

Install Ubuntu on VirtualBox

This guide demonstrates how to install a Linux distro (Ubuntu) on a Virtual Machine (virtualbox).

The Lab environment is on MacOS, but it applies to Windows with some minor changes.

VirtualBox Version: 6.1.30

Ubuntu: 20.04.3

Install Ubuntu on VirtualBox

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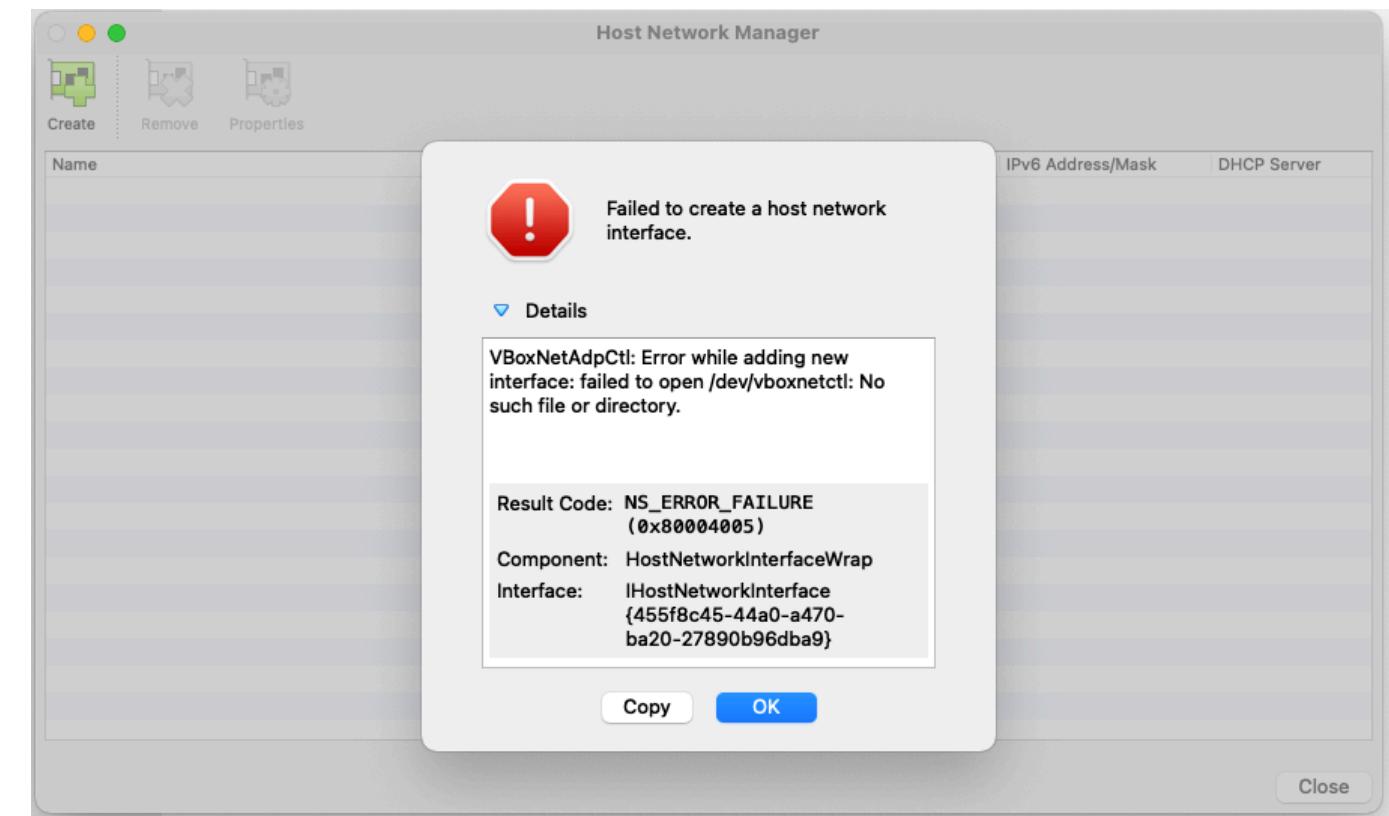
1. Install virtualization tools

1.1 Install VirtualBox

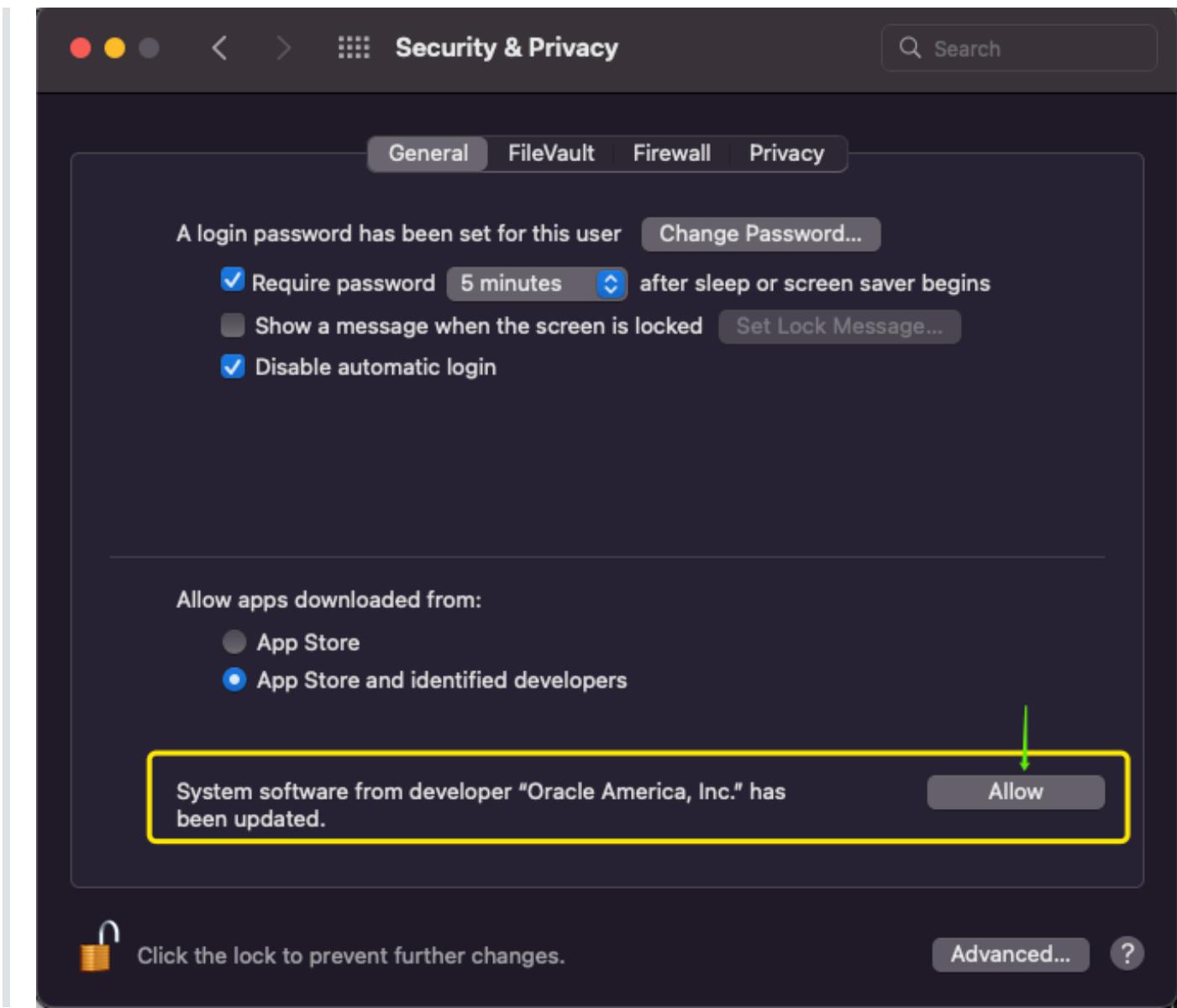
You can download binaries from [Download VirtualBox](#)

