Installation k3s ec2 ubuntu.20.04

Tuesday, November 29, 2022 12:02 AM

Launch 2 instances with Amazon Ubuntu 20.04 image, t3.medium (2CPU and 4GI) one will be master, one will be the worker
Open port TCP 6443 to anywhere and port TCP TCP 22 to MyIP in the security group
Update both the instances with "sudo apt update -y" and "sudo apt upgrade -y" commands
Reboot the instances with "sudo systemctl reboot"
Change the master node's hostname with "sudo hostname master&&bash"
Change the worker node's hostname with "sudo hostname worker&&bash"
Only after performing the steps mentioned above proceed with the following:

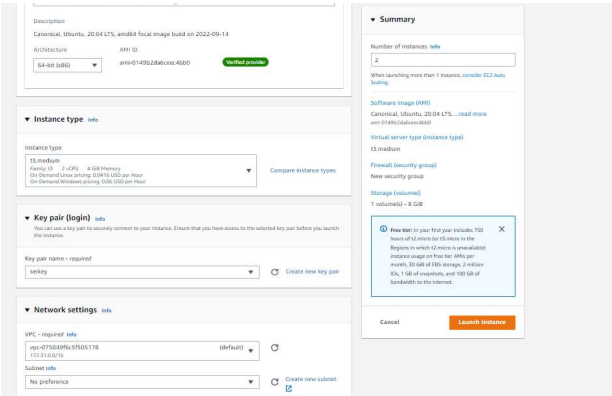
MASTER NODE K3S SERVER INSTALLATION

Connect via ssh to the master node with "ssh -i <pem-key> ubuntu@master-ip
Establish in which mode to write k3s configutation when not running as root with ; export K3S_KUBECONFIG_MODE="644"
Run installer with " curl -sfL https://get.k3s.io | sh -
Verify the status ; sudo systemctl status k3s
Get details on the " nodes with kubectl get nodes -o wide "
Save access token (we need it in the nex steps when setting worker node) with: sudo cat /var/lib/rancher/k3s/server/node-token

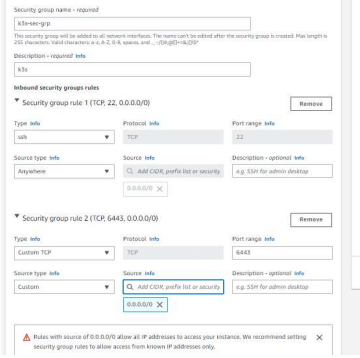
Worker NODE k3s INSTALLATION
Connect via ssh to the worker node with "ssh -i <pem-key> ubuntu@worker-ip
Configure environment variables with : export K3S_KUBECONFIG_MODE="644"; export K3S_URL="https:master_private_ip:6443", export K3S_TOKEN="....."
Or You can use this command only; run the installer with "curl -sfL https://get.k3s.io | K3S_URL=https://<master_private_ip>:6443 K3s_TOKEN="....." sh -
Verify the status with sudo systemctl status k3s-agent
Go to master node and make sure the node has been added : kubectl get nodes -o wide

Lets GO

Launch 2 instances with Amazon Ubuntu 20.04 image, t3.medium (2CPU and 4GI) one will be master, one will be the worker

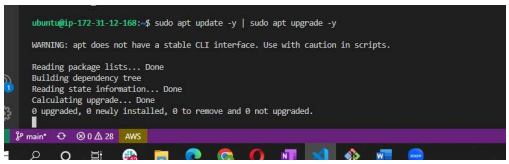


Open port TCP 6443 to anywhere and port TCP TCP 22 to MyIP in the security group



MASTER NODE K3S SERVER INSTALLATION
Connect via ssh to the master node with "ssh -i <pem-key> ubuntu@master-ip

Update both the instances with "sudo apt update -y" and "sudo apt upgrade -y " commands



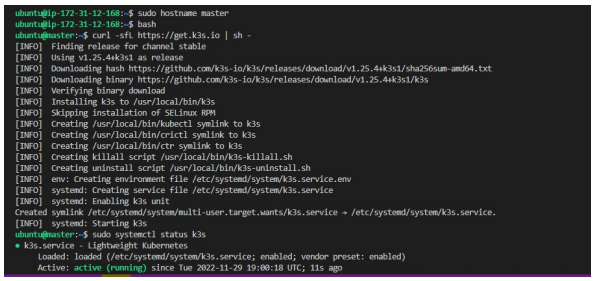
Reboot the instances with "sudo systemctl reboot"

