



What the heck is serverless computing? Find out in our latest episode of the [Weekly Update \(https://www.youtube.com/watch?v=KITuH9w0Ao0\)](https://www.youtube.com/watch?v=KITuH9w0Ao0)!

# Creating a Kubernetes Cluster

73 Min.

Remaining

[Beginner \(/search?type=Hands-On Lab-Live Environment Learning Activity&difficulty=Beginner&categories=Containers\)](#)

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How was this lab?

CredentialsUsage Help (https://support.linuxacademy.com/hc/en-us/articles/360028198971)

## Cloud Server

K8sMaster

Username

cloud\_user

Password

iBCPmanNCI

Private ip address of K8sMaster

10.0.1.100

Public ip address of K8sMaster

54.146.34.182

(http://guac.linuxacademy.com/?a=beab25d6415ca28c7814&b=96d185ea722b7d7a0c72)

How do I connect? (https://support.linuxacademy.com/hc/en-us/articles/360028198971-Connecting-to-Hands-On-Labs)

## Cloud Server

K8sNode2

Username

cloud\_user

Password

iBCPmanNCI

Public ip address of K8sNode2

100.24.62.48

(http://guac.linuxacademy.com/?a=c63c55dd331a9418d4d2&b=366950f45a21df1e621f)

Private ip address of K8sNode2

10.0.1.102

How do I connect? (https://support.linuxacademy.com/hc/en-us/articles/360028198971-Connecting-to-Hands-On-Labs)

## Cloud Server

K8sNode1

Username

cloud\_user

Password

iBCPmanNCI



Private ip address of K8sNode1

10.0.1.101



Public ip address of K8sNode1

54.166.158.225  
(<http://guac.linuxacademy.com/?a=c310823a14c6499c8968&b=afcb8797f9cf0e27150d>)

❓ How do I connect? (<https://support.linuxacademy.com/hc/en-us/articles/360028198971-Connecting-to-Hands-On-Labs>)

## Additional Information and Resources

In this learning activity, we will create a Kubernetes cluster. The commands we will use for this process can be found in the task list by clicking on the orange question mark buttons.

Once you have completed the lab, leave your cluster in its final state. Do not delete the deployment.

## Learning Objectives

### ✔ Install Docker and Kubernetes on all servers.



1. The first thing that we are going to do is use SSH to log in to all machines. Once we have logged in, we need to elevate privileges using `sudo`.

```
sudo su
```

2. Disable SELinux.

```
setenforce 0  
sed -i --follow-symlinks 's/SELINUX=enforcing/SELINUX=disabled/g' /etc/sysconfig/selinux
```

3. Enable the `br_netfilter` module for cluster communication.

```
modprobe br_netfilter  
echo '1' > /proc/sys/net/bridge/bridge-nf-call-iptables
```

4. Ensure that the Docker dependencies are satisfied.

```
yum install -y yum-utils device-mapper-persistent-data lvm2
```

5. Add the Docker repo and install Docker.

```
yum-config-manager --add-repo https://download.docker.com/linux/centos/docker-ce.repo  
yum install -y docker-ce
```

6. Set the cgroup driver for Docker to systemd, then reload systemd, enable and start Docker

```
sed -i '/^ExecStart/ s/$/ --exec-opt native.cgroupdriver=systemd/'  
/usr/lib/systemd/system/docker.service  
systemctl daemon-reload  
systemctl enable docker --now
```

7. Add the repo for Kubernetes.

```
cat << EOF > /etc/yum.repos.d/kubernetes.repo
[kubernetes]
name=Kubernetes
baseurl=https://packages.cloud.google.com/yum/repos/kubernetes-el7-x86_64
enabled=1
gpgcheck=0
repo_gpgcheck=0
gpgkey=https://packages.cloud.google.com/yum/doc/yum-key.gpg
https://packages.cloud.google.com/yum/doc/rpm-package-key.gpg
EOF
```

8. Install Kubernetes.

```
yum install -y kubelet kubeadm kubectl
```

9. Enable the kubelet service. The kubelet service will fail to start until the cluster is initialized, this is expected.

```
systemctl enable kubelet
```

