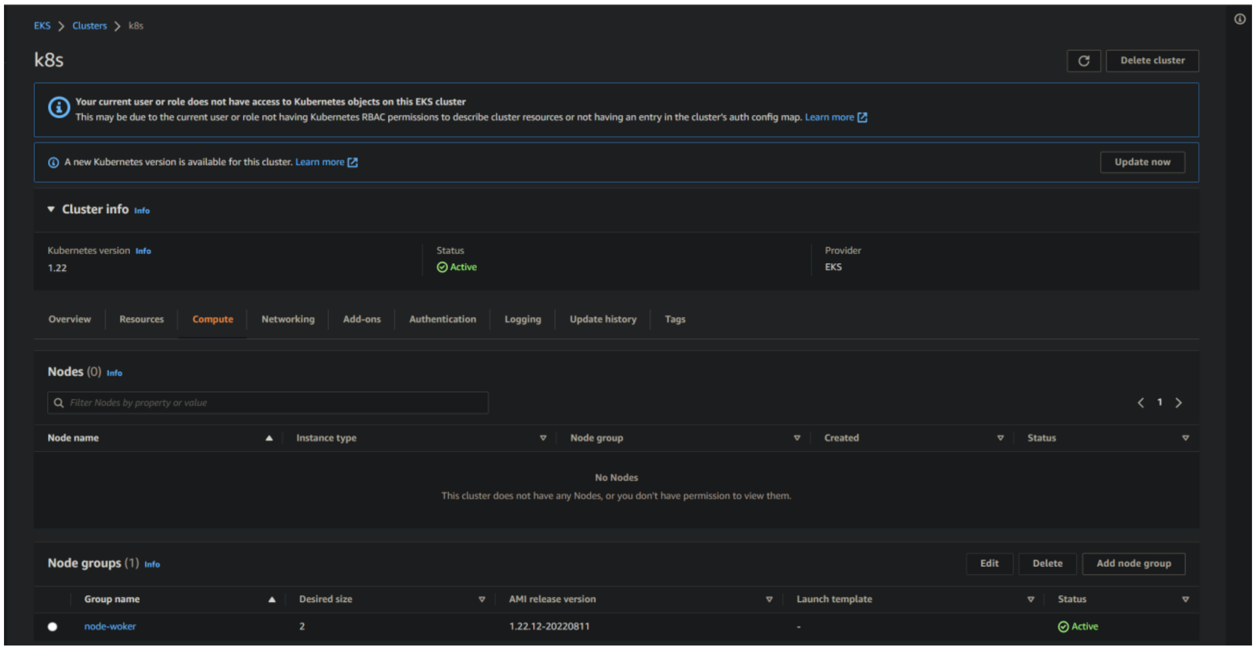


```
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [6m20s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [6m30s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [6m40s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [6m50s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [7m0s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [7m10s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [7m20s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [7m30s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [7m40s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [7m50s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [8m0s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [8m10s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [8m20s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [8m30s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Still creating... [8m40s elapsed]
module.compute.aws_eks_cluster.k8s-cluster: Creation complete after 8m42s [id=k8s]
module.compute.aws_eks_node_group.k8s-node: Creating...
module.compute.aws_eks_node_group.k8s-node: Still creating... [10s elapsed]
module.compute.aws_eks_node_group.k8s-node: Still creating... [20s elapsed]
module.compute.aws_eks_node_group.k8s-node: Still creating... [30s elapsed]
module.compute.aws_eks_node_group.k8s-node: Still creating... [40s elapsed]
module.compute.aws_eks_node_group.k8s-node: Still creating... [50s elapsed]
module.compute.aws_eks_node_group.k8s-node: Still creating... [1m0s elapsed]
module.compute.aws_eks_node_group.k8s-node: Still creating... [1m10s elapsed]
module.compute.aws_eks_node_group.k8s-node: Still creating... [1m20s elapsed]
module.compute.aws_eks_node_group.k8s-node: Still creating... [1m30s elapsed]
module.compute.aws_eks_node_group.k8s-node: Still creating... [1m40s elapsed]
module.compute.aws_eks_node_group.k8s-node: Still creating... [1m50s elapsed]
module.compute.aws_eks_node_group.k8s-node: Still creating... [2m0s elapsed]
module.compute.aws_eks_node_group.k8s-node: Creation complete after 2m10s [id=k8s:node-woker]

Apply complete! Resources: 18 added, 0 changed, 0 destroyed.
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$
```

*The whole provisioning process may take more than 20 minutes.

Confirm terraform with EKS cluster 2 worker nodes on the public subnet



EKS > Clusters > k8s

k8s

Your current user or role does not have access to Kubernetes objects on this EKS cluster
This may be due to the current user or role not having Kubernetes RBAC permissions to describe cluster resources or not having an entry in the cluster's auth config map. Learn more

A new Kubernetes version is available for this cluster. Learn more

Cluster info

Kubernetes version	Status	Provider
1.22	Active	EKS

Nodes (0)

Node name	Instance type	Node group	Created	Status

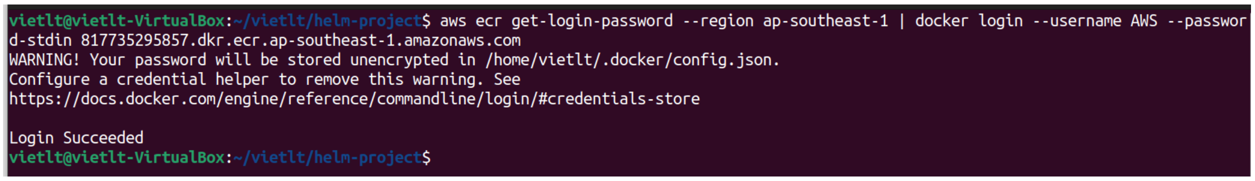
No Nodes
This cluster does not have any Nodes, or you don't have permission to view them.

Node groups (1)

Group name	Desired size	AMI release version	Launch template	Status
node-woker	2	1.22.12-20220811	-	Active

Package ChatApp application to a Docker image and upload to the container registry ECR

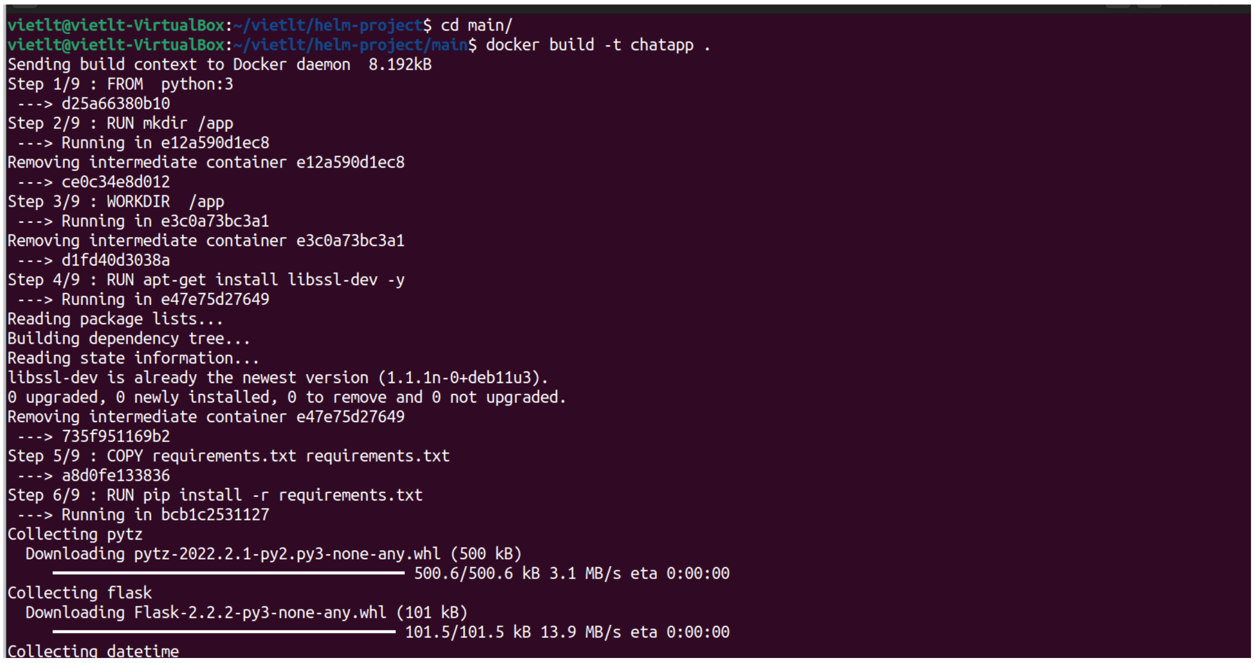
‘aws ecr get-login-password --region ap-southeast-1 | docker login --username AWS --password-stdin ************.dkr.ecr.ap-southeast-1.amazonaws.com’



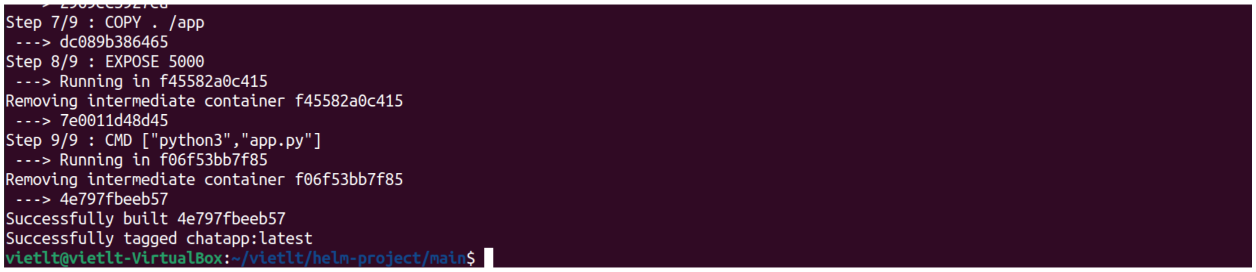
```
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$ aws ecr get-login-password --region ap-southeast-1 | docker login --username AWS --passwor
d-stdin 817735295857.dkr.ecr.ap-southeast-1.amazonaws.com
WARNING! Your password will be stored unencrypted in /home/vietlt/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$
```

Change dir into folder main and run ‘docker build -t chatapp .’