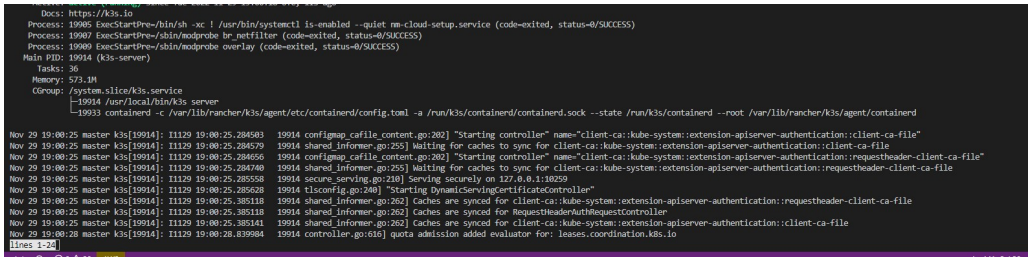
Change the master node's hostname with "sudo hostname master&&bash"

Establish in which mode to write k3s configutation when not running as root with ; export K3S_KUBECONFIG_MODE="644"

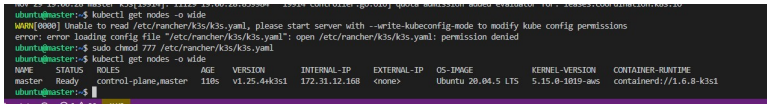
Run installer with " curl -sfL https://get.k3s.io | sh -

Verify the status ; sudo systemctl status k3s





Get details on the " nodes with kubectl get nodes -o wide "



Save access token (we need it in the nex steps when setting worker node) with: sudo cat /var/lib/rancher/k3s/server/node-token

```
ubuntu@master:~$ sudo cat /var/lib/rancher/k3s/server/node-token
K10394fdb5abfdb46c803e75fdcd08da861beb601e98ec7aa4285bc1f5c963491f2::server:5f8cd029e125204617b7f6f61fbe2e87
```

Worker

Connect via ssh to the worker node with "ssh -i <pem-key> ubuntu@worker-ip

```
$ ssh -i "serkey.pem" ubuntu@ec2-54-91-38-250.compute-1.amazonaws.com
The authenticity of host 'ec2-54-91-38-250.compute-1.amazonaws.com (54.91.38.250)' can't be established.
ED25519 key fingerprint is SHA256:iAnBwjk3KT5MMrwsZ3ryGLTJLNqU8q67LEagh6qJfv4.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-54-91-38-250.compute-1.amazonaws.com' (ED25519) to the list of known hosts.
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-1019-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Tue Nov 29 19:03:45 UTC 2022

  System load:  0.0               Processes:             101
  Usage of /:   19.6% of 7.57GB   Users logged in:       0
  Memory usage: 5%                IPv4 address for ens5: 172.31.1.170
  Swap usage:   0%

0 updates can be applied immediately.
```

```
ubuntu@ip-172-31-1-170:~$ sudo hostname worker
ubuntu@ip-172-31-1-170:~$ bash
ubuntu@worker:~$
```

run the installer with "curl -sfL https://get.k3s.io | K3S_URL=https://<master_private_ip>:6443 K3s_TOKEN="....." sh -

