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QUESTION 1

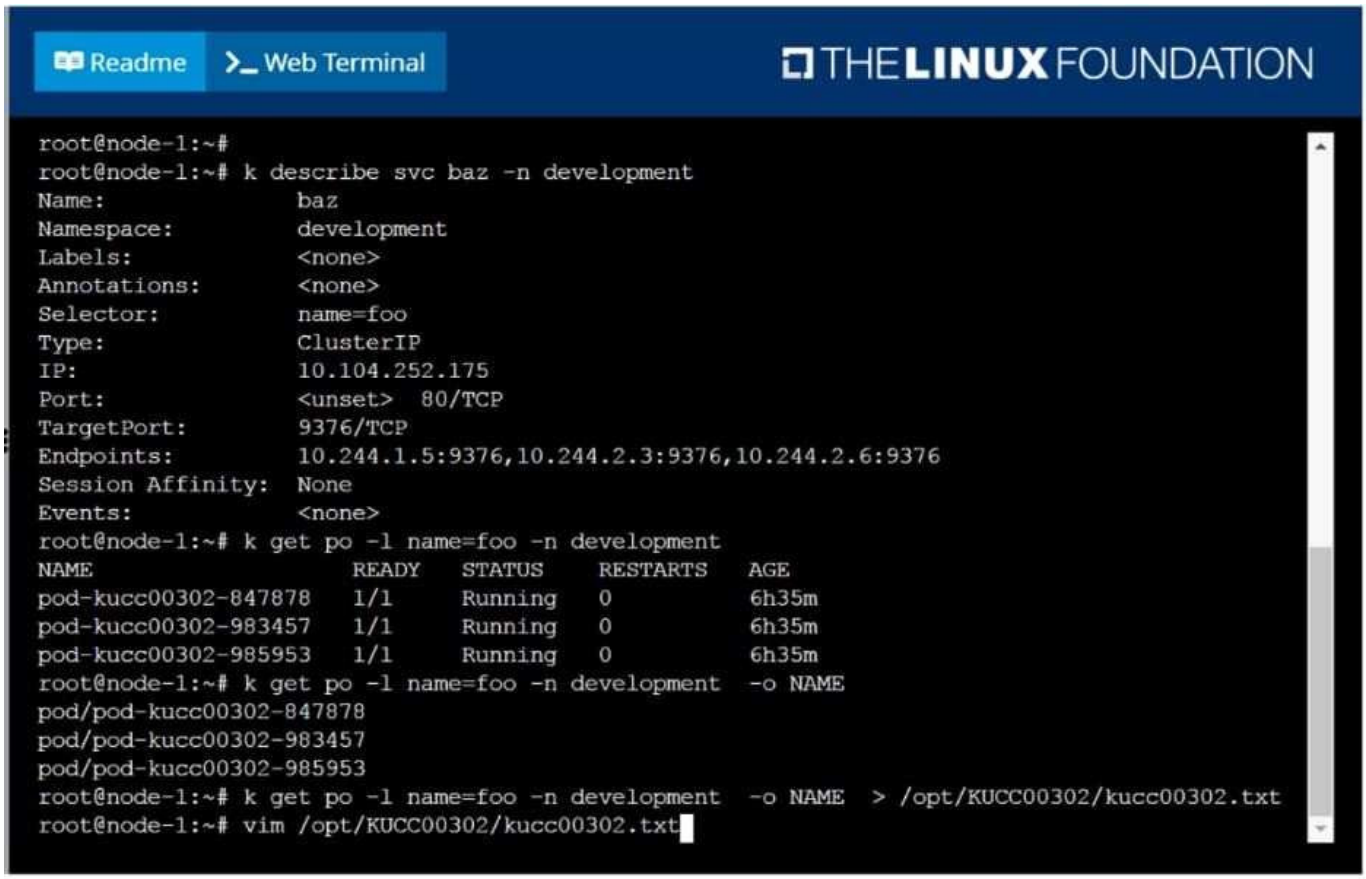
