Lesson 02 Demo 08

Upgrading the Kubernetes Version of a Control Plane

Objective: To update the Kubernetes control plane and worker node to version v1.30.4 and confirm the success of the upgrade by deploying a test pod

Tools required: kubeadm, kubectl, kubelet, and containerd

Prerequisites: A Kubernetes cluster (refer to Demo 01 from Lesson 01 for setting up a cluster)

Steps to be followed:

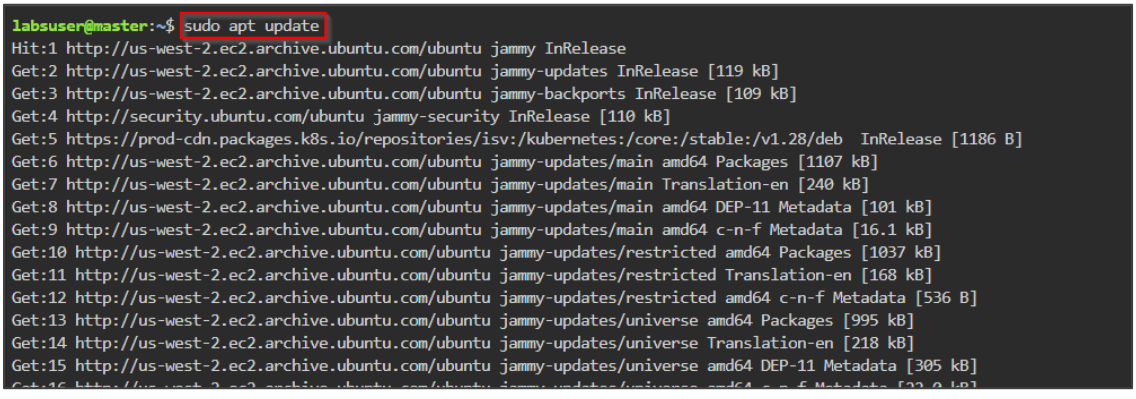
1. Upgrade the control plane
2. Upgrade the worker node
3. Validate the cluster upgrade by creating a pod

Step 1: Upgrade the control plane

1.1 Execute the following command to update the control plane:

sudo apt update

apt-cache madison kubeadm



```
Get:26 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 c-n-f Metadata [19.3 kB]
Fetched 13.4 MB in 6s (2406 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
390 packages can be upgraded. Run 'apt list --upgradable' to see them.
labsuser@master:~$ apt-cache madison kubeadm
   kubeadm | 1.30.5-1.1 | https://pkgs.k8s.io/core:/stable:/v1.30/deb  Packages
   kubeadm | 1.30.4-1.1 | https://pkgs.k8s.io/core:/stable:/v1.30/deb  Packages
   kubeadm | 1.30.3-1.1 | https://pkgs.k8s.io/core:/stable:/v1.30/deb  Packages
   kubeadm | 1.30.2-1.1 | https://pkgs.k8s.io/core:/stable:/v1.30/deb  Packages
   kubeadm | 1.30.1-1.1 | https://pkgs.k8s.io/core:/stable:/v1.30/deb  Packages
   kubeadm | 1.30.0-1.1 | https://pkgs.k8s.io/core:/stable:/v1.30/deb  Packages
labsuser@master:~$
```

Note: Choose the latest version from the output. In this case, pick version 1.30.3-1.1 for the upgrade

1.2 Install the latest version of kubeadm using the following commands:

sudo apt-mark unhold kubeadm

sudo apt-get update

sudo apt-get install -y kubeadm=' 1.30.3-1.1'

sudo apt-mark hold kubeadm

```
labsuser@master:~$ sudo apt-mark unhold kubeadm
Canceled hold on kubeadm.
labsuser@master:~$ sudo apt-get update
Hit:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Hit:3 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Hit:5 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.30/deb  InRelease
Hit:6 https://ppa.launchpadcontent.net/mozillateam/ppa/ubuntu jammy InRelease
Fetched 257 kB in 1s (206 kB/s)
Reading package lists... Done
labsuser@master:~$ sudo apt-get install -y kubeadm=' 1.30.3-1.1'
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Package kubeadm is not available, but is referred to by another package.
This may mean that the package is missing, has been obsoleted, or
is only available from another source

E: Version '' for 'kubeadm' was not found
E: Unable to locate package 1.30.3-1.1'
E: Couldn't find any package by glob '1.30.3-1.1''
E: Couldn't find any package by regex '1.30.3-1.1''
labsuser@master:~$ sudo apt-mark hold kubeadm
kubeadm set on hold.
labsuser@master:~$
```