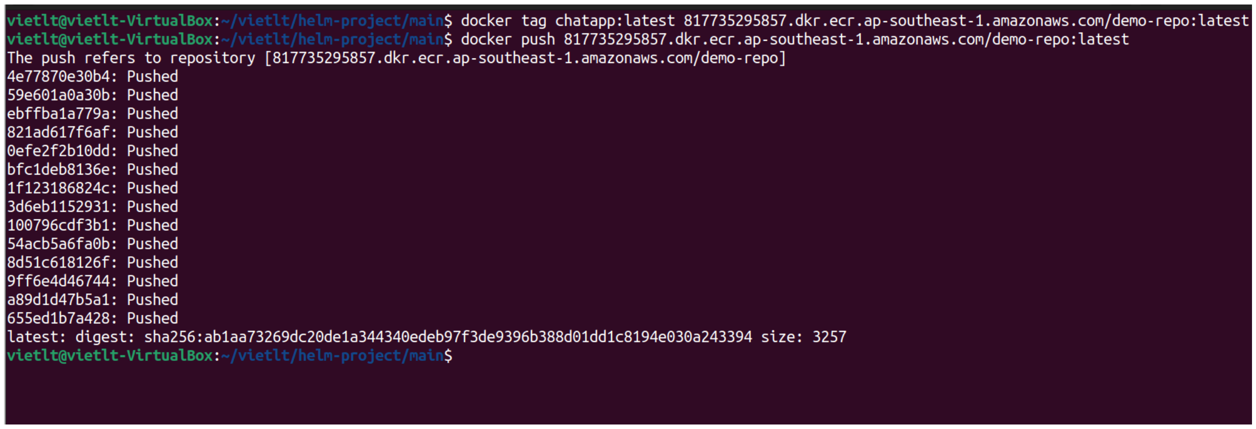
```
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$ cd main/
vietlt@vietlt-VirtualBox:~/vietlt/helm-project/main$ docker build -t chatapp .
Sending build context to Docker daemon  8.192kB
Step 1/9 : FROM  python:3
 ---> d25a66380b10
Step 2/9 : RUN mkdir /app
 ---> Running in e12a590d1ec8
Removing intermediate container e12a590d1ec8
 ---> ce0c34e8d012
Step 3/9 : WORKDIR  /app
 ---> Running in e3c0a73bc3a1
Removing intermediate container e3c0a73bc3a1
 ---> d1fd40d3038a
Step 4/9 : RUN apt-get install libssl-dev -y
 ---> Running in e47e75d27649
Reading package lists...
Building dependency tree...
Reading state information...
libssl-dev is already the newest version (1.1.1n-0+deb11u3).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Removing intermediate container e47e75d27649
 ---> 735f951169b2
Step 5/9 : COPY requirements.txt requirements.txt
 ---> a8d0fe133836
Step 6/9 : RUN pip install -r requirements.txt
 ---> Running in bcb1c2531127
Collecting pytz
  Downloading pytz-2022.2.1-py2.py3-none-any.whl (500 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 500.6/500.6 kB 3.1 MB/s eta 0:00:00
Collecting flask
  Downloading Flask-2.2.2-py3-none-any.whl (101 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 101.5/101.5 kB 13.9 MB/s eta 0:00:00
Collecting datetime
```



```
Step 7/9 : COPY . /app
 ---> dc089b386465
Step 8/9 : EXPOSE 5000
 ---> Running in f45582a0c415
Removing intermediate container f45582a0c415
 ---> 7e0011d48d45
Step 9/9 : CMD ["python3","app.py"]
 ---> Running in f06f53bb7f85
Removing intermediate container f06f53bb7f85
 ---> 4e797fbeeb57
Successfully built 4e797fbeeb57
Successfully tagged chatapp:latest
vietlt@vietlt-VirtualBox:~/vietlt/helm-project/main$ 
```

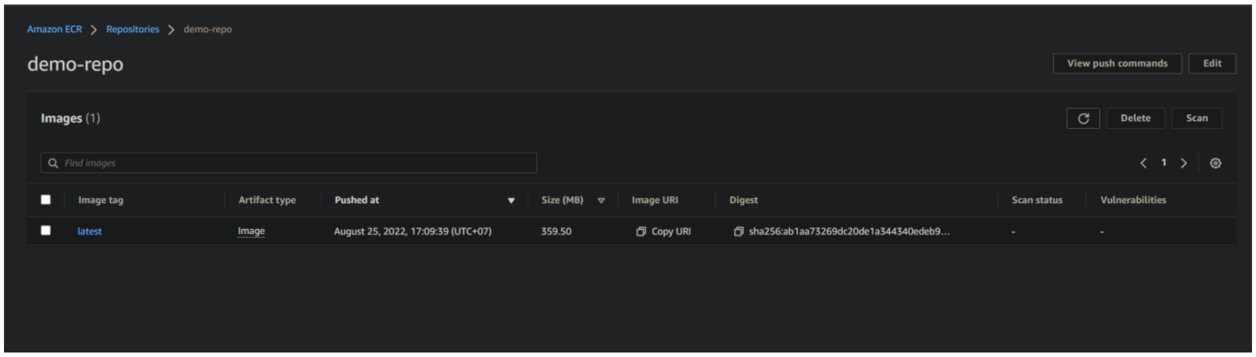
‘docker tag chatapp:latest ************.dkr.ecr.ap-southeast-1.amazonaws.com/demo-repo:latest’

‘docker push ************.dkr.ecr.ap-southeast-1.amazonaws.com/demo-repo:latest’



```
vietlt@vietlt-VirtualBox:~/vietlt/helm-project/main$ docker tag chatapp:latest 817735295857.dkr.ecr.ap-southeast-1.amazonaws.com/demo-repo:latest
vietlt@vietlt-VirtualBox:~/vietlt/helm-project/main$ docker push 817735295857.dkr.ecr.ap-southeast-1.amazonaws.com/demo-repo:latest
The push refers to repository [817735295857.dkr.ecr.ap-southeast-1.amazonaws.com/demo-repo]
4e77870e30b4: Pushed
59e601a0a30b: Pushed
ebffba1a779a: Pushed
821ad617f6af: Pushed
0efe2f2b10dd: Pushed
bfc1deb8136e: Pushed
1f123186824c: Pushed
3d6eb1152931: Pushed
100796cdf3b1: Pushed
54acb5a6fa0b: Pushed
8d51c618126f: Pushed
9ff6e4d46744: Pushed
a89d1d47b5a1: Pushed
655ed1b7a428: Pushed
latest: digest: sha256:ab1aa73269dc20de1a344340edeb97f3de9396b388d01dd1c8194e030a243394 size: 3257
vietlt@vietlt-VirtualBox:~/vietlt/helm-project/main$
```

Confirm the image had been pushed to the ECR repository.



demo-repo

Images (1)

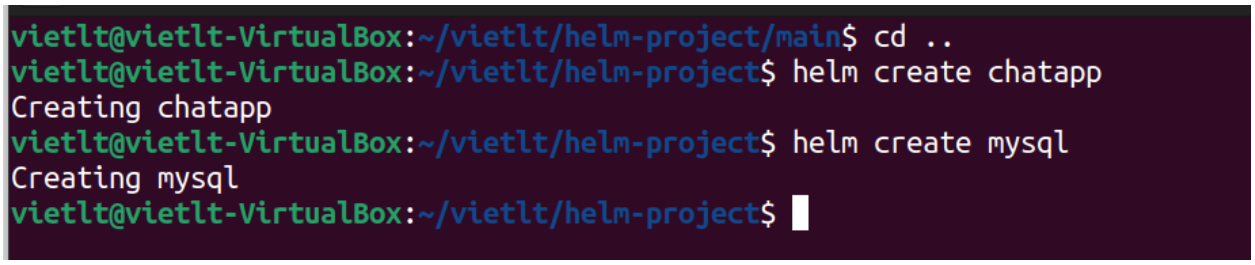
	Image tag	Artifact type	Pushed at	Size (MB)	Image URI	Digest	Scan status	Vulnerabilities
	latest	Image	August 25, 2022, 17:09:39 (UTC+07)	359.50	Copy URI	sha256:ab1aa73269dc20de1a344340edeb9...	-	-

Create chart repository

Change dir back to the outside directory, then run commands below

‘helm create chatapp’

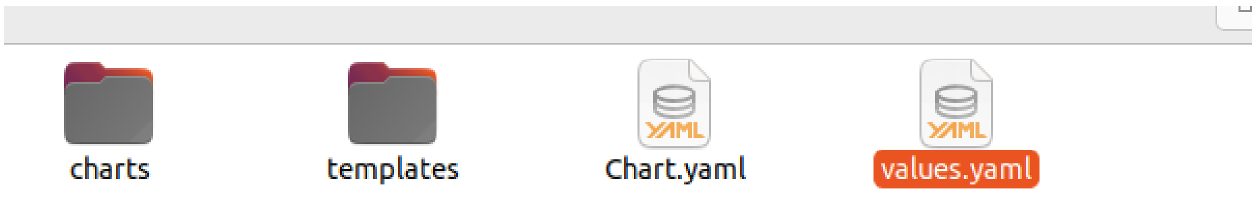
‘helm create mysql’

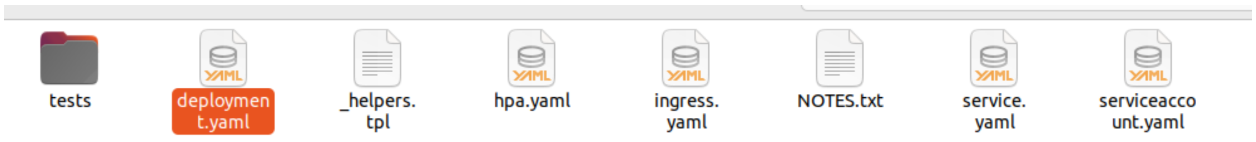


```
vietlt@vietlt-VirtualBox:~/vietlt/helm-project/main$ cd ..
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$ helm create chatapp
Creating chatapp
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$ helm create mysql
Creating mysql
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$
```

Write chart files and deploy the application on EKS

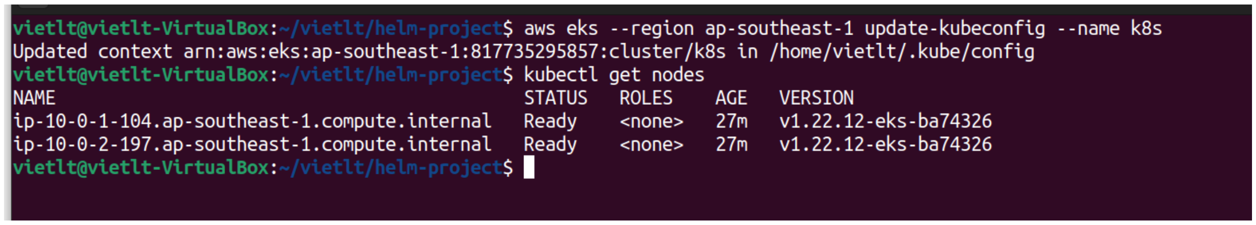
Make necessary configuration to the values.yaml and development.yaml files in each chart repository





