

Kubeadm setup installation

<https://v1-26.docs.kubernetes.io/docs/setup/production-environment/tools/kubeadm/install-kubeadm/>

Installing kubeadm

This page shows how to install the kubeadm toolbox. For information on how to create a cluster with kubeadm once you have performed this installation process, see the Creating a cluster with kubeadm...

<https://devopscube.com/upgrade-kubernetes-cluster-kubeadm/>

- Master node

```
root@DESKTOP-THN1IG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/k8S/k8sCluster_kubeadm_terraform# ssh -i /root/.ssh/id_rsa ubuntu@35.175.57.123
The authenticity of host '35.175.57.123 (35.175.57.123)' can't be established.
ED25519 key fingerprint is SHA256:N2jchWZbbiqXW61zqeURR9qFLpRXUo1NvJ77+KMIDec.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '35.175.57.123' (ED25519) to the list of known hosts.
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-1103-aws x86_64)

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

System information as of Wed Mar  6 08:46:53 UTC 2024

System load:  0.05          Users logged in:      0
Usage of /:   57.5% of 7.57GB IP address for eth0:  172.31.20.170
Memory usage: 24%          IP address for docker0: 172.17.0.1
Swap usage:   0%           IP address for tunl0:  10.107.205.128
Processes:   148

Expanded Security Maintenance for Infrastructure is not enabled.

10 updates can be applied immediately.
2 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

91 additional security updates can be applied with ESM Infra.
Learn more about enabling ESM Infra service for Ubuntu 18.04 at
https://ubuntu.com/18-04

New release '20.04.6 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
```

ubuntu@ip-172-31-20-170:~\$ **sudo -i**

root@ip-172-31-20-170:~# **sudo apt-get update**

Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease

Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease

Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease

Hit:4 http://security.ubuntu.com/ubuntu bionic-security InRelease

Hit:5 https://prod-cdn.packages.k8s.io/repositories/iscv:/kubernetes:/core:/stable:/v1.25/deb InRelease

Reading package lists... Done

root@ip-172-31-20-170:~# **sudo apt-get install -y apt-transport-https ca-certificates curl**

Reading package lists... Done

Building dependency tree

Reading state information... Done

ca-certificates is already the newest version (20230311ubuntu0.18.04.1).

curl is already the newest version (7.58.0-2ubuntu3.24).

apt-transport-https is already the newest version (1.6.17).

0 upgraded, 0 newly installed, 0 to remove and 9 not upgraded.

root@ip-172-31-20-170:~# **curl -fsSL https://pkgs.k8s.io/core:/stable:/v1.26/deb/Release.key | sudo gpg --dearmor -o /etc/apt/keyrings/kubernetes-apt-keyring.gpg**

File '/etc/apt/keyrings/kubernetes-apt-keyring.gpg' exists. Overwrite? (y/N) **Y**

root@ip-172-31-20-170:~# **echo 'deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg] https://pkgs.k8s.io/core:/stable:/v1.26/deb/ /' | sudo tee /etc/apt/sources.list.d/kubernetes.list**

deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg] https://pkgs.k8s.io/core:/stable:/v1.26/deb/ /

root@ip-172-31-20-170:~# **sudo apt-get update**

Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease

Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease

Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease

Hit:4 http://security.ubuntu.com/ubuntu bionic-security InRelease

Get:5 https://prod-cdn.packages.k8s.io/repositories/iscv:/kubernetes:/core:/stable:/v1.26/deb InRelease [1192 B]

Get:6 https://prod-cdn.packages.k8s.io/repositories/iscv:/kubernetes:/core:/stable:/v1.26/deb Packages [20.8 kB]

Fetchd 22.0 kB in 1s (36.2 kB/s)

Reading package lists... Done

root@ip-172-31-20-170:~# **sudo apt-get install -y kubelet kubeadm kubectl**

Reading package lists... Done

Building dependency tree

Reading state information... Done

The following packages will be upgraded:

kubeadm kubectl kubelet

3 upgraded, 0 newly installed, 0 to remove and 9 not upgraded.

Need to get 41.0 MB of archives.

After this operation, 13.9 MB of additional disk space will be used.

Get:1 <https://prod-cdn.packages.k8s.io/repositories/iscv:/kubernetes:/core:/stable:/v1.26/deb> kubelet 1.26.14-1.1 [21.1 MB]

Get:2 <https://prod-cdn.packages.k8s.io/repositories/iscv:/kubernetes:/core:/stable:/v1.26/deb> kubectl 1.26.14-1.1 [10.1 MB]

Get:3 <https://prod-cdn.packages.k8s.io/repositories/iscv:/kubernetes:/core:/stable:/v1.26/deb> kubeadm 1.26.14-1.1 [9827 kB]

Fetchd 41.0 MB in 1s (49.1 MB/s)

(Reading database ... 58639 files and directories currently installed.)

Preparing to unpack .../kubelet_1.26.14-1.1_amd64.deb ...

Unpacking kubelet (1.26.14-1.1) over (1.25.16-1.1) ...

Preparing to unpack .../kubectl_1.26.14-1.1_amd64.deb ...