Verify the status with sudo systemctl status k3s-agent

```
ubuntu@worker:~$ curl -sfL http://get.k3s.io | K3S_URL=https://172.31.12.168:6443 K3S_TOKEN="K10394fdb5abfdb46c803e75fdcd08da861beb601e98ec7aa4285bc1f5c963491f2::server:5f8cd029e125204617b7f6f61fbe2e87" sh -
[INFO]  Finding release for channel stable
[INFO]  Using v1.25.4+k3s1 as release
[INFO]  Downloading hash https://github.com/k3s-io/k3s/releases/download/v1.25.4+k3s1/sha256sum-amd64.txt
[INFO]  Downloading binary https://github.com/k3s-io/k3s/releases/download/v1.25.4+k3s1/k3s
[INFO]  Verifying binary download
[INFO]  Installing k3s to /usr/local/bin/k3s
[INFO]  Skipping installation of SELinux RPM
[INFO]  Creating /usr/local/bin/kubectl symlink to k3s
[INFO]  Creating /usr/local/bin/crictl symlink to k3s
[INFO]  Creating /usr/local/bin/ctr symlink to k3s
[INFO]  Creating killall script /usr/local/bin/k3s-killall.sh
[INFO]  Creating uninstall script /usr/local/bin/k3s-agent-uninstall.sh
[INFO]  env: Creating environment file /etc/systemd/system/k3s-agent.service.env
[INFO]  systemd: Creating service file /etc/systemd/system/k3s-agent.service
[INFO]  systemd: Enabling k3s-agent unit
Created symlink /etc/systemd/system/multi-user.target.wants/k3s-agent.service → /etc/systemd/system/k3s-agent.service.
[INFO]  systemd: Starting k3s-agent
ubuntu@worker:~$ sudo systemctl status k3s-agent
● k3s-agent.service - Lightweight Kubernetes
     Loaded: loaded (/etc/systemd/system/k3s-agent.service; enabled; vendor preset: enabled)
     Active: active (running) since Tue 2022-11-29 19:07:46 UTC; 11s ago
       Docs: https://k3s.io
```

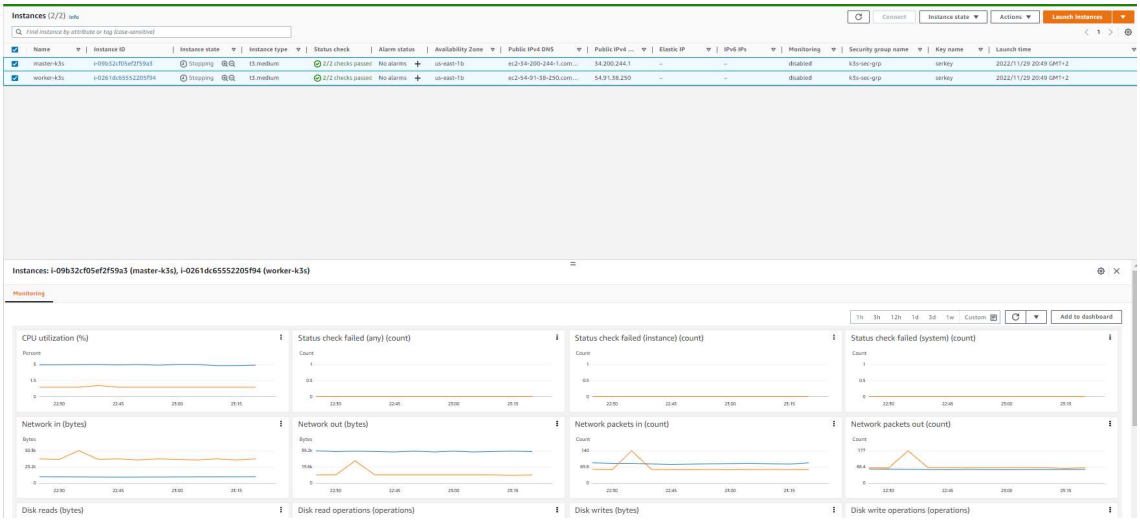
Go to master node and make sure the node has been added : kubectl get nodes -o wide

```
ubuntu@master:~$ kubectl get nodes -o wide
NAME     STATUS   ROLES                  AGE    VERSION        INTERNAL-IP    EXTERNAL-IP   OS-IMAGE             KERNEL-VERSION    CONTAINER-RUNTIME
master   Ready    control-plane,master   8m46s  v1.25.4+k3s1   172.31.12.168  <none>        Ubuntu 20.04.5 LTS   5.15.0-1019-aws   containerd://1.6.8-k3s1
worker   Ready    <none>                 79s    v1.25.4+k3s1   172.31.1.170   <none>        Ubuntu 20.04.5 LTS   5.15.0-1019-aws   containerd://1.6.8-k3s1
ubuntu@master:~$
```

