

# Linux on a Windows machine

Thomas Ropars

`thomas.ropars@imag.fr`

2016

# An operating system

## Definition

An operating system provides services to the applications:

- Hide the hardware details through virtualization
- Operate the hardware with device drivers
- Arbitrate concurrent accesses to the hardware

Windows and Linux are operating systems

# Windows machine ... how to install Linux?

(Without losing Windows)

2 solutions:

- A dual boot
- A virtual machine

# Dual boot

## Principle

Install two operating systems side-by-side on the machine to have the possibility to start one or the other.

## Comments

- A *boot loader* allows selecting the operating system to start at boot time.
- It requires having at least 2 disk partitions, one for each OS.
  - ▶ Warning: Creating new partitions on a disk where Windows is already installed might be risky.
- Complex to set up on recent computers (windows security + UEFI)

**This is not the recommended solution**

# Virtual Machine

## Principle

Virtual machines (VM) allow emulating several machine on top of a single real machine. A different operating system can be installed in each VM and executed at the same time on the hardware.

## Comments

- Allows running Linux on top of Windows
  - ▶ Window runs the VM in which Linux runs
- No risk for Windows
- Might be slow on old hardware

**This is the solution we recommend**

# About virtualization tools

Several virtualization tools exist:

- VMware
- Virtual PC
- VirtualBox
- ...

**We recommend using VirtualBox (simple and efficient)**

The next step is choosing which Linux distribution to use ...

# Linux distributions

- Linux is the name of the operating system kernel
- A Linux distribution is an operating system made from a software collection, which is based upon the Linux kernel<sup>1</sup>.
- Distributions are free and provide a full set of softwares and tools.
- Distributions mainly differ by the set of applications they provide and the way manage software installation.

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<sup>1</sup>wikipedia

# Linux distributions

## Some of the main distributions<sup>1</sup>

- ArchLinux
- Debian
- Fedora
- Gentoo
- Linux Mint
- OpenSuse
- Ubuntu

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<sup>1</sup>For trends, check <http://distrowatch.com/>



# Ubuntu

## Advantages

- Widely used
- Well documented on the Internet
- Distribution installed on the machines at UFR IM2AG

## Time-based releases

- A new version every 6 months / a new version with long-term support (LTS) every 2 years
- **Recommended to use last LTS version: Ubuntu 16.04**
- This is the version installed in the computer classrooms
- To be downloaded for free from  
<http://www.ubuntu.com/desktop>

# And now?

## What to do now?

1. Install VirtualBox on your machine
2. Download a image (.iso) of the distribution you want to install
3. Create a new VM in VirtualBox
4. Use the image you downloaded to configure the VM
5. ... that's almost it!

## Comments

- Many tutorials on the web
- **A nice step-by-step tutorial:** <https://henricasanova.github.io/VirtualBoxUbuntuHowTo.html>

# Once your VM with Ubuntu is set up

## Installing new softwares

- "Ubuntu Software": graphical interface to manage software installation – not always easy to work with.
- Synaptic : Powerful graphical interface to manage software installation
- apt-get: command line tool for software installation – usually simple to use.

# Softwares to install

- programming tools: gcc, g++, manpages-dev and manpages-posix-dev.
- Editors: Vi/Emacs/Gedit, Geany/Kate/Code::Blocks
- Connection to remote machine: ssh

```
$ sudo apt-get install gcc  
$ sudo apt-get install geany
```

Figure: Command line installation<sup>1</sup>

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<sup>1</sup>sudo is used to execute a command with admin privileges