Unpacking kubectl (1.26.14-1.1) over (1.25.16-1.1) ...

Preparing to unpack .../kubeadm_1.26.14-1.1_amd64.deb ...

Unpacking kubeadm (1.26.14-1.1) over (1.25.16-1.1) ...

Setting up kubelet (1.26.14-1.1) ...

Setting up kubectl (1.26.14-1.1) ...

Setting up kubeadm (1.26.14-1.1) ...

```
root@ip-172-31-20-170:~# sudo apt-mark hold kubelet kubeadm kubectl
kubelet set on hold.
kubeadm set on hold.
kubectl set on hold.
```

```
root@ip-172-31-20-170:~# kubectl version -o json
{
  "clientVersion": {
    "major": "1",
    "minor": "26",
    "gitVersion": "v1.26.14",
    "gitCommit": "6db79806d788bfb9cfc996deb7e2e178402e8b50",
    "gitTreeState": "clean",
    "buildDate": "2024-02-14T10:40:25Z",
    "goVersion": "go1.21.7",
    "compiler": "gc",
    "platform": "linux/amd64"
  }
}
```

root@ip-172-31-20-170:~# **sudo apt update**

Hit:1 <http://us-east-1.ec2.archive.ubuntu.com/ubuntu> bionic InRelease

Hit:2 <http://us-east-1.ec2.archive.ubuntu.com/ubuntu> bionic-updates InRelease

Hit:3 <http://us-east-1.ec2.archive.ubuntu.com/ubuntu> bionic-backports InRelease

Hit:4 <http://security.ubuntu.com/ubuntu> bionic-security InRelease

Hit:5 <https://prod-cdn.packages.k8s.io/repositories/isv/kubernetes/core/stable/v1.26/deb> InRelease

Reading package lists... Done

Building dependency tree

Reading state information... Done

9 packages can be upgraded. Run 'apt list --upgradable' to see them.

root@ip-172-31-20-170:~# **sudo apt-cache madison kubectl | tac**

kubectl | 1.26.0-2.1 | <https://pkgs.k8s.io/core/stable/v1.26/deb> Packages

kubectl | 1.26.1-1.1 | <https://pkgs.k8s.io/core/stable/v1.26/deb> Packages

kubectl | 1.26.2-1.1 | <https://pkgs.k8s.io/core/stable/v1.26/deb> Packages

kubectl | 1.26.3-1.1 | <https://pkgs.k8s.io/core/stable/v1.26/deb> Packages

kubectl | 1.26.4-1.1 | <https://pkgs.k8s.io/core/stable/v1.26/deb> Packages

kubectl | 1.26.5-1.1 | <https://pkgs.k8s.io/core/stable/v1.26/deb> Packages

kubectl | 1.26.6-1.1 | <https://pkgs.k8s.io/core/stable/v1.26/deb> Packages

kubectl | 1.26.7-1.1 | <https://pkgs.k8s.io/core/stable/v1.26/deb> Packages

kubectl | 1.26.8-1.1 | <https://pkgs.k8s.io/core/stable/v1.26/deb> Packages

kubeadm | 1.26.9-1.1 | <https://pkgs.k8s.io/core:/stable/v1.26/deb> Packages

kubeadm | 1.26.10-1.1 | <https://pkgs.k8s.io/core:/stable/v1.26/deb> Packages

kubeadm | 1.26.11-1.1 | <https://pkgs.k8s.io/core:/stable/v1.26/deb> Packages

kubeadm | 1.26.12-1.1 | <https://pkgs.k8s.io/core:/stable/v1.26/deb> Packages

kubeadm | 1.26.13-1.1 | <https://pkgs.k8s.io/core:/stable/v1.26/deb> Packages

kubeadm | 1.26.14-1.1 | <https://pkgs.k8s.io/core:/stable/v1.26/deb> Packages

```
root@ip-172-31-20-170:~# sudo kubeadm upgrade plan
[upgrade/config] Making sure the configuration is correct:
[upgrade/config] Reading configuration from the cluster...
[upgrade/config] FYI: You can look at this config file with 'kubectl -n kube-system get cm kubeadm-config -o yaml'
[preflight] Running pre-flight checks.
[upgrade] Running cluster health checks
[upgrade] Fetching available versions to upgrade to
[upgrade/versions] Cluster version: v1.25.16
[upgrade/versions] kubeadm version: v1.26.14
[0306 08:53:22.489986 3371 version.go:256] remote version is much newer: v1.29.2; falling back to: stable-1.26
[upgrade/versions] Target version: v1.26.14
[upgrade/versions] Latest version in the v1.25 series: v1.25.16

w0306 08:53:22.691224 3371 configset.go:177] error unmarshaling configuration schema.GroupVersionKind{Group:"kubeproxy.config.k8s.io", Version:"v1alpha1", Kind:"KubeProxyConfiguration"}:
strict decoding error: unknown field "udpIdleTimeout"
Components that must be upgraded manually after you have upgraded the control plane with 'kubeadm upgrade apply':
COMPONENT  CURRENT  TARGET
kubelet     3 x v1.25.16  v1.26.14

Upgrade to the latest stable version:

COMPONENT  CURRENT  TARGET
kube-apiserver  v1.25.16  v1.26.14
kube-controller-manager  v1.25.16  v1.26.14
kube-scheduler  v1.25.16  v1.26.14
kube-proxy      v1.25.16  v1.26.14
coreDNS         v1.9.3    v1.9.3
etcd            3.5.9-0   3.5.10-0

You can now apply the upgrade by executing the following command:

    kubeadm upgrade apply v1.26.14
```

