

Deliverable 2

What is Virtualization?

Virtualization is a replication of hardware to simulate a virtual machine inside a physical machine, basically it simulates a computer inside of another computer this gives for example a way for windows and or mac machines to run linux without having to go and buy a new computer with linux installed as the Operating system.

If you are going to virtualize using your own computer you will have to meet certain requirements to have a good experience.



Can my computer virtualize?

For a decent virtualization experience your computer should meet the following minimal specifications:

- AMD V or INTEL V compatible processor

- Dual core x64 processor with 1.3 GHz or faster

- 4GB of RAM

- Enough free hard drive space for installing guest OSs (see the minimal requirements of the desired Operating System)

There are two general types of virtualization client-side and server-side

Types of Virtualization

- **Client side virtualization** Client side virtualization is installed to a home computer unlike a server side virtualization you will need to meet the requirements to be cable of virtualization.

Client-side virtualization

- Software installed on a computer to manage virtual machines
- Each VM has its own operating system installed
- For client-side virtualization, the computer needs:
 - A hypervisor (Software that allows the management of virtual machines)
 - Hardware support
 - capable CPU
 - Enough RAM
 - Enough storage

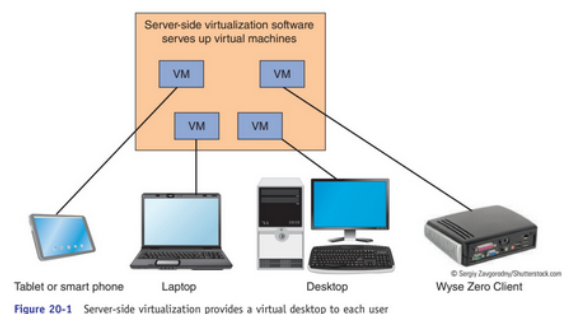


- **Server side virtualization** Server side virtualization allows for a companies to host virtual machines for us the public to access. You do not need to install anything because the virtualization takes place on a server from the company. For example websites like DistroTest.net that allow the user to launch virtual machines to test Linux distributions through our web browser.

Server-side virtualization

Virtual Desktop Infrastructure (VDI).

- Thick client or fat client
- Thin client
- Zero client



Hypervisor

Virtualization requires the use of a hypervisor, a hypervisor enables the hosts hardware to operate multiple virtual machines independent of each other and share the resources such as memory and RAM. There are two different types of hypervisors.

Types of Hypervisors

- A type 1 hypervisor runs directly on the host machines hardware. Basically it does not need to load the operating system on the host computer it has direct access to drivers and other hardware. This makes it very secure and runs much faster than type 2.
- A type 2 hypervisor is installed on top of the existing OS of the system and it relies on the host machines OS to manager its access to the CPU, memory, and storage. It is less secure and slower than type 1 hypervisors due to latency because all of the hypervisors work has to go through the hosts OS. They also cost less than type 1.

Type 1 VS Type 2 Hypervisor

Type 1

Runs on the hardware

Examples are:

VMware ESX and ESXi
Citrix XenServer

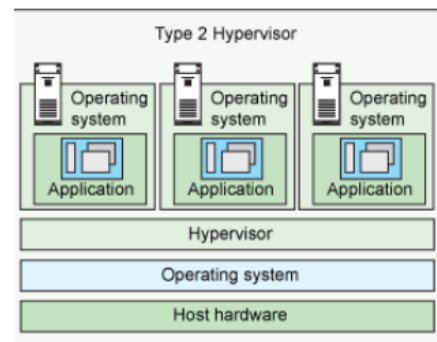
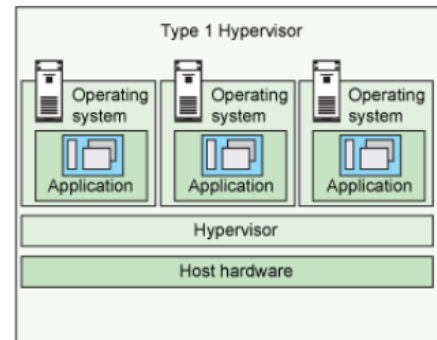
Type 2

Runs on a Host Operating System

Examples are:

VMware Workstation Player/Pro
Oracle VirtualBox

SEE [HTTPS://VAPOUR-APPS.COM/WHAT-IS-HYPERVISOR/](https://VAPOUR-APPS.COM/WHAT-IS-HYPERVISOR/) FOR MORE INFORMATION



Virtualbox

VirtualBox is a type 2 virtualization product for enterprise and at home use. It can run on Windows, Linux, Mac and supports a large assortment of guest operating systems.