1.3 Enter the following command to check the kubeadm version:

kubeadm version

```
labsuser@master:~$ kubeadm version
kubeadm version: &version.Info{Major:"1", Minor:"30", GitVersion:"v1.30.4", GitCommit:"a51b3b711150f57ffc1f526a640ec058514ed596", GitTreeState:"clean", BuildDate:"2024-08-14T19:02:46Z", GoVersion:"go1.22.5", Compiler:"gc", Platform:"linux/amd64"}
labsuser@master:~$
```

1.4 Run the following command to upgrade the plan:

sudo kubeadm upgrade plan

```
labsuser@master:~$ sudo kubeadm upgrade plan
[preflight] Running pre-flight checks.
[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'
[upgrade] Running cluster health checks
[upgrade] Fetching available versions to upgrade to
[upgrade/versions] Cluster version: 1.30.5
[upgrade/versions] kubeadm version: v1.30.4
I0925 09:01:44.216508   60279 version.go:256] remote version is much newer: v1.31.1; falling back to: stable-1.30
[upgrade/versions] Target version: v1.30.5
[upgrade/versions] Latest version in the v1.30 series: v1.30.5

labsuser@master:~$
```

1.5 Execute the following command to apply the upgrade and enter **y** to proceed:

sudo kubeadm upgrade apply v1.30.5 --force

```
labsuser@master:~$ sudo kubeadm upgrade apply v1.30.5 --force
[preflight] Running pre-flight checks.
[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'
[upgrade] Running cluster health checks
[upgrade/version] You have chosen to change the cluster version to "v1.30.5"
[upgrade/versions] Cluster version: v1.30.5
[upgrade/versions] kubeadm version: v1.30.4
[upgrade/version] Found 1 potential version compatibility errors but skipping since the --force flag is set:

        - Specified version to upgrade to "v1.30.5" is higher than the kubeadm version "v1.30.4". Upgrade kubeadm first using the tool you used to install kubeadm
[upgrade/prepull] Pulling images required for setting up a Kubernetes cluster
[upgrade/prepull] This might take a minute or two, depending on the speed of your internet connection
[upgrade/prepull] You can also perform this action in beforehand using 'kubeadm config images pull'
W0925 09:05:36.548065   62907 checks.go:844] detected that the sandbox image "k8s.gcr.io/pause:3.6" of the container runtime is inconsistent with that used by kubeadm.It is recommended to use "registry.k8s.io/pause:3.9" as the CRI sandbox image.
[upgrade/apply] Upgrading your Static Pod-hosted control plane to version "v1.30.5" (timeout: 5m0s)...
[upgrade/etcd] Upgrading to TLS for etcd
[upgrade/staticpods] Preparing for "etcd" upgrade
[upgrade/staticpods] Current and new manifests of etcd are equal, skipping upgrade
[upgrade/etcd] Waiting for etcd to become available
[upgrade/staticpods] Writing new Static Pod manifests to "/etc/kubernetes/tmp/kubeadm-upgraded-manifests1777999257"
[upgrade/staticpods] Preparing for "kube-apiserver" upgrade
[upgrade/staticpods] Current and new manifests of kube-apiserver are equal, skipping upgrade
[upgrade/staticpods] Preparing for "kube-controller-manager" upgrade
[upgrade/staticpods] Current and new manifests of kube-controller-manager are equal, skipping upgrade
[upgrade/staticpods] Preparing for "kube-scheduler" upgrade
```

```
[upgrade/staticpods] Current and new manifests of kube-scheduler are equal, skipping upgrade
[upload-config] Storing the configuration used in ConfigMap "kubeadm-config" in the "kube-system" Namespace
[kubelet] Creating a ConfigMap "kubelet-config" in namespace kube-system with the configuration for the kubelets in the cluster
[upgrade] Backing up kubelet config file to /etc/kubernetes/tmp/kubeadm-kubelet-config3078923608/config.yaml
[kubelet-start] Writing kubelet configuration to file "/var/lib/kubelet/config.yaml"
[bootstrap-token] Configured RBAC rules to allow Node Bootstrap tokens to get nodes
[bootstrap-token] Configured RBAC rules to allow Node Bootstrap tokens to post CSRs in order for nodes to get long term certificate credentials
[bootstrap-token] Configured RBAC rules to allow the csrapprover controller automatically approve CSRs from a Node Bootstrap Token
[bootstrap-token] Configured RBAC rules to allow certificate rotation for all node client certificates in the cluster
[addons] Applied essential addon: CoreDNS
[addons] Applied essential addon: kube-proxy

[upgrade/successful] SUCCESS! Your cluster was upgraded to "v1.30.5". Enjoy!

[upgrade/kubelet] Now that your control plane is upgraded, please proceed with upgrading your kubelets if you haven't already done so.
labsuser@master:~$
```