SIMULATION

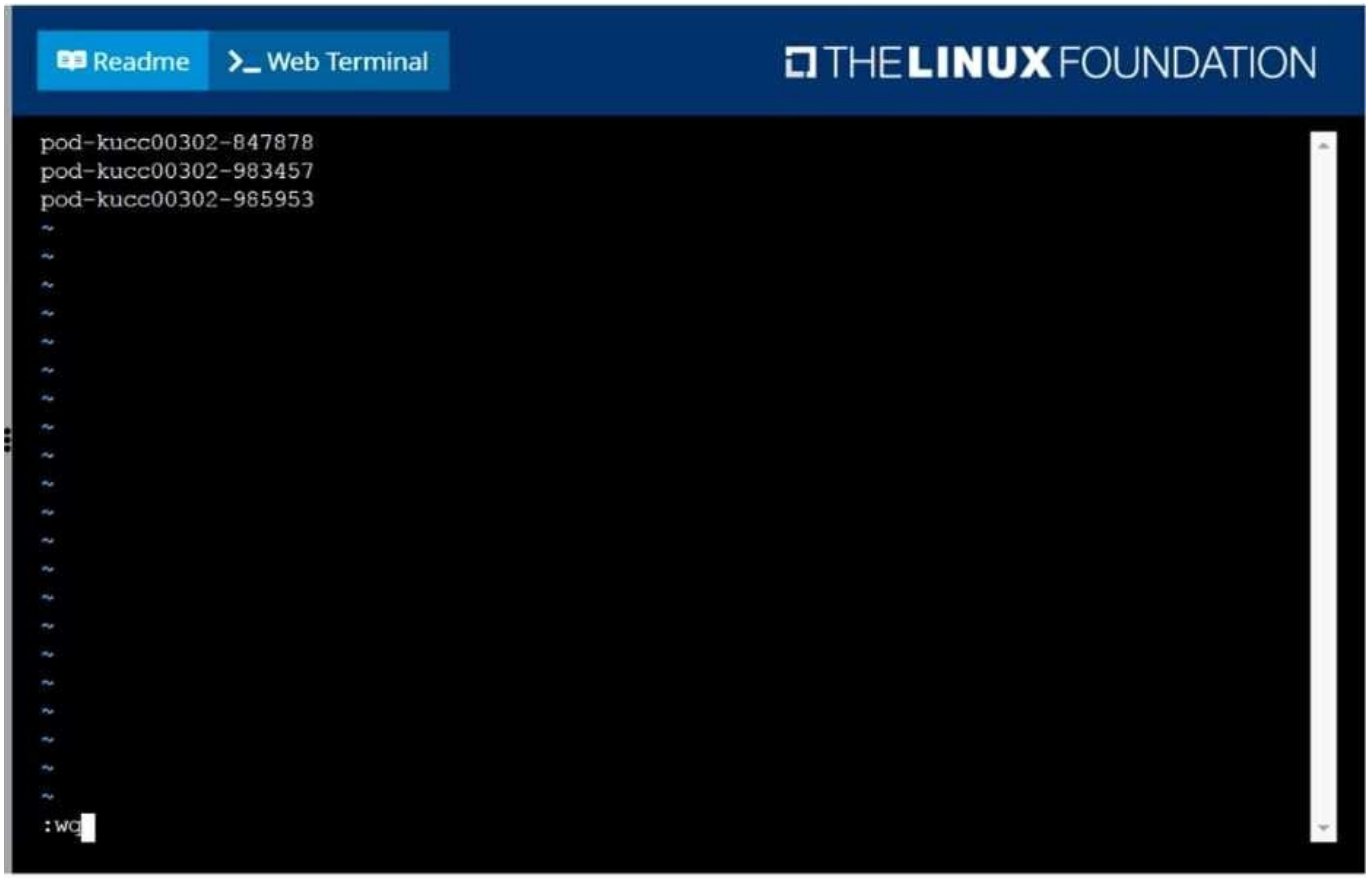
Create a file:

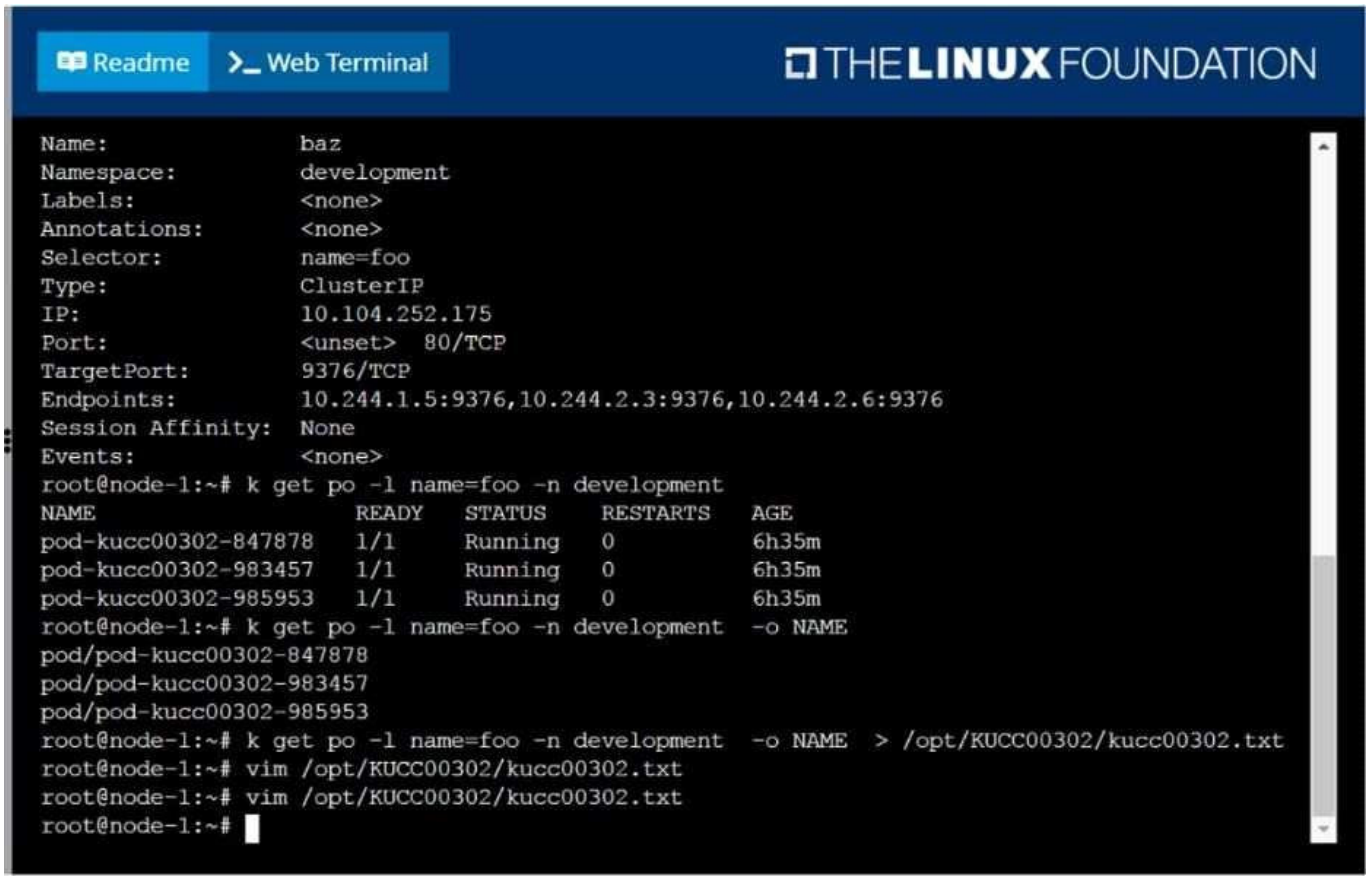
/opt/KUCC00302/kucc00302.txt that lists all pods that implement service baz in namespace development.

