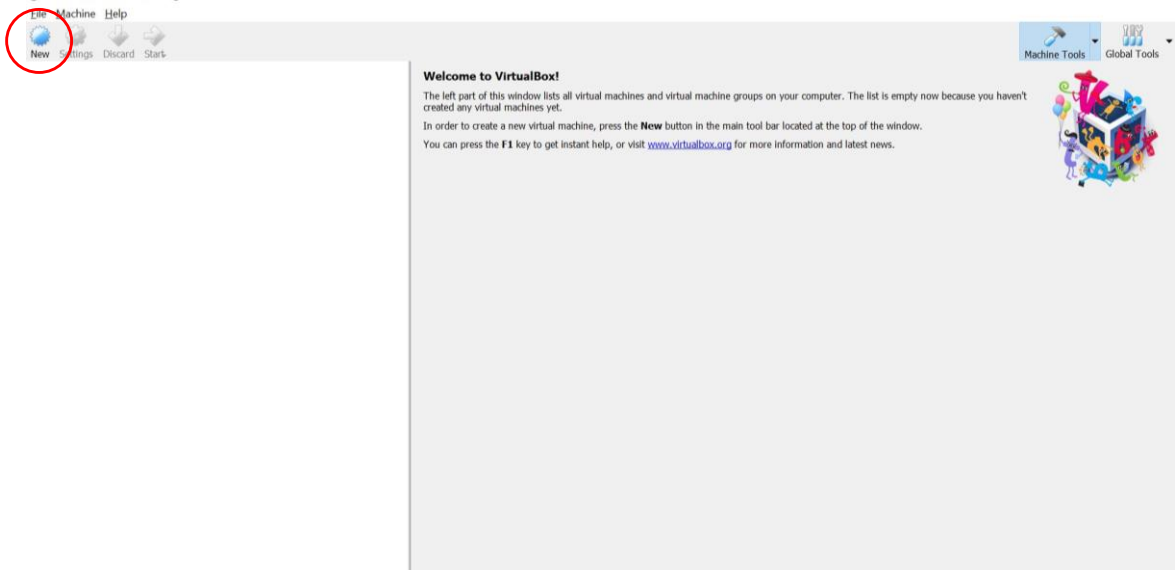


# Installation Virtual Machine in VirtualBox

A Visual Guide

1



Open VB -> click 'New' (blue icon)

2

?


×

← Create Virtual Machine

### Name and operating system

Please choose a descriptive name for the new virtual machine and select the type of operating system you intend to install on it. The name you choose will be used throughout VirtualBox to identify this machine.

Name:

Type:  

Version:

Expert Mode

Next

Cancel

Choose OS, storage location and name

3

?


×

← Create Virtual Machine

### Memory size

Select the amount of memory (RAM) in megabytes to be allocated to the virtual machine.

The recommended memory size is **1024 MB**.

  MB

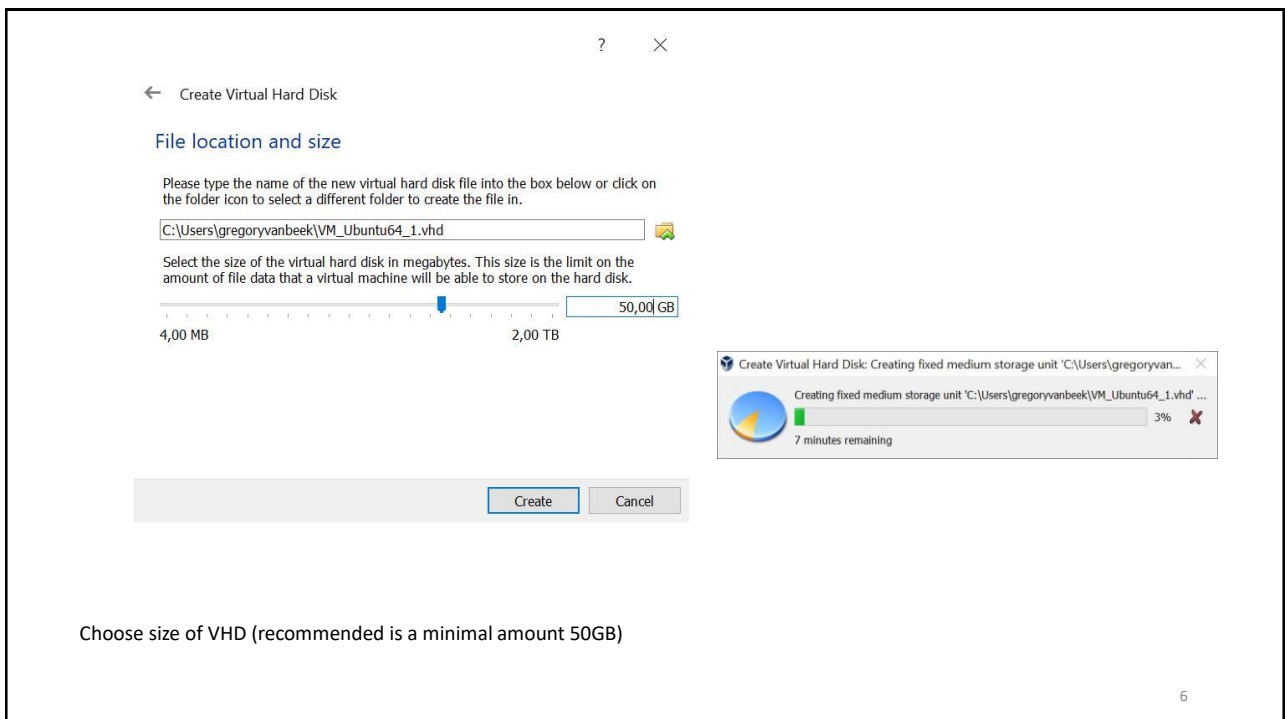
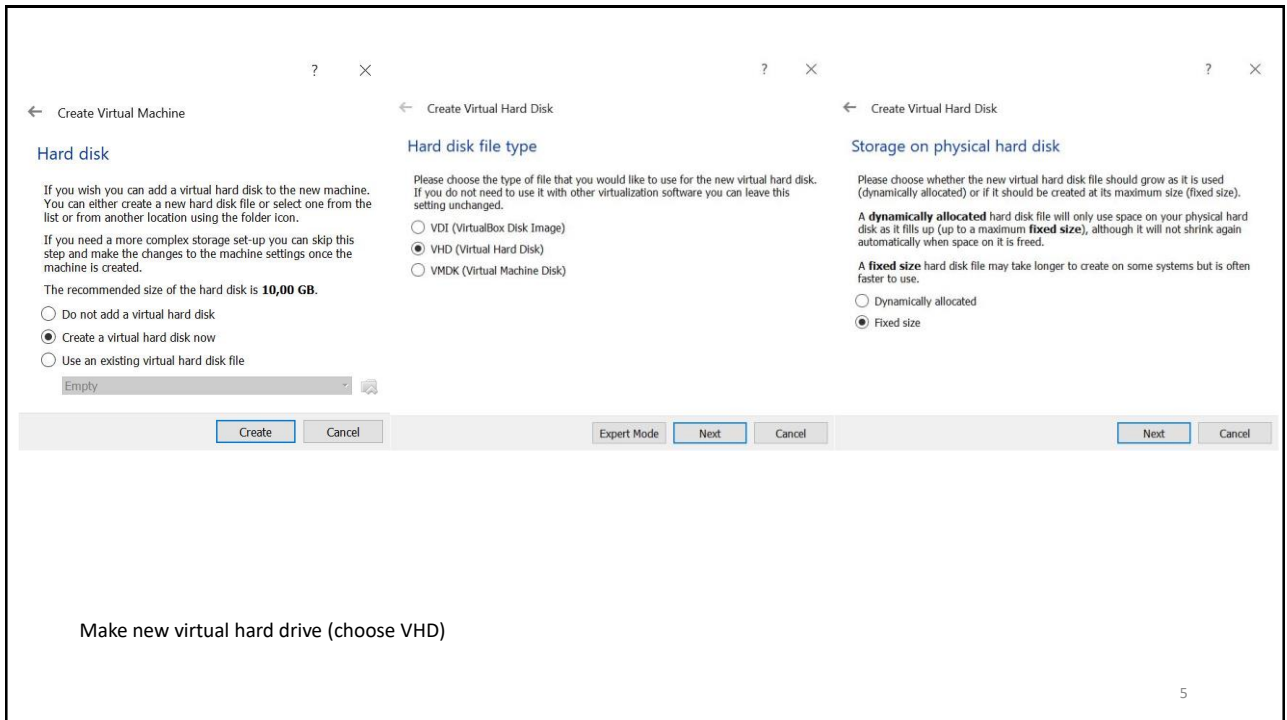
4 MB 8192 MB