Alternatively, if you are using a package manager, just type `brew install --cask virtualbox`.

👉 VirtualBox requires a kernel extension to work. The kernel extension module is blocked due to the macOS security restrictions. You have to enable it first, otherwise you may run into failure when configure the **Host Network Interface**.



How to enable the extension: System Preferences → Security & Privacy → General → **Allow System software from developer "Oracle America, Inc" has been updated.**

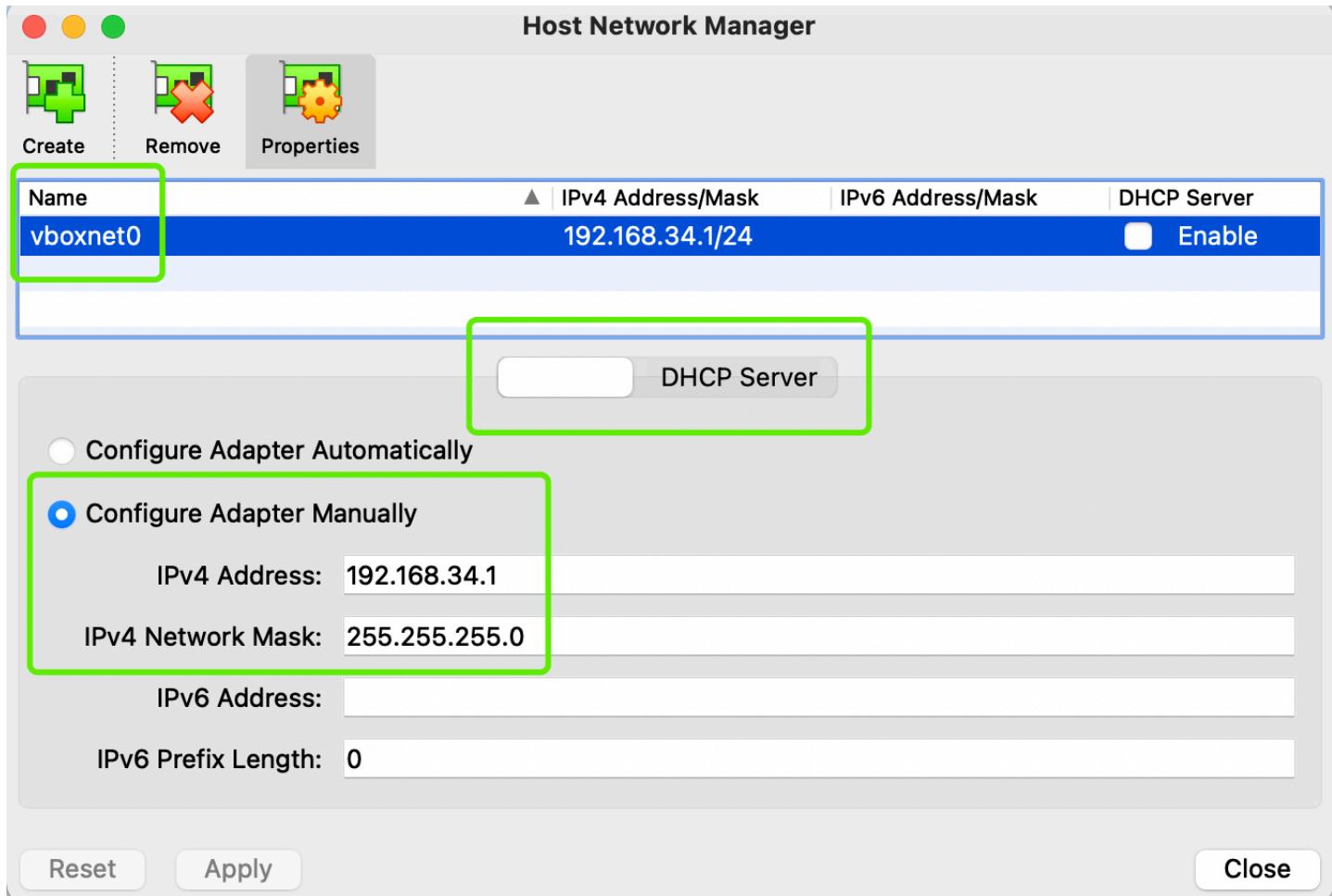


1.2 Configure VirtualBox Network

In File → Host Network Manager → Properties

- Make sure you configure `vboxnet0` and set it to `192.168.56.1/24`.
- If the subnet is different, update IPv4 Address to `192.168.56.1` and IPv4 Network Mask `255.255.255.0`
- Disable DHCP

Now you have added `vboxnet0`



2. Install Ubuntu Image

This section shows how to install and prepare a **Ubuntu base VM**. In the future, we can clone new VMs quickly from the base VM.