Master node: TOP command

```
top - 19:09:40 up 19 min,  1 user,  load average: 0.02, 0.11, 0.14
Tasks: 122 total,   1 running, 121 sleeping,   0 stopped,   0 zombie
%Cpu(s):  1.5 us,  0.8 sy,  0.0 ni, 95.9 id,  0.2 wa,  0.0 hi,  0.0 si,  1.7 st
MiB Mem :   3864.0 total,    590.4 free,    728.5 used,   2545.1 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   2842.8 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
  19914 root      20   0 1332484 480256 102992 S   4.7  12.1   0:39.90 k3s-server
  19933 root      20   0 770400  63512  30888 S   1.0   1.6   0:09.75 containerd
  21054 ubuntu    20   0 751956  47400  34208 S   0.7   1.2   0:04.16 metrics-server
  20640 root      20   0 720748  10416   8168 S   0.3   0.3   0:00.22 containerd-shim
  20664 root      20   0 720748  10004   7848 S   0.3   0.3   0:00.26 containerd-shim
  21799 root      20   0 720492  10348   7336 S   0.3   0.3   0:00.45 containerd-shim
      1 root      20   0 171344  13016   8616 S   0.0   0.3   0:09.02 systemd
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kthreadd
      3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_gp
      4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_par_gp
      5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 netns
      7 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-events_highpri
      8 root      20   0       0      0      0 I   0.0   0.0   0:00.43 kworker/u4:0-events_power_efficient
      9 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 mm_percpu_wq
     10 root      20   0       0      0      0 S   0.0   0.0   0:00.00 rcu_tasks_rude_
     11 root      20   0       0      0      0 S   0.0   0.0   0:00.00 rcu_tasks_trace
     12 root      20   0       0      0      0 S   0.0   0.0   0:00.20 ksoftirqd/0
     13 root      20   0       0      0      0 I   0.0   0.0   0:00.32 rcu_sched
```

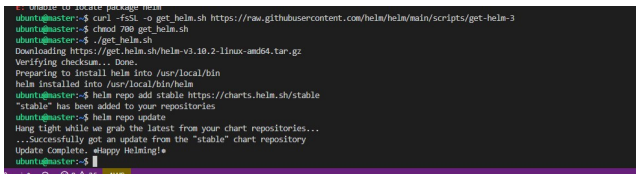
EC2- monitor




```
Deploy Addons to K3s
- K3s is a lightweight kubernetes tool that doesn't come packaged with all the tools but you can install them separately.
# Install Helm Commandline tool on k3s
- Download the latest version of Helm commandline tool from this page.
- Extract the tar file using tar -xvcf <downloaded-file>
- Move the binary file to /usr/local/bin/helm
- sudo mv linux-amd64/helm /usr/local/bin/helm
# Check version
helm version
- Add the helm chart repository to allow installation of applications using helm:
helm repo add stable https://charts.helm.sh/stable
helm repo update
### Demo Application Deploy
# Deploy Nginx Web-proxy on K3s
- Nginx can be used as a web proxy to expose ingress web traffic routes in and out of the cluster.
- We can install nginx web-proxy using Helm:
helm install nginx-ingress stable/nginx-ingress --namespace kube-system \
  --set defaultBackend.enabled=false
- We can test if the application has been installed by:
kubectl get pods -n kube-system -l app=nginx-ingress -o wide
### Step 9: Removing k3s
- After all the steps if you completed your task, you can remove k3s on the worker nodes
sudo /usr/local/bin/k3s-agent-uninstall.sh
sudo rm -rf /var/lib/rancher
- and master node:
sudo /usr/local/bin/k3s-uninstall.sh
sudo rm -rf /var/lib/rancher
```

Adding addon
Helm installation to the k3s master

```
Deploy Addons to K3s
- K3s is a lightweight kubernetes tool that doesn't come packaged with all the tools but you can install them separately.
# Install Helm Commandline tool on k3s
- Download the latest version of Helm commandline tool from this page.
- Extract the tar file using tar -xvcf <downloaded-file>
- Move the binary file to /usr/local/bin/helm
- sudo mv linux-amd64/helm /usr/local/bin/helm
# Check version
helm version
- Add the helm chart repository to allow installation of applications using helm:
helm repo add stable https://charts.helm.sh/stable
helm repo update
```




```
ubuntu@master:~$ helm version
WARNING: Kubernetes configuration file is group-readable. This is insecure. Location: /etc/rancher/k3s/k3s.yaml
WARNING: Kubernetes configuration file is world-readable. This is insecure. Location: /etc/rancher/k3s/k3s.yaml
version.BuildInfo{Version:"v3.10.2", GitCommit:"50f003e5ee8704ec937a756c646870227d7c8b58", GitTreeState:"clean", GoVersion:"go1.18.8"}
ubuntu@master:~$
```