The table below shows the current state of component configs as understood by this version of kubeadm. Configs that have a "yes" mark in the "MANUAL UPGRADE REQUIRED" column require manual config upgrade or resetting to kubeadm defaults before a successful upgrade can be performed. The version to manually upgrade to is denoted in the "PREFERRED VERSION" column.

API GROUP	CURRENT VERSION	PREFERRED VERSION	MANUAL UPGRADE REQUIRED
kubeproxy.config.k8s.io	v1alpha1	v1alpha1	no
kubelet.config.k8s.io	v1beta1	v1beta1	no

```
root@ip-172-31-20-170:~# sudo apt-mark unhold kubeadm && \

> sudo apt-get update && sudo apt-get install -y --allow-downgrades kubeadm=1.26.3-1.1 && \

> sudo apt-mark hold kubeadm

kubeadm was already not hold.

Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease

Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease

Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease

Hit:4 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.26/deb InRelease

Hit:5 http://security.ubuntu.com/ubuntu bionic-security InRelease

Reading package lists... Done

Reading package lists... Done

Building dependency tree
```

Reading state information... Done

The following packages will be DOWNGRADED:

kubeadm

0 upgraded, 0 newly installed, 1 downgraded, 0 to remove and 9 not upgraded.

Need to get 9750 kB of archives.

After this operation, 160 kB disk space will be freed.

Get:1 <https://prod-cdn.packages.k8s.io/repositories/isv/kubernetes/core/stable/v1.26/deb> kubeadm 1.26.3-1.1 [9750 kB]

Fetched 9750 kB in 0s (37.9 MB/s)

dpkg: warning: downgrading kubeadm from 1.26.14-1.1 to 1.26.3-1.1

(Reading database ... 58639 files and directories currently installed.)

Preparing to unpack .../kubeadm_1.26.3-1.1_amd64.deb ...

Unpacking kubeadm (1.26.3-1.1) over (1.26.14-1.1) ...

Setting up kubeadm (1.26.3-1.1) ...

kubeadm set on hold.

```
root@ip-172-31-20-170:~# sudo kubeadm upgrade node
[upgrade] Reading configuration from the cluster...
[upgrade] FYI: You can look at this config file with 'kubectl -n kube-system get cm kubeadm-config -o yaml'
[00:00:00:57:28:04:548] 7568 configset.go:177] error: unmarshaling configuration schema.GroupVersionKind(Group:"kubeproxy.config.k8s.io", Version:"v1alpha1", Kind:"KubeProxyConfiguration"):
strict decoding error: unknown field "udpIdleTimeout"
[preflight] Running pre-flight checks
[preflight] Pulling images required for setting up a Kubernetes cluster
[preflight] This might take a minute or two, depending on the speed of your internet connection
[preflight] You can also perform this action in beforehand using 'kubeadm config images pull'
[upgrade] Upgrading your Static Pod-hosted control plane to version "v1.25.16"...
[upgrade/etcd] Upgrading to TLS for etcd
[upgrade/etcd] Non-fatal issue encountered during upgrade: the desired etcd version "3.5.6-0" is older than the currently installed "3.5.9-0". Skipping etcd upgrade
[upgrade/staticpods] Writing new Static Pod manifests to "/etc/kubernetes/tmp/kubeadm-upgraded-manifests2993012196"
[upgrade/staticpods] Preparing for "kube-apiserver" upgrade
[upgrade/staticpods] Renewing apiserver certificate
[upgrade/staticpods] Renewing apiserver-kubelet-client certificate
[upgrade/staticpods] Renewing front-proxy-client certificate
[upgrade/staticpods] Renewing apiserver-etcd-client certificate
[upgrade/staticpods] Moved new manifest to "/etc/kubernetes/manifests/kube-apiserver.yaml" and backed up old manifest to "/etc/kubernetes/tmp/kubeadm-backup-manifests-2024-03-06-08-57-34/kube-apiserver.yaml"
[upgrade/staticpods] Waiting for the kubelet to restart the component
[upgrade/staticpods] This might take a minute or longer depending on the component/version gap (timeout 5m0s)
[apiclient] Found 1 Pods for label selector component=kube-apiserver
[upgrade/staticpods] Component "kube-apiserver" upgraded successfully!
[upgrade/staticpods] Preparing for "kube-controller-manager" upgrade
[upgrade/staticpods] Renewing controller-manager.conf certificate
[upgrade/staticpods] Moved new manifest to "/etc/kubernetes/manifests/kube-controller-manager.yaml" and backed up old manifest to "/etc/kubernetes/tmp/kubeadm-backup-manifests-2024-03-06-08-57-34/kube-controller-manager.yaml"
[upgrade/staticpods] Waiting for the kubelet to restart the component
[upgrade/staticpods] This might take a minute or longer depending on the component/version gap (timeout 5m0s)
[apiclient] Found 1 Pods for label selector component=kube-controller-manager
[upgrade/staticpods] Component "kube-controller-manager" upgraded successfully!
[upgrade/staticpods] Preparing for "kube-scheduler" upgrade
[upgrade/staticpods] Renewing scheduler.conf certificate
[upgrade/staticpods] Moved new manifest to "/etc/kubernetes/manifests/kube-scheduler.yaml" and backed up old manifest to "/etc/kubernetes/tmp/kubeadm-backup-manifests-2024-03-06-08-57-34/kube-scheduler.yaml"
[upgrade/staticpods] Waiting for the kubelet to restart the component
[upgrade/staticpods] This might take a minute or longer depending on the component/version gap (timeout 5m0s)
[apiclient] Found 1 Pods for label selector component=kube-scheduler
[upgrade/staticpods] Component "kube-scheduler" upgraded successfully!
[upgrade] The control plane instance for this node was successfully updated!
[kubelet-start] Writing kubelet configuration to file "/var/lib/kubelet/config.yaml"
[upgrade] The configuration for this node was successfully updated!
[upgrade] Now you should go ahead and upgrade the kubelet package using your package manager.
```

```
root@ip-172-31-20-170:~# kubectl version -o json
{
  "clientVersion": {
    "major": "1",
    "minor": "26",
    "gitVersion": "v1.26.3",
    "gitCommit": "9e644106593f3f4aa98f8a84b23db5fa378900bd",
    "gitTreeState": "clean",
    "buildDate": "2023-03-15T13:38:47Z",
    "goVersion": "go1.19.7",
    "compiler": "gc",
    "platform": "linux/amd64"
  }
}
```

```
root@DESKTOP-THNIIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# kgn
```