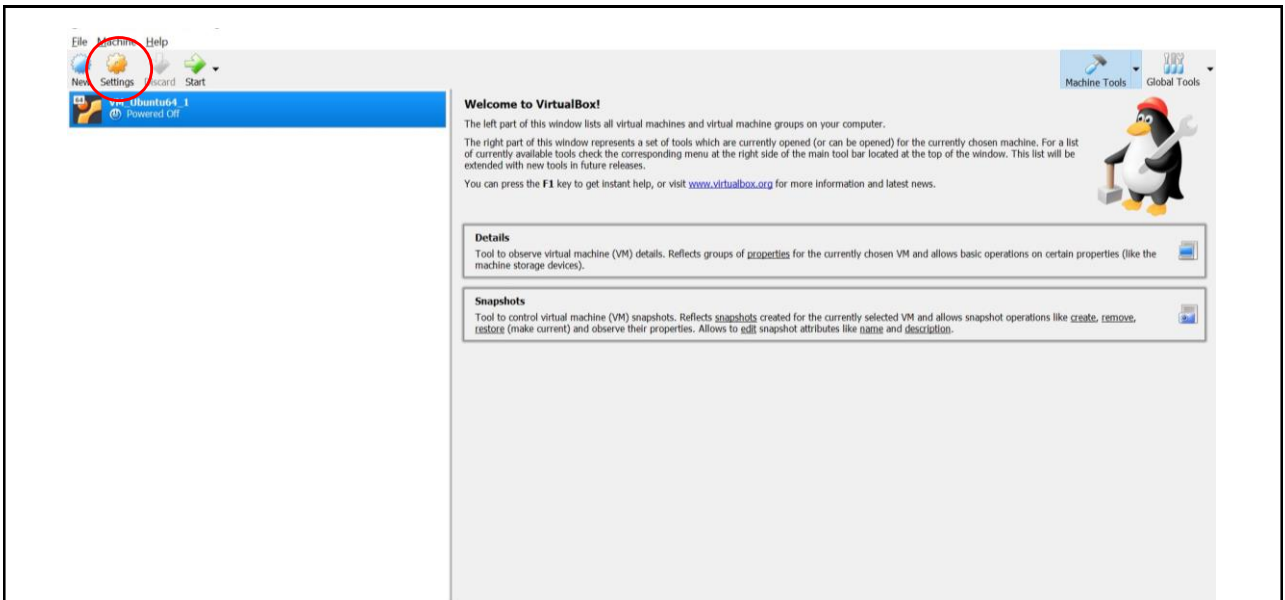
Next

Cancel

Allocate RAM memory (advised is to use not more than one fourth of your computer memory)

4





**Welcome to VirtualBox!**

The left part of this window lists all virtual machines and virtual machine groups on your computer.

The right part of this window represents a set of tools which are currently opened (or can be opened) for the currently chosen machine. For a list of currently available tools check the corresponding menu at the right side of the main tool bar located at the top of the window. This list will be extended with new tools in future releases.

You can press the F1 key to get instant help, or visit [www.virtualbox.org](http://www.virtualbox.org) for more information and latest news.

**Details**

Tool to observe virtual machine (VM) details. Reflects groups of **properties** for the currently chosen VM and allows basic operations on certain properties (like the machine storage devices).

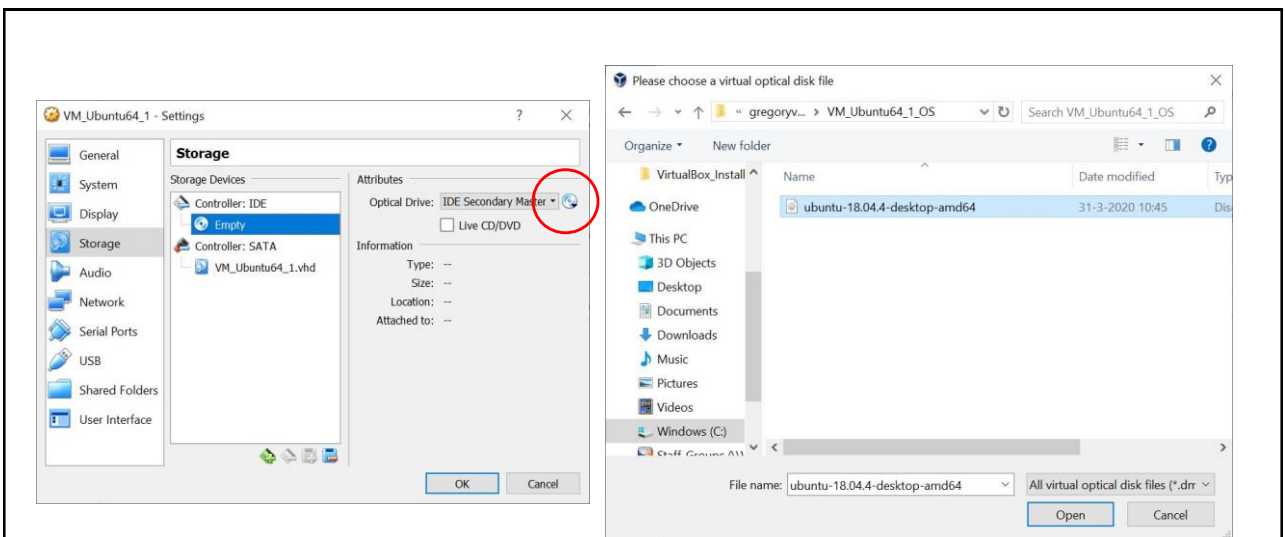
**Snapshots**

Tool to control virtual machine (VM) snapshots. Reflects **snapshots** created for the currently selected VM and allows snapshot operations like **create**, **remove**, **restore** (make current) and observe their properties. Allows to edit snapshot attributes like **name** and **description**.

Download the Ubuntu 18.04.4 LTS operating system (<https://ubuntu.com/download/desktop>) and save the 'Disc Image File' at a convenient location.

