Kubernetes文章专栏地址: http://blog.51cto.com/cloumn/detail/10

# 官方提供Kubernetes部署3种方式

#### minikube

Minikube是一个工具,可以在本地快速运行一个单点的Kubernetes,尝试Kubernetes或日常开发的用户使用。不能用于生产环境。

官方文档: https://kubernetes.io/docs/setup/minikube/

#### kubeadm

kubeadm可帮助你快速部署一套kubernetes集群。kubeadm设计目的为新用户开始尝试kubernetes提供一种简单的方法。目前是Beta版。

官方文档: <a href="https://kubernetes.io/docs/reference/setup-tools/kubeadm/kubeadm/">https://kubernetes.io/docs/reference/setup-tools/kubeadm/kubeadm/</a> https://kubernetes.io/docs/setup-tools/kubeadm/kubeadm/ https://kubernetes.io/docs/setup-tools/kubeadm/kubeadm/ https://kubernetes.io/docs/setup-tools/kubeadm/kubeadm/ https://kubernetes.io/docs/setup-tools/kubeadm/kubeadm/kubeadm/ https://kubernetes.io/docs/setup-tools/kubeadm/kubeadm/kubeadm/ https://kubernetes.io/docs/setup-tools/kubeadm/kubead

### • 二进制包

从官方下载发行版的二进制包,手动部署每个组件,组成Kubernetes集群。目前企业生产环境中主要使用该方式。下载地址:https://github.com/kubernetes/kubernetes/blob/master/CHANGELOG-1.11.md#v1113

# 1. 安装要求

- 操作系统
  - o Ubuntu 16.04+
  - o Debian 9
  - o CentOS 7
  - o RHEL 7
  - Fedora 25/26 (best-effort)
  - 。 其他
- 内存2GB+, 2核CPU+
- 集群节点之间可以通信
- 每个节点唯一主机名,MAC地址和product\_uuid
  - o 检查MAC地址:使用ip link或者ifconfig -a
  - 检查product\_uuid: cat /sys/class/dmi/id/product\_uuid
- 禁止swap分区。这样才能使kubelet正常工作

# 2. 准备环境

#### 关闭防火墙:

- # systemctl stop firewalld
- # systemctl disable firewalld

关闭selinux:

```
# sed -i 's/enforcing/disabled/' /etc/selinux/config
# setenforce 0

关闭swap:
# swapoff -a # 临时
# vim /etc/fstab # 永久

添加主机名与IP对应关系:
# cat /etc/hosts
192.168.0.11 k8s-master
192.168.0.12 k8s-node1
192.168.0.13 k8s-node2

同步时间:
# yum install ntpdate -y
# ntpdate ntp.api.bz
```

# 3. 安装Docker

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

# yum-config-manager --add-repo https://download.docker.com/linux/centos/docker-ce.repo
目前docker最大支持docker-ce-17.03, 所以要指定该版本安装:
# yum install docker-ce-17.03.3.ce -y

如果提示container-selinux依赖问题, 先安装ce-17.03匹配版本:
# yum localinstall
https://download.docker.com/linux/centos/7/x86_64/stable/Packages/docker-ce-selinux-17.03.3.ce-1.el7.noarch.rpm

# systemctl enable docker && systemctl start docker
```

# 4. 安装kubeadm, kubelet和kubectl

• kubeadm: 引导集群的命令

• kubelet: 集群中运行任务的代理程序

• kubectl: 命令行管理工具

### 4.1 添加阿里云YUM软件源

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

### 4.2 安装kubeadm, kubelet和kubectl

```
# yum install -y kubelet kubeadm kubectl --disableexcludes=kubernetes
# systemctl enable kubelet && systemctl start kubelet
```

注意:使用Docker时,kubeadm会自动检查kubelet的cgroup驱动程序,并/var/lib/kubelet/kubeadm-flags.env在运行时将其设置在文件中。如果使用的其他CRI,则必须在/etc/default/kubelet中cgroup-driver值修改为cgroupfs:

```
# cat /var/lib/kubelet/kubeadm-flags.env
KUBELET_KUBEADM_ARGS=--cgroup-driver=cgroupfs --cni-bin-dir=/opt/cni/bin --cni-conf-
dir=/etc/cni/net.d --network-plugin=cni
# systemctl daemon-reload
# systemctl restart kubelet
```

# 5. 使用kubeadm创建单个Master集群

### 5.1 默认下载镜像地址在国外无法访问,先从准备好所需镜像

保存到脚本之间运行:

```
K8S_VERSION=v1.11.2
ETCD_VERSION=3.2.18
DASHBOARD_VERSION=v1.8.3
FLANNEL_VERSION=v0.10.0-amd64
DNS_VERSION=1.1.3
PAUSE_VERSION=3.1
# 基本组件
docker pull registry.cn-hangzhou.aliyuncs.com/google_containers/kube-apiserver-
amd64: $K8S_VERSION
docker pull registry.cn-hangzhou.aliyuncs.com/google_containers/kube-controller-manager-
amd64: $K8S_VERSION
docker pull registry.cn-hangzhou.aliyuncs.com/google_containers/kube-scheduler-
amd64: $K8S_VERSION
docker pull registry.cn-hangzhou.aliyuncs.com/google_containers/kube-proxy-
docker pull registry.cn-hangzhou.aliyuncs.com/google_containers/etcd-
amd64: $ETCD_VERSION
```

```
docker pull registry.cn-hangzhou.aliyuncs.com/google_containers/pause:$PAUSE_VERSION
docker pull registry.cn-hangzhou.aliyuncs.com/google_containers/coredns:$DNS_VERSION
# 网络组件
docker pull quay.io/coreos/flannel:$FLANNEL_VERSION
# 修改tag
docker tag registry.cn-hangzhou.aliyuncs.com/google_containers/kube-apiserver-
amd64:$k8S_VERSION k8s.gcr.io/kube-apiserver-amd64:$k8S_VERSION
docker tag registry.cn-hangzhou.aliyuncs.com/google_containers/kube-controller-manager-
amd64:$K8S_VERSION k8s.gcr.io/kube-controller-manager-amd64:$K8S_VERSION
docker tag registry.cn-hangzhou.aliyuncs.com/google_containers/kube-scheduler-
amd64:$k8S_VERSION k8s.gcr.io/kube-scheduler-amd64:$k8S_VERSION
docker tag registry.cn-hangzhou.aliyuncs.com/google_containers/kube-proxy-
amd64:\$K8S_VERSION k8s.gcr.io/kube-proxy-amd64:\$K8S_VERSION
docker tag registry.cn-hangzhou.aliyuncs.com/google_containers/etcd-amd64:$ETCD_VERSION
k8s.gcr.io/etcd-amd64:$ETCD_VERSION
docker tag registry.cn-hangzhou.aliyuncs.com/google_containers/pause:$PAUSE_VERSION
k8s.gcr.io/pause:$PAUSE_VERSION
docker tag registry.cn-hangzhou.aliyuncs.com/google_containers/coredns:$DNS_VERSION
k8s.gcr.io/coredns:$DNS_VERSION
```

### 5.2 初始化Master

```
# kubeadm init --kubernetes-version=1.11.2 --pod-network-cidr=10.244.0.0/16 --apiserver-
advertise-address=192.168.0.11
...

Your Kubernetes master has initialized successfully!

To start using your cluster, you need to run (as a regular user):

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

You should now deploy a pod network to the cluster.
Run "kubectl apply -f [podnetwork].yaml" with one of the addon options listed at:
    http://kubernetes.io/docs/admin/addons/

You can now join any number of machines by running the following on each node
as root:
    kubeadm join --token <token> <master-ip>:<master-port> --discovery-token-ca-cert-hash sha256:<hash>
```

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

# 5.3 安装Pod网络 - 插件

```
# kubectl apply -f
https://raw.githubusercontent.com/coreos/flannel/v0.10.0/Documentation/kube-flannel.yml
```

# 5.4 加入工作节点

在Node节点切换到root账号:

格式: kubeadm join --token: --discovery-token-ca-cert-hash sha256:

# kubeadm join 192.168.0.11:6443 --token 6hk68y.0rdz1wdjyh85ntkr --discovery-token-ca-cert-hash sha256:d1d3f59ae37fbd632707cbeb9b095d0d0b19af535078091993c4bc4d9d2a7782

### 6. kubernetes dashboard

```
# wget
```

 $\verb|https://raw.githubusercontent.com/kubernetes/dashboard/master/src/deploy/recommended/kubernetes-dashboard.yaml|$ 

#### 修改镜像地址:

```
# registry.cn-hangzhou.aliyuncs.com/google_containers/kubernetes-dashboard-
amd64:v1.10.0
```

#### 修改Service:

```
kind: Service
apiVersion: v1
metadata:
    labels:
        k8s-app: kubernetes-dashboard
    name: kubernetes-dashboard
    namespace: kube-system
spec:
    type: NodePort
    ports:
        - port: 443
            targetPort: 8443
            nodePort: 30001
selector:
        k8s-app: kubernetes-dashboard
```