Install nginx with helm

```
### Demo Application Deploy
# Deploy Nginx Web-proxy on K3s
- Nginx can be used as a web proxy to expose ingress web traffic routes in and out of the cluster.
- We can install nginx web-proxy using Helm:
helm install nginx-ingress stable/nginx-ingress --namespace kube-system \
  --set defaultBackend.enabled=false
- We can test if the application has been installed by:
kubectl get pods -n kube-system -l app=nginx-ingress -o wide
```

```
ubuntu@master:~$ helm install nginx-ingress stable/nginx-ingress --namespace kube-system \
>   --set defaultBackend.enabled=false
WARNING: This chart is deprecated
Error: INSTALLATION FAILED: Kubernetes cluster unreachable: Get "http://localhost:8080/version": dial tcp 127.0.0.1:8080: connect: connection refused
ubuntu@master:~$ helm repo add stable https://charts.helm.sh/stable --force-update
"stable" has been added to your repositories
ubuntu@master:~$ export KUBECONFIG=/etc/rancher/k3s/k3s.yaml
ubuntu@master:~$ sudo chmod 777 /etc/rancher/k3s/k3s.yaml
ubuntu@master:~$ helm install nginx-ingress stable/nginx-ingress --namespace kube-system   --set defaultBackend.enabled=false
WARNING: Kubernetes configuration file is group-readable. This is insecure. Location: /etc/rancher/k3s/k3s.yaml
WARNING: Kubernetes configuration file is world-readable. This is insecure. Location: /etc/rancher/k3s/k3s.yaml
WARNING: This chart is deprecated
NAME: nginx-ingress
LAST DEPLOYED: Wed Nov 30 12:50:59 2022
NAMESPACE: kube-system
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
**********************************************************************************************
* DEPRECATED, please use https://github.com/kubernetes/ingress-nginx/tree/master/charts/ingress-nginx *
**********************************************************************************************


The nginx-ingress controller has been installed.
```

The nginx-ingress controller has been installed.
It may take a few minutes for the LoadBalancer IP to be available.
You can watch the status by running 'kubectl --namespace kube-system get services -o wide -w nginx-ingress-controller'

An example Ingress that makes use of the controller:

```
apiVersion: extensions/v1beta1
kind: Ingress
metadata:
  annotations:
    kubernetes.io/ingress.class: nginx
  name: example
  namespace: foo
spec:
  rules:
    - host: www.example.com
      http:
        paths:
          - backend:
              serviceName: exampleService
              servicePort: 80
            path: /
  # This section is only required if TLS is to be enabled for the Ingress
  tls:
      - hosts:
          - www.example.com
        secretName: example-tls
```

If TLS is enabled for the Ingress, a Secret containing the certificate and key must also be provided:

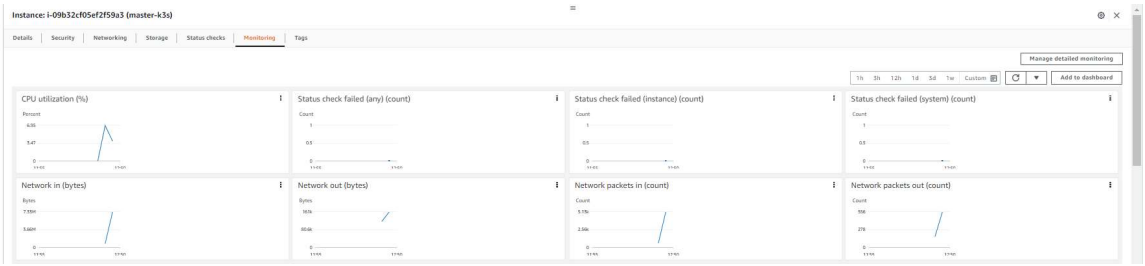
```
apiVersion: v1
kind: Secret
metadata:
  name: example-tls
  namespace: foo
data:
  tls.crt: <base64 encoded cert>
  tls.key: <base64 encoded key>
type: kubernetes.io/tls
```

```
ubuntu@master:~$ kubectl get pods -n kube-system -l app=nginx-ingress -o wide
NAME                                        READY   STATUS    RESTARTS   AGE   IP          NODE                NOMINATED NODE   READINESS GATES
nginx-ingress-controller-6576b87746-br29p   0/1     Running   1 (41s ago)   95s   10.42.2.5   ip-172-31-12-168   <none>           <none>
ubuntu@master:~$
```