NAME	STATUS	ROLES	AGE	VERSION
master	Ready	control-plane	91m	v1.25.16
worker-0	Ready	<none>	91m	v1.25.16
worker-1	Ready	<none>	91m	v1.25.16

```
root@DESKTOP-THNIIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# kubectl drain master --ignore-daemonsets
```

node/master cordoned

Warning: ignoring DaemonSet-managed Pods: kube-system/calico-node-7mp4s, kube-system/kube-proxy-drfls

evicting pod kube-system/coredns-565d847f94-lmqc9

evicting pod kube-system/calico-kube-controllers-74677b4c5f-crlbp

evicting pod kube-system/coredns-565d847f94-4wlrh

pod/calico-kube-controllers-74677b4c5f-crlbp evicted

pod/coredns-565d847f94-lmqc9 evicted

pod/coredns-565d847f94-4wlrh evicted

node/master drained

```
root@DESKTOP-THNIIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# sudo apt-cache madison kubeadm | tac
```

```
root@DESKTOP-THNIIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# ssh -i /root/.ssh/id_rsa ubuntu@35.175.57.123
```

```
ubuntu@ip-172-31-20-170:~$ sudo apt-mark unhold kubelet kubectl && sudo apt-get update && sudo apt-get install -y kubelet=1.26.3-1.1
kubectl=1.26.3-1.1 && sudo apt-mark hold kubelet kubectl
```

Canceled hold on kubelet.

Canceled hold on kubectl.

Hit:1 <http://us-east-1.ec2.archive.ubuntu.com/ubuntu/bionic> InRelease

Hit:2 <http://us-east-1.ec2.archive.ubuntu.com/ubuntu/bionic-updates> InRelease

Hit:3 <http://us-east-1.ec2.archive.ubuntu.com/ubuntu/bionic-backports> InRelease

Hit:4 <http://security.ubuntu.com/ubuntu/bionic-security> InRelease

Hit:5 <https://prod-cdn.packages.k8s.io/repositories/isv/kubernetes/core/stable/v1.26/deb> InRelease

Reading package lists... Done

Reading package lists... Done

Building dependency tree

Reading state information... Done

The following packages will be DOWNGRADED:

kubect! kubelet

0 upgraded, 0 newly installed, 2 downgraded, 0 to remove and 10 not upgraded.

E: Packages were downgraded and -y was used without --allow-downgrades.

ubuntu@ip-172-31-20-170:~\$ **sudo systemctl daemon-reload**

ubuntu@ip-172-31-20-170:~\$ **sudo systemctl restart kubelet**

ubuntu@ip-172-31-20-170:~\$ **exit**

logout

Connection to 35.175.57.123 closed.

root@DESKTOP-THNIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/k8S/k8sCluster_kubeadm_terraform# kubect! uncordon master

node/master uncordoned

•

```
root@DESKTOP-THNIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/k8S/k8sCluster_kubeadm_terraform# kgn
NAME          STATUS    ROLES    AGE   VERSION
master        Ready     control-plane  98m   v1.26.14
worker-0      Ready     <none>      98m   v1.25.16
worker-1      Ready     <none>      98m   v1.25.16
root@DESKTOP-THNIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/k8S/k8sCluster_kubeadm_terraform#
```