How to install virtualbox in windows 10

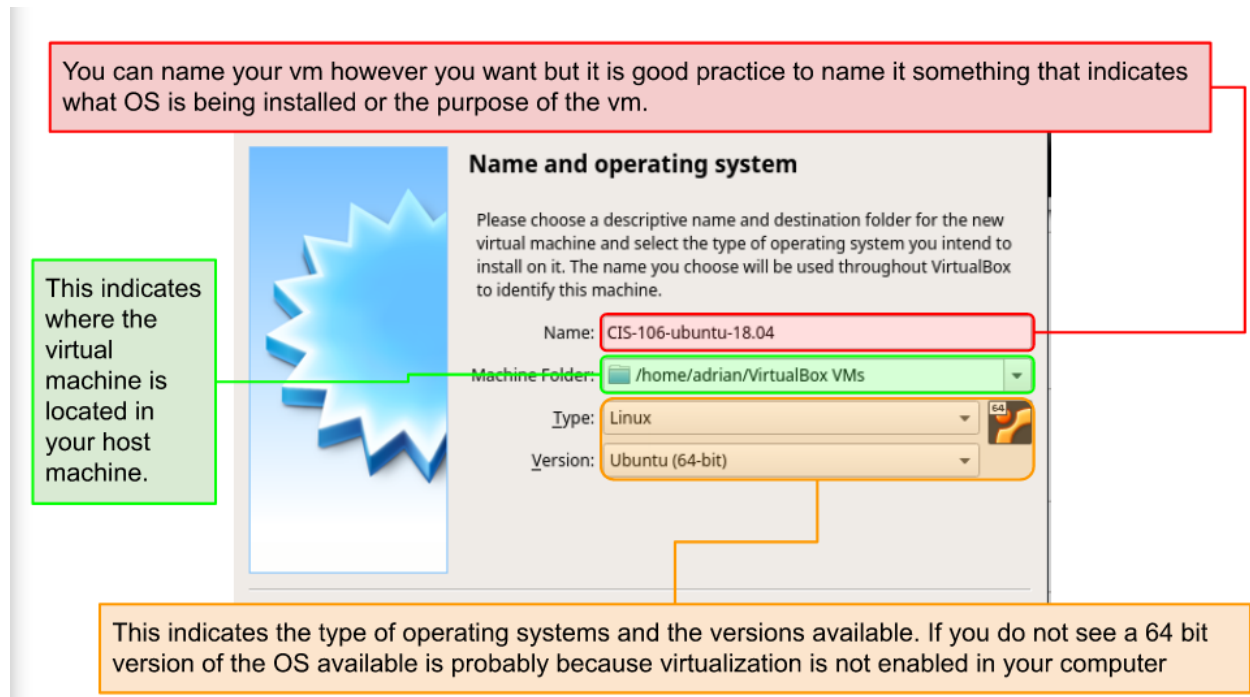
1. First you must have virtualization enabled you can enable it through the BIOS of your system.
2. Next download the installer for the Windows host machine from [virtualbox.org](https://www.virtualbox.org).
3. Than download the extension pack from the same place.
4. Run the install wizard hit next, yes, and than install



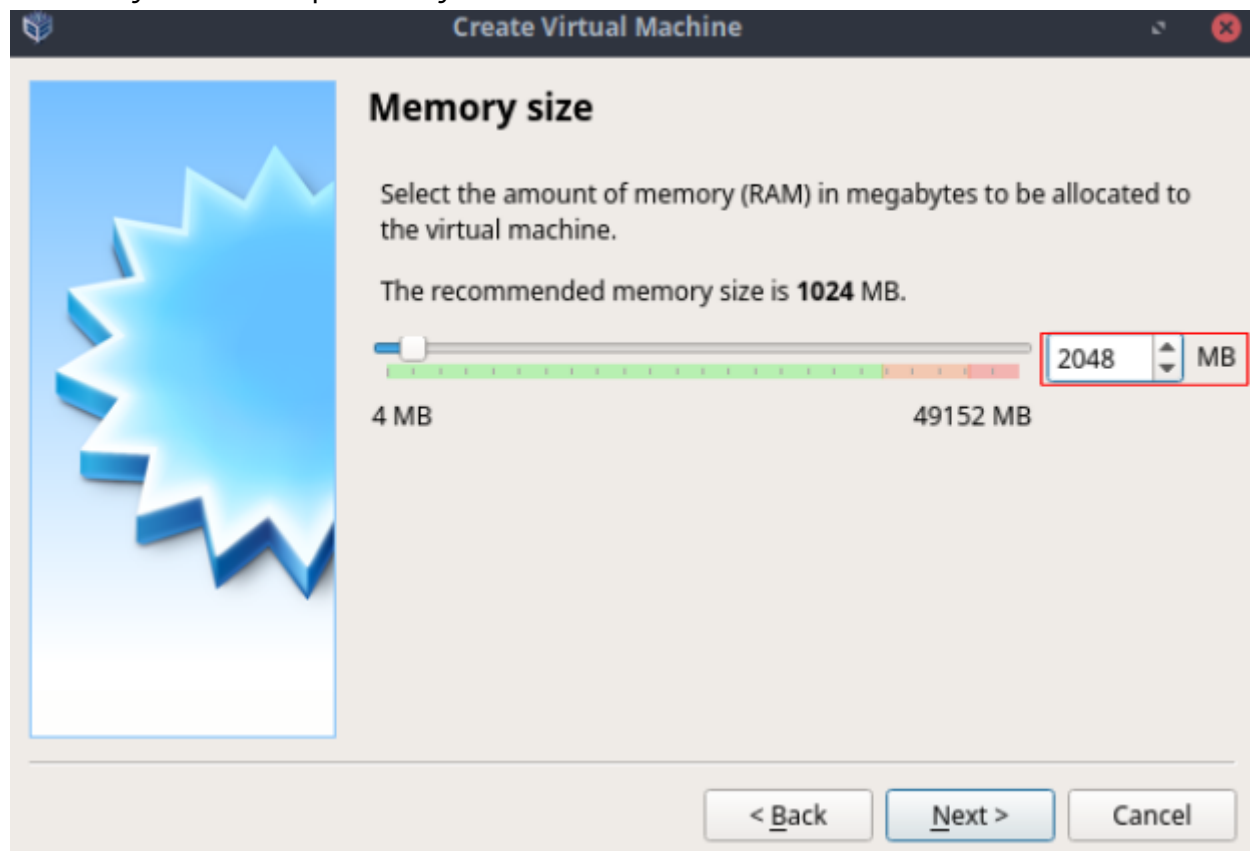
5. After waiting for the install to finish and after restarting your computer you will have successfully installed virtualbox.