Update config to connect to aws eks

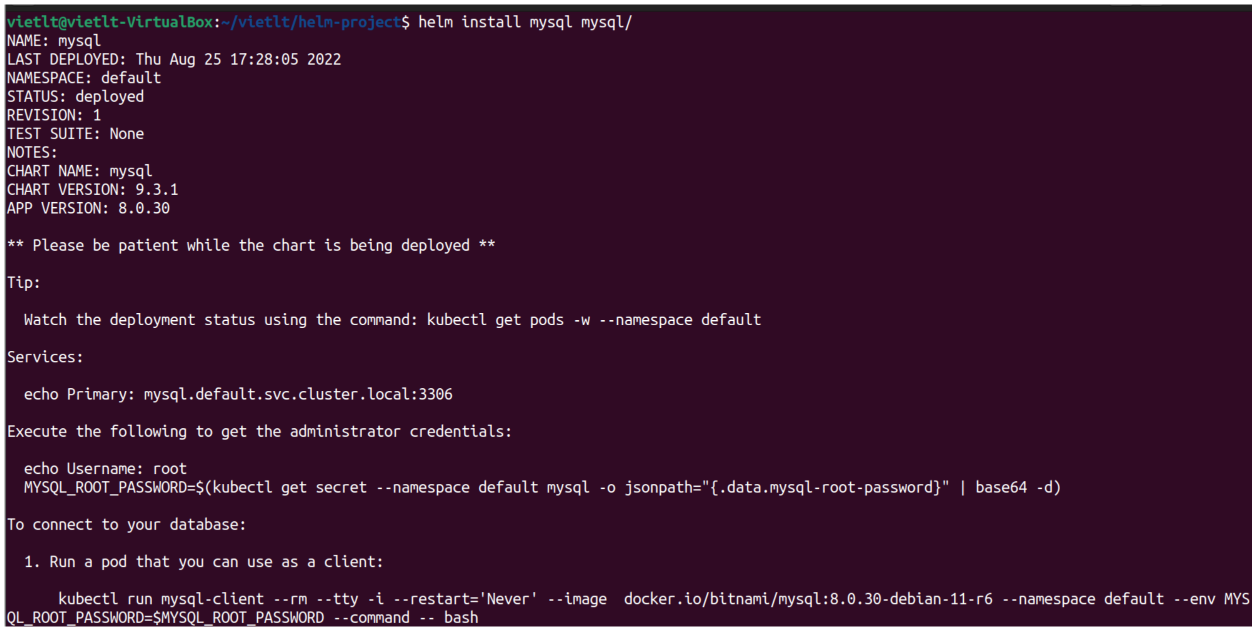
‘aws eks --region ap-southeast-1 update-kubeconfig --name k8s’



```
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$ aws eks --region ap-southeast-1 update-kubeconfig --name k8s
Updated context arn:aws:eks:ap-southeast-1:817735295857:cluster/k8s in /home/vietlt/.kube/config
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$ kubectl get nodes
NAME                                             STATUS   ROLES    AGE   VERSION
ip-10-0-1-104.ap-southeast-1.compute.internal   Ready    <none>   27m   v1.22.12-eks-ba74326
ip-10-0-2-197.ap-southeast-1.compute.internal   Ready    <none>   27m   v1.22.12-eks-ba74326
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$
```

Deploying the application using Helm chart

‘helm install mysql mysql/’



```
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$ helm install mysql mysql/
NAME: mysql
LAST DEPLOYED: Thu Aug 25 17:28:05 2022
NAMESPACE: default
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
CHART NAME: mysql
CHART VERSION: 9.3.1
APP VERSION: 8.0.30

** Please be patient while the chart is being deployed **

Tip:

  Watch the deployment status using the command: kubectl get pods -w --namespace default

Services:

  echo Primary: mysql.default.svc.cluster.local:3306

Execute the following to get the administrator credentials:

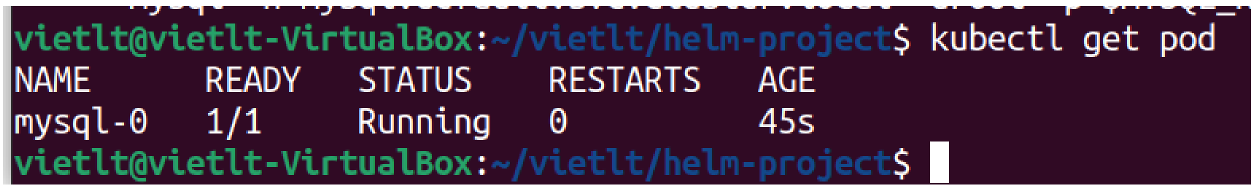
  echo Username: root
  MYSQL_ROOT_PASSWORD=$(kubectl get secret --namespace default mysql -o jsonpath="{.data.mysql-root-password}" | base64 -d)

To connect to your database:

  1. Run a pod that you can use as a client:

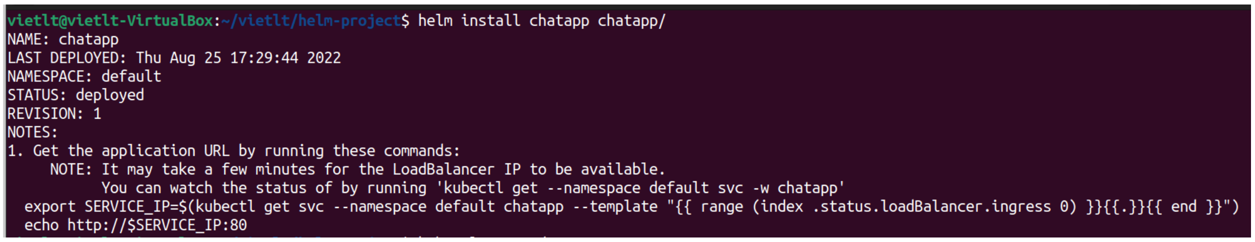
      kubectl run mysql-client --rm --tty -i --restart='Never' --image  docker.io/bitnami/mysql:8.0.30-debian-11-r6 --namespace default --env MYS
QL_ROOT_PASSWORD=$MYSQL_ROOT_PASSWORD --command -- bash
```

Confirm chart has been deploy

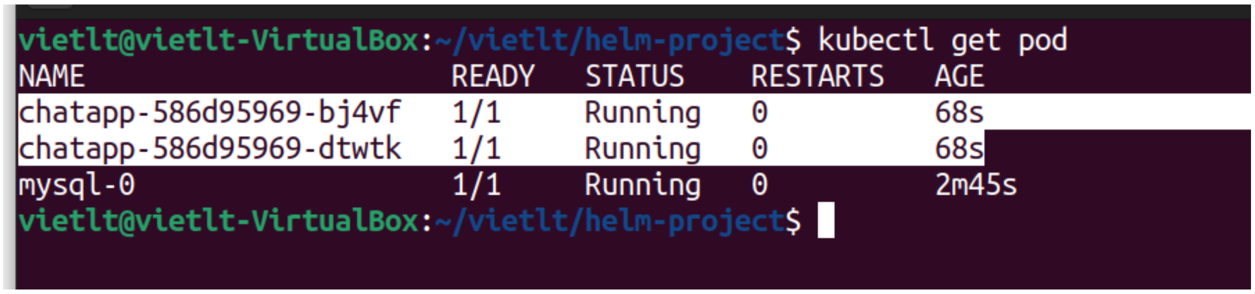


```
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$ kubectl get pod
NAME      READY   STATUS    RESTARTS   AGE
mysql-0   1/1     Running   0          45s
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$
```

Run ‘helm install chatapp chatapp/’



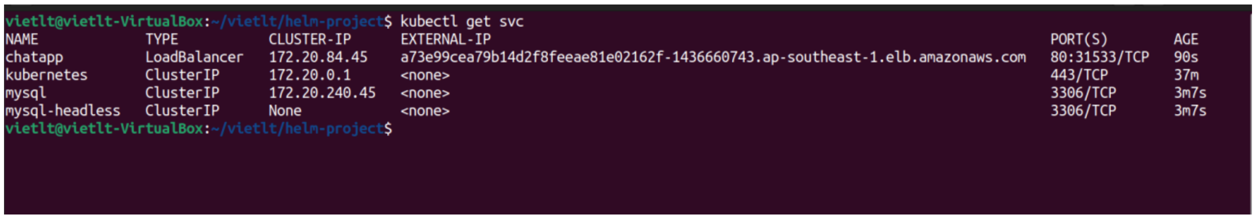
```
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$ helm install chatapp chatapp/
NAME: chatapp
LAST DEPLOYED: Thu Aug 25 17:29:44 2022
NAMESPACE: default
STATUS: deployed
REVISION: 1
NOTES:
1. Get the application URL by running these commands:
     NOTE: It may take a few minutes for the LoadBalancer IP to be available.
           You can watch the status of by running 'kubectl get --namespace default svc -w chatapp'
  export SERVICE_IP=$(kubectl get svc --namespace default chatapp --template "{{ range (index .status.loadBalancer.ingress 0) }}{{.}}{{ end }}")
  echo http://$SERVICE_IP:80
```



```
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$ kubectl get pod
NAME                      READY   STATUS    RESTARTS   AGE
chatapp-586d95969-bj4vf   1/1     Running   0          68s
chatapp-586d95969-dtwtk   1/1     Running   0          68s
mysql-0                   1/1     Running   0          2m45s
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$
```