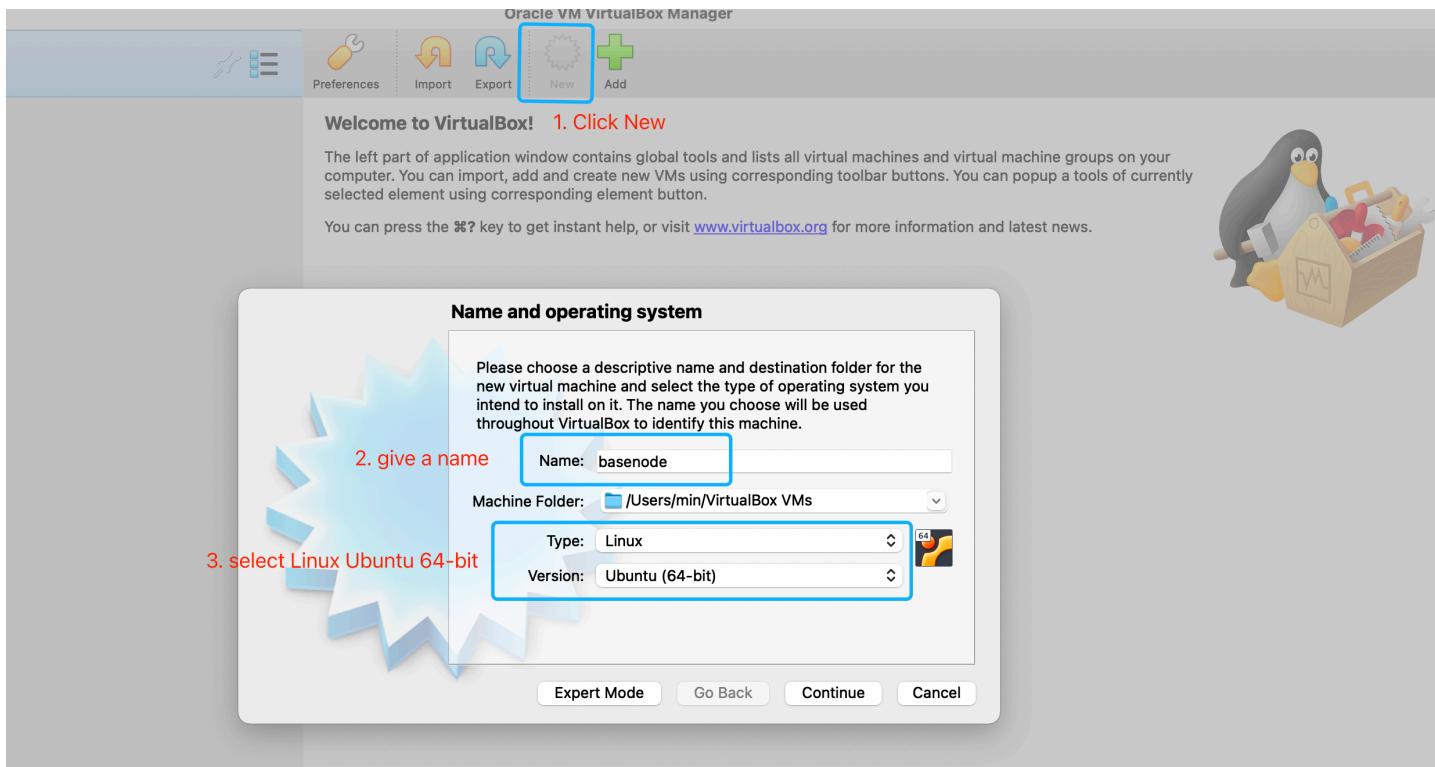
2.1 Download Ubuntu ISO

Download Ubuntu 20.04 LTS (Focal Fossa) from [Ubuntu 20.04](#).

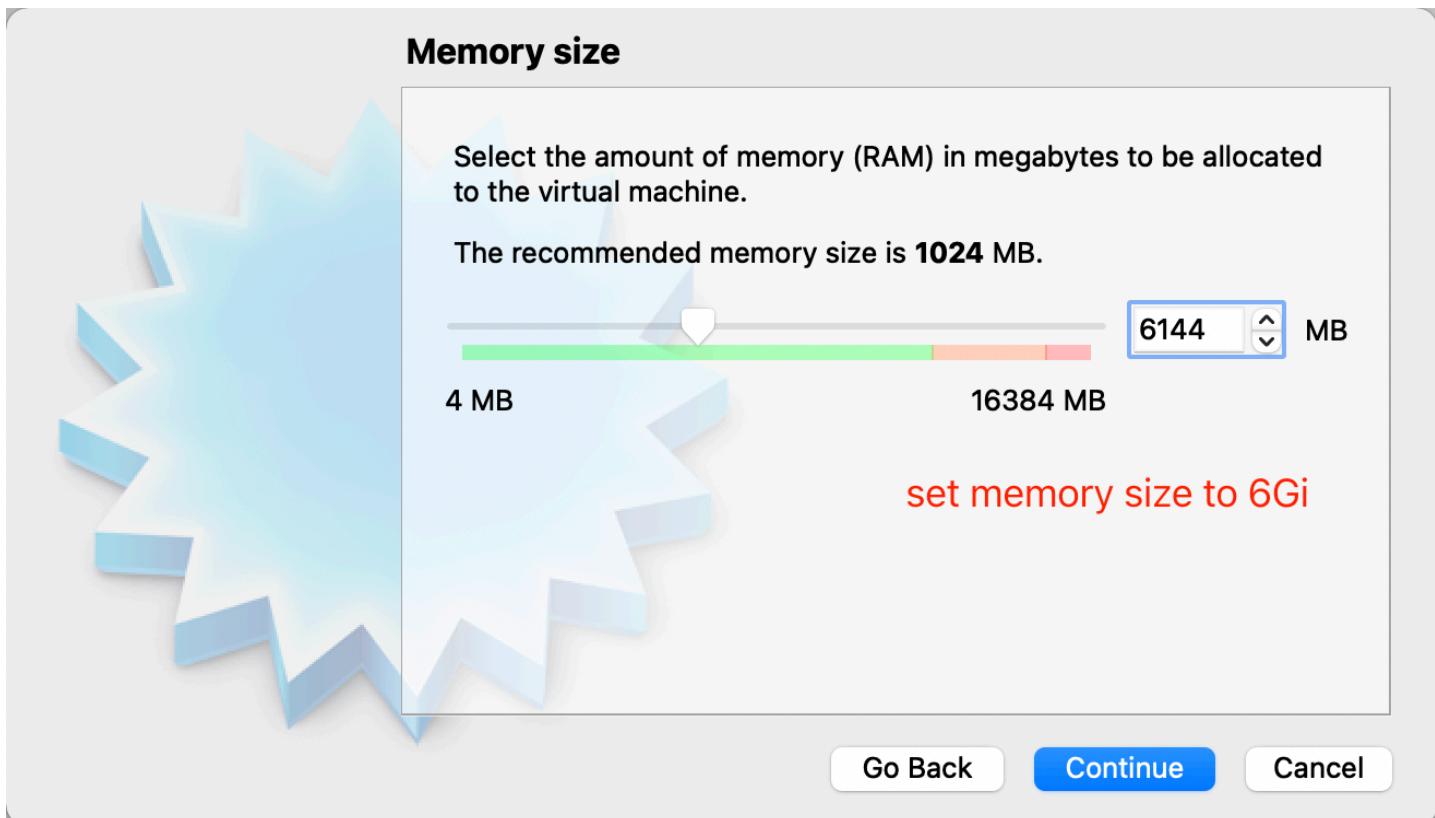
Choose the **Server install image** to download.