How to create a virtual machine

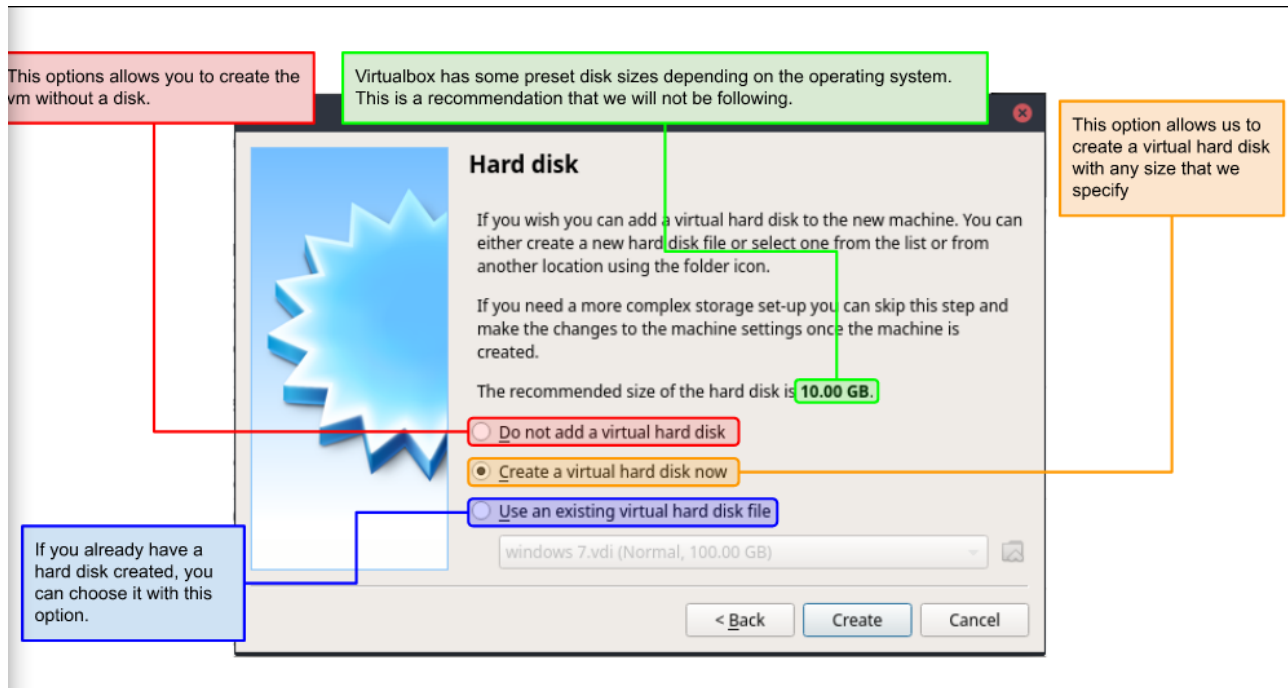
1. First in VirtualBox click the New button to create a new virtual machine.
2. The first step is to name, pick the folder it will be located, the type of operating system and than the version of the operating system.



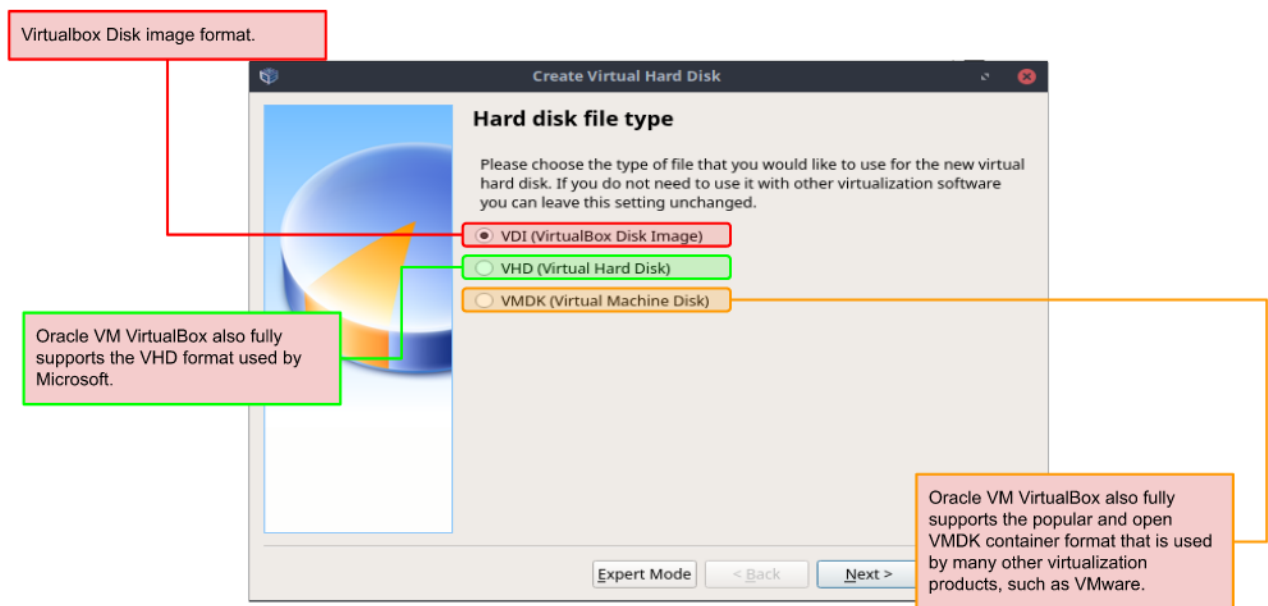
3. Next you set the amount of RAM you want to use for your Virtual machine the amount can vary based on your host computer but you want to use at least 2GB of RAM.