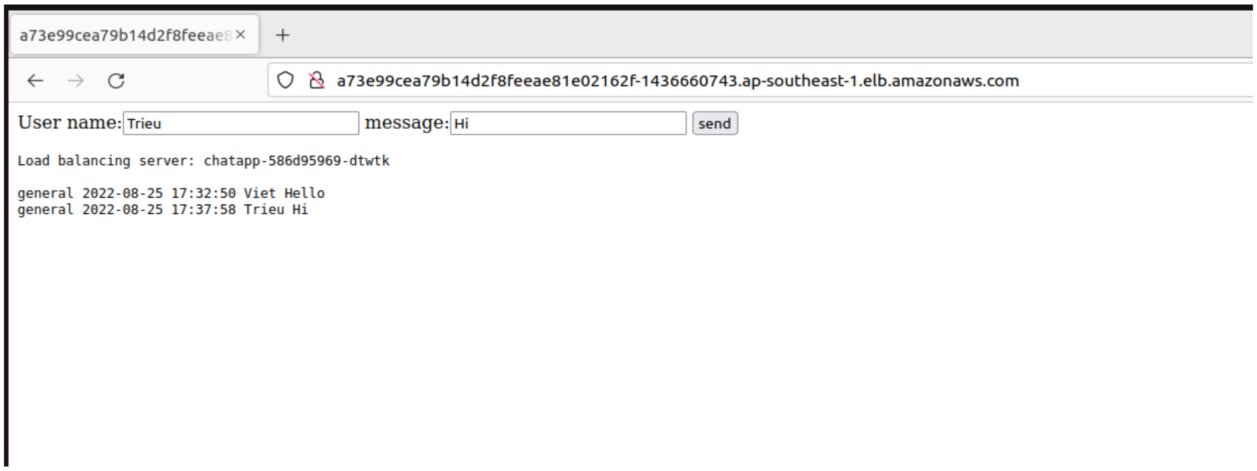
Showing the application works

Get load balancer



```
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$ kubectl get svc
NAME             TYPE           CLUSTER-IP      EXTERNAL-IP                                                                   PORT(S)        AGE
chatapp          LoadBalancer   172.20.84.45    a73e99cea79b14d2f8feeae81e02162f-1436660743.ap-southeast-1.elb.amazonaws.com   80:31533/TCP   90s
kubernetes       ClusterIP      172.20.0.1      <none>                                                                        443/TCP        37m
mysql            ClusterIP      172.20.240.45   <none>                                                                        3306/TCP       3m7s
mysql-headless   ClusterIP      None            <none>                                                                        3306/TCP       3m7s
vietlt@vietlt-VirtualBox:~/vietlt/helm-project$
```

Show the result



a73e99cea79b14d2f8feeae81e02162f-1436660743.ap-southeast-1.elb.amazonaws.com

User name: Trieu message: Hi send

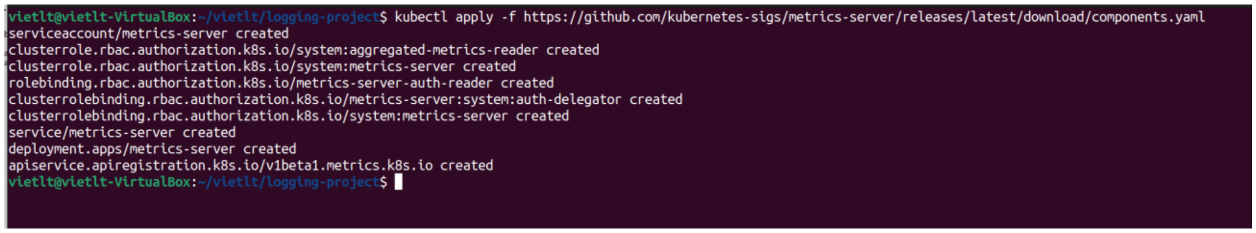
```
Load balancing server: chatapp-586d95969-dtwtk

general 2022-08-25 17:32:50 Viet Hello
general 2022-08-25 17:37:58 Trieu Hi
```

Note: up until this point, I have reuse all of my resources from the previous project. The below section will be for this project.

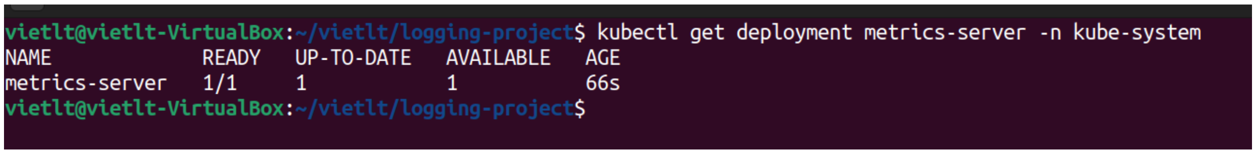
Installing Kubernetes Metrics Server

Use the command 'kubectl apply -f https://github.com/kubernetes-sigs/metrics-server/releases/latest/download/components.yaml' to install KMS



```
vietlt@vietlt-VirtualBox:~/vietlt/logging-project$ kubectl apply -f https://github.com/kubernetes-sigs/metrics-server/releases/latest/download/components.yaml
serviceaccount/metrics-server created
clusterrole.rbac.authorization.k8s.io/system:aggregated-metrics-reader created
clusterrole.rbac.authorization.k8s.io/system:metrics-server created
rolebinding.rbac.authorization.k8s.io/metrics-server-auth-reader created
clusterrolebinding.rbac.authorization.k8s.io/metrics-server:system:auth-delegator created
clusterrolebinding.rbac.authorization.k8s.io/system:metrics-server created
service/metrics-server created
deployment.apps/metrics-server created
apiservice.apiregistration.k8s.io/v1beta1.metrics.k8s.io created
vietlt@vietlt-VirtualBox:~/vietlt/logging-project$
```

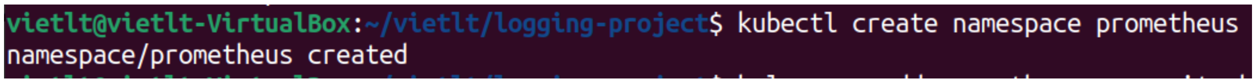
Verify that the metrics-server deployment is running 'kubectl get deployment metrics-server -n kube-system'



```
vietlt@vietlt-VirtualBox:~/vietlt/logging-project$ kubectl get deployment metrics-server -n kube-system
NAME             READY   UP-TO-DATE   AVAILABLE   AGE
metrics-server   1/1     1            1           66s
vietlt@vietlt-VirtualBox:~/vietlt/logging-project$
```

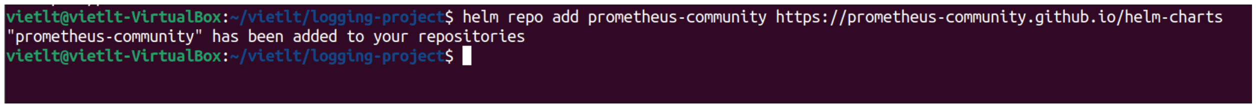
Deploying Prometheus on EKS Kubernetes Cluster using Helm

Create a Prometheus namespace 'kubectl create namespace prometheus'



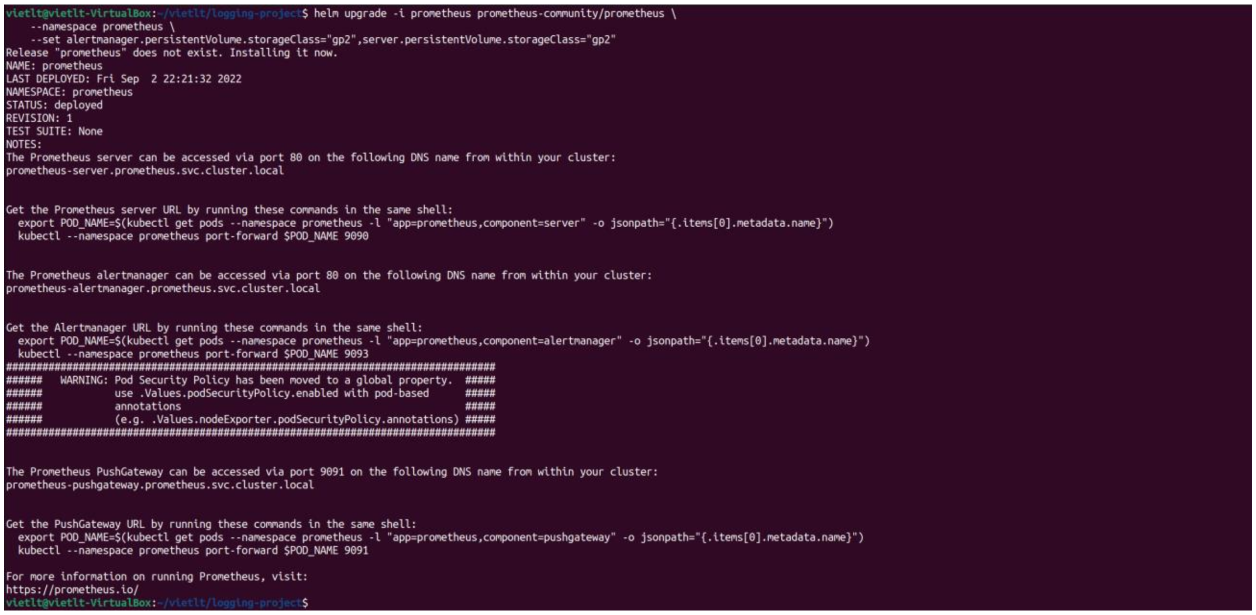
```
vietlt@vietlt-VirtualBox:~/vietlt/logging-project$ kubectl create namespace prometheus
namespace/prometheus created
```

Add the prometheus-community chart repository ‘helm repo add prometheus-community https://prometheus-community.github.io/helm-charts’



```
vietlt@vietlt-VirtualBox:~/vietlt/logging-project$ helm repo add prometheus-community https://prometheus-community.github.io/helm-charts
"prometheus-community" has been added to your repositories
vietlt@vietlt-VirtualBox:~/vietlt/logging-project$ 
```

