Lesson 03 Demo 04

Working with kubeadm

Objective: To generate kubeadm tokens, verify certificate expiration, and access certificate encryption key for Kubernetes cluster management

Tools required: kubeadm, kubectl, kubelet, and containerd

Prerequisites: A Kubernetes cluster should already be set up (refer to the steps provided in Lesson 02, Demo 01 for guidance)

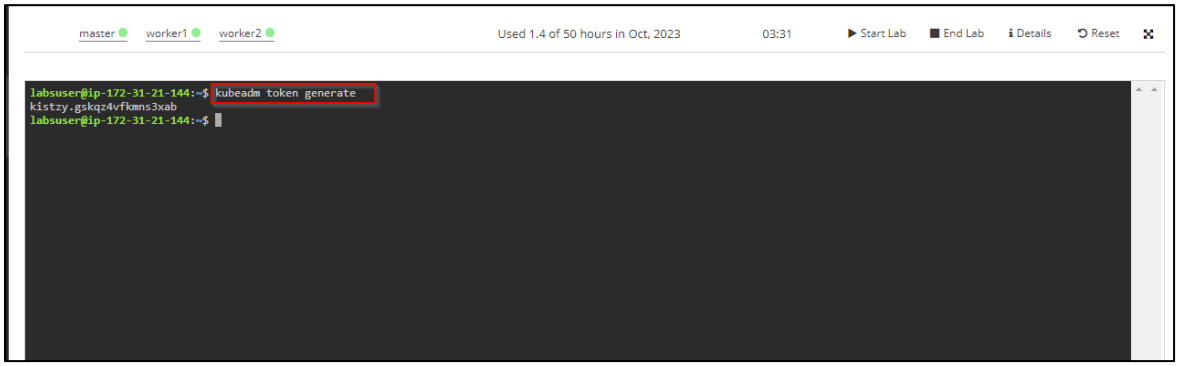
Steps to be followed:

1. Generate tokens for kubeadm

Step 1: Generate tokens for kubeadm

1.1 Generate a new token using the following command:

kubeadm token generate



This command will generate a new token for node join operations.

1.2 Check the expiration of all the certificates in the cluster using the command below:
sudo kubeadm certs check-expiration

```
master.example.com          Ready    control-plane   14m   v1.28.2
worker-node-1.example.com   Ready    <none>          12m   v1.28.2
worker-node-2.example.com   Ready    <none>          11m   v1.28.2
labsuser@master:~$ kubeadm token generate
ryl1xo.w8wuox0cochduijl
labsuser@master:~$ sudo kubeadm certs check-expiration
[check-expiration] Reading configuration from the cluster...
[check-expiration] FYI: You can look at this config file with 'kubectl -n kube-system get cm kubeadm-config -o yaml'

CERTIFICATE                EXPIRES                  RESIDUAL TIME   CERTIFICATE AUTHORITY   EXTERNALLY MANAGED
admin.conf                 Oct 04, 2024 06:38 UTC   364d            ca                      no
apiserver                  Oct 04, 2024 06:38 UTC   364d            ca                      no
apiserver-etcd-client      Oct 04, 2024 06:38 UTC   364d            etcd-ca                 no
apiserver-kubelet-client   Oct 04, 2024 06:38 UTC   364d            ca                      no
controller-manager.conf    Oct 04, 2024 06:38 UTC   364d            ca                      no
etcd-healthcheck-client    Oct 04, 2024 06:38 UTC   364d            etcd-ca                 no
etcd-peer                  Oct 04, 2024 06:38 UTC   364d            etcd-ca                 no
etcd-server                Oct 04, 2024 06:38 UTC   364d            etcd-ca                 no
front-proxy-client         Oct 04, 2024 06:38 UTC   364d            front-proxy-ca          no
scheduler.conf             Oct 04, 2024 06:38 UTC   364d            ca                      no

CERTIFICATE AUTHORITY   EXPIRES                  RESIDUAL TIME   EXTERNALLY MANAGED
ca                      Oct 02, 2033 06:38 UTC   9y              no
etcd-ca                 Oct 02, 2033 06:38 UTC   9y              no
front-proxy-ca          Oct 02, 2033 06:38 UTC   9y              no
labsuser@master:~$
```