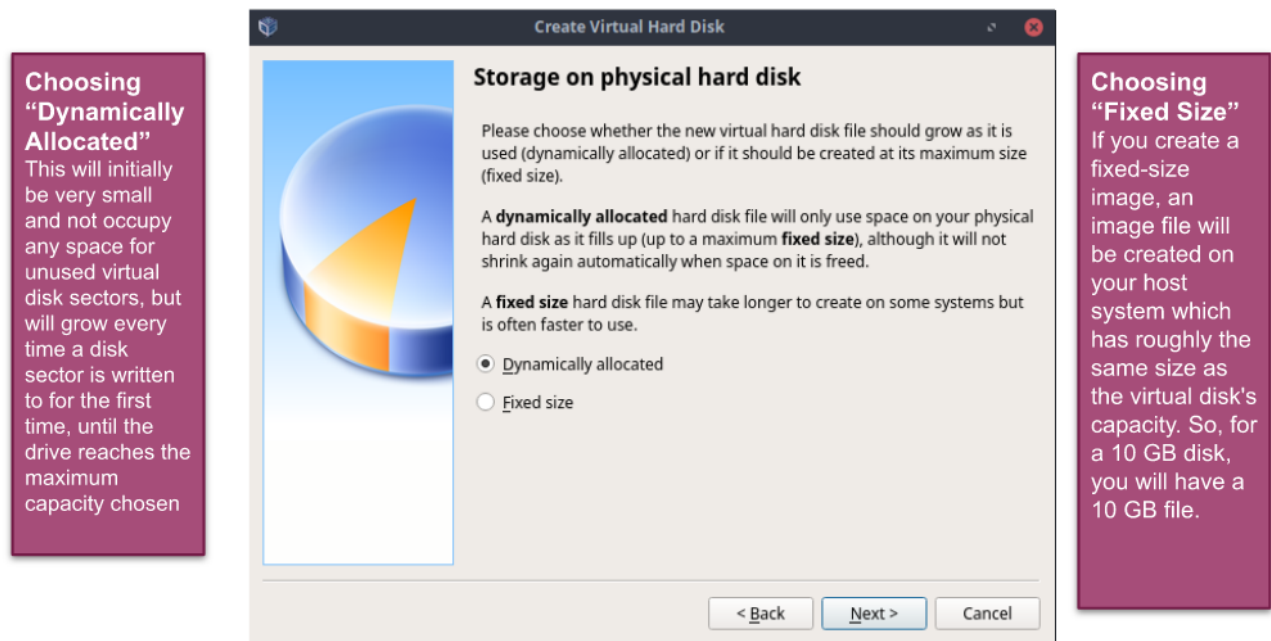
4. Next you choose if you want a virtual hard disk and how much space want to allocate to your VM.



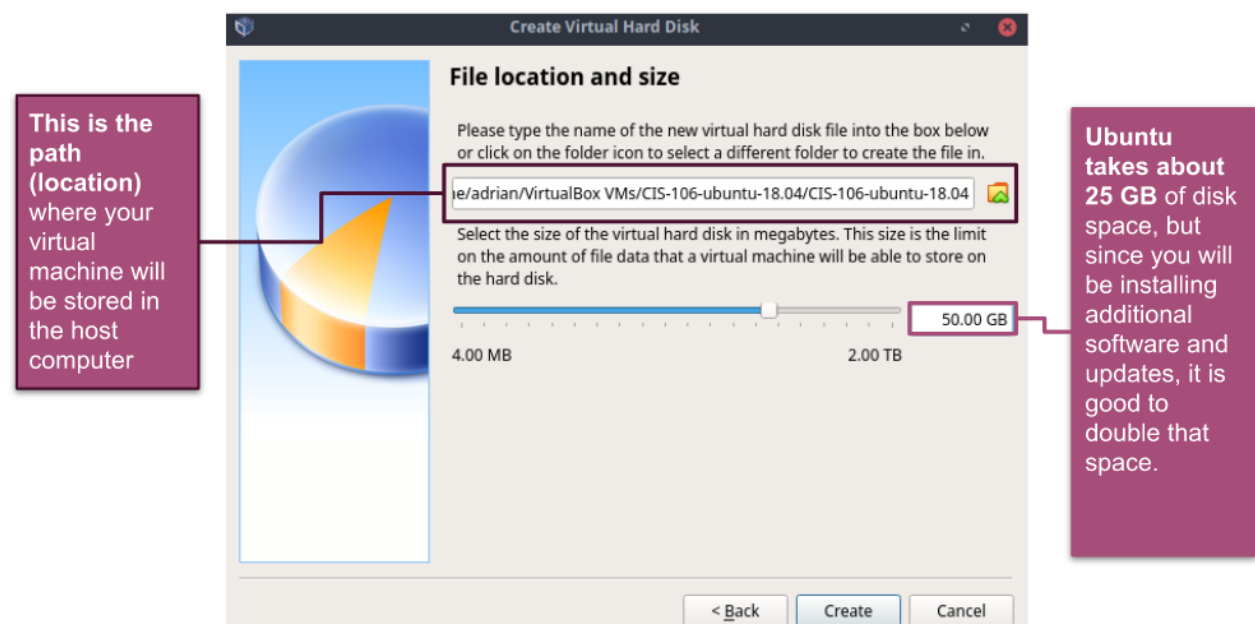
5. Now choose your hard disk file type.



6. Next choose if you want the size of your hard disk to change based on how much you have stored on it or to be a fixed size.