Deploy Prometheus ‘helm upgrade -i prometheus prometheus-community/prometheus --namespace prometheus --set alertmanager.persistentVolume.storageClass="gp2",server.persistentVolume.storageClass="gp2" ’



```
vietlt@vietlt-VirtualBox:~/vietlt/logging-project$ helm upgrade -i prometheus prometheus-community/prometheus \
    --namespace prometheus \
    --set alertmanager.persistentVolume.storageClass="gp2",server.persistentVolume.storageClass="gp2"
Release "prometheus" does not exist. Installing it now.
NAME: prometheus
LAST DEPLOYED: Fri Sep  2 22:21:32 2022
NAMESPACE: prometheus
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
The Prometheus server can be accessed via port 80 on the following DNS name from within your cluster:
prometheus-server.prometheus.svc.cluster.local


Get the Prometheus server URL by running these commands in the same shell:
  export POD_NAME=$(kubectl get pods --namespace prometheus -l "app=prometheus,component=server" -o jsonpath="{.items[0].metadata.name}")
  kubectl --namespace prometheus port-forward $POD_NAME 9090

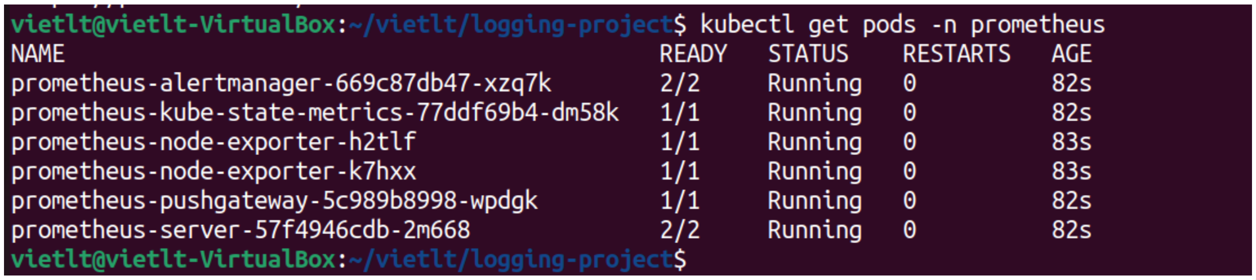

The Prometheus alertmanager can be accessed via port 80 on the following DNS name from within your cluster:
prometheus-alertmanager.prometheus.svc.cluster.local


Get the Alertmanager URL by running these commands in the same shell:
  export POD_NAME=$(kubectl get pods --namespace prometheus -l "app=prometheus,component=alertmanager" -o jsonpath="{.items[0].metadata.name}")
  kubectl --namespace prometheus port-forward $POD_NAME 9093
#################################################################################
######   WARNING: Pod Security Policy has been moved to a global property.  #####
######            use .Values.podSecurityPolicy.enabled with pod-based      #####
######            annotations                                               #####
######            (e.g. .Values.nodeExporter.podSecurityPolicy.annotations) #####
#################################################################################


The Prometheus PushGateway can be accessed via port 9091 on the following DNS name from within your cluster:
prometheus-pushgateway.prometheus.svc.cluster.local

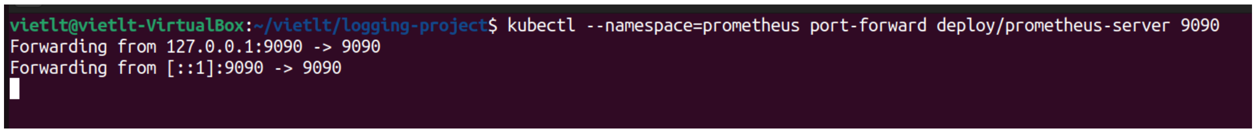

Get the PushGateway URL by running these commands in the same shell:
  export POD_NAME=$(kubectl get pods --namespace prometheus -l "app=prometheus,component=pushgateway" -o jsonpath="{.items[0].metadata.name}")
  kubectl --namespace prometheus port-forward $POD_NAME 9091

For more information on running Prometheus, visit:
https://prometheus.io/
vietlt@vietlt-VirtualBox:~/vietlt/logging-project$
```



```
vietlt@vietlt-VirtualBox:~/vietlt/logging-project$ kubectl get pods -n prometheus
NAME                                            READY   STATUS    RESTARTS   AGE
prometheus-alertmanager-669c87db47-xzq7k        2/2     Running   0          82s
prometheus-kube-state-metrics-77ddf69b4-dm58k   1/1     Running   0          82s
prometheus-node-exporter-h2tlf                  1/1     Running   0          83s
prometheus-node-exporter-k7hxx                  1/1     Running   0          83s
prometheus-pushgateway-5c989b8998-wpdgk         1/1     Running   0          82s
prometheus-server-57f4946cdb-2m668              2/2     Running   0          82s
vietlt@vietlt-VirtualBox:~/vietlt/logging-project$
```

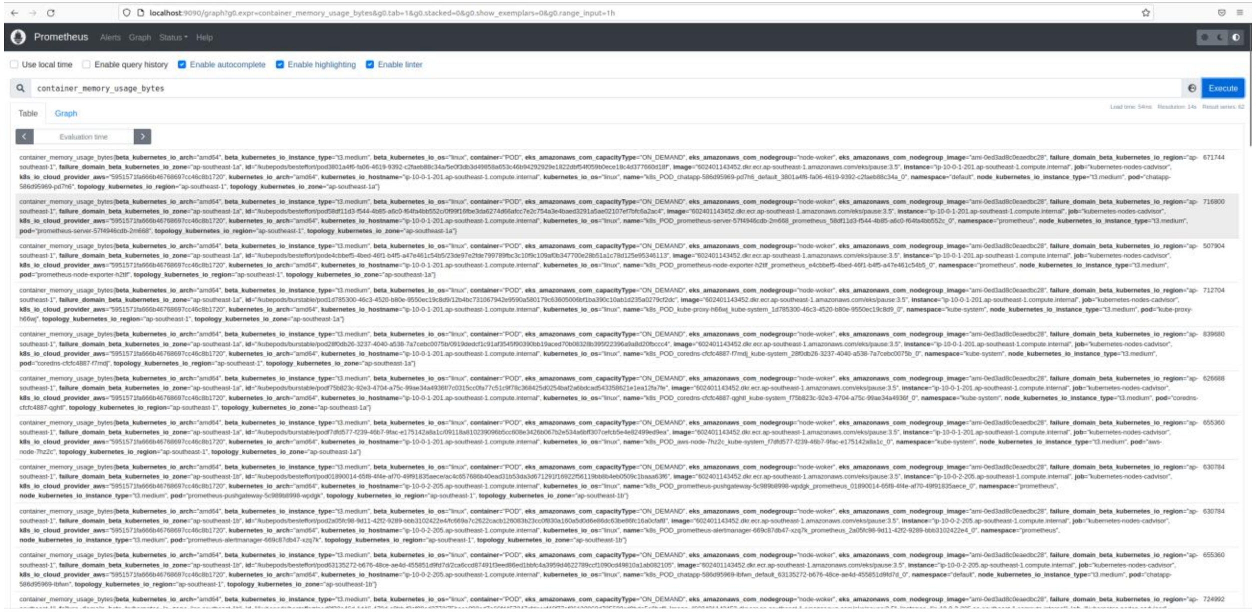
Use kubectl to port forward the Prometheus console to our local machine ‘kubectl --namespace=prometheus port-forward deploy/prometheus-server 9090’



```
vietlt@vietlt-VirtualBox:~/vietlt/logging-project$ kubectl --namespace=prometheus port-forward deploy/prometheus-server 9090
Forwarding from 127.0.0.1:9090 -> 9090
Forwarding from [::1]:9090 -> 9090
```

Monitoring EKS cluster using Prometheus. Query some metrics of EKS cluster, such as: CPU, memory, network latency, disk utilization

Memory usage ‘container_memory_usage_bytes’:



localhost:9090/graph?g0.expr=container_memory_usage_bytes&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