• Worker-0 node

```
root@DESKTOP-THNIIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# ssh -i /root/.ssh/id_rsa ubuntu@54.237.141.1
```

```
ubuntu@ip-172-31-27-168:~$ sudo apt-get update
```

```
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease
```

```
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease
```

```
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease
```

```
Hit:5 http://security.ubuntu.com/ubuntu bionic-security InRelease
```

```
Hit:4 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.25/deb InRelease
```

```
Reading package lists... Done
```

```
ubuntu@ip-172-31-27-168:~$ sudo apt-get install -y apt-transport-https ca-certificates curl
```

```
Reading package lists... Done
```

```
Building dependency tree
```

```
Reading state information... Done
```

```
ca-certificates is already the newest version (20230311ubuntu0.18.04.1).
```

```
curl is already the newest version (7.58.0-2ubuntu3.24).
```

```
apt-transport-https is already the newest version (1.6.17).
```

```
0 upgraded, 0 newly installed, 0 to remove and 9 not upgraded.
```

```
ubuntu@ip-172-31-27-168:~$ curl -fsSL https://pkgs.k8s.io/core:/stable:/v1.26/deb/Release.key | sudo gpg --dearmor -o /etc/apt/keyrings/kubernetes-apt-keyring.gpg
```

```
gpg: WARNING: unsafe ownership on homedir '/home/ubuntu/.gnupg'
```

```
File '/etc/apt/keyrings/kubernetes-apt-keyring.gpg' exists. Overwrite? (y/N) y
```

```
ubuntu@ip-172-31-27-168:~$ echo 'deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg] https://pkgs.k8s.io/core:/stable:/v1.26/deb/ ' | sudo tee /etc/apt/sources.list.d/kubernetes.list
```

```
deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg] https://pkgs.k8s.io/core:/stable:/v1.26/deb/ 
```

```
ubuntu@ip-172-31-27-168:~$ sudo apt-get update
```

```
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease
```

```
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease
```

```
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease
```

```
Hit:4 http://security.ubuntu.com/ubuntu bionic-security InRelease
```

```
Get:5 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.26/deb InRelease [1192 B]
```

```
Get:6 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.26/deb Packages [20.8 kB]
```

Fetches 22.0 kB in 1s (25.5 kB/s)

Reading package lists... Done

ubuntu@ip-172-31-27-168:~\$ **sudo apt-get install -y kubelet kubeadm kubectl**

Reading package lists... Done

Building dependency tree

Reading state information... Done

The following packages will be upgraded:

kubeadm kubectl kubelet

3 upgraded, 0 newly installed, 0 to remove and 9 not upgraded.

Need to get 41.0 MB of archives.

After this operation, 13.9 MB of additional disk space will be used.

Get:1 <https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes/core:/stable:/v1.26/deb> kubelet 1.26.14-1.1 [21.1 MB]

Get:2 <https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes/core:/stable:/v1.26/deb> kubectl 1.26.14-1.1 [10.1 MB]

Get:3 <https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes/core:/stable:/v1.26/deb> kubeadm 1.26.14-1.1 [9827 kB]

Fetches 41.0 MB in 1s (42.0 MB/s)

(Reading database ... 58639 files and directories currently installed.)

Preparing to unpack .../kubelet_1.26.14-1.1_amd64.deb ...

Unpacking kubelet (1.26.14-1.1) over (1.25.16-1.1) ...

Preparing to unpack .../kubectl_1.26.14-1.1_amd64.deb ...

Unpacking kubectl (1.26.14-1.1) over (1.25.16-1.1) ...

Preparing to unpack .../kubeadm_1.26.14-1.1_amd64.deb ...

Unpacking kubeadm (1.26.14-1.1) over (1.25.16-1.1) ...

Setting up kubelet (1.26.14-1.1) ...

Setting up kubectl (1.26.14-1.1) ...

Setting up kubeadm (1.26.14-1.1) ...

```
ubuntu@ip-172-31-27-168:~$ sudo apt-mark hold kubelet kubeadm kubectl
kubelet set on hold.
kubeadm set on hold.
kubectl set on hold.
```

ubuntu@ip-172-31-27-168:~\$ **sudo apt-mark unhold kubeadm && sudo apt-get update && sudo apt-get install -y kubeadm=1.26.3-1.1 && sudo apt-mark hold kubeadm**

Canceled hold on kubeadm.

Hit:1 <http://us-east-1.ec2.archive.ubuntu.com/ubuntu/bionic/InRelease>

Hit:2 <http://security.ubuntu.com/ubuntu/bionic-security/InRelease>

Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease

Hit:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease

Hit:5 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.26/deb InRelease

Reading package lists... Done

Reading package lists... Done

Building dependency tree

Reading state information... Done

The following packages will be DOWNGRADED:

kubeadm

0 upgraded, 0 newly installed, 1 downgraded, 0 to remove and 9 not upgraded.