The format of the file should be one pod name per line.

Correct Answer: Check the answer in explanation.




Readme
Web Terminal
THE LINUX FOUNDATION
pod-kucc00302-847878
pod-kucc00302-983457
pod-kucc00302-985953
:wq


Readme
Web Terminal
THE LINUX FOUNDATION
Name: baz
Namespace: development
Labels: <none>
Annotations: <none>
Selector: name=foo
Type: ClusterIP
IP: 10.104.252.175
Port: <unset> 80/TCP
TargetPort: 9376/TCP
Endpoints: 10.244.1.5:9376,10.244.2.3:9376,10.244.2.6:9376
Session Affinity: None
Events: <none>
root@node-1:~# k get po -l name=foo -n development
NAME READY STATUS RESTARTS AGE
pod-kucc00302-847878 1/1 Running 0 6h35m
pod-kucc00302-983457 1/1 Running 0 6h35m
pod-kucc00302-985953 1/1 Running 0 6h35m
root@node-1:~# k get po -l name=foo -n development -o NAME
pod/pod-kucc00302-847878
pod/pod-kucc00302-983457
pod/pod-kucc00302-985953
root@node-1:~# k get po -l name=foo -n development -o NAME > /opt/KUCC00302/kucc00302.txt
root@node-1:~# vim /opt/KUCC00302/kucc00302.txt
root@node-1:~# vim /opt/KUCC00302/kucc00302.txt
root@node-1:~#

QUESTION 2

Create a pod with environment variables as var1=value1.Check the environment variable in pod

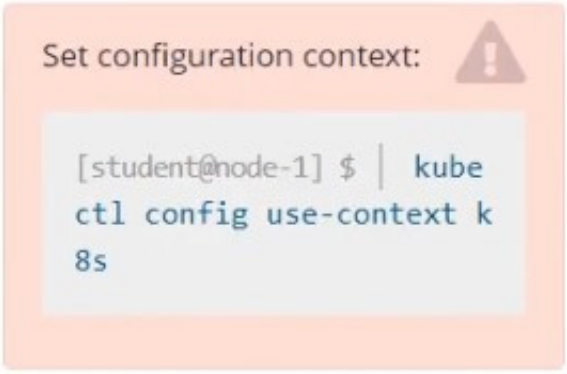
Correct Answer: Check the answer in explanation.

Solution

kubectl run nginx --image=nginx --restart=Never --env=var1=value1 # then kubectl exec -it nginx -- env # or kubectl exec -it nginx -- sh -c \\'echo $var1\\' # or kubectl describe po nginx | grep value1

QUESTION 3

SIMULATION



Task

Create a new nginx Ingress resource as follows:

1.

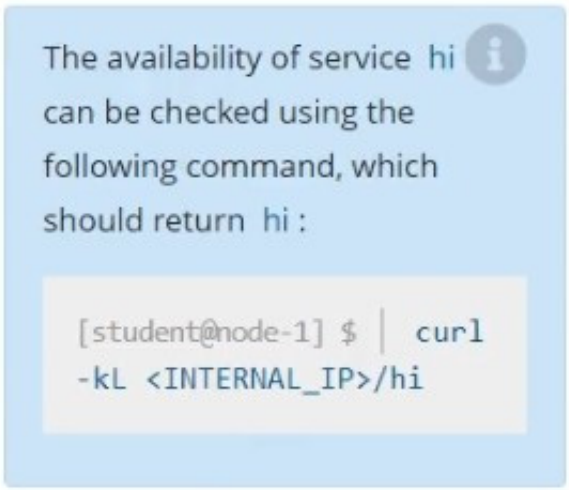
Name: ping

2.