After installing nginx check the CPU

```
top - 12:54:09 up 14 min,  1 user,  load average: 0.01, 0.10, 0.09
Tasks: 121 total,   1 running, 120 sleeping,   0 stopped,   0 zombie
%Cpu(s):  1.0 us,  0.3 sy,  0.0 ni, 98.3 id,  0.2 wa,  0.0 hi,  0.0 si,  0.2 st
MiB Mem :   3864.0 total,   1105.7 free,    747.2 used,   2011.1 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   2876.5 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
    560 root      20   0 1265388 519640 101840 S   2.0  13.1   0:35.12 k3s-server
    789 root      20   0  769940  61048  38716 S   0.3   1.5   0:06.24 containerd
   2608 root      20   0  720748  11028   7804 S   0.3   0.3   0:00.58 containerd-shim
   3996 root      20   0  720748  10224   7416 S   0.3   0.3   0:00.26 containerd-shim
   4106 ubuntu    20   0  751956  47172  33676 S   0.3   1.2   0:03.06 metrics-server
   4795 root      20   0  720748  11020   7732 S   0.3   0.3   0:00.13 containerd-shim
      1 root      20   0  104028  12792   8176 S   0.0   0.3   0:05.16 systemd
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kthreadd
      3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_gp
      4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_par_gp
      5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 netns
      7 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-events_highpri
      8 root      20   0       0      0      0 I   0.0   0.0   0:00.15 kworker/u4:0-events_unbound
      9 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 mm_percpu_wq
     10 root      20   0       0      0      0 S   0.0   0.0   0:00.00 rcu_tasks_rude_
     11 root      20   0       0      0      0 S   0.0   0.0   0:00.00 rcu_tasks_trace
     12 root      20   0       0      0      0 S   0.0   0.0   0:00.11 ksoftirqd/0
     13 root      20   0       0      0      0 I   0.0   0.0   0:00.34 rcu_sched
     14 root      rt   0       0      0      0 S   0.0   0.0   0:00.00 migration/0
     15 root     -51   0       0      0      0 S   0.0   0.0   0:00.00 idle_inject/0
     17 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/0
     18 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/1
     19 root     -51   0       0      0      0 S   0.0   0.0   0:00.00 idle_inject/1
     20 root      rt   0       0      0      0 S   0.0   0.0   0:00.09 migration/1
     21 root      20   0       0      0      0 S   0.0   0.0   0:00.11 ksoftirqd/1
```

```
    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
    560 root      20   0 1265772 515332 101040 S   2.7  13.0   0:35.65 k3s-server
      1 root      20   0  104028  12800   8176 S   0.7   0.3   0:05.18 systemd
    459 message+  20   0    7700   4752   3880 S   0.7   0.1   0:00.61 dbus-daemon
    789 root      20   0  769940  61048  38716 S   0.7   1.5   0:06.29 containerd
   2608 root      20   0  720748  11292   7804 S   0.7   0.3   0:00.60 containerd-shim
   3317 ubuntu    20   0   19172   9768   8164 S   0.7   0.2   0:00.26 systemd
   4795 root      20   0  720748  10912   7732 S   0.7   0.3   0:00.15 containerd-shim
   4106 ubuntu    20   0  751956  47172  33676 S   0.3   1.2   0:03.12 metrics-server
   5322 ubuntu    20   0   11264   3988   3344 R   0.3   0.1   0:00.03 top
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kthreadd
      3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_gp
      4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_par_gp
      5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 netns
      7 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-events_highpri
      8 root      20   0       0      0      0 I   0.0   0.0   0:00.15 kworker/u4:0-events_unbound
```



If you want you could install the prometheus with helm to the node

install Prometheus-operator

add repos

helm repo add prometheus-community https://prometheus-community.github.io/helm-chartshelm

repo add stable https://kubernetes-charts.storage.googleapis.com/helm repo update