**\*Note: Complete the following section on the MASTER ONLY!**

10. Initialize the cluster using the IP range for Flannel.

```
kubeadm init --pod-network-cidr=10.244.0.0/16
```

11. Copy the `kubeadmn join` command that is in the output. We will need this later.

12. Exit `sudo` and copy the `admin.conf` to your home directory and take ownership.

```
mkdir -p $HOME/.kube
sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
sudo chown $(id -u):$(id -g) $HOME/.kube/config
```

13. Deploy Flannel.

```
kubectl apply -f https://raw.githubusercontent.com/coreos/flannel/master/Documentation/kube-flannel.yml
```

14. Check the cluster state.

```
kubectl get pods --all-namespaces
```

**✓ Create and scale a deployment using kubectl. Note: Complete the following steps on the NODES ONLY!**

15. Run the `join` command that you copied earlier, this requires running the command as `sudo` on the nodes. Then check your nodes from the master.

```
kubectl create deployment nginx --image=nginx
kubectl get nodes
```

2. Inspect the pod.

```
kubectl get pods
```

3. Scale the deployment.

```
kubectl scale deployment nginx --replicas=4
```

4. Inspect the pods. You should now have 4.


```
kubectl get pods
```

## Tools

**Instant Terminal**

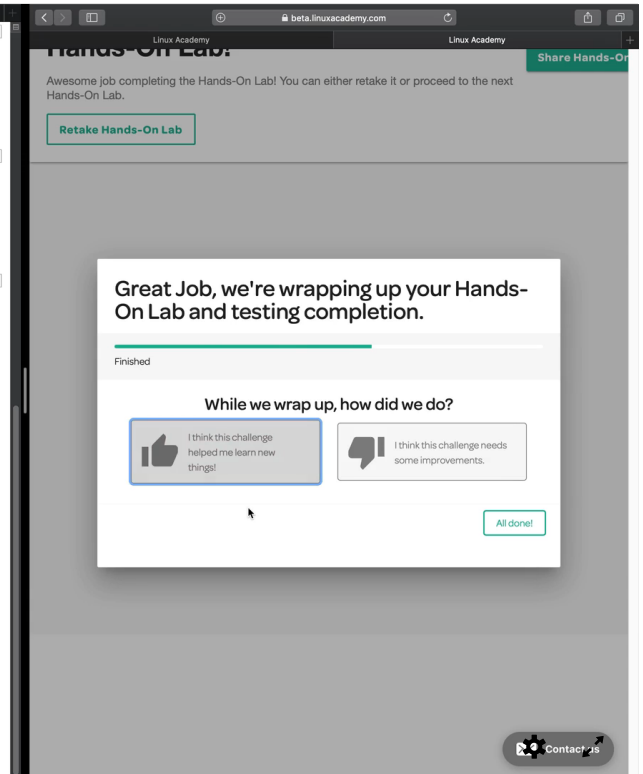
(<https://ssh.instantterminal.linuxacademy.com>)

 **Diagram**

 (<https://support.linuxacademy.com/hc/en-us/articles/360028193131>)

Video

```
[cloud_user@k8smaster ~]$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-65f88748fd-x2fgn             1/1     Running   0           41s
[cloud_user@k8smaster ~]$ kubectl scale deployment nginx --replicas=4
deployment.extensions/nginx scaled
[cloud_user@k8smaster ~]$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-65f88748fd-5f2n1             0/1     ContainerCreating   0           3s
nginx-65f88748fd-t1lps             0/1     ContainerCreating   0           3s
nginx-65f88748fd-vfw4j             1/1     Running            0           3s
nginx-65f88748fd-x2fgn             1/1     Running            0           65s
[cloud_user@k8smaster ~]$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
nginx-65f88748fd-5f2n1             1/1     Running        0           12s
nginx-65f88748fd-t1lps             1/1     Running        0           12s
nginx-65f88748fd-vfw4j             1/1     Running        0           12s
nginx-65f88748fd-x2fgn             1/1     Running        0           74s
[cloud_user@k8smaster ~]$
```



## Creating a Kubernetes Cluster

In this video, we will walk through the Hands-On Lab and create a Kubernetes cluster.