

# Binglab setup

- [Setting up kubernetes on Rocky Linux](#)

# Setting up kubernetes on Rocky Linux

## Install kubernetes cluster and nginx

### What is needed and how they will be used

We will be using 2 control plan nodes, 4 worker/agent nodes and eventually 3 nodes for storage. One will also be used as a reverse proxy using Nginx.

The DNS server that will be used is currently running on a raspberry pi, it is running PiHole and has a local DNS server.

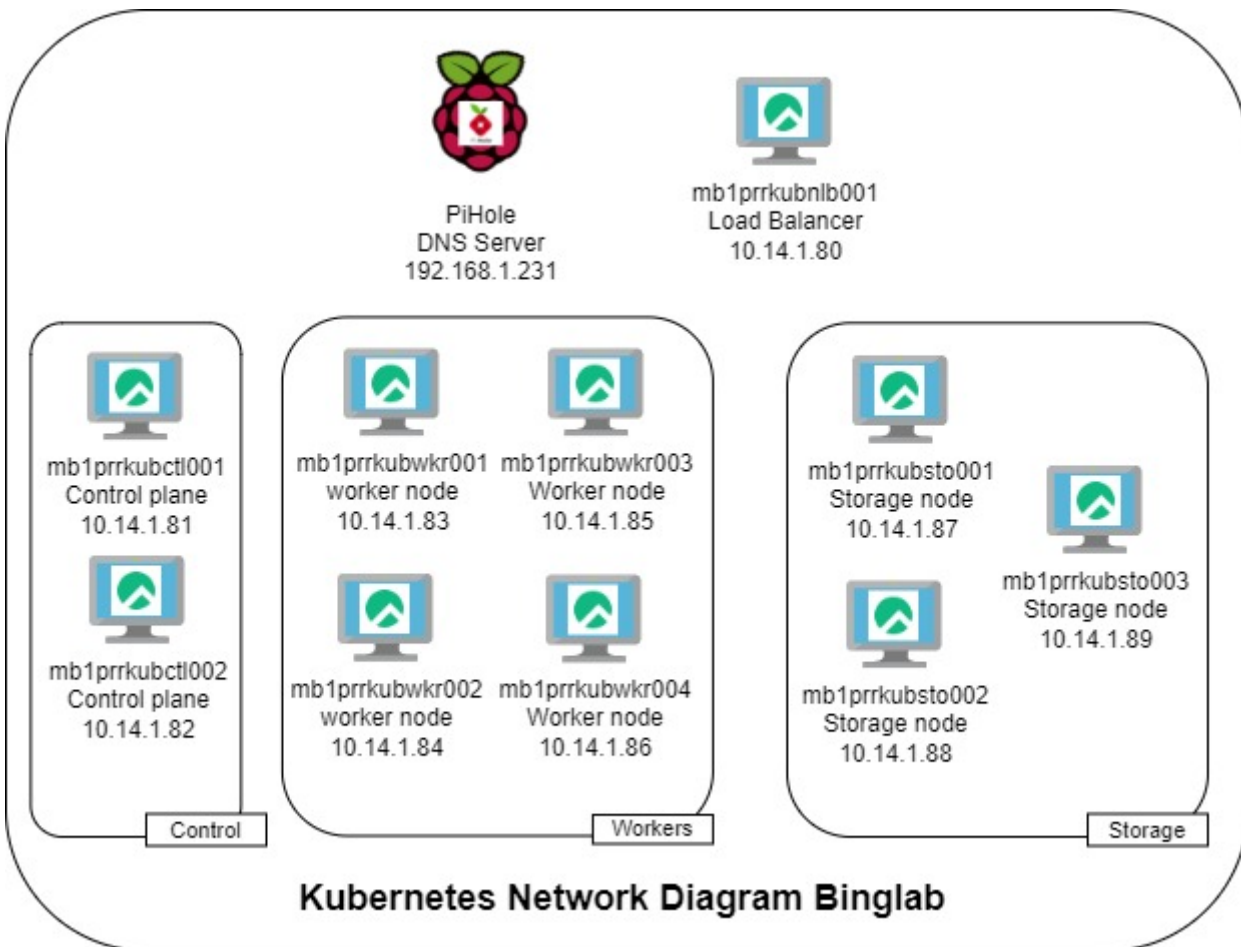
This is an initial install of Kubernetes on Rocky Linux 8.5.