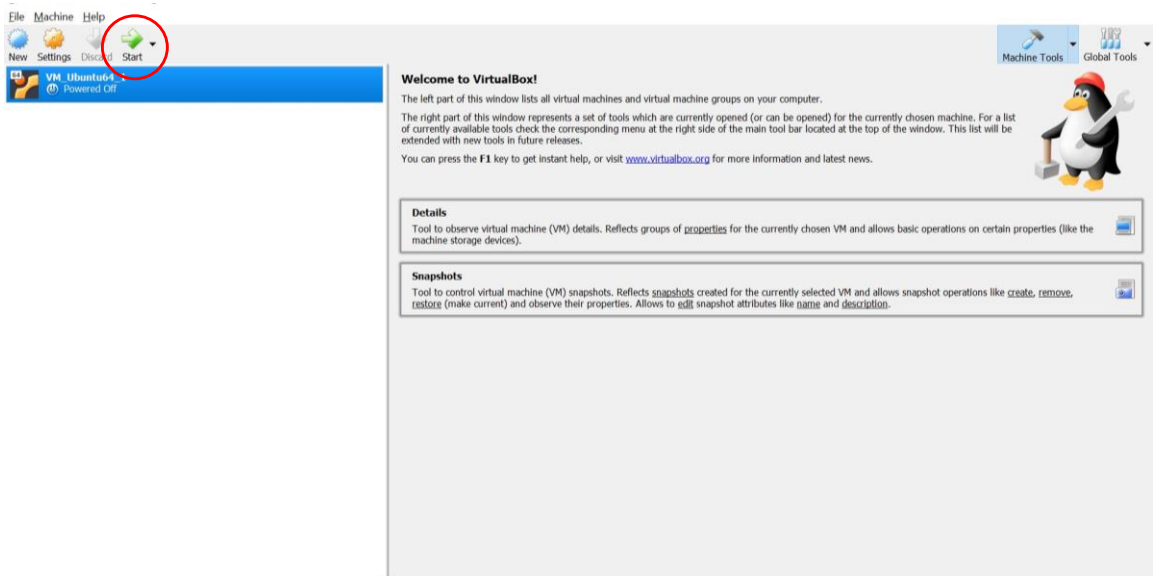
Go to settings of your new virtual machine (VM) (yellow gear symbol) and go to the storage tab.

7



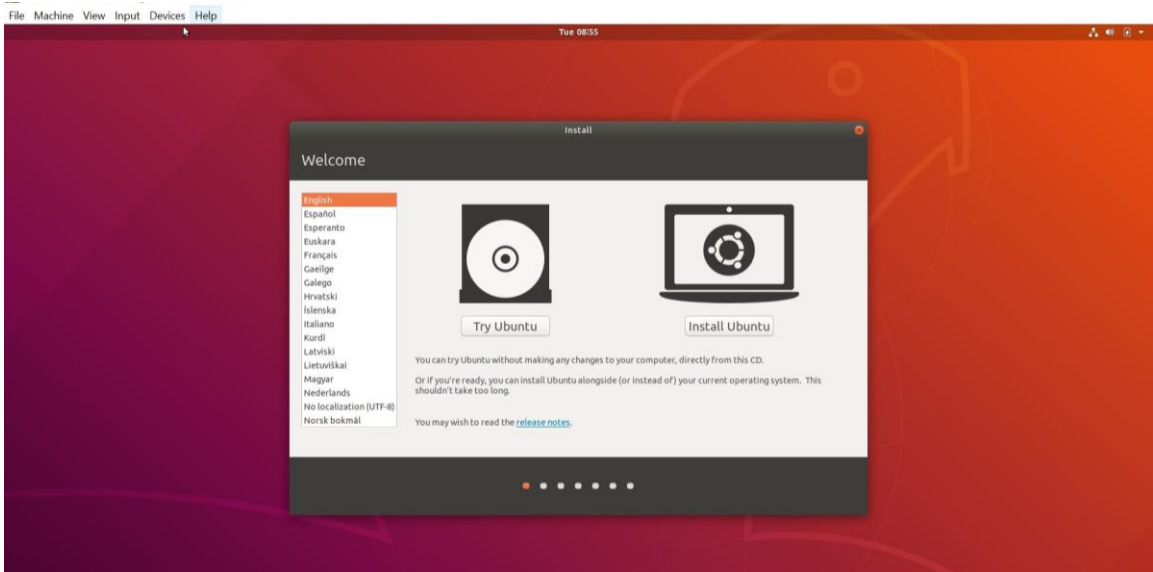
Click 'empty' under 'Controller IDE'. Next to 'IDE Secondary master' click the blue CD icon and select 'choose/create a virtual optical disk'. Click 'Add' and choose your downloaded Linux OS.

8



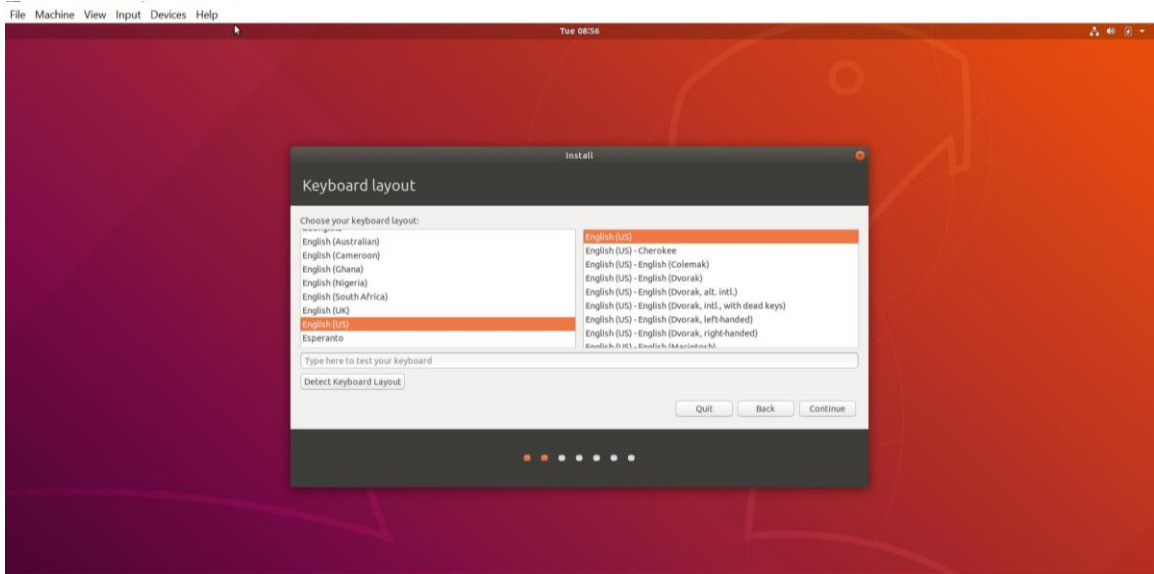
Start the VM and run the Linux install process with the recommended settings. Note that this might freeze sometimes, so it might be necessary to reinstall it a few times, especially with a slow computer or when little RAM memory is allocated for the VM.)