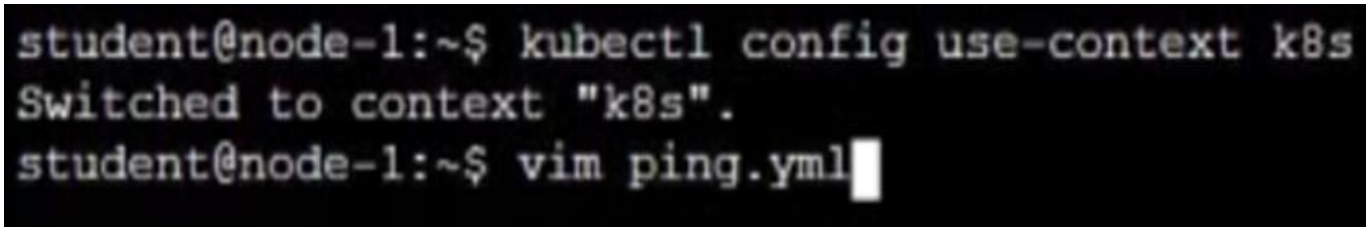
Namespace: ing-internal

3.

Exposing service hi on path /hi using service port 5678



Correct Answer: Check the answer in explanation.



QUESTION 4

Create a busybox pod and add "sleep 3600" command

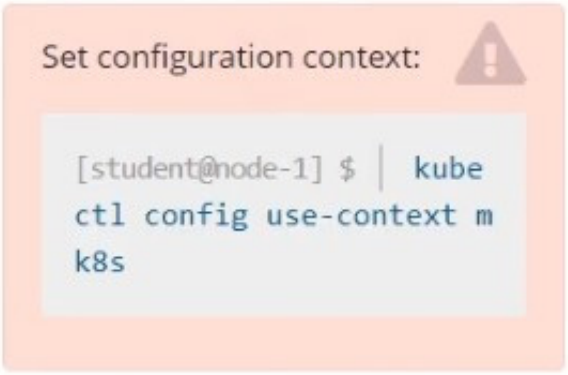
Correct Answer: Check the answer in explanation.

Solution

kubectl run busybox --image=busybox --restart=Never -- /bin/sh -c "sleep 3600"

QUESTION 5

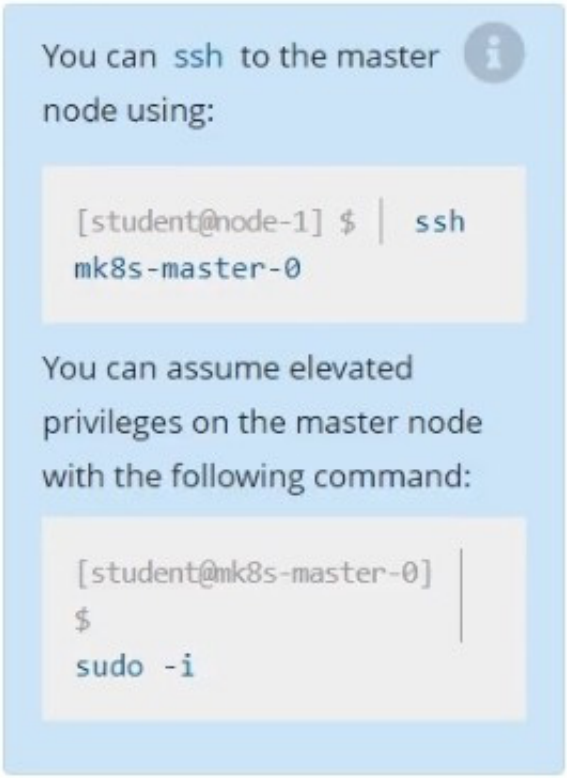
SIMULATION



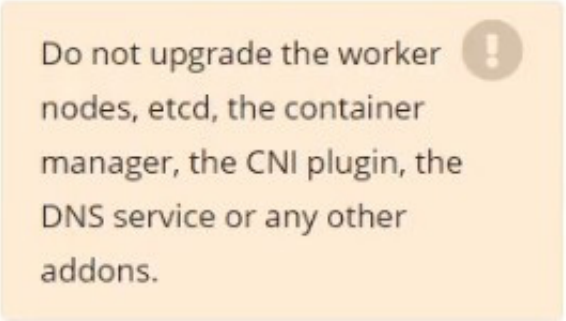
Task

Given an existing Kubernetes cluster running version 1.20.0, upgrade all of the Kubernetes control plane and node components on the master node only to version 1.20.1.