1.6 Run the following command to ignore DaemonSets:

kubectl drain master.example.com --ignore-daemonsets

```
[upgrade/kubelet] Now that your control plane is upgraded, please proceed with upgrading your kubelets if you haven't already done so.
labsuser@master:~$ kubectl drain master.example.com --ignore-daemonsets
node/master.example.com cordoned
Warning: ignoring DaemonSet-managed Pods: kube-system/calico-node-dcmv8, kube-system/kube-proxy-q8twm
evicting pod kube-system/calico-kube-controllers-5b9b456c66-tgbsl
evicting pod kube-system/coredns-7db6d8ff4d-gn852
evicting pod kube-system/coredns-7db6d8ff4d-b6bjr
pod/calico-kube-controllers-5b9b456c66-tgbsl evicted
pod/coredns-7db6d8ff4d-gn852 evicted
pod/coredns-7db6d8ff4d-b6bjr evicted
node/master.example.com drained
labsuser@master:~$
```

1.7 Run the following commands to install kubectl:

sudo apt-mark unhold kubelet kubectl

sudo apt-get update

sudo apt-get install -y kubelet='1.30.5-1.1' kubectl='1.30.5-1.1'

sudo apt-mark hold kubelet kubectl

```
labsuser@master:~$ sudo apt-mark unhold kubelet kubectl
sudo apt-get update
sudo apt-get install -y kubelet='1.30.5-1.1' kubectl='1.30.5-1.1'
sudo apt-mark hold kubelet kubectl
Canceled hold on kubelet.
Canceled hold on kubectl.
Hit:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:5 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:4 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.30/deb  InRelease
Hit:6 https://ppa.launchpadcontent.net/mozillateam/ppa/ubuntu jammy InRelease
Reading package lists... Done
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  ebtables socat
Use 'sudo apt autoremove' to remove them.
The following packages will be upgraded:
  kubectl kubelet
2 upgraded, 0 newly installed, 0 to remove and 388 not upgraded.
Need to get 28.9 MB of archives.
After this operation, 4096 B of additional disk space will be used.
```

```
Get:1 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.30/deb  kubectl 1.30.5-1.1 [10.8 MB]
Get:2 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.30/deb  kubelet 1.30.5-1.1 [18.1 MB]
Fetched 28.9 MB in 1s (46.8 MB/s)
(Reading database ... 218319 files and directories currently installed.)
Preparing to unpack .../kubectl_1.30.5-1.1_amd64.deb ...
Unpacking kubectl (1.30.5-1.1) over (1.30.4-1.1) ...
Preparing to unpack .../kubelet_1.30.5-1.1_amd64.deb ...
Unpacking kubelet (1.30.5-1.1) over (1.30.4-1.1) ...
Setting up kubectl (1.30.5-1.1) ...
Setting up kubelet (1.30.5-1.1) ...
Scanning processes...
Scanning candidates...
Scanning linux images...

Running kernel seems to be up-to-date.

Restarting services...
 systemctl restart kubelet.service

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
kubelet set on hold.
kubectl set on hold.
labsuser@master:~$
```