9



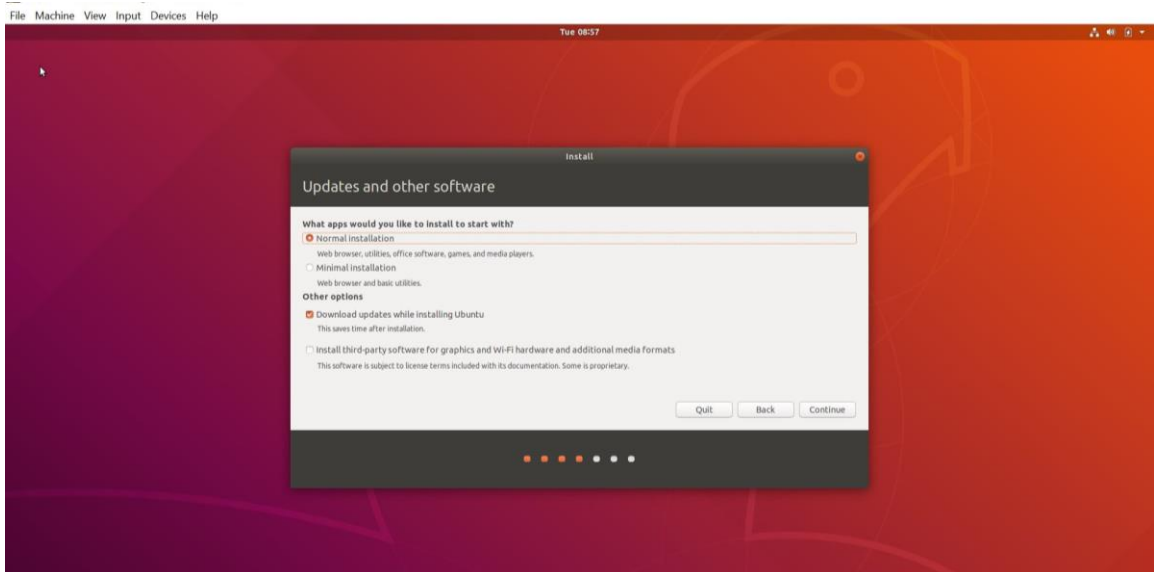
Click 'Install Ubuntu'.

10



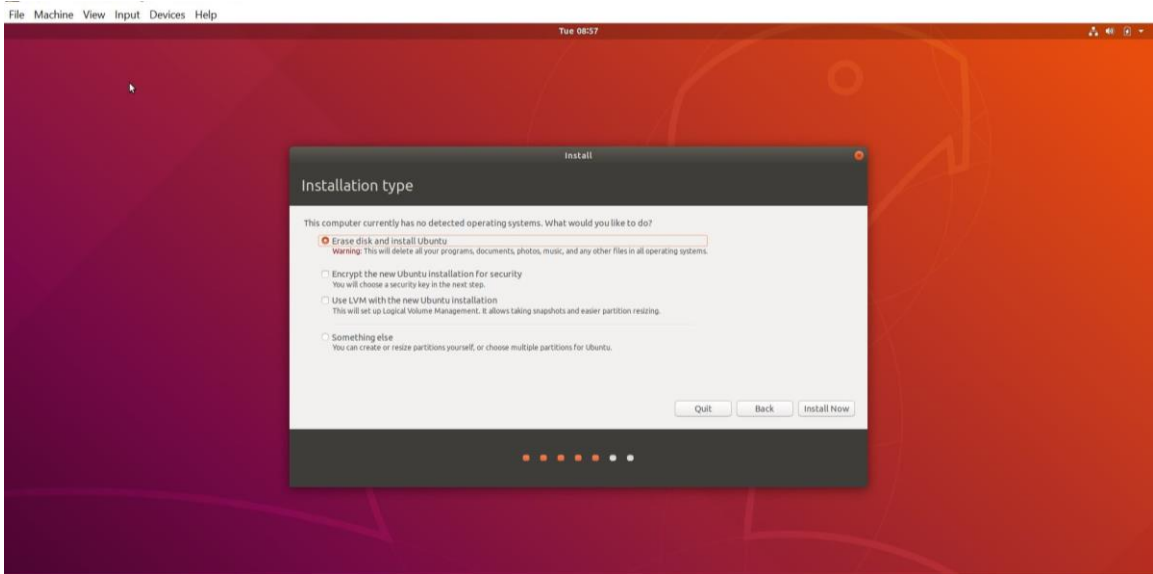
Select your preferred keyboard outlay.

11



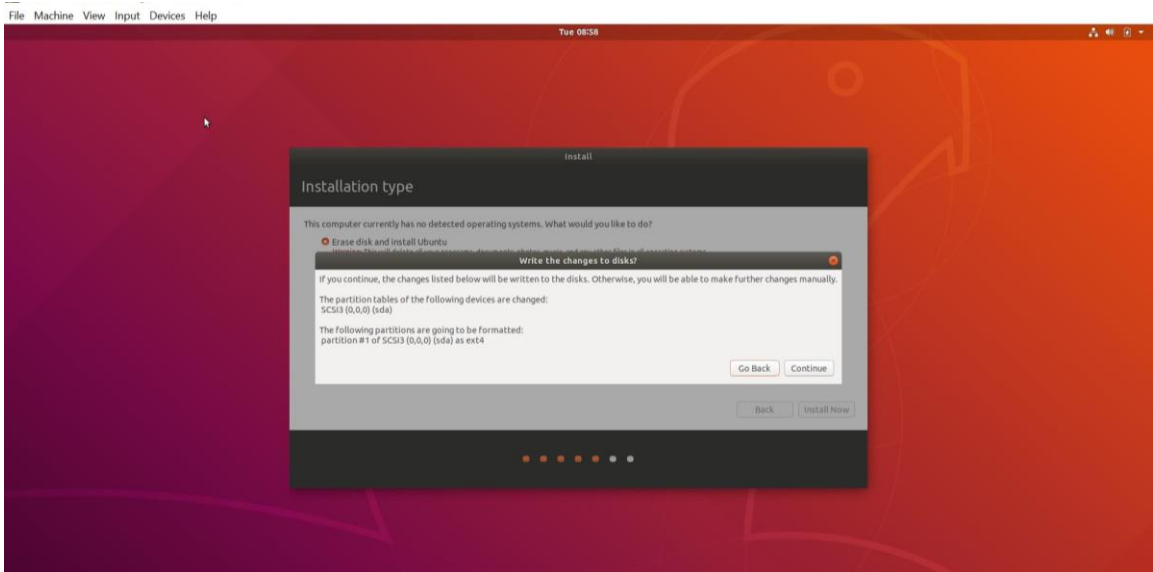
Click 'Normal Installation'.