Be sure to drain the master node before upgrading it and uncordon it after the upgrade.



You are also expected to upgrade kubelet and kubectl on the master node.



Correct Answer: Check the answer in explanation.

```
student@node-1:~$ kubectl config use-context mk8s
Switched to context "mk8s".
student@node-1:~$ kubectl config use-context mk8s
Switched to context "mk8s".
student@node-1:~$ kubectl get nodes
NAME           STATUS   ROLES                  AGE   VERSION
mk8s-master-0  Ready    control-plane,master   67d   v1.22.1
mk8s-node-0    Ready    <none>                 67d   v1.22.1
student@node-1:~$ kubectl drain mk8s-master-0 --ignore-daemonsets
node/mk8s-master-0 cordoned
WARNING: ignoring DaemonSet-managed Pods: kube-system/kube-flannel-ds-jxzmk, kube-system/kube-proxy-9rzg9
evicting pod kube-system/coredns-78fcd69978-tt2b8
evicting pod default/nginx-74b46d4cfc-dfkvs
evicting pod kube-system/coredns-78fcd69978-nbkmz
pod/nginx-74b46d4cfc-dfkvs evicted
pod/coredns-78fcd69978-tt2b8 evicted
pod/coredns-78fcd69978-nbkmz evicted
node/mk8s-master-0 drained
student@node-1:~$ kubectl get nodes
NAME           STATUS                     ROLES                  AGE   VERSION
mk8s-master-0  Ready,SchedulingDisabled   control-plane,master   67d   v1.22.1
mk8s-node-0    Ready                      <none>                 67d   v1.22.1
student@node-1:~$ ssh mk8s-master-0
Warning: Permanently added '10.250.5.55' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.11.0-1028-aws x86_64)

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

  System information as of Mon Apr 25 09:30:48 UTC 2022

  System load:  1.98               Users logged in:          0
  Usage of /:   83.2% of 67.79GB   IPv4 address for cni0:    10.244.0.1
  Memory usage: 2%                 IPv4 address for docker0: 172.17.0.1
  Swap usage:   0%                 IPv4 address for eth0:    10.250.5.55
  Processes:    85


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


The list of available updates is more than a week old.
To check for new updates run: sudo apt update

student@mk8s-master-0:~$ sudo -i
root@mk8s-master-0:~# apt install kubeadm=1.22.2-00 kubelet=1.22.2-00 kubectl=1.22.2-00
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 27 not upgraded.
Need to get 39.6 MB of archives.
After this operation, 0 B of additional disk space will be used.
Get:1 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 kubelet amd64 1.22.2-00 [21.9 MB]
Get:2 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 kubectl amd64 1.22.2-00 [9038 kB]
Get:3 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 kubeadm amd64 1.22.2-00 [8718 kB]
Fetched 39.6 MB in 13s (3156 kB/s)
(Reading database ... 33901 files and directories currently installed.)
Preparing to unpack .../kubelet_1.22.2-00_amd64.deb ...
Unpacking kubelet (1.22.2-00) over (1.22.1-00) ...
Preparing to unpack .../kubectl_1.22.2-00_amd64.deb ...
Unpacking kubectl (1.22.2-00) over (1.22.1-00) ...
Preparing to unpack .../kubeadm_1.22.2-00_amd64.deb ...
Unpacking kubeadm (1.22.2-00) over (1.22.1-00) ...
Setting up kubectl (1.22.2-00) ...
Setting up kubelet (1.22.2-00) ...
Setting up kubeadm (1.22.2-00) ...
root@mk8s-master-0:~# apt install kubeadm=1.22.2-00 kubelet=1.22.2-00 kubectl=1.22.2-00
Reading package lists... Done
Building dependency tree
Reading state information... Done
kubeadm is already the newest version (1.22.2-00).
kubectl is already the newest version (1.22.2-00).
kubelet is already the newest version (1.22.2-00).
