



# OpenSUSE Kubic

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## Installation

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# 1 Section 1: Setup the Clone Master

Description: In this section you will set up a Kubic Clone Master which will make it easier to create new nodes.



## Note

This tutorial was written using Virtualbox 6.0. It contains step by step instructions for the installation process. However it is assumed that the user knows how to install and use Virtualbox on the operating system of their choice.

## 1.1 Task 1: Download the installation media

1. Go to the following url and download the current version of the Kubic url: [http://download.opensuse.org/tumbleweed/iso/openSUSE-Tumbleweed-Kubic-DVD-x86\\_64-Current.iso.mirrorlist](http://download.opensuse.org/tumbleweed/iso/openSUSE-Tumbleweed-Kubic-DVD-x86_64-Current.iso.mirrorlist)

## 1.2 Task 2: Set up NAT Network

1. Open VirtualBox and Click on File and then Preferences:
2. Click on the Network Icon
3. Click on the first icon on the right that Adds new NAT network
4. Click on the third icon on the right that Edits selected NAT network

The Network CIDR should be:  
10.0.2.0/24  
Leave the rest of the settings as their default values  
Click OK to close this screen

5. Click OK to close the preferences screen

## 1.3 Task 3: Set up a new VM

1. Open VirtualBox and Click on the New icon:

2. In the Name field, enter a name:

Kubic-CloneMaster

3. In the Version field, choose OpenSUSE 64-bit

Click Next

4. Allow for 2048MB RAM

Click Next

5. Choose Create a virtual hard disk now

Click Next

6. Choose VDI (Virtual Disk Image)

Click Next

7. Choose Dynamically allocated

Click Next

8. Allow for 30GB

Click Create

9. Click on the Settings icon on the right

10. Go to the Network icon

11. Change Attached to

NAT Network  
Name: NatNetwork

12. Go to the System icon and click on the Processor tab

13. Change the number of processors to 2

14. Click OK

## 1.4 Task 4: Start Installation

1. On the main Virtualbox screen, choose Kubic-CloneMaster and click on the Start icon

You will be prompted to Select a start-up disk

2. Click on the folder icon:

Choose the current iso file that you downloaded in Task 1

3. Click start
4. When the virtual machine boots, choose the installation option.
5. On the license screen, click next if you agree
6. Choose kubeadm Node

Click Next

7. Enter an NTP server local to you or use the default one that is provided

Go to <http://ntp.org> for more information.  
Click Next

8. Enter a root password and then confirm it

Click Next

9. Click Install

## 1.5 Task 5: Post-Installation setup

1. After the installation has finished, the VM will reboot. Choose Boot from Hard Disk
2. Choose the first option: openSUSE Tumbleweed Kubic
3. Log into the command line:

Userid: root  
Password: [your root password]

4. Eject the installation media:

```
eject /dev/sr0
```

5. Install Yast for easier network configuration:

```
transactional-update pkg install yast2-network
```

6. Reboot your vm:

```
reboot
```

7. Repeat steps 1-3 in this task:

8. Start the curses version of yast to configure networking

```
yast2 lan
```

9. Use the F4 key on your keyboard to edit:

You can use the tab key to navigate the screen

10. Click alt t on your keyboard to change to Statically Assigned IP Address

11. In the IP Address field, enter:

```
10.0.2.10  
Use the tab key to go to the next field
```

12. In the Subnet Mask field, enter:

```
/24
```

13. Use the F10 key to go to the next screen

14. Click alt s on your keyboard to change the Hostname/DNS

15. In the hostname field, enter: clone-master

Use the tab key to go to the Name Server 1 field

16. Enter the generic Google DNS or substitute another if you prefer:

```
8.8.8.8
```

17. Click alt u on your keyboard to change the Routing

18. In the Default IPv4 Gateway field, enter:

```
10.0.2.2
```

19. Select click alt i on your keyboard to select Enable IPv4 Forwarding

20. Use the F10 key to finish.

21. Ping the gateway. If you get a positive response, then you have set up the network correctly:

```
ping 10.0.2.2
```

22. Ping an internet website. If you get a positive response, then you have set up the DNS correctly:

```
ping opensuse.org
```

23. If either step 19 or 20 gives an error, review the steps in this task.

24. Shut down the VM:

```
halt -p
```



## Note: Summary

In this section you set up a new Kubic VM which will be used as a template for creating further VMs.

## 2 Section 2: Clone the VMs

### Description:

In this section you will create VMs for your Kubic cluster.

### 2.1 Task 1: Create the Kubic Master Node

1. Right-click on the Kubic-CloneMaster VM and choose Clone
2. In the Name field, enter:  
Kubic-Master

3. In the Mac Address Policy field, choose:  
Generate new MAC addresses for all network adapters
4. On the Clone type screen, choose Linked Clone  
Click Clone

## 2.2 Task 2: Create a Kubic Worker Node

1. Right-click on the Kubic-CloneMaster VM and choose Clone
2. In the Name field, enter:  
Kubic-Worker1
3. In the Mac Address Policy field, choose:  
Generate new MAC addresses for all network adapters
4. On the Clone type screen, choose Linked Clone  
Click Clone
5. Repeat this task once more and create **Kubic\_Worker2**. You may repeat as many times as you like as long as you have memory and disk space for each node.