E: Packages were downgraded and -y was used without --allow-downgrades.

ubuntu@ip-172-31-27-168:~\$ sudo kubeadm upgrade node

[upgrade] Reading configuration from the cluster...

[upgrade] FYI: You can look at this config file with 'kubectl -n kube-system get cm kubeadm-config -o yaml'

W0306 10:17:14.908919 21334 configset.go:177] error unmarshaling configuration schema.GroupVersionKind{Group:"kubeproxy.config.k8s.io", Version:"v1alpha1", Kind:"KubeProxyConfiguration"}: strict decoding error: unknown field "udpIdleTimeout"

[preflight] Running pre-flight checks

[preflight] Skipping prepull. Not a control plane node.

[upgrade] Skipping phase. Not a control plane node.

[kubelet-start] Writing kubelet configuration to file "/var/lib/kubelet/config.yaml"

[upgrade] The configuration for this node was successfully updated!

[upgrade] Now you should go ahead and upgrade the kubelet package using your package manager.

ubuntu@ip-172-31-27-168:~\$ **exit**

logout

Connection to 54.237.141.1 closed.

root@DESKTOP-THNIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# **kubectl drain worker-0 --ignore-daemonsets**

node/worker-0 cordoned

Warning: ignoring DaemonSet-managed Pods: kube-system/calico-node-22lc9, kube-system/kube-proxy-f8gvm

evicting pod kube-system/coredns-565d847f94-gpdrd

evicting pod kube-system/calico-kube-controllers-74677b4c5f-8hptm

pod/calico-kube-controllers-74677b4c5f-8hptm evicted

pod/coredns-565d847f94-gpdrd evicted

node/worker-0 drained

```
root@DESKTOP-THNIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# ssh -i /root/.ssh/id_rsa ubuntu@54.237.141.1
```

```
node/master uncor'doned
root@DESKTOP-THNIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# kgn
NAME          STATUS    ROLES          AGE      VERSION
master        Ready     control-plane   98m      v1.26.14
worker-0      Ready     <none>          98m      v1.25.16
worker-1      Ready     <none>          98m      v1.25.16

ubuntu@ip-172-31-27-168:~$ sudo apt-mark unhold kubelet kubect1 && sudo apt-get update && sudo apt-get install -y kubelet=1.26.3-1.1 kubect1=1.26.3-1.1 && sudo apt-mark hold kubelet kubect1
Canceled hold on kubelet.
Canceled hold on kubect1.
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu bionic-security InRelease
Hit:5 https://prod-cdn.packages.k8s.io/repositories/1sv:/kubernetes:/core:/stable:/v1.26/deb InRelease
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages will be DOWNGRADED:
  kubect1 kubelet
0 upgraded, 0 newly installed, 2 downgraded, 0 to remove and 9 not upgraded.
E: Packages were downgraded and -y was used without --allow-downgrades.
ubuntu@ip-172-31-27-168:~$ sudo systemctl daemon-reload
ubuntu@ip-172-31-27-168:~$ sudo systemctl restart kubelet
```

```
ubuntu@ip-172-31-27-168:~$ exit
```

```
logout
```

```
Connection to 54.237.141.1 closed.
```

```
root@DESKTOP-THNIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# kubectl uncordon worker-0
```

```
node/worker-0 uncor'doned
```

```
root@DESKTOP-THNIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# kgn
NAME          STATUS    ROLES          AGE      VERSION
master        Ready     control-plane   135m     v1.26.14
worker-0      Ready     <none>          135m     v1.26.14
worker-1      Ready     <none>          134m     v1.25.16
root@DESKTOP-THNIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform#
```

• Worker-1 node

```
root@DESKTOP-THNIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# ssh -i /root/.ssh/id_rsa  
ubuntu@54.235.17.1
```

```
ubuntu@ip-172-31-22-157:~$ sudo apt-get update
```

```
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease
```

```
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease
```

```
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease
```

```
Hit:4 http://security.ubuntu.com/ubuntu bionic-security InRelease
```

```
Hit:5 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.25/deb InRelease
```

```
Reading package lists... Done
```

```
ubuntu@ip-172-31-22-157:~$ sudo apt-get install -y apt-transport-https ca-certificates curl
```

```
Reading package lists... Done
```

```
Building dependency tree
```

```
Reading state information... Done
```

```
ca-certificates is already the newest version (20230311ubuntu0.18.04.1).
```

```
curl is already the newest version (7.58.0-2ubuntu3.24).
```

```
apt-transport-https is already the newest version (1.6.17).
```

```
0 upgraded, 0 newly installed, 0 to remove and 9 not upgraded.
```

```
ubuntu@ip-172-31-22-157:~$ curl -fsSL https://pkgs.k8s.io/core:/stable:/v1.26/deb/Release.key | sudo gpg --dearmor -o /etc/apt/keyrings/kubernetes-apt-keyring.gpg
```

```
gpg: WARNING: unsafe ownership on homedir '/home/ubuntu/.gnupg'
```

```
File '/etc/apt/keyrings/kubernetes-apt-keyring.gpg' exists. Overwrite? (y/N) Y
```

```
ubuntu@ip-172-31-22-157:~$ echo 'deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg]  
https://pkgs.k8s.io/core:/stable:/v1.26/deb/ /' | sudo tee /etc/apt/sources.list.d/kubernetes.list
```

```
deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg] https://pkgs.k8s.io/core:/stable:/v1.26/deb/ /
```

```
ubuntu@ip-172-31-22-157:~$ sudo apt-get update
```

```
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease
```

```
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease
```

```
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease
```

```
Hit:4 http://security.ubuntu.com/ubuntu bionic-security InRelease
```

```
Get:5 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.26/deb InRelease [1192 B]
```