0 upgraded, 0 newly installed, 0 to remove and 27 not upgraded.
root@mk8s-master-0:~# 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: v1.22.1
[upgrade/versions] kubeadm version: v1.22.2
```

```
COMPONENT   CURRENT       TARGET
kubelet     1 x v1.22.1   v1.22.9
            1 x v1.22.2   v1.22.9

Upgrade to the latest version in the v1.22 series:

COMPONENT                 CURRENT   TARGET
kube-apiserver            v1.22.1   v1.22.9
kube-controller-manager   v1.22.1   v1.22.9
kube-scheduler            v1.22.1   v1.22.9
kube-proxy                v1.22.1   v1.22.9
CoreDNS                   v1.8.4    v1.8.4
etcd                      3.5.0-0   3.5.0-0

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

        kubeadm upgrade apply v1.22.9

Note: Before you can perform this upgrade, you have to update kubeadm to v1.22.9.

_____


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@mk8s-master-0:~#  kubeadm upgrade apply v1.22.2
[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/version] You have chosen to change the cluster version to "v1.22.2"
[upgrade/versions] Cluster version: v1.22.1
[upgrade/versions] kubeadm version: v1.22.2
[upgrade/confirm] Are you sure you want to proceed with the upgrade? [y/N]: y
[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'
[upgrade/apply] Upgrading your Static Pod-hosted control plane to version "v1.22.2"...
Static pod: kube-apiserver-mk8s-master-0 hash: b1d9f2b63ce85cb6310a6d8f6f728f03
Static pod: kube-controller-manager-mk8s-master-0 hash: 91af4173de8872b5f7aec58b2fc0f1fc
Static pod: kube-scheduler-mk8s-master-0 hash: d98fe109788b5b498301dd6c53afcfa9
[upgrade/etcd] Upgrading to TLS for etcd
Static pod: etcd-mk8s-master-0 hash: 6828726f91dba72616d11ac4a737e533
[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-manifests804306747"
[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-2022-04-25-15-11-18/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)
Static pod: kube-scheduler-mk8s-master-0 hash: d98fe109788b5b498301dd6c53afcfa9
Static pod: kube-scheduler-mk8s-master-0 hash: acb75f76060c8873ac4bf8b2fc1a9466
[apiclient] Found 1 Pods for label selector component=kube-scheduler
[upgrade/staticpods] Component "kube-scheduler" upgraded successfully!
[upgrade/postupgrade] Applying label node-role.kubernetes.io/control-plane='' to Nodes with label node-role.kubernetes.i
aster='' (deprecated)
[upload-config] Storing the configuration used in ConfigMap "kubeadm-config" in the "kube-system" Namespace
[kubelet] Creating a ConfigMap "kubelet-config-1.22" in namespace kube-system with the configuration for the kubelets in
e cluster
[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
tificate credentials
[bootstrap-token] configured RBAC rules to allow the csrapprover controller automatically approve CSRs from a Node Boots
p 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 "v1.22.2". Enjoy!

[upgrade/kubelet] Now that your control plane is upgraded, please proceed with upgrading your kubelets if you haven't al
dy done so.
root@mk8s-master-0:~# systemctl restart kubelet
root@mk8s-master-0:~# exit
logout
student@mk8s-master-0:~$ exit
logout
Connection to 10.250.5.55 closed.
student@node-1:~$ kubectl uncordon mk8s-master-0
node/mk8s-master-0 uncordoned
student@node-1:~$ kubectl get nodes
NAME           STATUS   ROLES                  AGE   VERSION
mk8s-master-0  Ready    control-plane,master   67d   v1.22.2
mk8s-node-0    Ready    <none>                 67d   v1.22.1
student@node-1:~$
```