2.2 Create and setup a VM

- Click **New** button option, Name the virtual machine `basenode`, select Linux Ubuntu (64-bit)



- Set **Memory size to 6G**



- Create a virtual hard disk

Hard disk

If you wish you can add a virtual hard disk to the new machine. You can either create a new hard disk file or select one from the list or from another location using the folder icon.

If you need a more complex storage set-up you can skip this step and make the changes to the machine settings once the machine is created.

The recommended size of the hard disk is **10.00 GB**.

- Do not add a virtual hard disk
- Create a virtual hard disk now
- Use an existing virtual hard disk file

Empty



Go Back

Create

Cancel

- Select **VDI** as the hard disk file type

Hard disk file type

Please choose the type of file that you would like to use for the new virtual hard disk. If you do not need to use it with other virtualization software you can leave this setting unchanged.

- VDI (VirtualBox Disk Image)
- VHD (Virtual Hard Disk)
- VMDK (Virtual Machine Disk)

Choose VDI by default

Expert Mode

Go Back

Continue

Cancel

- Configure storage on physical hard disk as **Dynamically allocated**



- Set the hard disk file size to **40G** and then create the VM.

File location and size

Please type the name of the new virtual hard disk file into the box below or click on the folder icon to select a different folder to create the file in.

/Users/min/VirtualBox VMs/basenode/basenode.vdi 

Select the size of the virtual hard disk in megabytes. This size is the limit on the amount of file data that a virtual machine will be able to store on the hard disk.

4.00 MB  2.00 TB

40.00 GB

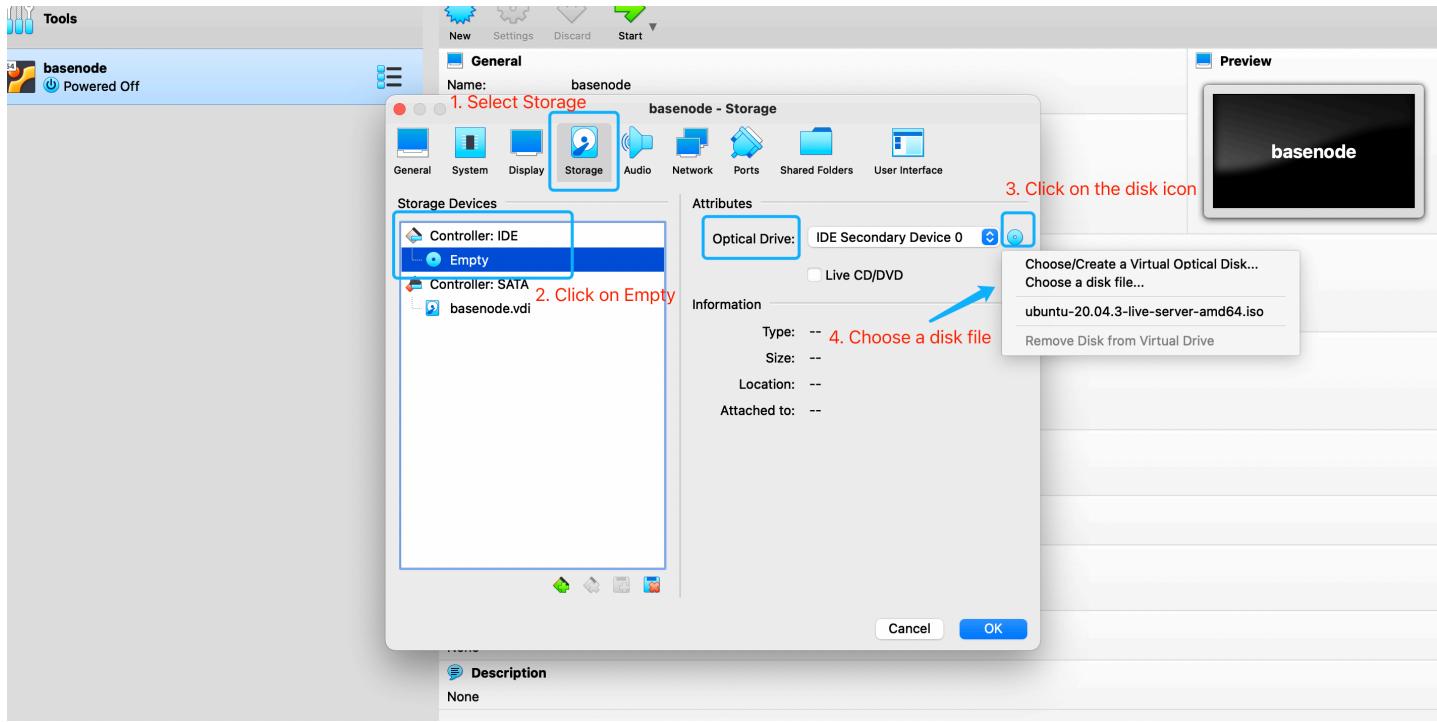
Give a reasonable size of hard disk, here 40 GB
Otherwise you have to resize the VM later if you find the hard disk size is not enough.