Get:6 <https://prod-cdn.packages.k8s.io/repositories/iscv:/kubernetes:/core:/stable:/v1.26/deb> Packages [20.8 kB]

Fetchd 22.0 kB in 1s (25.4 kB/s)

Reading package lists... Done

ubuntu@ip-172-31-22-157:~\$ **sudo apt-get install -y kubelet kubeadm kubectl**

Reading package lists... Done

Building dependency tree

Reading state information... Done

The following packages will be upgraded:

kubeadm kubectl kubelet

3 upgraded, 0 newly installed, 0 to remove and 9 not upgraded.

Need to get 41.0 MB of archives.

After this operation, 13.9 MB of additional disk space will be used.

Get:1 <https://prod-cdn.packages.k8s.io/repositories/iscv:/kubernetes:/core:/stable:/v1.26/deb> kubelet 1.26.14-1.1 [21.1 MB]

Get:2 <https://prod-cdn.packages.k8s.io/repositories/iscv:/kubernetes:/core:/stable:/v1.26/deb> kubectl 1.26.14-1.1 [10.1 MB]

Get:3 <https://prod-cdn.packages.k8s.io/repositories/iscv:/kubernetes:/core:/stable:/v1.26/deb> kubeadm 1.26.14-1.1 [9827 kB]

Fetchd 41.0 MB in 1s (45.0 MB/s)

(Reading database ... 58639 files and directories currently installed.)

Preparing to unpack .../kubelet_1.26.14-1.1_amd64.deb ...

Unpacking kubelet (1.26.14-1.1) over (1.25.16-1.1) ...

Preparing to unpack .../kubectl_1.26.14-1.1_amd64.deb ...

Unpacking kubectl (1.26.14-1.1) over (1.25.16-1.1) ...

Preparing to unpack .../kubeadm_1.26.14-1.1_amd64.deb ...

Unpacking kubeadm (1.26.14-1.1) over (1.25.16-1.1) ...

Setting up kubelet (1.26.14-1.1) ...

Setting up kubectl (1.26.14-1.1) ...

Setting up kubeadm (1.26.14-1.1) ...

```
ubuntu@ip-172-31-22-157:~$ sudo apt-mark hold kubelet kubeadm kubectl
kubelet set on hold.
kubeadm set on hold.
kubectl set on hold.
```

ubuntu@ip-172-31-22-157:~\$ **sudo apt-mark unhold kubeadm && sudo apt-get update && sudo apt-get install -y kubeadm=1.26.3-1.1 && sudo apt-mark hold kubeadm**

Canceled hold on kubeadm.

Hit:1 <http://us-east-1.ec2.archive.ubuntu.com/ubuntu/bionic/InRelease>

Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease

Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease

Hit:4 http://security.ubuntu.com/ubuntu bionic-security InRelease

Hit:5 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.26/deb InRelease

Reading package lists... Done

Reading package lists... Done

Building dependency tree

Reading state information... Done

The following packages will be DOWNGRADED:

kubeadm

0 upgraded, 0 newly installed, 1 downgraded, 0 to remove and 9 not upgraded.

E: Packages were downgraded and -y was used without --allow-downgrades.

ubuntu@ip-172-31-22-157:~\$ **sudo kubeadm upgrade node**

[upgrade] Reading configuration from the cluster...

[upgrade] FYI: You can look at this config file with 'kubectl -n kube-system get cm kubeadm-config -o yaml'

W0306 10:41:18.392392 24199 configset.go:177] error unmarshaling configuration schema.GroupVersionKind{Group:"kubeproxy.config.k8s.io", Version:"v1alpha1", Kind:"KubeProxyConfiguration"}: strict decoding error: unknown field "udpIdleTimeout"

[preflight] Running pre-flight checks

[preflight] Skipping prepull. Not a control plane node.

[upgrade] Skipping phase. Not a control plane node.

[kubelet-start] Writing kubelet configuration to file "/var/lib/kubelet/config.yaml"

[upgrade] The configuration for this node was successfully updated!