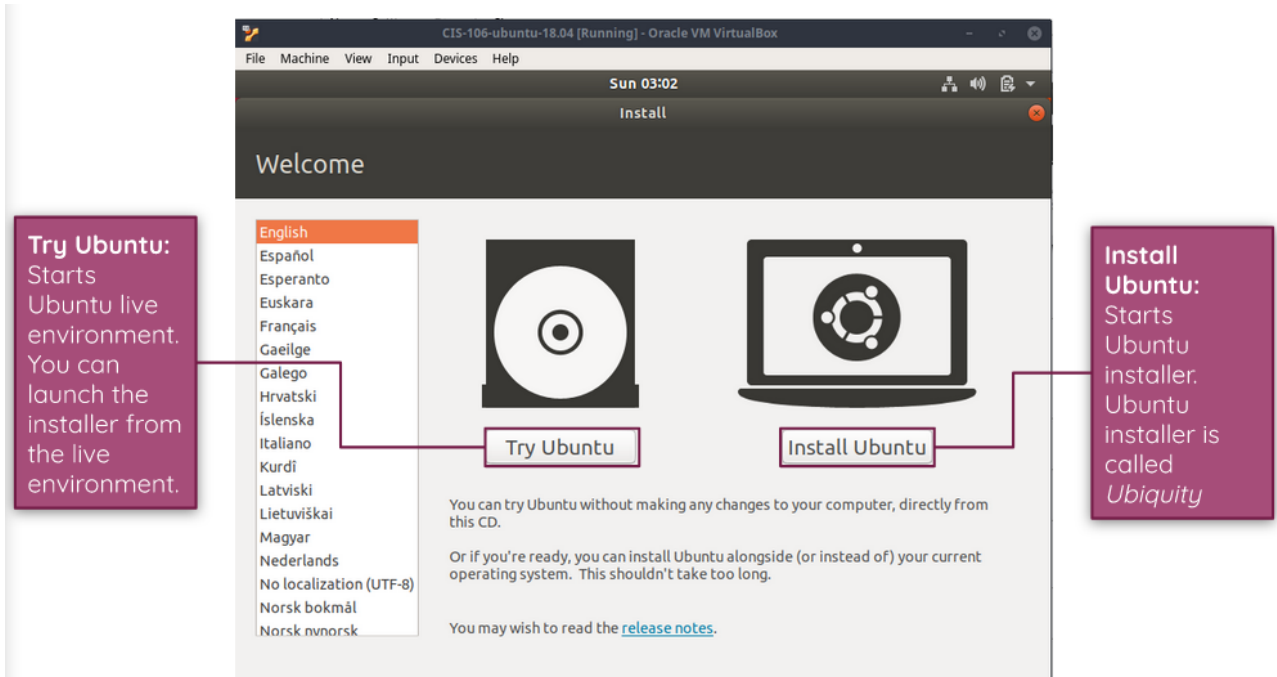


7. Now choose the amount of space for your hard disk.

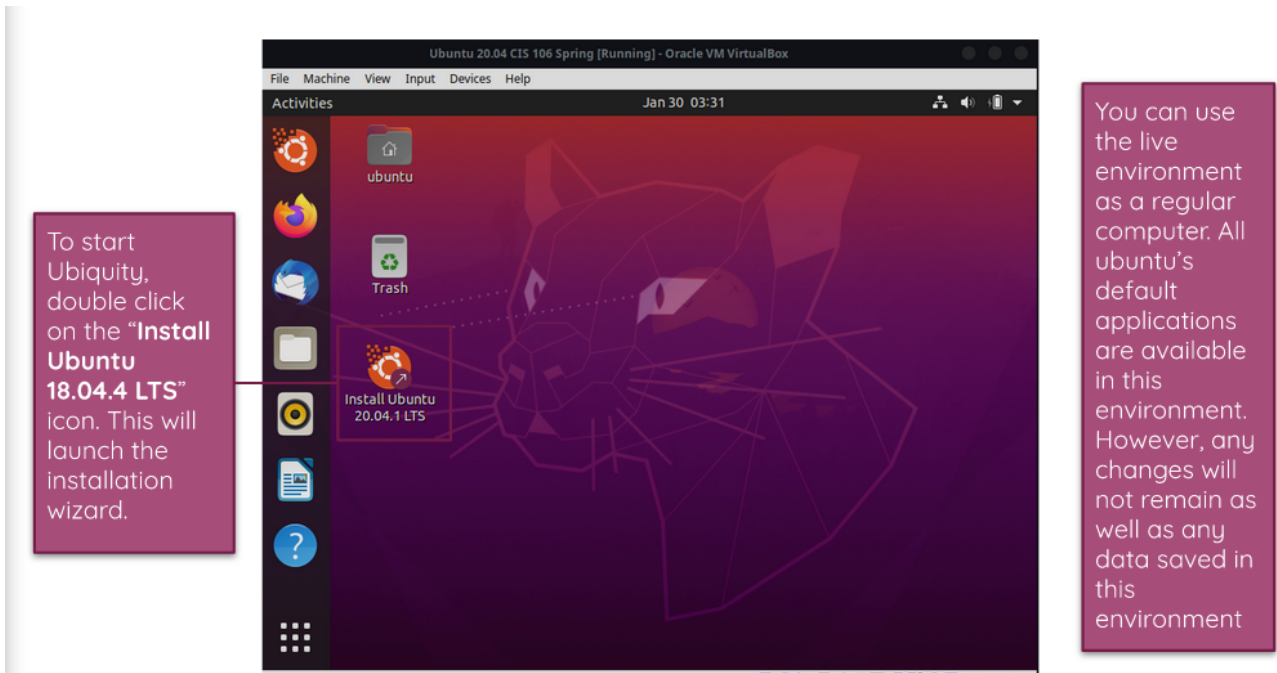


Installing Ubuntu in a virtual machine

1. Launch your virtual machine and you will be but in Ubuntu to install it.

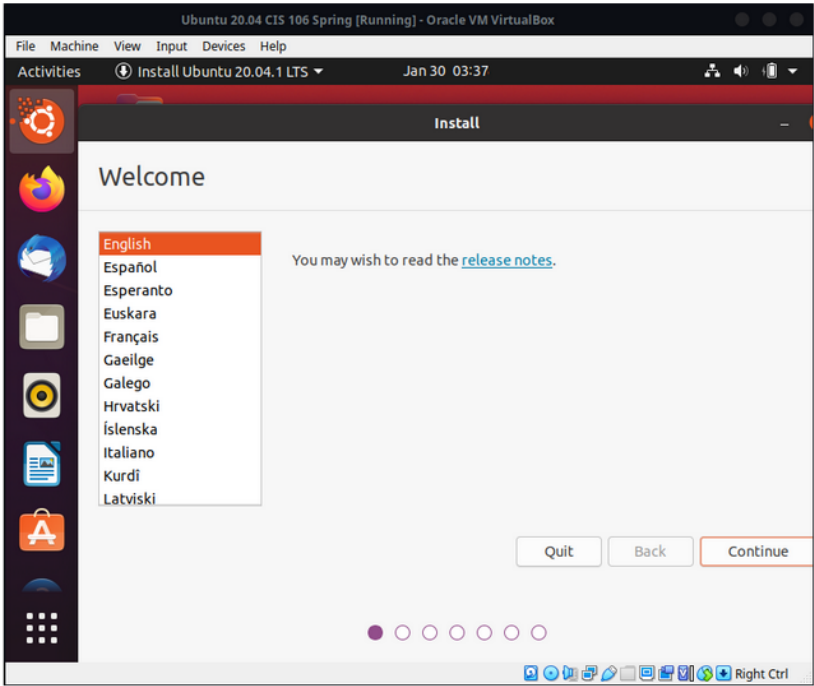


2. Double click the Ubuntu installer.



3. Click what language you want your system in and click continue.

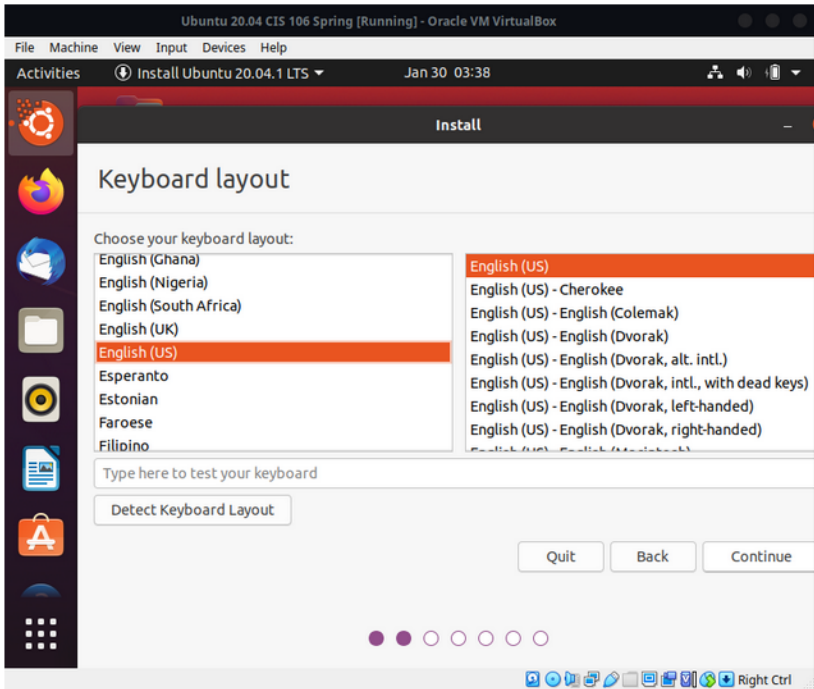
Ubiquity's Welcome screen allows you to select the installation wizard and read the release notes that list all changes in the release. The default language is English.



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4. Choose your keyboard layout than continue.

Ubiquity's keyboard layout screen will automatically detect your keyboard. However, if the default selection is not correct, you can use the "Detect Keyboard Layout" button to start a keyboard detection wizard.



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5. Choose what type of installation you want and choose any other options needed.

Normal Installation