Go Back

Create

Cancel

- Now the VM is successfully created, select the VM and click the **settings** property on the top menu bar.
- Go to **System → Processor**, set the number of **CPUs to 2**. Save the changes.
- Go to **Storage → Controller: IDE**, now it should be empty. Then click the **disk icon** on the right of the **Optical Drive**. Select **choose a disk file**. Locate the **Ubuntu ISO image** you have downloaded before and select it.



2.3 Install Ubuntu

- Click **Start** to boot the `basenode` VM, and choose the system language, for example **English**.

Willkommen! Bienvenue! Welcome! Добро пожаловать! Welkom!

[Help]

Use UP, DOWN and ENTER keys to select your language.

- [Asturianu ►]
- [Bahasa Indonesia ►]
- [Català ►]
- [Deutsch ►]
- [English ►]
- [English (UK) ►]
- [Español ►]
- [Français ►]
- [Hrvatski ►]
- [Latviski ►]
- [Lietuviškai ►]
- [Magyar ►]
- [Nederlands ►]
- [Norsk bokmål ►]
- [Polski ►]
- [Suomi ►]
- [Svenska ►]
- [Čeština ►]
- [Ελληνικά ►]
- [Беларуская ►]
- [Русский ►]
- [Српски ►]
- [Українська ►]

- Choose **Continue without updating**.

Installer update available

[Help]

Version 21.12.2 of the installer is now available (21.08.2 is currently running).

You can read the release notes for each version at:

<https://github.comcanonical/subiquity/releases>

If you choose to update, the update will be downloaded and the installation will continue from here.

[Update to the new installer]
[Continue without updating]
[Back]

- Select **default** setting for **Keyboard configuration**.

Keyboard configuration

[Help]

Please select your keyboard layout below, or select "Identify keyboard" to detect your layout automatically.

Layout: [English (US) ▾]

Variant: [English (US) ▾]

[Identify keyboard]

[Done]
[Back]

- Select **default** setting for **Network connections**.

Network connections

[Help]

Configure at least one interface this server can use to talk to other machines, and which preferably provides sufficient access for updates.

NAME	TYPE	NOTES
[enp0s3	eth	- ►]
DHCPv4	10.0.2.15/24	
08:00:27:cc:5e:1c	/ Intel Corporation / 82540EM Gigabit Ethernet Controller	
(PRO/1000 MT Desktop Adapter)		

[Create bond ►]

[Done]
[Back]

- Select **default** setting for **Configure proxy**.

Configure proxy

[Help]

If this system requires a proxy to connect to the internet, enter its details here.

Proxy address:

If you need to use a HTTP proxy to access the outside world, enter the proxy information here. Otherwise, leave this blank.

The proxy information should be given in the standard form of "http://[[user] [:pass]@]host[:port]/".

[Done]
[Back]

- Use **default** setting for **Ubuntu archive mirror**.

Configure Ubuntu archive mirror

[Help]

If you use an alternative mirror for Ubuntu, enter its details here.

Mirror address:

You may provide an archive mirror that will be used instead of
the default.

[Done]
[Back]

- Use **default** setting for **storage configuration**.

Configure a guided storage layout, or create a custom one:

(X) Use an entire disk

[VBOX_HARDDISK_VB61fcc988-b92ef207 local disk 40.000G ▾]

[X] Set up this disk as an LVM group

[] Encrypt the LVM group with LUKS

Passphrase:

Confirm passphrase:

() Custom storage layout

[Done]
[Back]

FILE SYSTEM SUMMARY

MOUNT POINT	SIZE	TYPE	DEVICE TYPE
/	20.000G	new ext4	new LVM logical volume ►]
/boot	1.000G	new ext4	new partition of local disk ►]

AVAILABLE DEVICES

DEVICE	TYPE	SIZE
[ubuntu-vg (new) free space	LVM volume group	38.996G ►] 18.996G
[Create software RAID (md) ►]		
[Create volume group (LVM) ►]		

USED DEVICES

DEVICE	TYPE	SIZE
[ubuntu-vg (new) ubuntu-lv new, to be formatted as ext4, mounted at /	LVM volume group local disk	38.996G ►] 20.000G ►]
[VBOX_HARDDISK_VB61fcc988-b92ef207 partition 1 new, BIOS grub spacer partition 2 new, to be formatted as ext4, mounted at /boot partition 3 new, PV of LVM volume group ubuntu-vg	local disk	40.000G ►] 1.000M ►] 1.000G ►] 38.997G ►]

[Done]
[Reset]
[Back]

Storage configuration

[Help]

FILE SYSTEM SUMMARY

MOUNT POINT	SIZE	TYPE	DEVICE TYPE
/	20.000G	new ext4	new LVM logical volume ►]
/boot	1.000G	new ext4	new partition of local disk ►]

AVAILABLE DEVICES

Confirm destructive action

Selecting Continue below will begin the installation process and result in the loss of data on the disks selected to be formatted.

You will not be able to return to this or a previous screen once the installation has started.

Are you sure you want to continue?

[No]
[Continue]

partition 2 new, to be formatted as ext4, mounted at /boot 1.000G ►
partition 3 new, PV of LVM volume group ubuntu-vg 38.997G ►

[Done]
[Reset]
[Back]

- Setup profile. For example:

- Your name: `sadmin`
- Your server's name: `basenode`
- Pick a username: `sadmin`
- Choose a password: `sadmin`

Enter the username and password you will use to log in to the system. You can configure SSH access on the next screen but a password is still needed for sudo.

Your name:

Your server's name:

The name it uses when it talks to other computers.

Pick a username:

Choose a password:

Confirm your password:

[Done]

- Enable **Install OpenSSH server**

You can choose to install the OpenSSH server package to enable secure remote access to your server.

[X] Install OpenSSH server

Import SSH identity: [No ▾]

You can import your SSH keys from GitHub or Launchpad.