- 1 x Nginx proxy running Rocky Linux 8.5, 2CPU, 4 GB RAM, 32 GB disk
- 2 x VM's for control plane Rocky Linux 8.5, 2CPU, 4 GB RAM, 32 GB disk
- 4 x VM's for Worker nodes Rocky Linux 8.5, 2CPU, 4 GB RAM, 32 GB disk
- 3 x VM's for storage nodes Rocky Linux 8.5, 2CPU, 4 GB RAM, 32 GB disk

| Hostname                    | IP Address | Description              |
|-----------------------------|------------|--------------------------|
| nlb.binglab.lan             | 10.14.1.80 | Load balancer            |
| mb1prrkubctl001.binglab.lan | 10.14.1.81 | Kubernetes Control plane |
| mb1prrkubctl002.binglab.lan | 10.14.1.82 | Kubernetes Control plane |
| mb1prrkubwkr001.binglab.lan | 10.14.1.83 | Kubernetes Worker node   |
| mb1prrkubwkr002.binglab.lan | 10.14.1.84 | Kubernetes Worker node   |
| mb1prrkubwkr003.binglab.lan | 10.14.1.85 | Kubernetes Worker node   |

|                             |            |                         |
|-----------------------------|------------|-------------------------|
| mb1prrkubwkr004.binglab.lan | 10.14.1.86 | Kubernetes Worker node  |
| mb1prrkubsto001.binglab.lan | 10.14.1.87 | Kubernetes Storage node |
| mb1prrkubsto002.binglab.lan | 10.14.1.88 | Kubernetes Storage node |
| mb1prrkubsto003.binglab.lan | 10.14.1.89 | Kubernetes Storage node |

## Network Diagram



## Software/Stack used

- Rocky Linux 8.5
- kubelet
- Kubectl
- Kubernetes-cni
- docker-ce

1 First install the load balancer

1.1 Install package

```
yum install nginx
```

## 1.2 configure Nginx

```
# For more information on configuration, see:
# * Official English Documentation: http://nginx.org/en/docs/
# * Official Russian Documentation: http://nginx.org/ru/docs/

user nginx;
worker_processes auto;
error_log /var/log/nginx/error.log;
pid /run/nginx.pid;

# Load dynamic modules. See /usr/share/doc/nginx/README.dynamic.
include /usr/share/nginx/modules/*.conf;

events {
    worker_connections 1024;
}

stream {
    upstream k3s_servers {
        server 10.14.1.81:6443;
        server 10.14.1.82:6443;
    }
    server {
        listen 6443;
        proxy_pass k3s_servers;
    }
}
```

## 2 Install Docker on the other nodes 6 for now

```
yum update
yum install -y yum-utils
sudo yum-config-manager --add-repo https://download.docker.com/linux/centos/docker-ce.repo
yum remove docker docker-client docker-client-latest docker-common docker-latest docker-
latest-logrotate docker-logrotate docker-engine
yum install docker-ce docker-ce-cli containerd.io
systemctl start docker
```

```
systemctl enable docker
systemctl status docker
docker ps
```

### 3 Install Kubernetes but first we need to add the repo on all the nodes

```
cat <<EOF | sudo tee /etc/yum.repos.d/kubernetes.repo
[kubernetes]
name=Kubernetes
baseurl=https://packages.cloud.google.com/yum/repos/kubernetes-el7-`basearch`
enabled=1
gpgcheck=1
repo_gpgcheck=1
gpgkey=https://packages.cloud.google.com/yum/doc/yum-key.gpg
https://packages.cloud.google.com/yum/doc/rpm-package-key.gpg
exclude=kubelet kubeadm kubectl
EOF
```

Once the repo is added we need to install the kubernetes packages: on all the nodes

```
dnf install -y kubelet kubeadm kubectl --disableexcludes=kubernetes
systemctl enable --now kubelet
echo "KUBELET_EXTRA_ARGS=--cgroup-driver=cgroupfs" | sudo tee /etc/sysconfig/kubelet
systemctl restart kubelet
systemctl status kubelet
echo "net.bridge.bridge-nf-call-iptables=1" | sudo tee /etc/sysctl.d/k8s-iptables.conf
echo "net.bridge.bridge-nf-call-ip6tables=1" | sudo tee /etc/sysctl.d/k8s-ip6tables.conf
sysctl --system
```

### 4 Install the first control plane node of cluster

```
kubeadm init --kubernetes-version "1.23.4" --pod-network-cidr "192.168.1.0/16" --service-dns-domain "apps.binglab.lan" --control-plane-endpoint "mb1prrkubnlb001.binglab.lan:6443" --upload-certs
```