[upgrade] Now you should go ahead and upgrade the kubelet package using your package manager.

ubuntu@ip-172-31-22-157:~\$ **exit**

logout

Connection to 54.235.17.1 closed.

root@DESKTOP-THNIIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# **kubectl drain worker-1 --ignore-daemonsets**

node/worker-1 cordoned

Warning: ignoring DaemonSet-managed Pods: kube-system/calico-node-k9zck, kube-system/kube-proxy-z4b9x

evicting pod kube-system/coredns-565d847f94-6jzhn

evicting pod kube-system/calico-kube-controllers-74677b4c5f-cztd2

pod/calico-kube-controllers-74677b4c5f-cztd2 evicted

pod/coredns-565d847f94-6jzhn evicted

node/worker-1 drained

root@DESKTOP-THNIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# **ssh -i /root/.ssh/id_rsa ubuntu@54.235.17.1**

```
root@DESKTOP-THNIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# kgn
NAME        STATUS    ROLES    AGE     VERSION
master      Ready    control-plane  135m    v1.26.14
worker-0    Ready    <none>      135m    v1.26.14
worker-1    Ready    <none>      134m    v1.25.16
```

ubuntu@ip-172-31-22-157:~\$ **sudo apt-mark unhold kubelet kubectl && sudo apt-get update && sudo apt-get install -y kubelet=1.26.3-1.1 kubectl=1.26.3-1.1 && sudo apt-mark hold kubelet kubectl**

Canceled hold on kubelet.

Canceled hold on kubectl.

Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease

Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease

Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease

Hit:4 http://security.ubuntu.com/ubuntu bionic-security InRelease

Hit:5 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.26/deb InRelease

Reading package lists... Done

Reading package lists... Done

Building dependency tree

Reading state information... Done

The following packages will be DOWNGRADED:

kubectl kubelet

0 upgraded, 0 newly installed, 2 downgraded, 0 to remove and 9 not upgraded.

E: Packages were downgraded and -y was used without --allow-downgrades.

ubuntu@ip-172-31-22-157:~\$ **sudo systemctl daemon-reload**

ubuntu@ip-172-31-22-157:~\$ **sudo systemctl restart kubelet**

ubuntu@ip-172-31-22-157:~\$ **exit**

logout

Connection to 54.235.17.1 closed.


```
root@DESKTOP-THNIIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# kubectl
uncordon worker-1
```

```
node/worker-1 uncordoned
```

- **Verify Cluster Upgrade**

```
root@DESKTOP-THNIIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# kgn
NAME        STATUS    ROLES    AGE      VERSION
master      Ready     control-plane  158m    v1.26.14
worker-0    Ready     <none>      158m    v1.26.14
worker-1    Ready     <none>      158m    v1.26.14
```

From the master node, you can use any one of the following kubectl commands to check the status of all the cluster components.

```
root@DESKTOP-THNIIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# kubectl get --raw='/readyz?verbose'
[+]ping ok
[+]log ok
[+]etcd ok
[+]etcd-readiness ok
[+]informer-sync ok
[+]poststarthook/start-kube-apiserver-admission-initializer ok
[+]poststarthook/generic-apiserver-start-informers ok
[+]poststarthook/priority-and-fairness-config-consumer ok
[+]poststarthook/priority-and-fairness-filter ok
[+]poststarthook/storage-object-count-tracker-hook ok
[+]poststarthook/start-apiextensions-informers ok
[+]poststarthook/start-apiextensions-controllers ok
[+]poststarthook/crd-informer-synced ok
[+]poststarthook/bootstrap-controller ok
[+]poststarthook/rbac/bootstrap-roles ok
[+]poststarthook/scheduling/bootstrap-system-priority-classes ok
[+]poststarthook/priority-and-fairness-config-producer ok
[+]poststarthook/start-cluster-authentication-info-controller ok
[+]poststarthook/aggregator-reload-proxy-client-cert ok
[+]poststarthook/start-kube-aggregator-informers ok
[+]poststarthook/apiservice-registration-controller ok
[+]poststarthook/apiservice-status-available-controller ok
[+]poststarthook/kube-apiserver-autoregistration ok
[+]autoregister-completion ok
[+]poststarthook/apiservice-openapi-controller ok
[+]poststarthook/apiservice-openapi3-controller ok
[+]shutdown ok
readyz check passed
```

Also, check if all the kube-system control node pods are running.

```
root@DESKTOP-THNIIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform# kubectl get po -n kube-system
NAME                                READY    STATUS    RESTARTS   AGE
calico-kube-controllers-74677b4c5f-fpft2  1/1      Running   0           3m7s
calico-node-22lc9                      1/1      Running   0          157m
calico-node-7mp4s                      1/1      Running   0          157m
calico-node-k9zck                      1/1      Running   0          157m
coredns-565d847f94-svqz7              1/1      Running   0           3m7s
coredns-565d847f94-vrxwz              1/1      Running   0           26m
etcd-master                           1/1      Running   1 (61m ago) 60m
kube-apiserver-master                  1/1      Running   1 (61m ago) 60m
kube-controller-manager-master         1/1      Running   0           60m
kube-proxy-drfls                      1/1      Running   0          159m
kube-proxy-f8gvm                      1/1      Running   0          159m
kube-proxy-z4b9x                      1/1      Running   0          158m
kube-scheduler-master                 1/1      Running   0           59m
root@DESKTOP-THNIIIG3:/mnt/c/Users/Admin/Desktop/TERRAFORM/K8S/k8sCluster_kubeadm_terraform#
```