Import Username:

[X] Allow password authentication over SSH

[Done]
[Back]

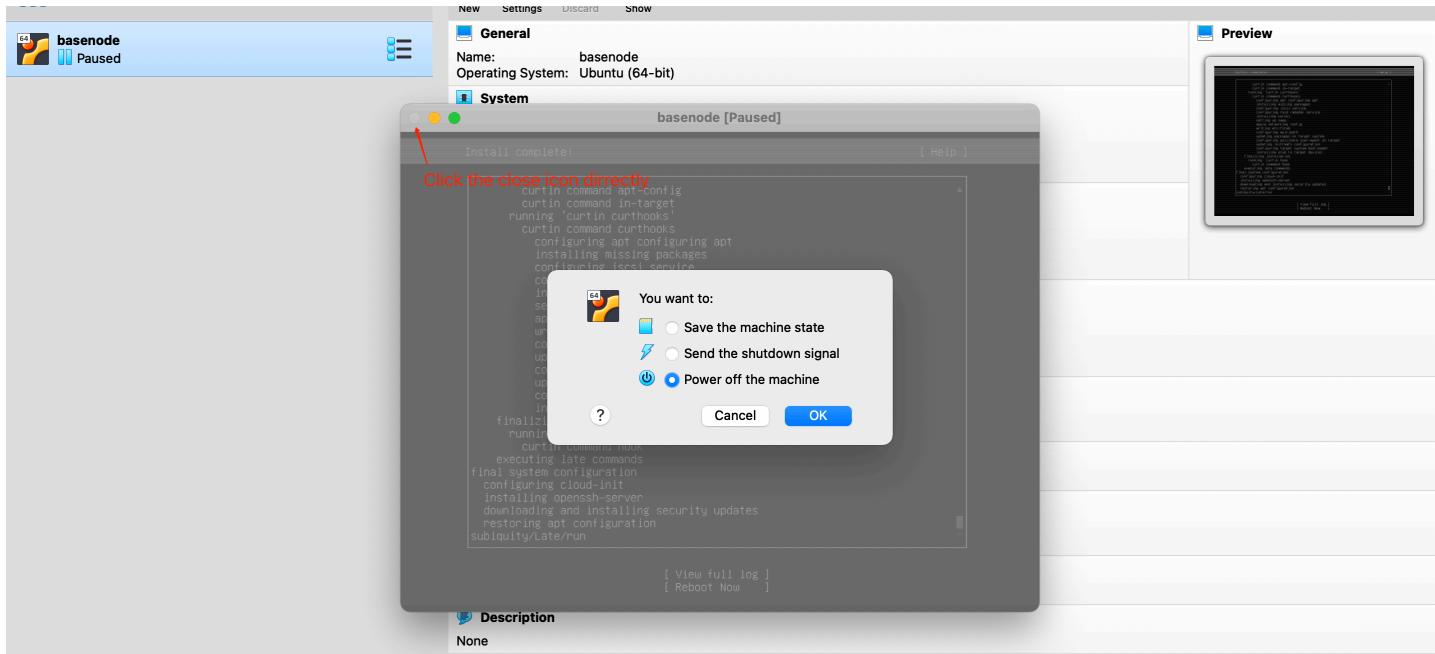
- Leave the **Featured Server Snaps** empty.

These are popular snaps in server environments. Select or deselect with SPACE, press ENTER to see more details of the package, publisher and versions available.

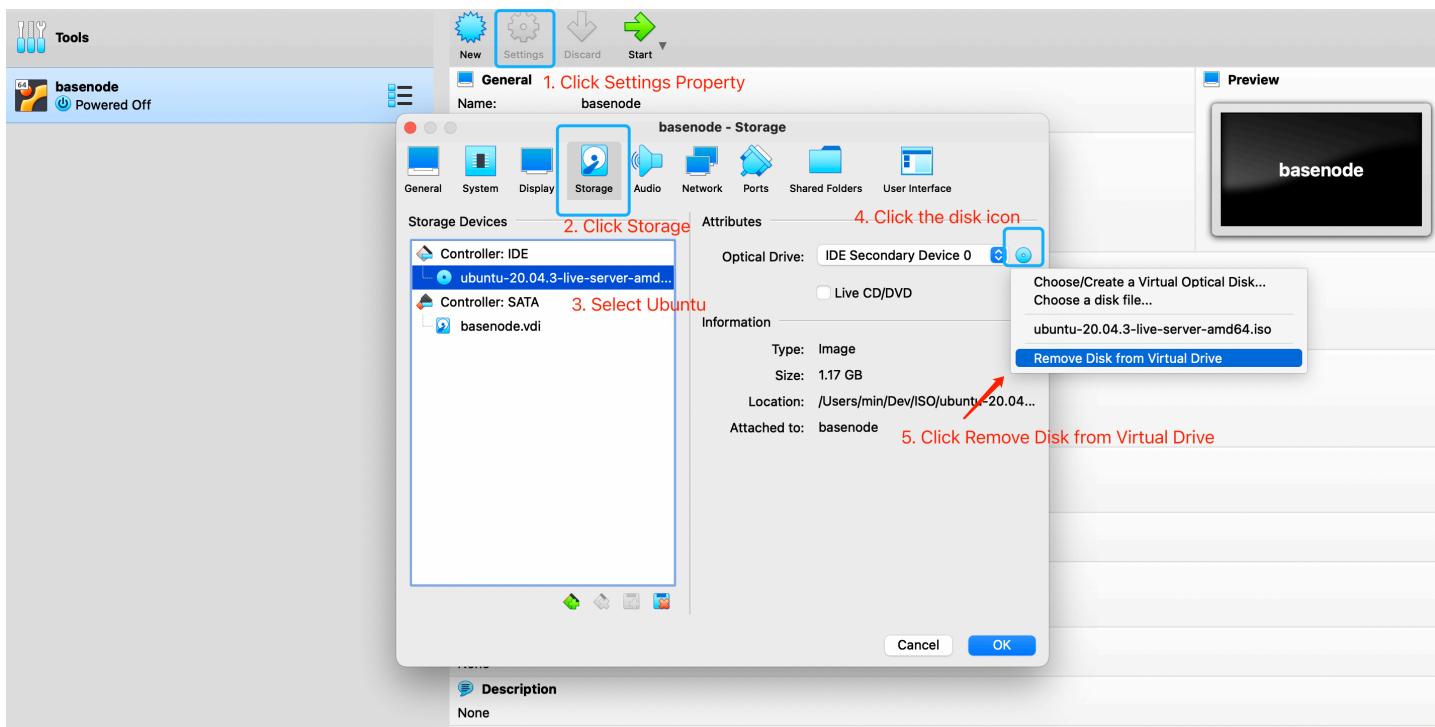
[] mikrocks	Kubernetes for workstations and appliances	►
[] nextcloud	Nextcloud Server - A safe home for all your data	►
[] wekan	The open-source Kanban	►
[] kata-containers	Build lightweight VMs that seamlessly plug into the cloud	►
[] docker	Docker container runtime	►
[] canonical-livepatch	Ubuntu Livepatch Client	►
[] rocketchat-server	Rocket.Chat server	►
[] mosquitto	Eclipse Mosquitto MQTT broker	►
[] etcd	Resilient key-value store by CoreOS	►
[] powershell	PowerShell for every system!	►
[] stress-ng	tool to load and stress a computer	►
[] sabnzbd	SABnzbd	►
[] wormhole	get things from one computer to another, safely	►
[] aws-cli	Universal Command Line Interface for Amazon Web Services	►
[] google-cloud-sdk	Google Cloud SDK	►
[] slcli	Python based SoftLayer API Tool.	►
[] doctl	The official DigitalOcean command line interface	►
[] conjure-up	Package runtime for conjure-up spells	►
[] postgresql10	PostgreSQL is a powerful, open source object-relational database system	►
[] heroku	CLI client for Heroku	►
[] keepalived	High availability VRRP/BFD and load-balancing for Linux	►
[] prometheus	The Prometheus monitoring system and time series data	►
[] juju	Juju - a model-driven operator lifecycle manager for Kubernetes	►