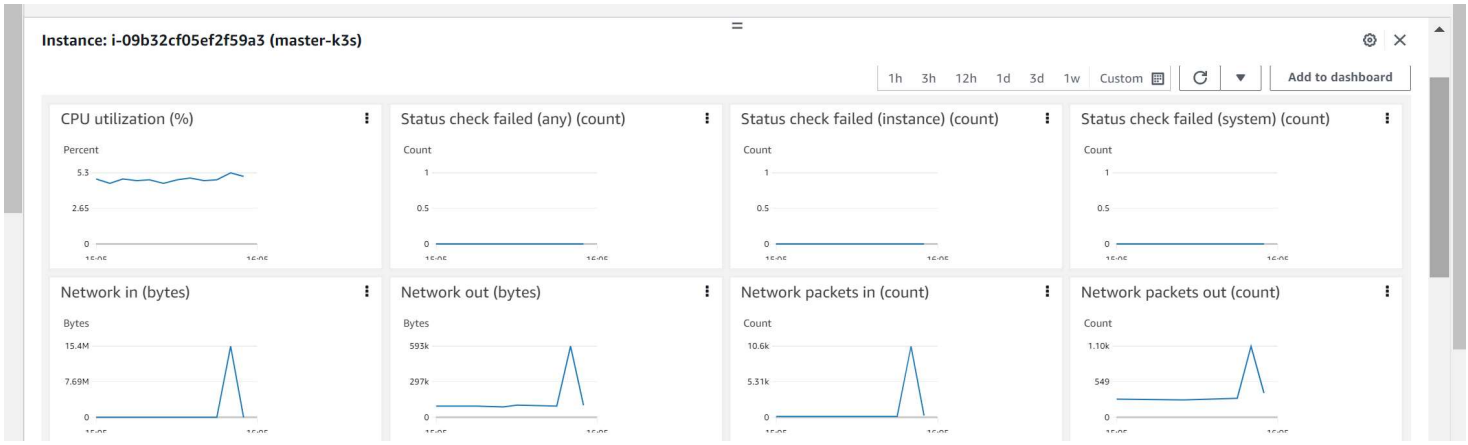
install chart

helm install prometheus prometheus-community/kube-prometheus-stack

install chart with fixed version

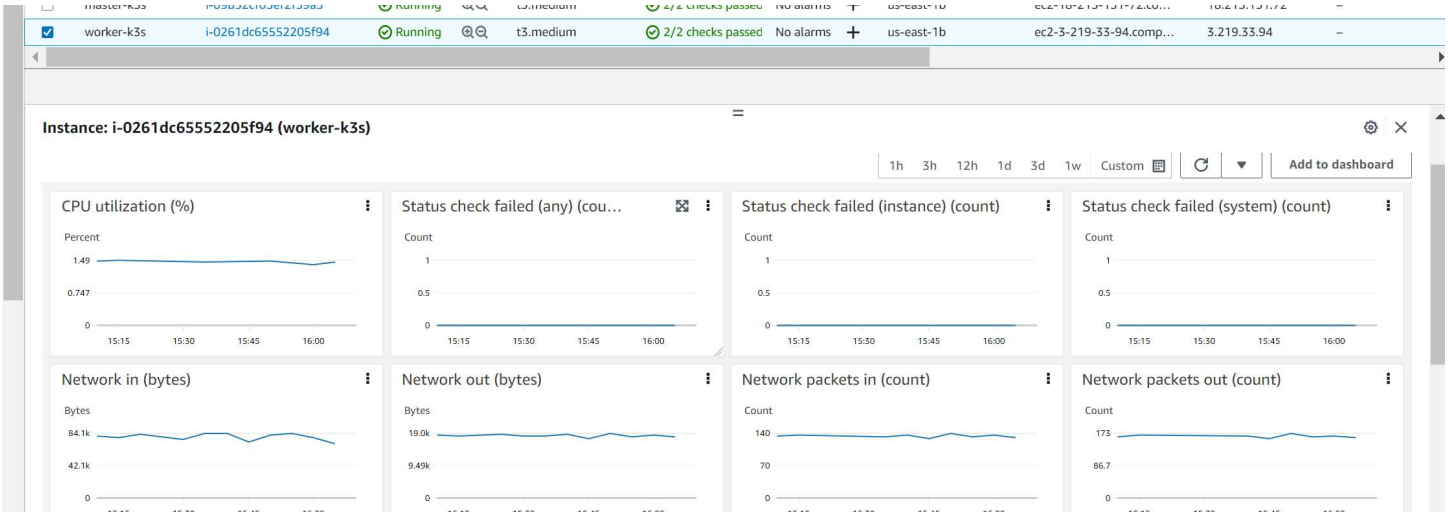
helm install prometheus prometheus-community/kube-prometheus-stack --version "9.4.1"

```
STATUS: deployed
REVISION: 1
NOTES:
kube-prometheus-stack has been installed. Check its status by running:
  kubectl --namespace default get pods -l "release=prometheus"

Visit https://github.com/prometheus-operator/kube-prometheus for instructions on how to create & configure Alertmanager and Prometheus instances using the Operator.
ubuntu@master:~$ kubectl get nodes -o wide
NAME              STATUS   ROLES                  AGE   VERSION    INTERNAL-IP     EXTERNAL-IP   OS-IMAGE             KERNEL-VERSION    CONTAINER-RUNTIME
master            NotReady control-plane,master   20h   v1.25.4+k3s1   172.31.12.168   <none>        Ubuntu 20.04.5 LTS   5.15.0-1019-aws   containerd://1.6.8-k3s1
worker            NotReady <none>                 20h   v1.25.4+k3s1   172.31.1.170    <none>        Ubuntu 20.04.5 LTS   5.15.0-1019-aws   containerd://1.6.8-k3s1
ip-172-31-12-168  Ready    control-plane,master   179m  v1.25.4+k3s1   172.31.12.168   <none>        Ubuntu 20.04.5 LTS   5.15.0-1023-aws   containerd://1.6.8-k3s1
ip-172-31-1-170   Ready    <none>                 179m  v1.25.4+k3s1   172.31.1.170    <none>        Ubuntu 20.04.5 LTS   5.15.0-1019-aws   containerd://1.6.8-k3s1
ubuntu@master:~$
```



```
top - 16:08:36 up  3:29,  1 user,  load average: 0.36, 0.17, 0.12
Tasks: 133 total,   1 running, 132 sleeping,   0 stopped,   0 zombie
%Cpu(s):  5.9 us,  1.0 sy,  0.0 ni, 92.9 id,  0.0 wa,  0.0 hi,  0.0 si,  0.2 st
MiB Mem :   3864.0 total,    105.1 free,   1619.8 used,   2139.1 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   1968.1 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
    560 root      20   0 1748388 688436  96096 S   7.3  17.4   8:28.08 k3s-server
   7319 ubuntu    20   0 1429400 560452  65976 S   4.3  14.2   2:46.29 prometheus
   6499 nobody    20   0  717892  19284  11564 S   1.3   0.5   0:11.36 node_exporter