### Note

The Kubic-CloneMaster VM can be deleted at this point if you don't think you will need more nodes or it can be left as a template. If it is deleted, it can always be recreated using the steps in the previous section.

#### Summary:

In this section you created additional VMs that will be used as Master and Worker nodes in an openUSE Kubic Kubernetes cluster.

## 3 Section 3: Configure the Master and Worker VMs

#### Description:

In this section, you will change the IP addresses on the Master and Worker VMs to be unique.

### 3.1 Task 1: Configure the Kubic-Master VM

1. From the main Virtualbox screen, choose the **Kubic-Master** VM and click on the down arrow next to the start icon. Click on Detachable Start
2. Log into the command line:  
**Userid: root**  
**Password: [your root password]**
3. Start the curses version of yast to configure networking  
**yast2 lan**
4. Use the **F4** key on your keyboard to edit
5. Use the **tab** key to navigate around the screen
6. Change the IP address to **10.0.2.11**
7. Change the Hostname to **kubic-master**
8. Use the **F10** key to go the next screen
9. User the **alt s** keys to go to the Hostname/DNS screen
10. Change the Hostname to **kubic-master**
11. Use the **F10** key to finish:

### 3.2 Task 2: Configure the Kubic-Worker1 VM

1. From the main Virtualbox screen, choose the **Kubic-Worker1** VM and click on the down arrow next to the start icon. Click on Detachable Start
2. Log into the command line:  
**Userid: root**  
**Password: [your root password]**
3. Start the curses version of yast to configure networking  
**yast2 lan**
4. Use the **F4** key on your keyboard to edit
5. Use the **tab** key to navigate around the screen



6. Change the IP address to 10.0.2.12
  7. Change the Hostname to **kubic-worker1**
  8. Use the **F10** key to go the next screen
  9. Use the **alt s** keys to go to the Hostname/DNS screen
  10. Change the Hostname to **kubic-worker1**
  11. Use the **F10** key to finish
- Repeat Task 2 for each worker node. Add 1 to the IP address and hostname for each node that you configure using the pattern in this section.
- All nodes should be able to ping 10.0.2.2, each other, and an internet website.

Summary:

In this section you changed the IP addresses on each node to be unique so they are ready to create a Kubernetes cluster

## 4 Section 4: Bootstrap the Cluster

Description:

In this section you will bootstrap your Kubic Kubernetes cluster

### 4.1 Task 1: Set up Kubic-Master

1. Login into the **Kubic-Master** VM if you have not already done so:

**UserId: root**

**Password: [your root password]**

2. Run the following command to configure this as a Kubernetes master node:

```
kubeadm init --cri-socket=/var/run/crio/crio.sock \ --pod-network-cidr=10.244.0.0/16
```

You should see some output and at the end, you will see this:

You can now join any number of machines by running the following on each node as root:

```
kubeadm join 10.0.2.11:6443 --token ...
```

## Important

Save this command. You will need it later!

### 4.2 Task 2: (optional) Add a second network interface to Kubic-Master VM

1. Power off the Kubic-Master VM

**halt -p**

2. From the main Virtualbox screen, choose the **Kubic-Master VM** and click on Settings

3. Click on the Network icon

4. Click on the Adaptor 2 tab

Change Attached to to Bridged Adaptor

Name should automatically change to whatever physical network adaptor you are using.

5. From the main Virtualbox screen, choose the **Kubic-Master** VM and click on the down arrow next to the start icon. Click on Detachable Start

6. Log into the command line:

Userid: **root**

Password: **[your root password]**

7. Start the curses version of yast to configure networking on the new nic

**yast2 lan**

8. Use the **F4** key on your keyboard to edit the new nic

9. Click on **alt y** on your keyboard to change this nic to DHCP. If your network does not have DHCP, set a static IP instead.

10. Click on **F10** on your keyboard to exit this screen

11. Click on **F10** on your keyboard to exit yast

12. Find your new IP addresses

**ip a**

You should now be able to log into the Kubic-Master using the terminal or application of your choice. You can also now copy and paste from this book.

### 4.3 Task 3: Set up the Kubic-Workers

1. Login to the Kubic-Worker1 VM if you have not already done so:

    Userid: **root**

    Password: **[your root password]**

2. Run the output command from Task 1 and add

**--cri-socket=/var/run/crio/crio.sock**

to the end of the command

3. Repeat this task for every worker VM

### 4.4 Task 4: Set up the kubectl

1. On the **Kubic-Master** VM, copy and set up the config file so that kubectl can interact with the cluster:

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

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

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

2. Check on your nodes

**kubectl get nodes**

You should have 3 nodes. All of them should be in a NotReady status

### 4.5 Task 5: Set up Flannel

1. Run the following command to install flannel on your cluster:

**kubectl apply -f https://0y.at/kubicflannel**

2. Check on your nodes

**watch kubectl get nodes**

In 1-2 minutes all of them should be in a Ready status. Click on **Ctrl c** on your keyboard to exit this screen.

You now have a fully functional Kubernetes cluster! You can add more worker nodes at any time and then bootstrap them in like you did above.

**Summary:**

In this section you completed your Kubic Kubernetes cluster. It is now fully functional and ready to be used.

(End of Exercise) < < <