12



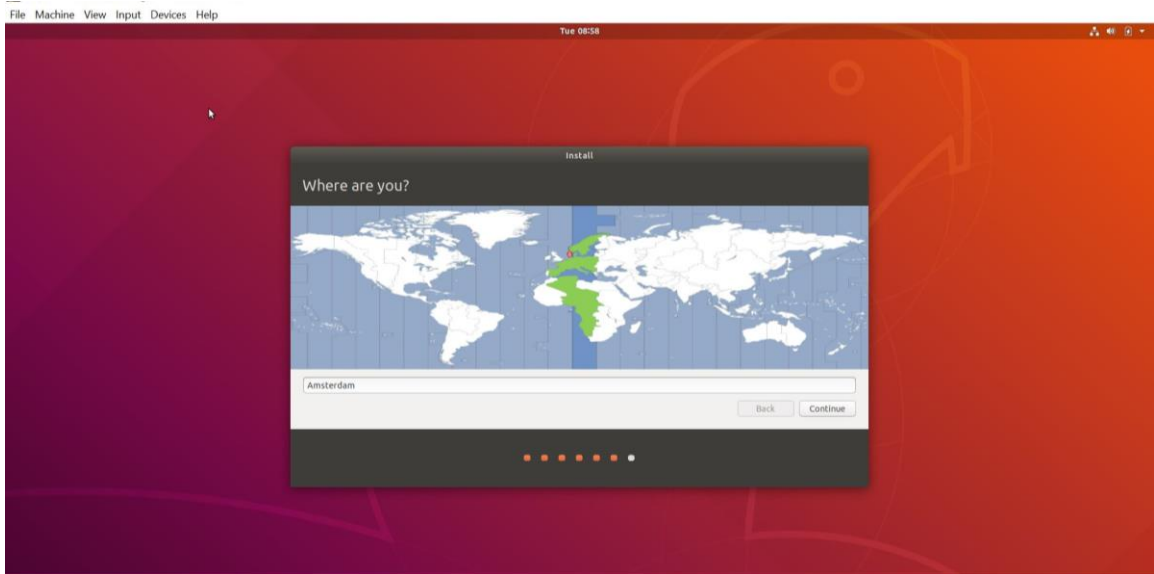
Click 'Erase Disk and Install Ubuntu'.

13



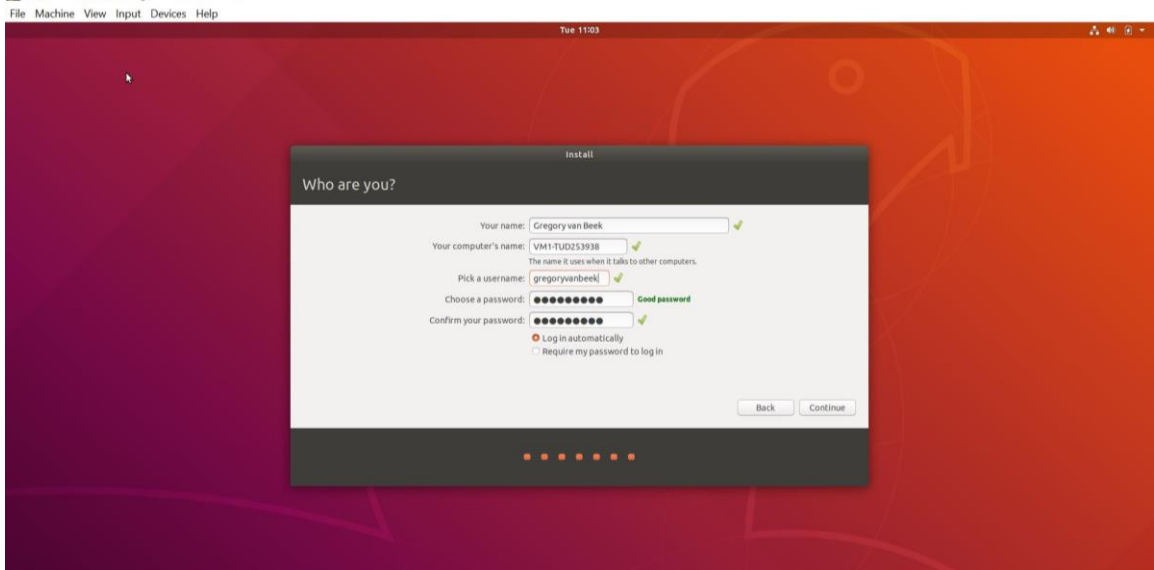
Click 'Continue'.

14



Select your current time region

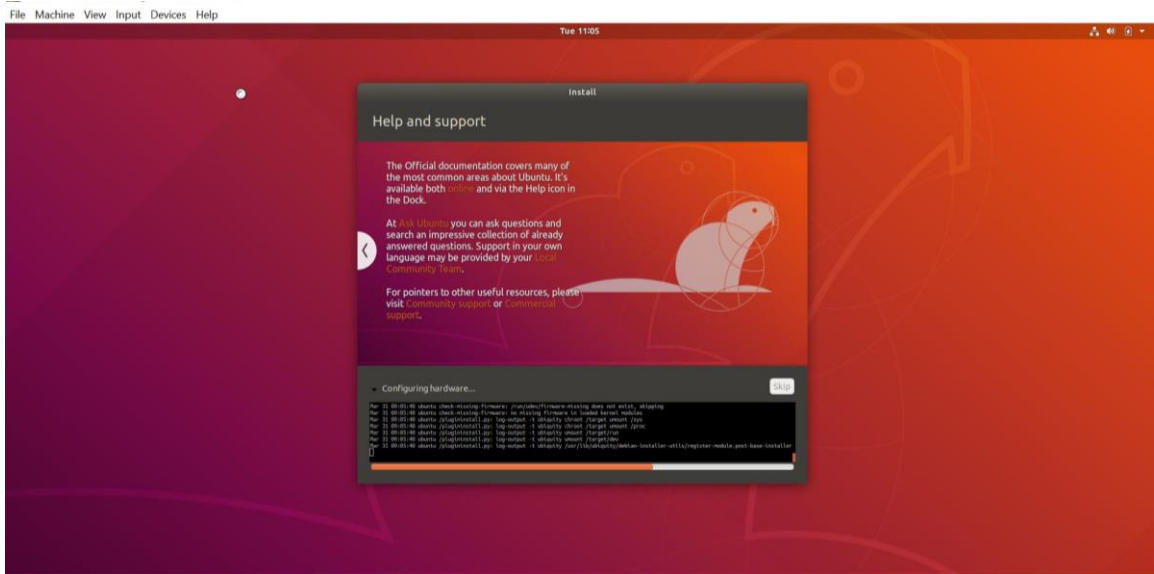
15



Enter your name, computernam, username and password.