Normal installation installs all the default applications.

Minimal Installation
Minimal Installation installs Only basic utilities and a web browser.

Allows you to install updates during the installation process
Download updates while installing Ubuntu. This saves time after installation.

Installs third party applications and extra drivers.
Install third-party software for graphics and Wi-Fi hardware and additional media formats. This software is subject to license terms included with its documentation. Some is proprietary.

Buttons: Quit, Back, Continue

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6. For the installation type pick erase disk and install ubuntu.

Advance features
Allows you to use LVM, disk encryption, and ZFS as the file system.

Something else
Allows you to partition your hard drive as you desire.

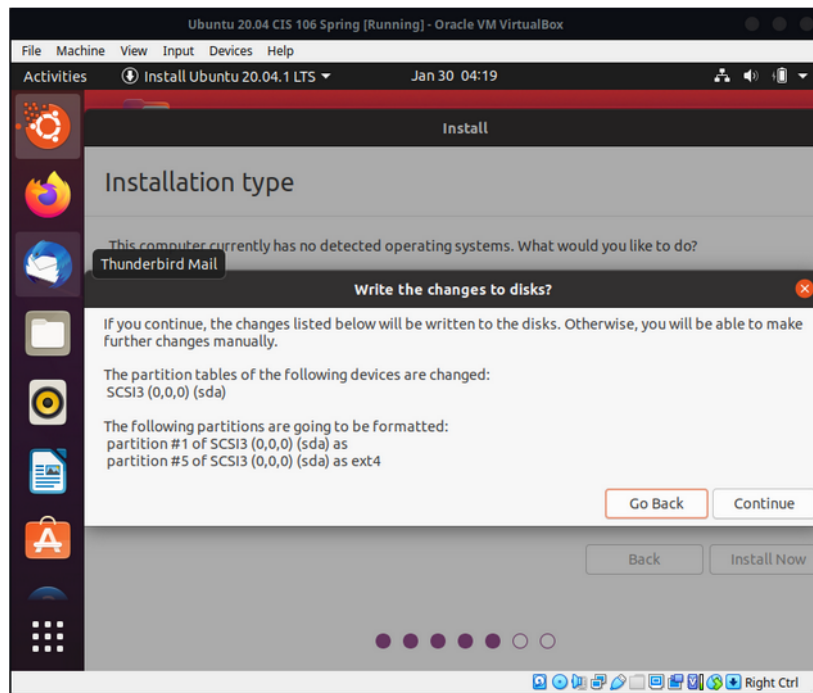
Erase disk and install Ubuntu
Erase disk and install Ubuntu will erase and format the virtual hard drive to use Ubuntu. Warning: This will delete all your programs, documents, photos, music, and any other files in all operating systems.