`container_memory_usage_bytes` Execute

Table Graph — Load time: 54ms Resolution: 14s Result series: 62

Evaluation time

```
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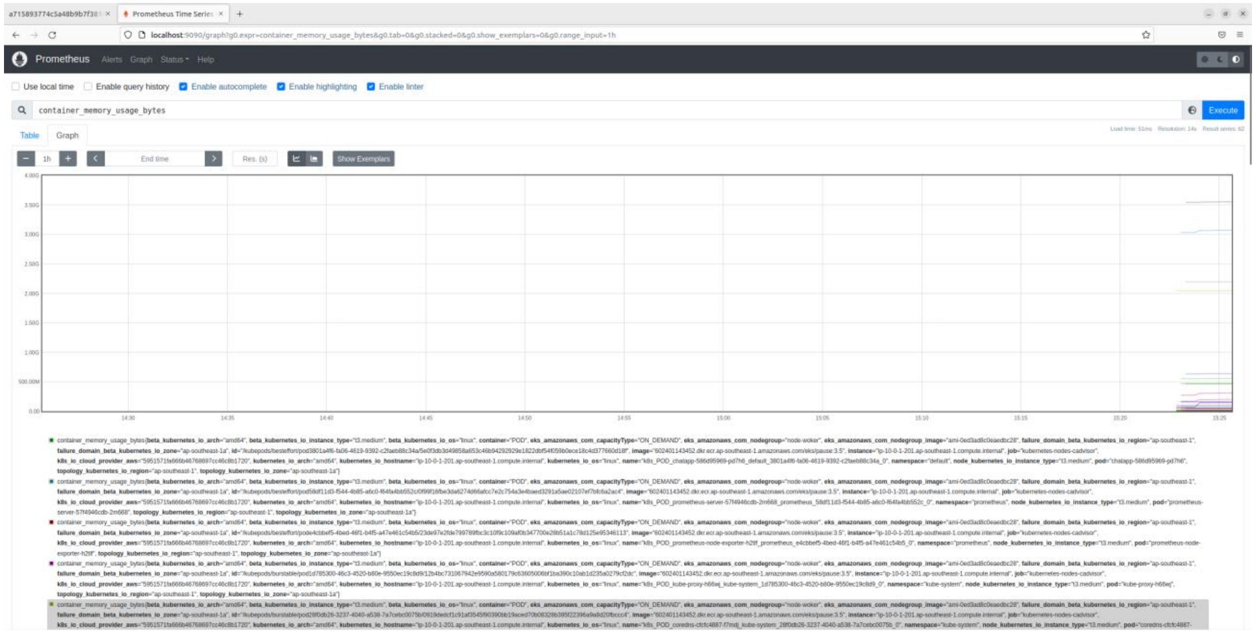

a715893774c5a48b9b7f38 × Prometheus Time Series ×

localhost:9090/graph?g0.expr=container_memory_usage_bytes&g0.tab=0&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

`container_memory_usage_bytes` Execute

Table Graph — Load time: 51ms Resolution: 14s Result series: 62

1h End time Res. (s) Show Exemplars

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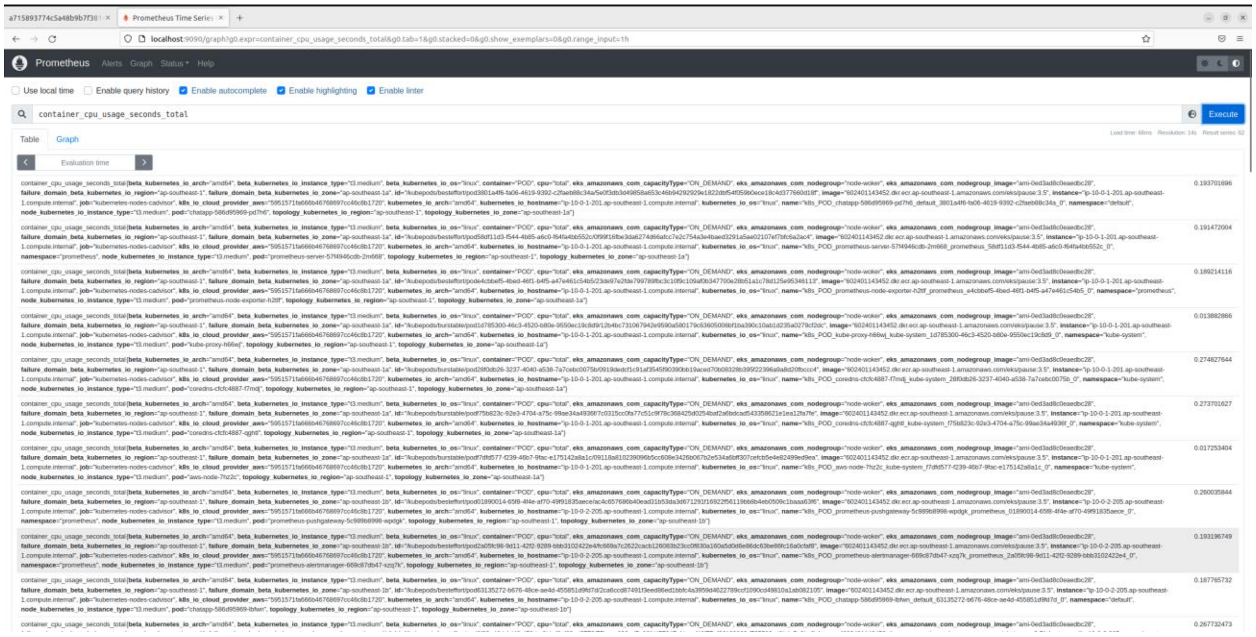
CPU usage ‘container_cpu_usage_seconds_total’:



a715893774c5a48b9b7f38 · Prometheus Time Series

localhost:9090/graph?g0.expr=container_cpu_usage_seconds_total&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

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container_cpu_usage_seconds_total
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Table Graph · Load time: 66ms Resolution: 14s Result series: 62

Evaluation time

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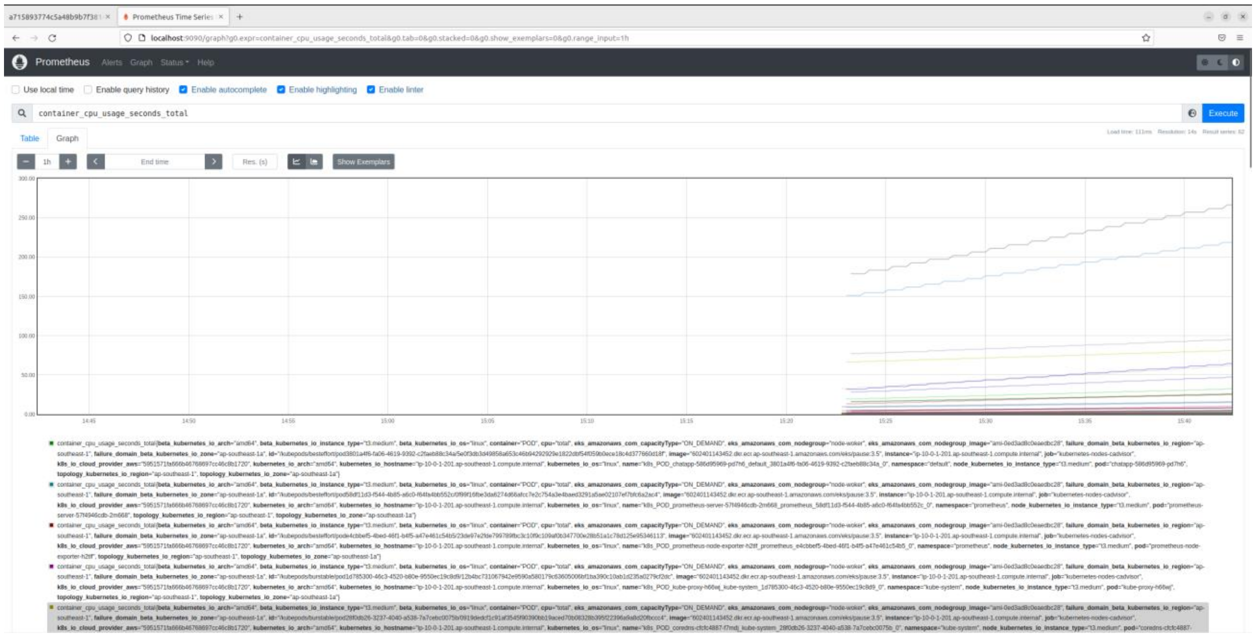


a715893774c5a48b9b7f38 · Prometheus Time Series

localhost:9090/graph?g0.expr=container_cpu_usage_seconds_total&g0.tab=0&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

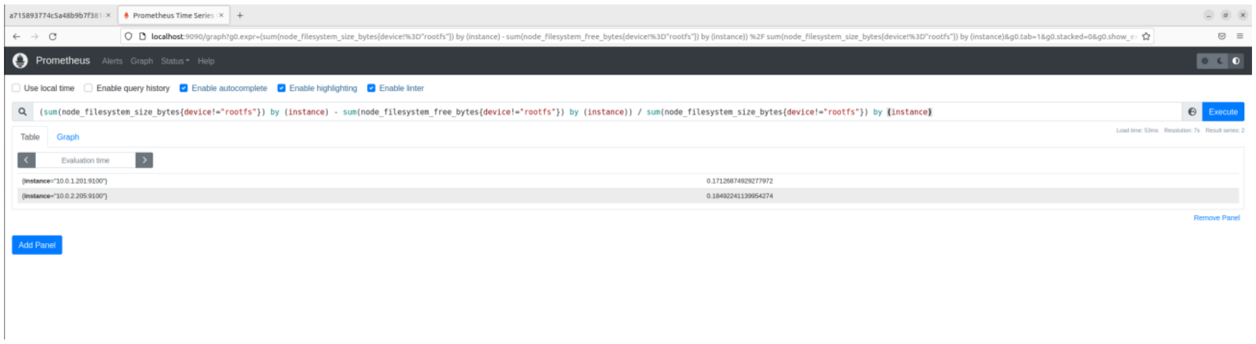
```
container_cpu_usage_seconds_total
```

Table Graph · Load time: 111ms Resolution: 14s Result series: 62