1.8 Run the following command to get nodes:

kubectl get nodes

```
labsuser@master:~$ kubectl get nodes
NAME                      STATUS                     ROLES           AGE    VERSION
master.example.com        Ready,SchedulingDisabled   control-plane   102m   v1.30.5
worker-node-1.example.com Ready                      <none>          99m    v1.30.4
worker-node-2.example.com Ready                      <none>          99m    v1.30.4
labsuser@master:~$
```

1.9 Enter the following commands to restart the kubelet:

sudo systemctl daemon-reload

sudo systemctl restart kubelet

```
labsuser@master:~$ kubectl get nodes
NAME                      STATUS                     ROLES           AGE    VERSION
master.example.com        Ready,SchedulingDisabled   control-plane   104m   v1.30.5
worker-node-1.example.com Ready                      <none>          101m   v1.30.4
worker-node-2.example.com Ready                      <none>          101m   v1.30.4
labsuser@master:~$ sudo systemctl daemon-reload
labsuser@master:~$ sudo systemctl restart kubelet
labsuser@master:~$
```

1.10 Execute the following commands to get nodes:

kubectl uncordon master.example.com

kubectl get nodes

```
labsuser@master:~$ kubectl get nodes
NAME                      STATUS   ROLES           AGE    VERSION
master.example.com        Ready    control-plane   114m   v1.30.5
worker-node-1.example.com Ready    <none>          111m   v1.30.4
worker-node-2.example.com Ready    <none>          112m   v1.30.4
labsuser@master:~$ kubectl uncordon master.example.com
node/master.example.com already uncordoned
labsuser@master:~$ kubectl get nodes
NAME                      STATUS   ROLES           AGE    VERSION
master.example.com        Ready    control-plane   115m   v1.30.5
worker-node-1.example.com Ready    <none>          112m   v1.30.4
worker-node-2.example.com Ready    <none>          112m   v1.30.4
labsuser@master:~$
```

Step 2: Upgrade the worker node

2.1 Run the following command to update worker-node-1:

sudo apt-get update

```
labsuser@worker-node-1:~$ sudo apt-get update
Hit:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:3 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [109 kB]
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:5 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.28/deb  InRelease [1186 B]
Get:6 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [1107 kB]
Get:7 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [240 kB]
Get:8 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 DEP-11 Metadata [101 kB]
Get:9 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [16.1 kB]
Get:10 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [1037 kB]
Get:11 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [168 kB]
Get:12 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 c-n-f Metadata [536 B]
Get:13 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [995 kB]
Get:14 https://ppa.launchpadcontent.net/mozillateam/ppa/ubuntu jammy InRelease [23.8 kB]
Get:15 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [218 kB]
```

2.2 Run the following commands to install the latest version of kubeadm:

sudo apt-mark unhold kubeadm

sudo apt-get update

sudo apt-get install -y kubeadm='1.30.5-1.1'

sudo apt-mark hold kubeadm

```
labsuser@master:~$ sudo apt-mark unhold kubeadm
sudo apt-get update
sudo apt-get install -y kubeadm='1.30.5-1.1'
sudo apt-mark hold kubeadm
Canceled hold on kubeadm.
Hit:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:5 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:4 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.30/deb  InRelease
Hit:6 https://ppa.launchpadcontent.net/mozillateam/ppa/ubuntu jammy InRelease
Reading package lists... Done
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
```

2.3 Run the following command to get the version:

kubeadm version

```
labsuser@master:~$ kubeadm version
kubeadm version: &version.Info{Major:"1", Minor:"30", GitVersion:"v1.30.4", GitCommit:"a51b3b711150f57ffc1f526a640ec058514ed596", GitTreeState:"clean", BuildDate:"2024-08-14T19:02:46Z", GoVersion:"go1.22.5", Compiler:"gc", Platform:"linux/amd64"}
labsuser@master:~$
```