1.3 To obtain the key used to encrypt the certificates, enter the following command:
kubeadm certs certificate-key

```
worker-node-2.example.com   Ready    <none>          11m   v1.28.2
labsuser@master:~$ kubeadm token generate
ryl1xo.w8wuox0cochduijl
labsuser@master:~$ sudo kubeadm certs check-expiration
[check-expiration] Reading configuration from the cluster...
[check-expiration] FYI: You can look at this config file with 'kubectl -n kube-system get cm kubeadm-config -o yaml'

CERTIFICATE                EXPIRES                  RESIDUAL TIME   CERTIFICATE AUTHORITY   EXTERNALLY MANAGED
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controller-manager.conf    Oct 04, 2024 06:38 UTC   364d            ca                      no
etcd-healthcheck-client    Oct 04, 2024 06:38 UTC   364d            etcd-ca                 no
etcd-peer                  Oct 04, 2024 06:38 UTC   364d            etcd-ca                 no
etcd-server                Oct 04, 2024 06:38 UTC   364d            etcd-ca                 no
front-proxy-client         Oct 04, 2024 06:38 UTC   364d            front-proxy-ca          no
scheduler.conf             Oct 04, 2024 06:38 UTC   364d            ca                      no

CERTIFICATE AUTHORITY   EXPIRES                  RESIDUAL TIME   EXTERNALLY MANAGED
ca                      Oct 02, 2033 06:38 UTC   9y              no
etcd-ca                 Oct 02, 2033 06:38 UTC   9y              no
front-proxy-ca          Oct 02, 2033 06:38 UTC   9y              no
labsuser@master:~$ kubeadm certs certificate-key
1042cd6e6989e2f904be29e9c9ed96a9d5af54eb9bd16a345563c676a5efca42
labsuser@master:~$
```
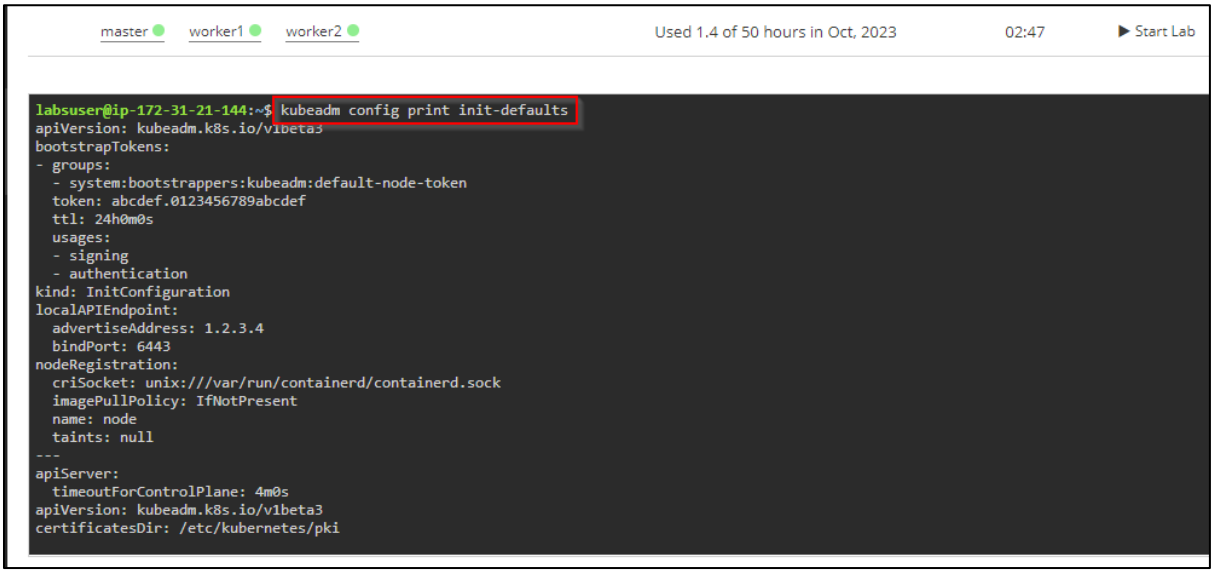

1.4 Print the default initialization configuration using the following command:
kubeadm config print init-defaults



By following these steps, you have successfully prepared your Kubernetes cluster for secure node joins, ensured certificate validity, and obtained the essential certificate encryption key, enhancing the security and functionality of your cluster.