```
# kubectl apply -f kubernetes-dashboard.yaml
```

### 创建一个管理员角色:

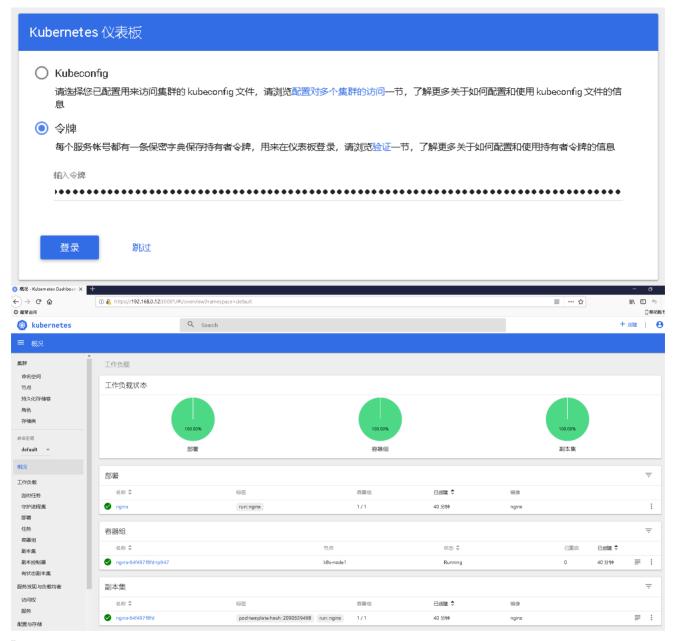
```
apiVersion: v1
kind: ServiceAccount
metadata:
```

```
name: dashboard-admin
namespace: kube-system
---
kind: ClusterRoleBinding
apiversion: rbac.authorization.k8s.io/vlbeta1
metadata:
name: dashboard-admin
subjects:
- kind: ServiceAccount
name: dashboard-admin
namespace: kube-system
roleRef:
kind: ClusterRole
name: cluster-admin
apiGroup: rbac.authorization.k8s.io
```

# kubectl apply -f k8s-admin.yaml

### 使用上述创建账号的token登录Kubernetes Dashboard:

```
# kubectl get secret -n kube-system
# kubectl describe secret dashboard-admin-token-bwdjj -n kube-system
...
token:
eyJhbGcioiJSUZIINiISImtpZCI6IiJ9.eyJpc3MioiJrdWJlcm5ldGVZL3NlcnZpY2VhY2NvdW50Iiwia3ViZXJ
uZXRlcy5pby9zZXJ2aWNlYWNjb3VudC9uYW1lc3BhY2UiOiJrdWJlLXN5c3RlbSISImt1YmVybmV0ZXMuaW8vc2V
ydmljZWFjY291bnQvc2Vjcmv0Lm5hbWUiOiJkYXNOYm9hcmQtYWRtaW4tdG9rZW4tYndkamoiLCJrdWJlcm5ldGV
zLmlvL3NlcnZpY2VhY2NvdW50L3NlcnZpY2UtYWNjb3VudC5uYW1lijoiZGFzaGJVYXJkLWFkbWluIiwia3ViZXJ
uZXRlcy5pby9zZXJ2aWNlYWNjb3VudC9zZXJ2aWNlLWFjY291bnQudWlkIjoiNzIyOTRmNTUtYjc1OcOxMWU4LTh
kY2UtMDAWYzI5ZGUyNWVhIiwic3ViIjoic3lzdGvtonNlcnZpY2VhY2NvdW50OmtlYmUtc3lzdGvtomRhc2hib2F
yZC1hZG1pbiJ9.0hQU5Di_P1OX1Dcnw2AYzjDAED66EorqhF5iupv39wvB8WE-
aLRSQypOtwx2M8u1KMZ67n6LxbH17vWEQkMDRVXS7ZlUCyAAD6kHDz3k-
f7PAZH5vcuyO4veQ9oovjk3DKjrP4zXQChH1lBB1wmD_oyLjoWxK3Z5MBTlVGZSixVwuQNpFPbuS6Z7iLGwU0gjI
OCGZ9Tt6cXzcK81KfAEpDIP_CtFV_Jw4s98EgBex9mZh6vq1dcxr03qfuK--
udd_8GWZctu_p_P15hZZLoKEm5GCbs6JGvKL2aao_DEHfLp3XYEnApojI91vU4qAqdkvMZ2qWQNGYv4KNi2yPO0
JQ
```



视频版: https://ke.qq.com/course/266656

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