[Done]
[Back]

- Wait for the installation to complete. **Remember do not restart the VM at the moment, shutdown the VM directly.**



- In VM settings, go to **Storage** → **Controller: IDE** → Select `Ubuntu-20.04.3-live-server-amd64.iso` and then choose **remove disk from virtual drive** from the Optical Drive. This step is to prevent VM reinstall ubuntu on reboot.



2.4 Add Host-only Network Adapter to VM

With **NAT** Network Adapter:

- **If host can access internet, then VM can access internet.**
- VM cannot ping another VM
- VM can ping the host
- **Host cannot ping VM.**
- IP is `10.0.2.15`
- Gateway is `10.0.2.2`
- Requests from the VM is passed to NAT Engine, the NAT engine can leverage the host to access internet, the processed packet is then come back to VM via the NAT Engine.

With **Host-only** Network Adapter:

- The VM cannot access internet
- VM can ping another VM
- VM can ping host
- Host can ping VM
- IP is in range of the Host-only network interface, default is `192.168.56.*`
- Gateway is the IP of Host-only network interface, default is `192.168.56.1`

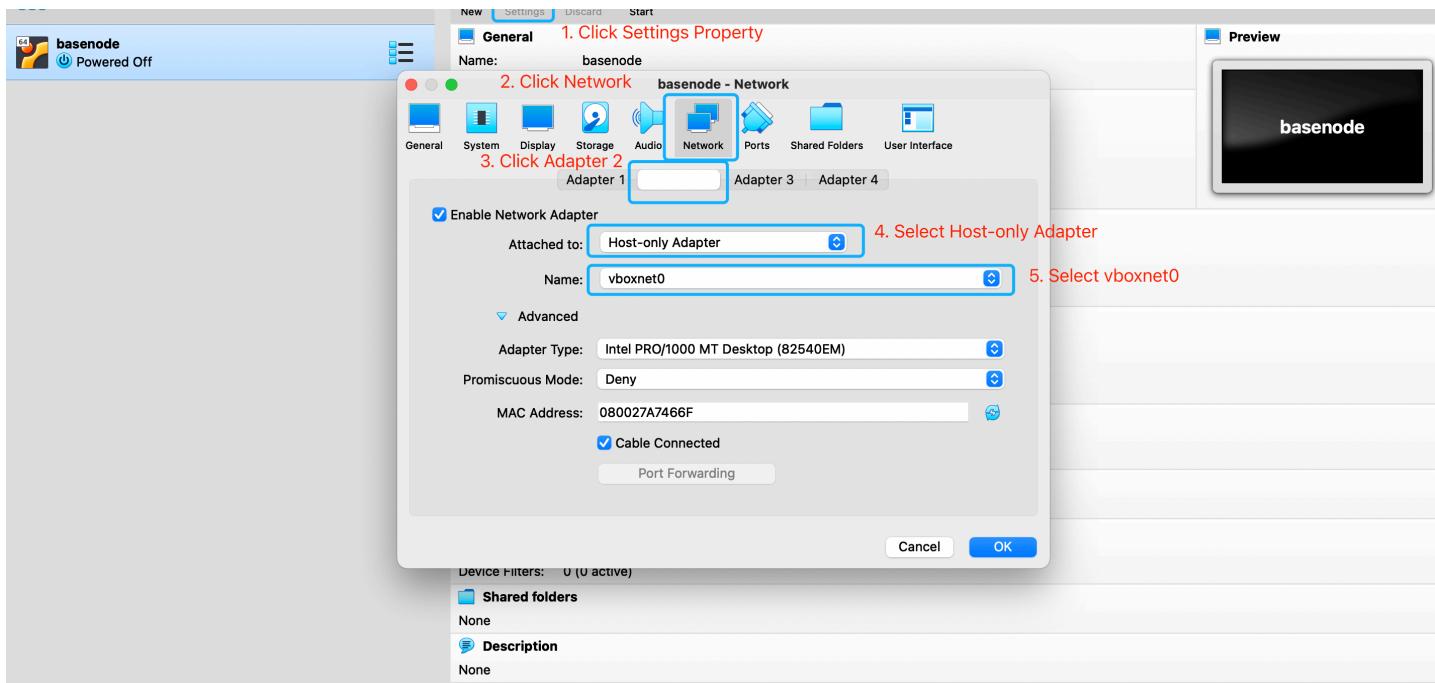
With the help of these two network interfaces:

- **Host can ping VM**
- **VM can access internet**
- **VM can ping another VM**
- **VM can ping host**

Go to **Settings → Network → Adapter 2**

Enable Network Adapter and Attach to `Host-only Adapter`, and select `vboxnet0` as the network.





2.5 Set IP of Adapter 2 Network

Boot the VM and **login** to the system.