2.4 Run the following command to upgrade the node:

sudo kubeadm upgrade node

```
labsuser@master:~$ kubeadm version
kubeadm version: &version.Info{Major:"1", Minor:"30", GitVersion:"v1.30.5", GitCommit:"74e84a90c725047b1328ff3d589fedb1cb7a120e", GitTreeState:"clean", BuildDate:"2024-09-12T00:17:07Z", GoVersion:"go1.22.6", Compiler:"gc", Platform:"linux/amd64"}
labsuser@master:~$ 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'
[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'
W0925 09:48:40.646759   87386 checks.go:844] detected that the sandbox image "k8s.gcr.io/pause:3.6" of the container runtime is inconsistent with that used by kubeadm.It is recommended to use "registry.k8s.io/pause:3.9" as the CRI sandbox image.
[upgrade] Upgrading your Static Pod-hosted control plane instance to version "v1.30.5"...
[upgrade/etcd] Upgrading to TLS for etcd
[upgrade/staticpods] Preparing for "etcd" upgrade
[upgrade/staticpods] Renewing etcd-server certificate
[upgrade/staticpods] Renewing etcd-peer certificate
[upgrade/staticpods] Renewing etcd-healthcheck-client certificate
[upgrade/staticpods] Moved new manifest to "/etc/kubernetes/manifests/etcd.yaml" and backed up old manifest to "/etc/kubernetes/tmp/kubeadm-backup-manifests-2024-09-25-09-48-47/etcd.yaml"
[upgrade/staticpods] Waiting for the kubelet to restart the component
[upgrade/staticpods] This can take up to 5m0s
[apiclient] Found 1 Pods for label selector component=etcd
[upgrade/staticpods] Component "etcd" upgraded successfully!
```

2.5 Run the following command to delete pods:

kubectl drain worker-node-1.example.com --ignore-daemonsets --delete-emptydir-data

```
labsuser@master:~$ kubectl drain worker-node-1.example.com --ignore-daemonsets --delete-emptydir-data
node/worker-node-1.example.com cordoned
error: unable to drain node "worker-node-1.example.com" due to error:cannot delete Pods declare no controller (use --force to override): default/tes
t-pod, continuing command...
There are pending nodes to be drained:
 worker-node-1.example.com
cannot delete Pods declare no controller (use --force to override): default/test-pod
labsuser@master:~$
```

> **Note:** If you encounter an error stating that some pods cannot be deleted, use the **--force** option to override the deletion

2.6 Run the following commands to drain worker-node-1:

kubectl get nodes

kubectl drain worker-node-1.example.com --ignore-daemonsets --delete-emptydir-data --force

```
labsuser@master:~$ kubectl get nodes
NAME                     STATUS   ROLES           AGE   VERSION
master.example.com       Ready    control-plane   19h   v1.30.4
worker-node-1.example.com   Ready    <none>          19h   v1.30.4
worker-node-2.example.com   Ready    <none>          19h   v1.30.4
labsuser@master:~$ kubectl drain worker-node-1.example.com --ignore-daemonsets --delete-emptydir-data --force
node/worker-node-1.example.com cordoned
Warning: deleting Pods that declare no controller: default/myapp-pod; ignoring DaemonSet-managed Pods: kube-system/calico-node-jt9ls, kube-system/kube-proxy-kxpcw
evicting pod vote/vote-69cb46f6fb-88cw2
evicting pod default/wordpress-9b874c79f-fpt9r
evicting pod default/myapp-pod
evicting pod kubernetes-dashboard/dashboard-metrics-scraper-795895d745-7pj8j
evicting pod vote/result-d8c4c69b8-mtvsr
pod/result-d8c4c69b8-mtvsr evicted
pod/vote-69cb46f6fb-88cw2 evicted
pod/dashboard-metrics-scraper-795895d745-7pj8j evicted
pod/wordpress-9b874c79f-fpt9r evicted
pod/myapp-pod evicted
node/worker-node-1.example.com drained
labsuser@master:~$
```