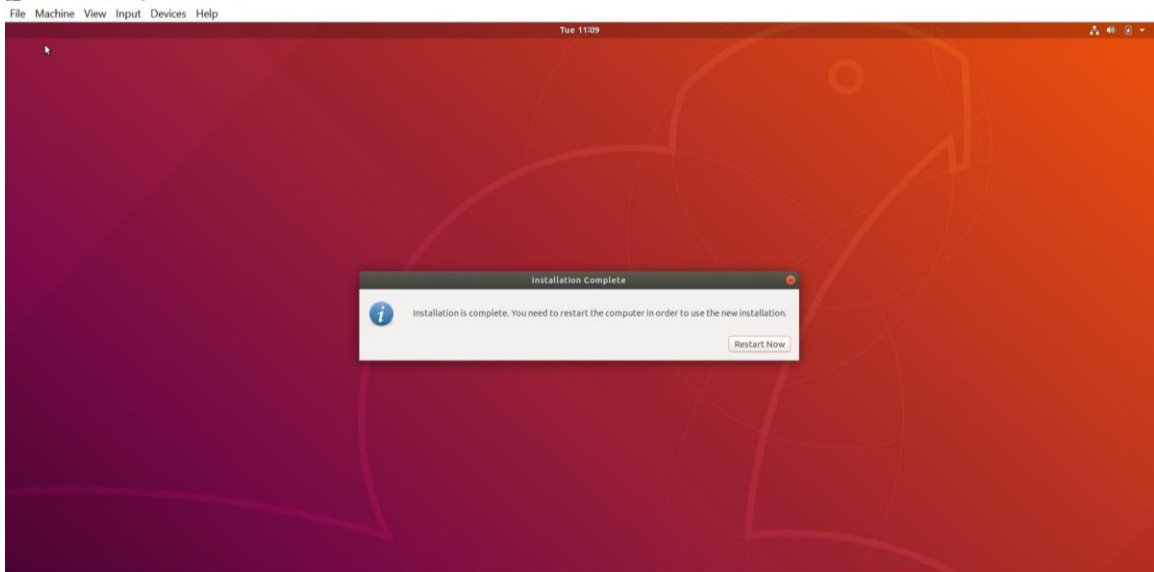
16





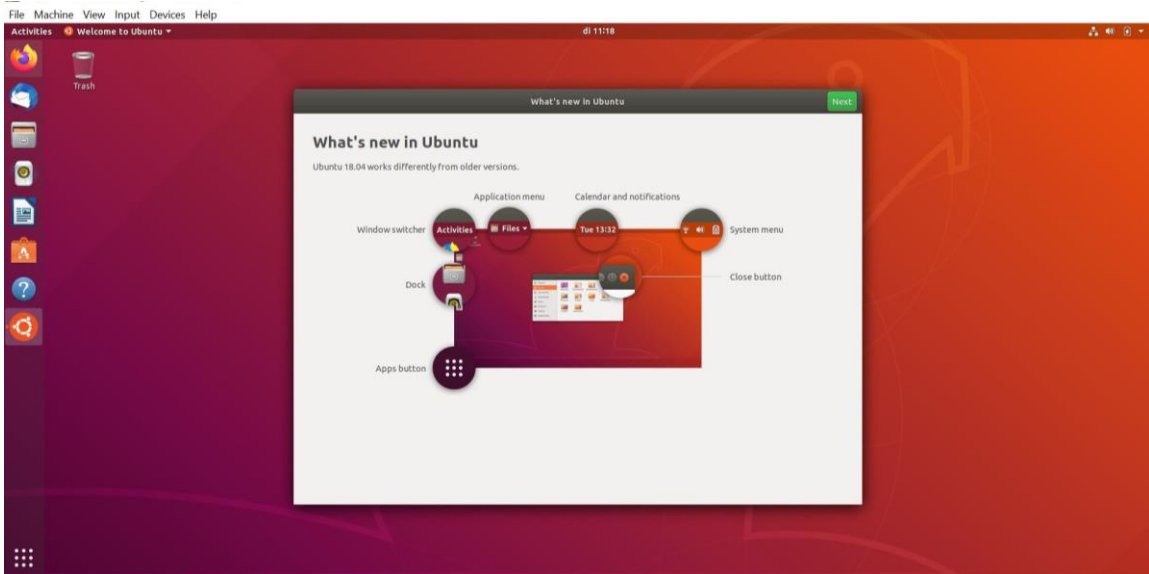
The install process should now start and should last more than 15 to 30 minutes (depending on how fast your computer is). If it takes a lot of time without progressing, restart the machine with the arrow in the top right corner.

17



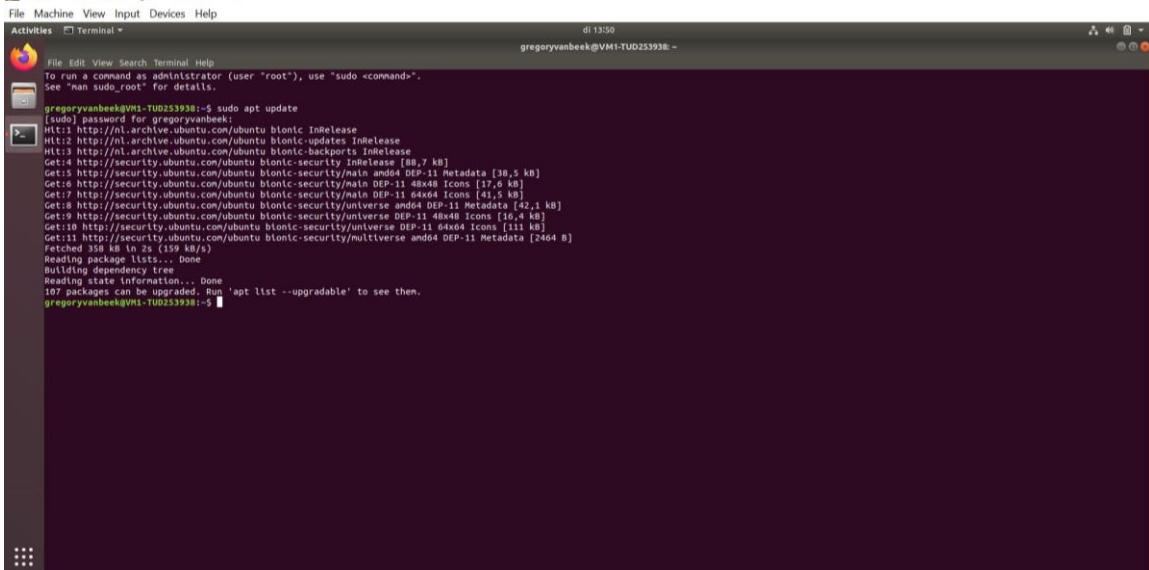
Restart the VM. If after restarting the VM ask to 'remove the start up medium', press enter. If the VM doesn't start up after that, turn the VM off (press the cross in the top right corner to close the window) and start the VM again.

18



If the installation is successful, the VM should look something like this. It is advised not to install many programs other than the ones needed for data processing (to save memory). The VM is now working, but for easy sharing of files between the physical computer and the VM, a shared folder can be created.

19



To add a shared folder, 'guest additions' needs to be installed in the VM. For this, enter 'sudo apt update'

When finished, enter 'sudo apt upgrade' and restart the system and restart the VM.