   6323 root      20   0  720748  11476   8116 S   1.0   0.3   0:22.66 containerd-shim
    789 root      20   0  771848  66984  39728 S   0.3   1.7   1:04.91 containerd
   2608 root      20   0  720748  11524   7872 S   0.3   0.3   0:16.51 containerd-shim
   3982 root      20   0  721004  11496   7916 S   0.3   0.3   0:08.50 containerd-shim
   4104 root      20   0  733460  26004  20060 S   0.3   0.7   0:02.70 local-path-prov
   6811 root      20   0  720748  10772   7364 S   0.3   0.3   0:15.71 containerd-shim
      1 root      20   0  104028  12808   8176 S   0.0   0.3   0:07.45 systemd
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kthreadd
      3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_gp
```

Worker node




```
top - 16:13:08 up  3:34,  1 user,  load average: 0.06, 0.04, 0.01
Tasks: 129 total,   1 running, 128 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.8 us,  0.3 sy,  0.0 ni, 98.5 id,  0.0 wa,  0.0 hi,  0.0 si,  0.3 st
MiB Mem :   3864.0 total,    744.3 free,    460.7 used,   2659.0 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   3118.8 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
    555 root      20   0  845916 132668  88804 S   1.3   3.4   3:06.95 k3s-agent
  35780 root      20   0  720492  10872   8212 S   1.0   0.3   0:03.64 containerd-shim
   6360 root      20   0  770992  64616  38084 S   0.3   1.6   1:01.57 containerd
  42563 ubuntu    20   0   11260   4124   3464 R   0.3   0.1   0:00.01 top
      1 root      20   0  104072  12964   8340 S   0.0   0.3   0:07.94 systemd
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kthreadd
      3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_gp
      4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_par_gp
      5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 netns
      7 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-events_highpri
      9 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 mm_percpu_wq
     10 root      20   0       0      0      0 S   0.0   0.0   0:00.00 rcu_tasks_rude_
     11 root      20   0       0      0      0 S   0.0   0.0   0:00.00 rcu_tasks_trace
```