Buttons: Quit, Back, Install Now

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7. Click continue to the warning the installer gives you.

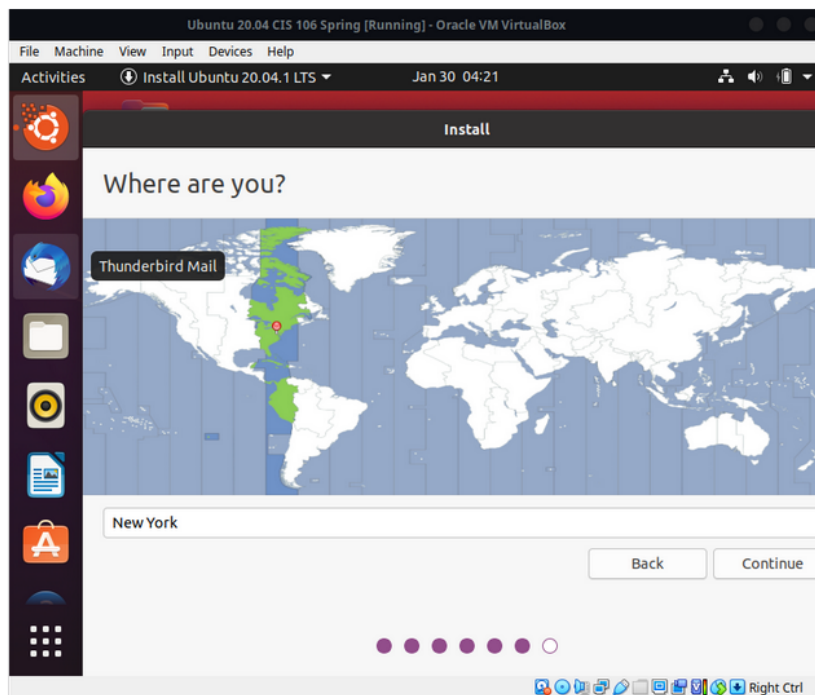
Ubiquity warns you to review the changes made to the disk before continuing. If you followed the steps so far, it is safe to continue.



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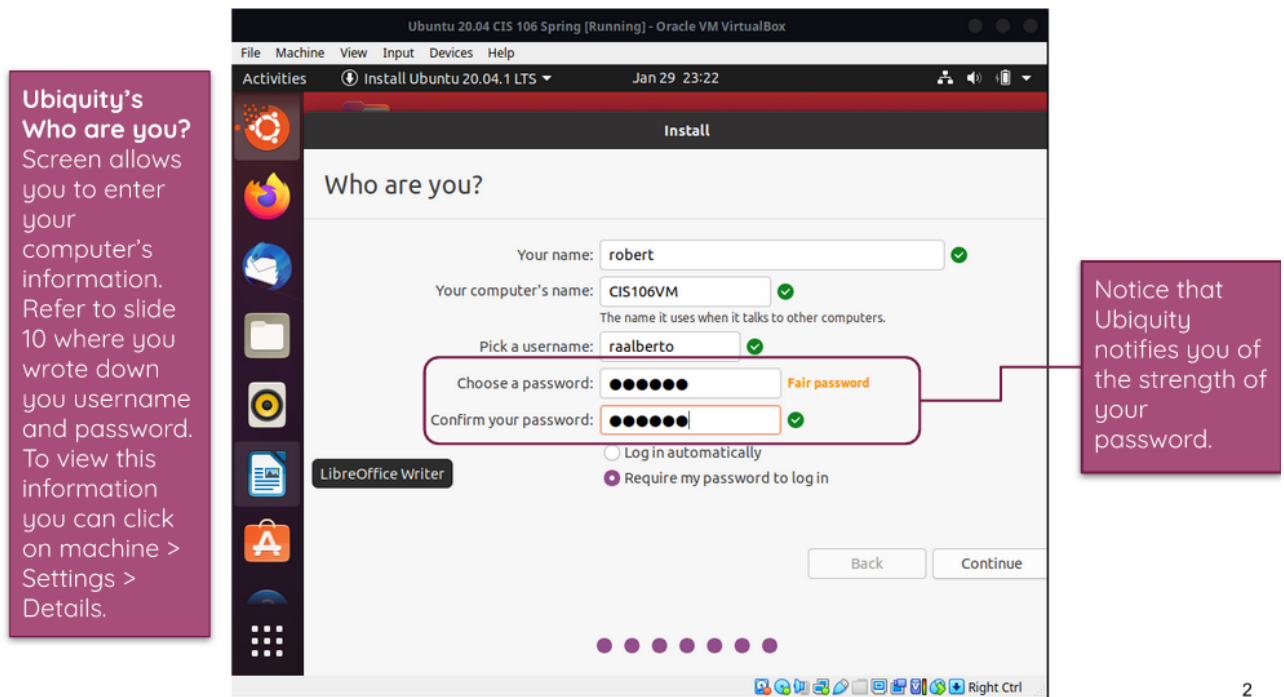
8. Click whatever your location is on the where are you screen and then continue.