Make sure you have the root privilege to make below changes.

```
# switch to root user
sudo -i

# Update netplan config
vi /etc/netplan/00-installer-config.yaml
```

Update config with below content.

```
network:
  ethernets:
    enp0s3:
      dhcp4: true
    enp0s8:
      dhcp4: no
      addresses:
        - 192.168.56.2/24
  version: 2
```

Then apply the changes.

```
netplan apply
```

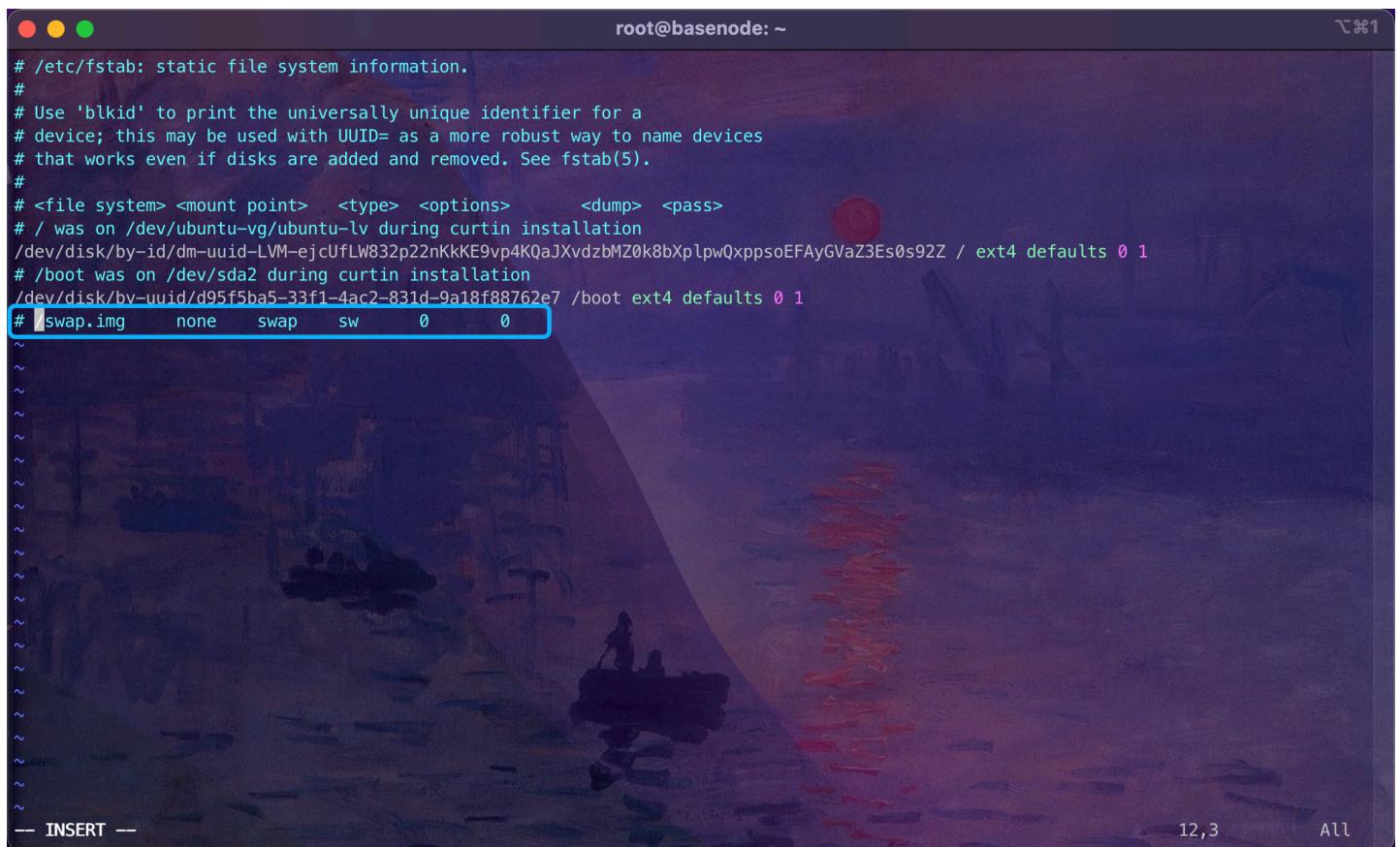
After this change, the VM has two network adapters:

- One is NAT which will get an IP automatically, for example, 10.0.2.15, allowing external access from your VM
- One is host adapter, whose static IP is configured as 192.168.56.2

2.6 Turn off swap

```
swapoff -a

vi /etc/fstab
# Comment or remove the line with `swap` keyword.
```



```
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point> <type> <options> <dump> <pass>
# / was on /dev/ubuntu-vg/ubuntu-lv during curtin installation
/dev/disk/by-id/dm-uuid-LVM-ejcUfLW832p22nKKKE9vp4KQaJXvdzbMZ0k8bXplpwQxppsoEFAyGVaZ3Es0s92Z / ext4 defaults 0 1
# /boot was on /dev/sda2 during curtin installation
/dev/disk/by-uuid/d95f5ba5-33f1-4ac2-831d-9a18f88762e7 /boot ext4 defaults 0 1
# /swap.img none swap sw 0 0
```

2.7 Update source

```
# 1. backup sources.list
sudo cp /etc/apt/sources.list /etc/apt/sources.list.bak

vi /etc/apt/sources.list
# Then press ESC + gg + dG to delete all lines
# Then Set paste
```

```
# 2. copy aliyun source to /etc/apt/sources.list
deb http://mirrors.aliyun.com/ubuntu/ focal main restricted universe multiverse

deb-src http://mirrors.aliyun.com/ubuntu/ focal main restricted universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ focal-security main restricted universe multiverse

deb-src http://mirrors.aliyun.com/ubuntu/ focal-security main restricted universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ focal-updates main restricted universe multiverse

deb-src http://mirrors.aliyun.com/ubuntu/ focal-updates main restricted universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ focal-proposed main restricted universe multiverse

deb-src http://mirrors.aliyun.com/ubuntu/ focal-proposed main restricted universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ focal-backports main restricted universe multiverse

deb-src http://mirrors.aliyun.com/ubuntu/ focal-backports main restricted universe multiverse

# 3. Update source list
sudo apt update
sudo apt upgrade
```

Poweroff current machine with `shutdown -h now`. The **basenode** VM is now successfully setup.