```
■ container_cpu_usage_seconds_total{beta_kubernetes_io_arch="amd64", beta_kubernetes_io_instance_type="t3.medium", beta_kubernetes_io_os="linux", container="POD", cpu="total", eks_amazonaws_com_capacityType="ON_DEMAND", eks_amazonaws_com_nodegroup="node-woker", eks_amazonaws_com_nodegroup_image="ami-0ed3ad8c0eaedbc28", failure_domain_beta_kubernetes_io_region="ap-
southeast-1", failure_domain_beta_kubernetes_io_zone="ap-southeast-1a", id="/kubepods/besteffort/pod3801a4f6-fa06-4619-9392-c2faeb88c34a/5e0f3db3d49858a653c46b94292929e1822dbf54f059b0ece18c4d377660d18f", image="602401143452.dkr.ecr.ap-southeast-1.amazonaws.com/eks/pause:3.5", instance="ip-10-0-1-201.ap-southeast-1.compute.internal", job="kubernetes-nodes-cadvisor",
k8s_io_cloud_provider_aws="5951571fa666b46768697cc46c8b1720", kubernetes_io_arch="amd64", kubernetes_io_hostname="ip-10-0-1-201.ap-southeast-1.compute.internal", kubernetes_io_os="linux", name="k8s_POD_chatapp-586d95969-pd7h6_default_3801a4f6-fa06-4619-9392-c2faeb88c34a_0", namespace="default", node_kubernetes_io_instance_type="t3.medium", pod="chatapp-586d95969-pd7h6",
topology_kubernetes_io_region="ap-southeast-1", topology_kubernetes_io_zone="ap-southeast-1a"}
■ container_cpu_usage_seconds_total{beta_kubernetes_io_arch="amd64", beta_kubernetes_io_instance_type="t3.medium", beta_kubernetes_io_os="linux", container="POD", cpu="total", eks_amazonaws_com_capacityType="ON_DEMAND", eks_amazonaws_com_nodegroup="node-woker", eks_amazonaws_com_nodegroup_image="ami-0ed3ad8c0eaedbc28", failure_domain_beta_kubernetes_io_region="ap-
southeast-1", failure_domain_beta_kubernetes_io_zone="ap-southeast-1a", id="/kubepods/besteffort/pod58df11d3-f544-4b85-a6c0-f64fa4bb552c/0f99f16fbe3da6274d66afcc7e2c754a3e4baed3291a5ae02107ef7bfc6a2ac4", image="602401143452.dkr.ecr.ap-southeast-1.amazonaws.com/eks/pause:3.5", instance="ip-10-0-1-201.ap-southeast-1.compute.internal", job="kubernetes-nodes-cadvisor",
k8s_io_cloud_provider_aws="5951571fa666b46768697cc46c8b1720", kubernetes_io_arch="amd64", kubernetes_io_hostname="ip-10-0-1-201.ap-southeast-1.compute.internal", kubernetes_io_os="linux", name="k8s_POD_prometheus-server-57f4946cdb-2m668_prometheus_58df11d3-f544-4b85-a6c0-f64fa4bb552c_0", namespace="prometheus", node_kubernetes_io_instance_type="t3.medium", pod="prometheus-
server-57f4946cdb-2m668", topology_kubernetes_io_region="ap-southeast-1", topology_kubernetes_io_zone="ap-southeast-1a"}
■ container_cpu_usage_seconds_total{beta_kubernetes_io_arch="amd64", beta_kubernetes_io_instance_type="t3.medium", beta_kubernetes_io_os="linux", container="POD", cpu="total", eks_amazonaws_com_capacityType="ON_DEMAND", eks_amazonaws_com_nodegroup="node-woker", eks_amazonaws_com_nodegroup_image="ami-0ed3ad8c0eaedbc28", failure_domain_beta_kubernetes_io_region="ap-
southeast-1", failure_domain_beta_kubernetes_io_zone="ap-southeast-1a", id="/kubepods/besteffort/pode4cbbef5-4bed-46f1-b4f5-a47e461c54b5/23de97e2fde799789fbc3c10f9c109af0b347700e28b51a1c78d125e95346113", image="602401143452.dkr.ecr.ap-southeast-1.amazonaws.com/eks/pause:3.5", instance="ip-10-0-1-201.ap-southeast-1.compute.internal", job="kubernetes-nodes-cadvisor",
k8s_io_cloud_provider_aws="5951571fa666b46768697cc46c8b1720", kubernetes_io_arch="amd64", kubernetes_io_hostname="ip-10-0-1-201.ap-southeast-1.compute.internal", kubernetes_io_os="linux", name="k8s_POD_prometheus-node-exporter-h2tf_prometheus_e4cbbef5-4bed-46f1-b4f5-a47e461c54b5_0", namespace="prometheus", node_kubernetes_io_instance_type="t3.medium", pod="prometheus-node-
exporter-h2tf", topology_kubernetes_io_region="ap-southeast-1", topology_kubernetes_io_zone="ap-southeast-1a"}
■ container_cpu_usage_seconds_total{beta_kubernetes_io_arch="amd64", beta_kubernetes_io_instance_type="t3.medium", beta_kubernetes_io_os="linux", container="POD", cpu="total", eks_amazonaws_com_capacityType="ON_DEMAND", eks_amazonaws_com_nodegroup="node-woker", eks_amazonaws_com_nodegroup_image="ami-0ed3ad8c0eaedbc28", failure_domain_beta_kubernetes_io_region="ap-
southeast-1", failure_domain_beta_kubernetes_io_zone="ap-southeast-1a", id="/kubepods/burstable/pod1d785300-46c3-4520-b80e-9550ec19c8d9/12b4bc731067942e9590a580179c63605006bf1ba390c10ab1d235a0279cf2dc", image="602401143452.dkr.ecr.ap-southeast-1.amazonaws.com/eks/pause:3.5", instance="ip-10-0-1-201.ap-southeast-1.compute.internal", job="kubernetes-nodes-cadvisor",
k8s_io_cloud_provider_aws="5951571fa666b46768697cc46c8b1720", kubernetes_io_arch="amd64", kubernetes_io_hostname="ip-10-0-1-201.ap-southeast-1.compute.internal", kubernetes_io_os="linux", name="k8s_POD_kube-proxy-h66wj_kube-system_1d785300-46c3-4520-b80e-9550ec19c8d9_0", namespace="kube-system", node_kubernetes_io_instance_type="t3.medium", pod="kube-proxy-h66wj",
topology_kubernetes_io_region="ap-southeast-1", topology_kubernetes_io_zone="ap-southeast-1a"}
■ container_cpu_usage_seconds_total{beta_kubernetes_io_arch="amd64", beta_kubernetes_io_instance_type="t3.medium", beta_kubernetes_io_os="linux", container="POD", cpu="total", eks_amazonaws_com_capacityType="ON_DEMAND", eks_amazonaws_com_nodegroup="node-woker", eks_amazonaws_com_nodegroup_image="ami-0ed3ad8c0eaedbc28", failure_domain_beta_kubernetes_io_region="ap-
southeast-1", failure_domain_beta_kubernetes_io_zone="ap-southeast-1a", id="/kubepods/burstable/pod28f0db26-3237-4040-a538-7a7cebc0075b/0919dedcf1c91af3545f90390bb19aced70b08328b395f22396a9a8d20fbccc4", image="602401143452.dkr.ecr.ap-southeast-1.amazonaws.com/eks/pause:3.5", instance="ip-10-0-1-201.ap-southeast-1.compute.internal", job="kubernetes-nodes-cadvisor",
k8s_io_cloud_provider_aws="5951571fa666b46768697cc46c8b1720", kubernetes_io_arch="amd64", kubernetes_io_hostname="ip-10-0-1-201.ap-southeast-1.compute.internal", kubernetes_io_os="linux", name="k8s_POD_coredns-cfcfc4887-f7mdj_kube-system_28f0db26-3237-4040-a538-7a7cebc0075b_0", namespace="kube-system", node_kubernetes_io_instance_type="t3.medium", pod="coredns-cfcfc4887-
```

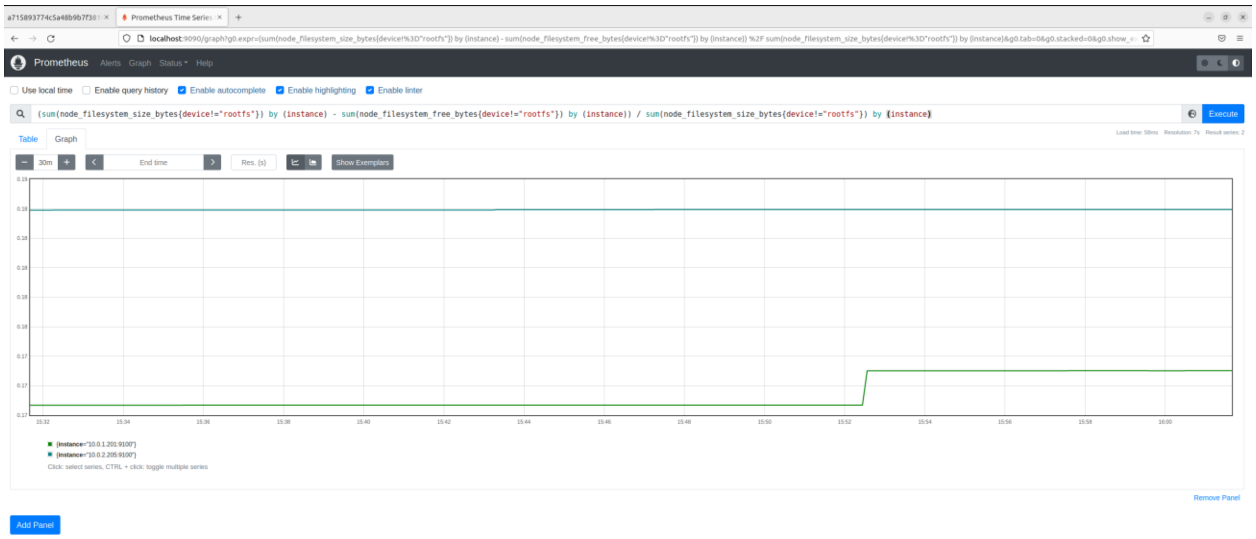
Disk utilization:

‘(sum(node_filesystem_size_bytes{device!="rootfs"}) by (instance) -
sum(node_filesystem_free_bytes{device!="rootfs"}) by (instance)) /
sum(node_filesystem_size_bytes{device!="rootfs"}) by (instance)’



```
(sum(node_filesystem_size_bytes{device!="rootfs"}) by (instance) - sum(node_filesystem_free_bytes{device!="rootfs"}) by (instance)) / sum(node_filesystem_size_bytes{device!="rootfs"}) by (instance)
```

{instance="10.0.1.201:9100"}	0.17126874929277972
{instance="10.0.2.205:9100"}	0.18492241139954274

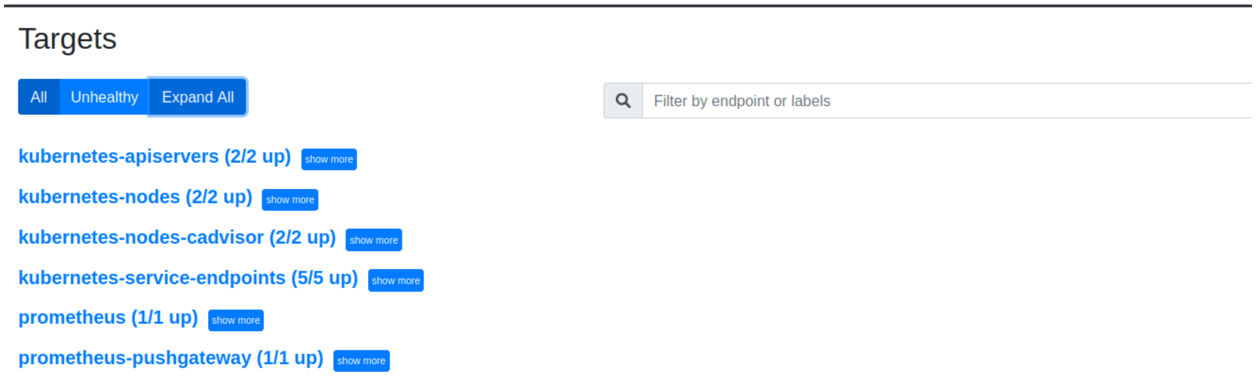