Ubiquity's Where are you screen? Screen allows you to select your location for setting the time zone. By default, ubiquity will select the location based on your computer's locale. However, this can be overwritten by sliding the location selector

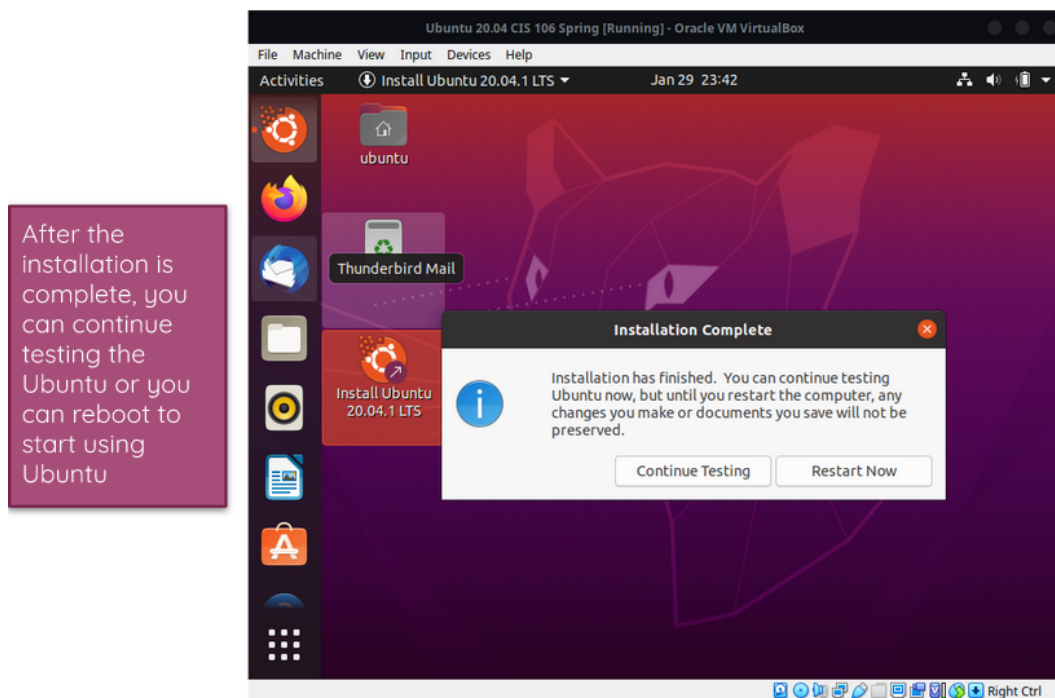


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9. On the Who are you screen enter your computer's name, username, and password then click continue.

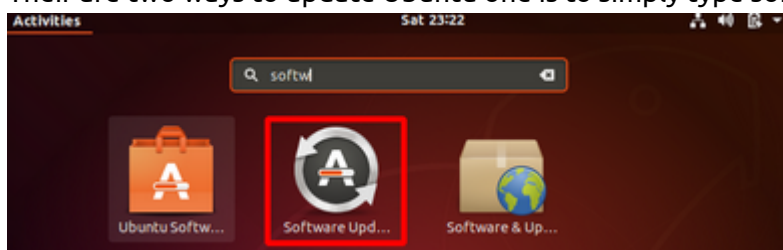
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10. After waiting for the installation to finish restart the virtual machine and your install will be complete.

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Updating Ubuntu

There are two ways to update Ubuntu one is to simply type software update into your applications.



The other is to use the command `sudo apt update; sudo apt upgrade -y`

• To update any Debian distro:

Update is used to download package information from all configured sources.

By terminating every command with a ; you can run multiple commands in a single line.

The -y option passes a yes answer to any question. Without this option apt will ask you if you want to install the upgrade. Using -y is optional and you should use it only if you are 100% sure about the upgrade.

Managing software and updates requires root privileges. Sudo allows you to run any command as the root user.

Apt is the program that we are using to manage software and updates.

upgrade is used to install available upgrades of all packages currently installed on the system from the sources configured via sources.list



Installing software In Ubuntu

Any software can be installed in Ubuntu by using the command line.

- You can install using the command `sudo apt install + package name`
- For example if you would like to install a program to play Tetris you can use a program called quadrapassel and use the command `sudo apt install quadrapassel -y`
- You can also delete software in a similar way with the command `sudo apt remove + package name`
- For example `sudo apt remove quadrapassel -y` will remove the Tetris game.

Basic Linux Commands

There are many simple commands to use in linux some include:

| command | what it does |
|---------|--|
| echo | display a line of text |
| fortune | print a random, hopefully interesting, adage |
| cowsay | configurable speaking/thinking cow (and a bit more) |
| lolcat | rainbow coloring for text |
| figlet | display large characters made up of ordinary screen characters |
| toilet | display large colorful characters |
| rig | Random Identity Generator |
| man | shows the manual for any command |

Navigating the filesystem

The linux file system has many commands that are useful to navigate through it. For example:

| Command | What it does | Syntax | Example |
|---------|--|---------------------------|----------------------------|
| pwd | Display the current working directory | pwd | pwd |
| cd | Change the current working directory | cd + destination | cd /home/user/Documents |
| ls | Display all the files inside a given directory | ls + option + file or dir | ls -a ~/Pictures |

Commands to move around the filesystem

- ★ The **pwd** command – used for displaying the current working directory
- ★ The **cd** command – used for changing the current working directory. When no directory is given, cd changes the current working directory to the home directory of the current user.
- ★ The **ls** command – used for displaying all the files inside a given directory. When no directory is specified, ls displays the files in the current working directory
- ★ **dir**, **tree**, and **exa** are commands similar to ls.

Managing files and directories

There are very powerful commands that can be used to manage files and directories in the Linux system some include:

| Command | Description | Syntax | Examples |
|---------|--|---------------------------|---------------------------------|
| mkdir | Creates a single or multiple directories | mkdir + name of directory | mkdir wallpapers |
| touch | Creates files | touch + filename | touch list |
| rm | Removes files | rm + filename | rm list |
| rmdir | Remove empty directories | rmdir + directory name | rmdir wallpapers |
| mv | Moves and renames directories | mv + source + destination | mv Downloads/cat.png Documents/ |

| Command | Description | Syntax | Examples |
|---------|-------------------------------|----------------------------------|---------------------------------------|
| cp | Copies files/directories | cp + files to copy + destination | cp Downloads/wallpapers.zip Pictures/ |
| ln | Create a hard link | ln + file + destination | ln file ~/Downloads/fileHL |
| man | Shows the manual for commands | man + command | man ls |