2.7 Install the latest versions of kubelet and kubectl using the following commands:

sudo apt-mark unhold kubelet kubectl

sudo apt-get update

sudo apt-get install -y kubelet='1.30.5-1.1' kubectl='1.30.5-1.1'

sudo apt-mark hold kubelet kubectl

```
labsuser@master:~$ sudo apt-mark unhold kubelet kubectl
sudo apt-get update
sudo apt-get install -y kubelet='1.30.5-1.1' kubectl='1.30.5-1.1'
sudo apt-mark hold kubelet kubectl
Canceled hold on kubelet.
Canceled hold on kubectl.
Hit:1 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://us-west-2.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:5 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.30/deb  InRelease
Hit:6 https://ppa.launchpadcontent.net/mozillateam/ppa/ubuntu jammy InRelease
Reading package lists... Done
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
kubectl is already the newest version (1.30.5-1.1).
kubelet is already the newest version (1.30.5-1.1).
The following packages were automatically installed and are no longer required:
  ebtables socat
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 387 not upgraded.
kubelet set on hold.
kubectl set on hold.
labsuser@master:~$
```

2.8 Enter the following commands to restart kubelet:

sudo systemctl daemon-reload

sudo systemctl restart kubelet

```
No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
kubelet set on hold.
kubectl set on hold.
labsuser@worker-node-1:~$ sudo systemctl daemon-reload
sudo systemctl restart kubelet
labsuser@worker-node-1:~$
```

2.9 On the master node, enter the following commands:

kubectl get nodes

kubectl uncordon worker-node-1.example.com

```
labsuser@master:~$ kubectl get nodes
NAME                      STATUS   ROLES           AGE   VERSION
master.example.com        Ready    control-plane   19h   v1.30.4
worker-node-1.example.com Ready    <none>          19h   v1.30.4
worker-node-2.example.com Ready    <none>          19h   v1.30.4
```

```
labsuser@master:~$ kubectl uncordon worker-node-1.example.com
node/worker-node-1.example.com uncordoned
labsuser@master:~$
```

The cluster and worker nodes are now successfully upgraded to v1.30.5.

Step 3: Validate the cluster upgrade by creating a pod

3.1 Deploy a test pod and view the deployed pods using the following commands:

kubectl run test-pod --image nginx --port 80

kubectl get pods -o wide

```
labsuser@master:~$ kubectl run test-pod --image nginx --port 80
pod/test-pod created
labsuser@master:~$ kubectl get pods -o wide
NAME                                READY   STATUS             RESTARTS      AGE   IP               NODE                        NOMINATED NODE   READINESS GATES
myapp-pod                           0/1     Init:1/2           3             6d1h  192.168.232.209  worker-node-2.example.com   <none>           <none>
nginx-deployment-b456ffb5d-dr78w    1/1     Running            0             5m3s  192.168.232.216  worker-node-2.example.com   <none>           <none>
nginx-deployment-b456ffb5d-mbscd    1/1     Running            4 (76m ago)   7d5h  192.168.232.213  worker-node-2.example.com   <none>           <none>
openshift                           0/1     ImagePullBackOff   0             2d    192.168.232.210  worker-node-2.example.com   <none>           <none>
php-apache-c5c66c46f-vv7m7          1/1     Running            0             5m3s  192.168.232.218  worker-node-2.example.com   <none>           <none>
redis-cache-75f6c65696-fsgqg        0/1     Pending            0             11m   <none>           <none>                      <none>           <none>
redis-cache-75f6c65696-n9pwc        1/1     Running            0             5m3s  192.168.47.157   worker-node-1.example.com   <none>           <none>
redis-cache-75f6c65696-zsjlp        1/1     Running            1 (76m ago)   2d2h  192.168.232.208  worker-node-2.example.com   <none>           <none>
test-pod                            1/1     Running            0             6s    192.168.47.159   worker-node-1.example.com   <none>           <none>
web-server-7d5c766889-cdslz         0/1     Pending            0             5m3s  <none>           <none>                      <none>           <none>
web-server-7d5c766889-gc6zf         1/1     Running            0             11m   192.168.47.158   worker-node-1.example.com   <none>           <none>
web-server-7d5c766889-v8md9         1/1     Running            1 (76m ago)   2d2h  192.168.232.211  worker-node-2.example.com   <none>           <none>
with-node-affinity                  1/1     Running            1 (76m ago)   2d4h  192.168.232.207  worker-node-2.example.com   <none>           <none>
labsuser@master:~$
```

By following these steps, you have successfully navigated the process of upgrading the Kubernetes control plane and worker nodes to version v1.30.5.