**Lesson 01 Demo 01**

**Creating and Configuring a Kubernetes Cluster**

**Objective:** To set up a Kubernetes cluster by configuring hostnames, initializing the master node, joining worker nodes, and verifying the cluster's status

**Tools required:** kubeadm, kubectl, kubelet, and containerd

**Prerequisites:** Ensure you have executed **sudo kubeadm reset** on all machines. This action will clear any past configurations and prepare the machines for a new cluster setup.

Steps to be followed:

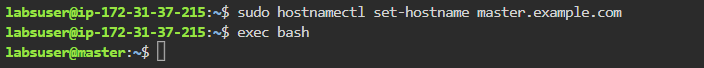
1. Change the hostnames of all machines
2. Set up the master node
3. Join the worker nodes in the cluster

**Step 1: Change the hostnames of all machines**

1. Execute the following commands on the master node:

**sudo hostnamectl set-hostname master.example.com**

**exec bash**

****

1. Execute the following commands on the **worker1** node:

**sudo hostnamectl set-hostname worker-node-1.example.com**

**exec bash**

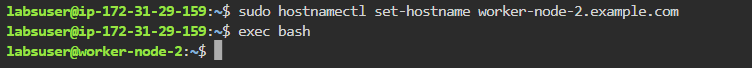
A black screen with white text

Description automatically generated

1. Execute the following commands on the **worker2** node:

**sudo hostnamectl set-hostname worker-node-2.example.com**

**exec bash**



**Step 2: Set up the master node**

1. Initiate kubeadm by executing the following command:

**sudo kubeadm init --ignore-preflight-errors=all**

**A screenshot of a computer program

Description automatically generated**

**A screenshot of a computer program

Description automatically generated**

1. Run the following commands to allow non-root users to access kubeadm:

**mkdir -p $HOME/.kube**

**sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config**

**sudo chown $(id -u):$(id -g) $HOME/.kube/config**

A screen shot of a computer

Description automatically generated

1. Run the following command to deploy the weave network:

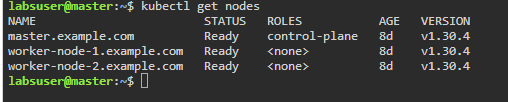
**kubectl apply -f https://docs.projectcalico.org/manifests/calico.yaml**

**A screenshot of a computer

Description automatically generated**

1. To verify the master node's status, execute the following command:

**kubectl get nodes**

****

You can see the master node is now ready and operational.

1. Run the following command to generate a command with a token for joining the worker nodes:

**sudo kubeadm token create --print-join-command  
  
A black background with red and white text

Description automatically generated**

|  |
| --- |
| **Note:** Save the displayed **kubeadm join** command and token for later; you will need them to connect the worker nodes. |

**Step 3: Join the worker nodes in the cluster**

1. Use the **kubeadm join** command (from step 2.5) on both worker nodes

A screenshot of a computer program

Description automatically generated

A screenshot of a computer program

Description automatically generated

|  |
| --- |
| **Note:** Ensure you use **sudo** before executing the command |

1. Return to the master node and check if the worker nodes have joined by executing the following command:

**kubectl get nodes**

A screenshot of a computer screen

Description automatically generated

Both worker nodes have been integrated into the cluster.

By following these steps, you have successfully set up a Kubernetes cluster by configuring hostnames, initializing the master node, joining worker nodes, and verifying the cluster's status.