20

```

File Machine View Input Devices Help
gregoryvanbeek@VMI-TU0253938:~$ sudo apt install build-essential dkms linux-headers-$(uname -r)
Reading package lists... Done
Building dependency tree
Reading state information... Done
linux-headers-5.3.0-45-generic is already the newest version (5.3.0-45.37-18.04.1).
linux-headers-5.3.0-45-generic set to manually installed.
The following packages were automatically installed and are no longer required:
  efi-bootmgr libfup1 libwayland-egl-mesa
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  dpkg-dev fakeroot g++ g++-7 gcc gcc-7 libalgorithm-diff-perl libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan4 libatomic1 libc-dev-bin libc6-dev libclkrts5 libfakeroot libgcc-7-dev libitm1
  liblsan4 libmpx2 libquadmath0 libstdc++-7-dev libstdc++6 libubsan4 linux-libc-dev make manpages-dev
Suggested packages:
  menu debconf-keyring g++-multilib g++-7-multilib gcc-7-doc libstdc++-7-dbg gcc-multilib autoconf automake libtool flex bison gcc-doc gcc-7-multilib gcc-7-locales libgcc1-dbg libgomp1-dbg libitm1-dbg
  libatomic1-dbg libasan4-dbg liblsan4-dbg libubsan4-dbg libstdc++-7-dbg libclkrts5-dbg libmpx2-dbg libquadmath0-dbg glibc-doc libstdc++-7-doc make-doc
The following NEW packages will be installed:
  build-essential dkms dpkg-dev fakeroot g++ g++-7 gcc gcc-7 libalgorithm-diff-perl libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan4 libatomic1 libc-dev-bin libc6-dev libclkrts5 libfakeroot
  libgcc-7-dev libitm1 liblsan4 libmpx2 libquadmath0 libstdc++-7-dev libstdc++6 libubsan4 linux-libc-dev make manpages-dev
0 upgraded, 28 newly installed, 0 to remove and 0 not upgraded.
Need to get 31.0 MB of archives.
After this operation, 221 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
OK [Working]
Get:1 http://nl.archive.ubuntu.com/ubuntu bionic/main amd64 libc-dev-bin amd64 2.27-3ubuntu1 [71.8 kB]
Get:2 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 linux-libc-dev amd64 4.15.0-91.92 [1026 kB]
Get:3 http://nl.archive.ubuntu.com/ubuntu bionic/main amd64 libc6-dev amd64 2.27-3ubuntu1 [2587 kB]
Get:4 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libitm1 amd64 8.4.0-1ubuntu1-18.04 [27.9 kB]
Get:5 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libatomic1 amd64 8.4.0-1ubuntu1-18.04 [9192 B]
Get:6 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libasan4 amd64 7.5.0-1ubuntu1-18.04 [358 kB]
Get:7 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 liblsan4 amd64 8.4.0-1ubuntu1-18.04 [42.5 kB]
Get:8 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libubsan4 amd64 8.4.0-1ubuntu1-18.04 [288 kB]
Get:9 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libubsan0 amd64 7.5.0-1ubuntu1-18.04 [126 kB]
Get:10 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libclkrts5 amd64 7.5.0-1ubuntu1-18.04 [42.5 kB]
Get:11 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libmpx2 amd64 8.4.0-1ubuntu1-18.04 [11.6 kB]
Get:12 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libquadmath0 amd64 8.4.0-1ubuntu1-18.04 [134 kB]
Get:13 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libgcc-7-dev amd64 7.5.0-1ubuntu1-18.04 [2378 kB]
Get:14 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 gcc-7 amd64 7.5.0-1ubuntu1-18.04 [9383 kB]
Get:15 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 gcc amd64 4:7.4.0-1ubuntu2.3 [5184 B]
Get:16 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libstdc++-7-dev amd64 7.5.0-1ubuntu1-18.04 [1471 kB]
Get:17 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 g++-7 amd64 7.5.0-1ubuntu1-18.04 [9607 kB]
Get:18 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 g++ amd64 4:7.4.0-1ubuntu2.3 [1568 B]
Get:19 http://nl.archive.ubuntu.com/ubuntu bionic/main amd64 make amd64 4.1-9.1ubuntu1 [154 kB]
Get:20 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 dkms-dev all 1.19.0-3ubuntu1 [3607 kB]
Get:21 http://nl.archive.ubuntu.com/ubuntu bionic/main amd64 build-essential amd64 12.4ubuntu1 [4750 B]
***
Get:22 http://nl.archive.ubuntu.com/ubuntu bionic-updates/main amd64 dkms all 2.3.3ubuntu9.7 [68.1 kB]
Get:23 http://nl.archive.ubuntu.com/ubuntu bionic/main amd64 libfakeroot amd64 1.22-2ubuntu1 [25.9 kB]
Get:24 http://nl.archive.ubuntu.com/ubuntu bionic/main amd64 fakeroot amd64 1.22-2ubuntu1 [62.3 kB]

```

Enter 'sudo apt install build-essential dkms linux-headers-\$(uname -r)'

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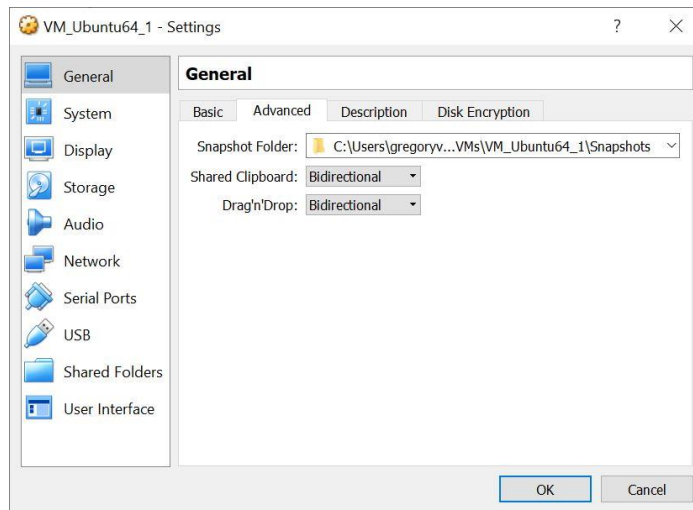
```

File Machine View Input Devices Help
gregoryvanbeek@VMI-TU0253938:~$ sudo apt install build-essential dkms linux-headers-$(uname -r)
Preparing to unpack .../24-libalgorithm-diff-perl_1.19.03-1_all.deb ...
Unpacking libalgorithm-diff-perl (1.19.03-1) ...
Selecting previously unselected package libalgorithm-diff-xs-perl.
Preparing to unpack .../25-libalgorithm-diff-xs-perl_0.04-5_amd64.deb ...
Unpacking libalgorithm-diff-xs-perl (0.04-5) ...
Selecting previously unselected package libalgorithm-merge-perl.
Preparing to unpack .../26-libalgorithm-merge-perl_0.08-3_all.deb ...
Unpacking libalgorithm-merge-perl (0.08-3) ...
Selecting previously unselected package manpages-dev.
Preparing to unpack .../27-manpages-dev_4.15-1_all.deb ...
Unpacking manpages-dev (4.15-1) ...
Setting up libquadmath0:amd64 (8.4.0-1ubuntu1-18.04) ...
Setting up libatomic1:amd64 (8.4.0-1ubuntu1-18.04) ...
Setting up libasan4:amd64 (7.5.0-1ubuntu1-18.04) ...
Setting up libclkrts5:amd64 (7.5.0-1ubuntu1-18.04) ...
Setting up libubsan4:amd64 (8.4.0-1ubuntu1-18.04) ...
Setting up libubsan0:amd64 (7.5.0-1ubuntu1-18.04) ...
Setting up linux-libc-dev:amd64 (4.15.0-91.92) ...
Setting up libmpx2:amd64 (8.4.0-1ubuntu1-18.04) ...
Setting up libquadmath0:amd64 (8.4.0-1ubuntu1-18.04) ...
Setting up dpkg-dev (1.19.0-3ubuntu1) ...
Setting up libfakeroot:amd64 (1.22-2ubuntu1) ...
Setting up libalgorithm-diff-perl (1.19.03-1) ...
Setting up libc-dev-bin (2.27-3ubuntu1) ...
Setting up manpages-dev (4.15-1) ...
Setting up libgcc-7-dev:amd64 (7.5.0-1ubuntu1-18.04) ...
Setting up libstdc++-7-dev:amd64 (7.5.0-1ubuntu1-18.04) ...
Setting up libstdc++6:amd64 (8.4.0-1ubuntu1-18.04) ...
Setting up gcc-7 (7.5.0-1ubuntu1-18.04) ...
Setting up gcc (4:7.4.0-1ubuntu2.3) ...
Setting up dkms (2.3.3ubuntu9.7) ...
Setting up g++ (4:7.4.0-1ubuntu2.3) ...
Setting up g++-7 (7.5.0-1ubuntu1-18.04) ...
Setting up build-essential (12.4ubuntu1) ...
Processing triggers for man-db (2.8.3-2ubuntu1) ...
Processing triggers for libc-bin (2.27-3ubuntu1) ...
gregoryvanbeek@VMI-TU0253938:~$