```
(sum(node_filesystem_size_bytes{device!="rootfs"}) by (instance) - sum(node_filesystem_free_bytes{device!="rootfs"}) by (instance)) / sum(node_filesystem_size_bytes{device!="rootfs"}) by (instance)
```

Table
Graph
30m
End time
Res. (s)
Show Exemplars
{instance="10.0.1.201:9100"}
{instance="10.0.2.205:9100"}
Click: select series, CTRL + click: toggle multiple series

Showing result ChatApp working and log from Prometheus

Everything is up and running



Targets

kubernetes-apiservers (2/2 up)

kubernetes-nodes (2/2 up)

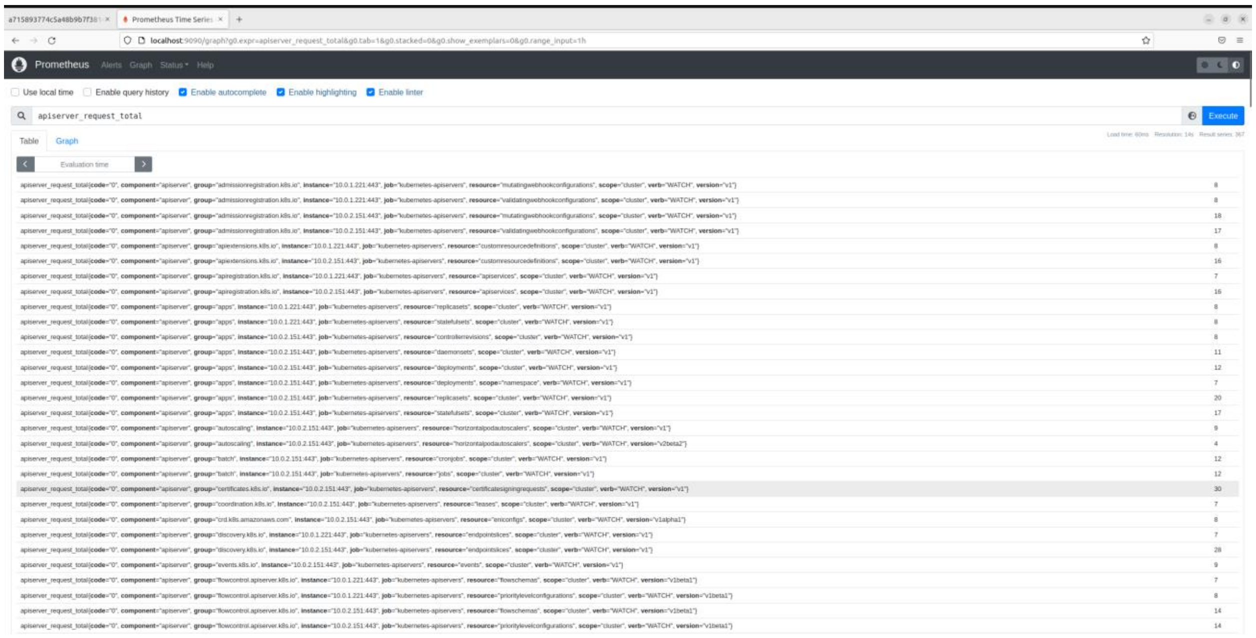
kubernetes-nodes-cadvisor (2/2 up)

kubernetes-service-endpoints (5/5 up)

prometheus (1/1 up)

prometheus-pushgateway (1/1 up)

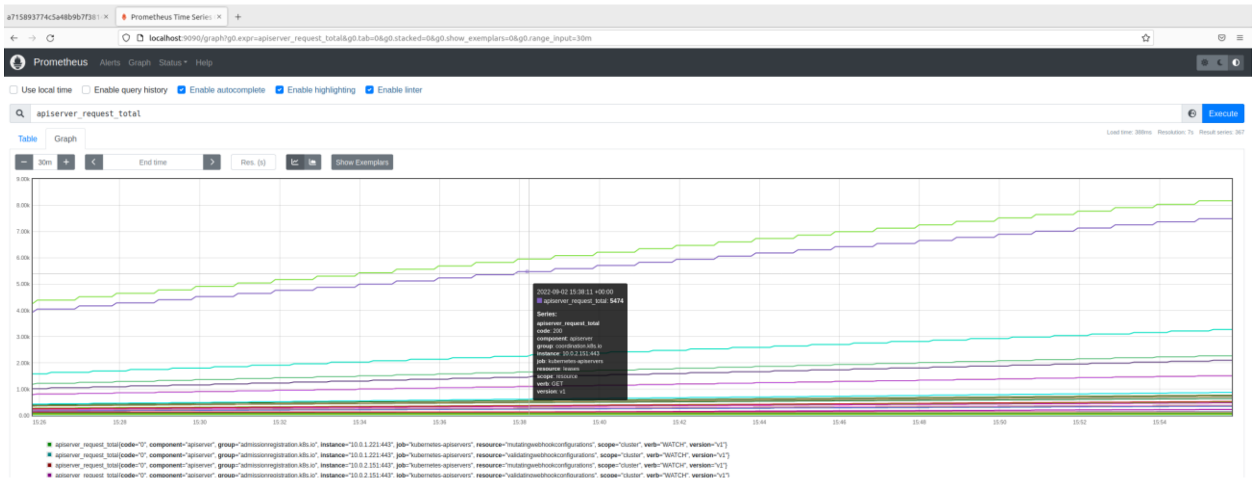
Check with ‘apiserver_request_total’



```
apiserver_request_total
```

Load time: 60ms   Resolution: 14s   Result series: 367

```
apiserver_request_total{code="0", component="apiserver", group="admissionregistration.k8s.io", instance="10.0.1.221:443", job="kubernetes-apiservers", resource="mutatingwebhookconfigurations", scope="cluster", verb="WATCH", version="v1"}   8
apiserver_request_total{code="0", component="apiserver", group="admissionregistration.k8s.io", instance="10.0.1.221:443", job="kubernetes-apiservers", resource="validatingwebhookconfigurations", scope="cluster", verb="WATCH", version="v1"}   8
apiserver_request_total{code="0", component="apiserver", group="admissionregistration.k8s.io", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="mutatingwebhookconfigurations", scope="cluster", verb="WATCH", version="v1"}   18
apiserver_request_total{code="0", component="apiserver", group="admissionregistration.k8s.io", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="validatingwebhookconfigurations", scope="cluster", verb="WATCH", version="v1"}   17
apiserver_request_total{code="0", component="apiserver", group="apiextensions.k8s.io", instance="10.0.1.221:443", job="kubernetes-apiservers", resource="customresourcedefinitions", scope="cluster", verb="WATCH", version="v1"}   8
apiserver_request_total{code="0", component="apiserver", group="apiextensions.k8s.io", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="customresourcedefinitions", scope="cluster", verb="WATCH", version="v1"}   16
apiserver_request_total{code="0", component="apiserver", group="apiregistration.k8s.io", instance="10.0.1.221:443", job="kubernetes-apiservers", resource="apiservices", scope="cluster", verb="WATCH", version="v1"}   7
apiserver_request_total{code="0", component="apiserver", group="apiregistration.k8s.io", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="apiservices", scope="cluster", verb="WATCH", version="v1"}   16
apiserver_request_total{code="0", component="apiserver", group="apps", instance="10.0.1.221:443", job="kubernetes-apiservers", resource="replicasets", scope="cluster", verb="WATCH", version="v1"}   8
apiserver_request_total{code="0", component="apiserver", group="apps", instance="10.0.1.221:443", job="kubernetes-apiservers", resource="statefulsets", scope="cluster", verb="WATCH", version="v1"}   8
apiserver_request_total{code="0", component="apiserver", group="apps", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="controllerrevisions", scope="cluster", verb="WATCH", version="v1"}   8
apiserver_request_total{code="0", component="apiserver", group="apps", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="daemonsets", scope="cluster", verb="WATCH", version="v1"}   11
apiserver_request_total{code="0", component="apiserver", group="apps", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="deployments", scope="cluster", verb="WATCH", version="v1"}   12
apiserver_request_total{code="0", component="apiserver", group="apps", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="deployments", scope="namespace", verb="WATCH", version="v1"}   7
apiserver_request_total{code="0", component="apiserver", group="apps", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="replicasets", scope="cluster", verb="WATCH", version="v1"}   20
apiserver_request_total{code="0", component="apiserver", group="apps", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="statefulsets", scope="cluster", verb="WATCH", version="v1"}   17
apiserver_request_total{code="0", component="apiserver", group="autoscaling", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="horizontalpodautoscalers", scope="cluster", verb="WATCH", version="v1"}   9
apiserver_request_total{code="0", component="apiserver", group="autoscaling", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="horizontalpodautoscalers", scope="cluster", verb="WATCH", version="v2beta2"}   4
apiserver_request_total{code="0", component="apiserver", group="batch", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="cronjobs", scope="cluster", verb="WATCH", version="v1"}   12
apiserver_request_total{code="0", component="apiserver", group="batch", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="jobs", scope="cluster", verb="WATCH", version="v1"}   12
apiserver_request_total{code="0", component="apiserver", group="certificates.k8s.io", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="certificatesigningrequests", scope="cluster", verb="WATCH", version="v1"}   30
apiserver_request_total{code="0", component="apiserver", group="coordination.k8s.io", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="leases", scope="cluster", verb="WATCH", version="v1"}   7
apiserver_request_total{code="0", component="apiserver", group="crd.k8s.amazonaws.com", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="eniconfigs", scope="cluster", verb="WATCH", version="v1alpha1"}   8
apiserver_request_total{code="0", component="apiserver", group="discovery.k8s.io", instance="10.0.1.221:443", job="kubernetes-apiservers", resource="endpointslices", scope="cluster", verb="WATCH", version="v1"}   7
apiserver_request_total{code="0", component="apiserver", group="discovery.k8s.io", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="endpointslices", scope="cluster", verb="WATCH", version="v1"}   28
apiserver_request_total{code="0", component="apiserver", group="events.k8s.io", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="events", scope="cluster", verb="WATCH", version="v1"}   9
apiserver_request_total{code="0", component="apiserver", group="flowcontrol.apiserver.k8s.io", instance="10.0.1.221:443", job="kubernetes-apiservers", resource="flowschemas", scope="cluster", verb="WATCH", version="v1beta1"}   7
apiserver_request_total{code="0", component="apiserver", group="flowcontrol.apiserver.k8s.io", instance="10.0.1.221:443", job="kubernetes-apiservers", resource="prioritylevelconfigurations", scope="cluster", verb="WATCH", version="v1beta1"}   8
apiserver_request_total{code="0", component="apiserver", group="flowcontrol.apiserver.k8s.io", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="flowschemas", scope="cluster", verb="WATCH", version="v1beta1"}   14
apiserver_request_total{code="0", component="apiserver", group="flowcontrol.apiserver.k8s.io", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="prioritylevelconfigurations", scope="cluster", verb="WATCH", version="v1beta1"}   14
```



```
apiserver_request_total
```

Load time: 388ms   Resolution: 7s   Result series: 367

```
2022-09-02 15:38:11 +00:00
apiserver_request_total: 5474
Series:
apiserver_request_total
code: 200
component: apiserver
group: coordination.k8s.io
instance: 10.0.2.151:443
job: kubernetes-apiservers
resource: leases
scope: resource
verb: GET
version: v1
```

```
■ apiserver_request_total{code="0", component="apiserver", group="admissionregistration.k8s.io", instance="10.0.1.221:443", job="kubernetes-apiservers", resource="mutatingwebhookconfigurations", scope="cluster", verb="WATCH", version="v1"}
■ apiserver_request_total{code="0", component="apiserver", group="admissionregistration.k8s.io", instance="10.0.1.221:443", job="kubernetes-apiservers", resource="validatingwebhookconfigurations", scope="cluster", verb="WATCH", version="v1"}
■ apiserver_request_total{code="0", component="apiserver", group="admissionregistration.k8s.io", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="mutatingwebhookconfigurations", scope="cluster", verb="WATCH", version="v1"}
■ apiserver_request_total{code="0", component="apiserver", group="admissionregistration.k8s.io", instance="10.0.2.151:443", job="kubernetes-apiservers", resource="validatingwebhookconfigurations", scope="cluster", verb="WATCH", version="v1"}
```