```

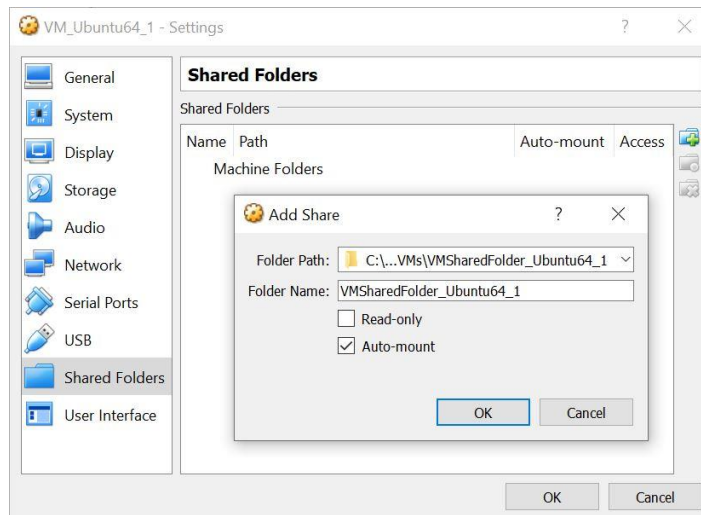
Click the 'devices' tab in the top of the window. Click 'Insert Guest Additions CD Image' and run the installer. Power off the VM when done.

22



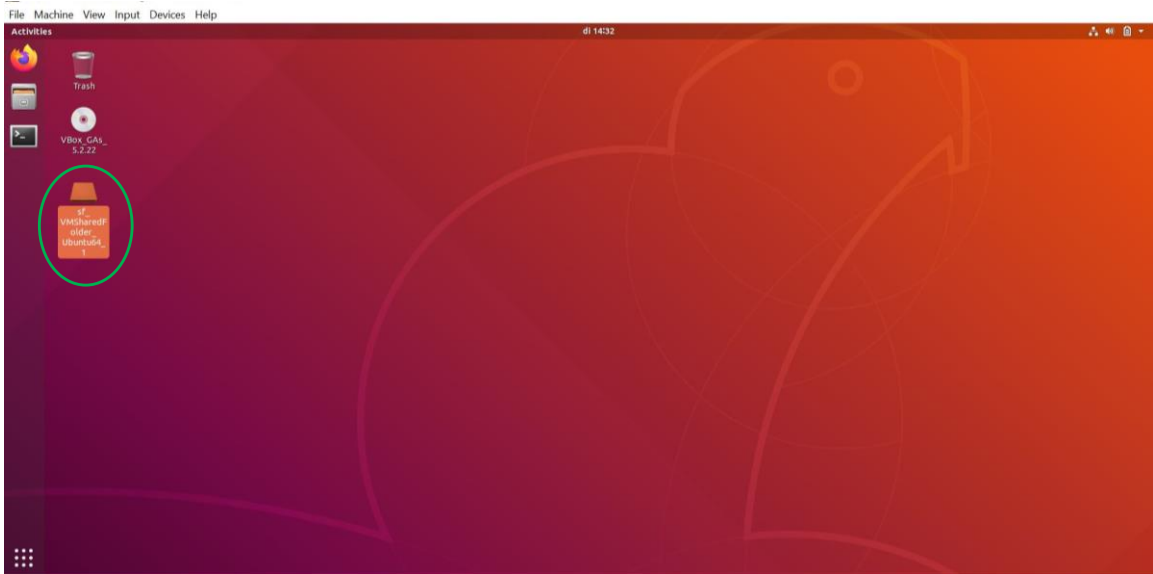
In VB click 'settings' (yellow gear symbol) and go to the 'General' tab; 'Advanced'. Set both 'shared clipboard' and 'drag n drop' to bidirectional and click 'ok'

23



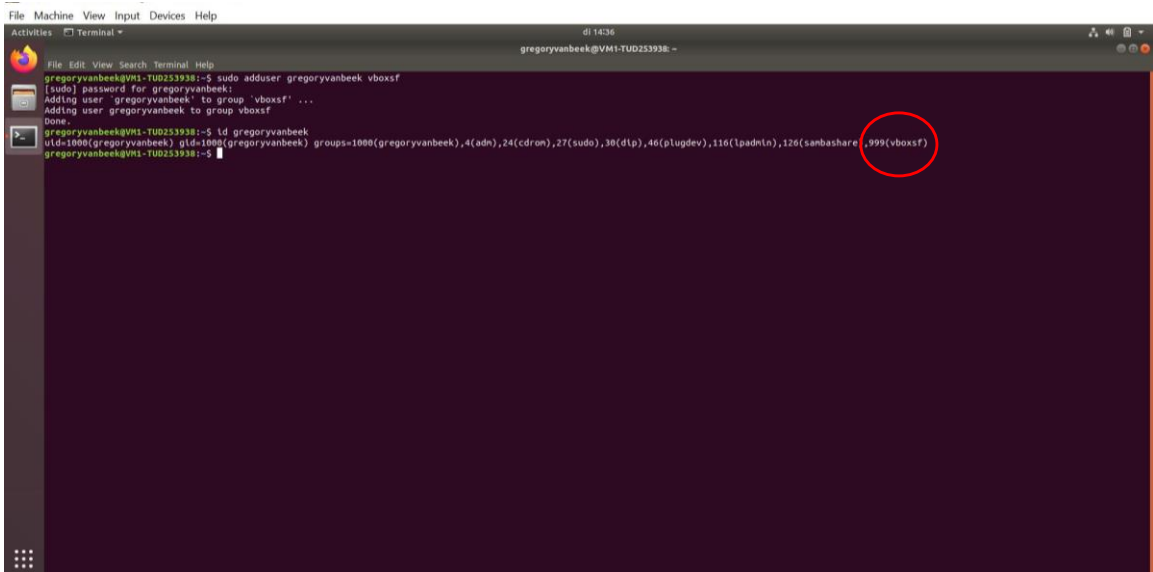
In VB click 'settings' again (yellow gear symbol) and go to the 'Shared Folders'. Add path to a folder that is going to be used as shared folder. Set 'Auto Mount' and click 'Ok'

24



Start the VM and check if the shared folder is present (either on the desktop, the files folder or in the media folder).

25



To be able to access the folder, special permission needs to be given. For this open the Terminal app. Enter 'sudo adduser [username] vboxsf' (where [username] should be replaced with your actual username of the VM). To check, enter 'id [username]'. This should give a list that needs to include 'vboxsf'. Restart the VM.

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To test the shared folder, try copying the folders for 'BWA', 'SAMTools' and 'Sambamba' as well as the reference sequence(s) and check if they show up in the VM. To unpack the software folders, copy them to the VM (e.g. the Documents folder).

The virtual machine should now be fully operational.

If a new shared folder is wanted, the 'guest additions' in Linux do not need to be installed again. The new shared folder only needs to be selected in the settings menu of VirtualBox (i.e. the yellow gear symbol). Do the following steps:

- In VB click 'settings' again (yellow gear symbol) and go to the 'Shared Folders'. Add path to a folder that is going to be used as shared folder. Set 'Auto Mount' and click 'Ok'
- Start the VM and check if the shared folder is present (either on the desktop, the files folder or in the media folder).
- To be able to access the folder, special permission needs to be given. For this open the Terminal app.

27

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