# Install a Virtual Machine and Node-Red

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## 1 Presentation

The goal of this exercice is to let you install a server hosting Node.js and Node-Red. We will access that server from within a browser in the host system.

## 2 Prepare

Download Virtual box for the server:

- Virtual box: `https://www.virtualbox.org/wiki/Downloads`

Download the install DVD of Linux (Ubuntu 64 bits):

- From Ubuntu's web site: `http://www.ubuntu.com/download/desktop` (Attention! You should not pay, it is for free, just download the 64 bit version)

If you have problems downloading the files, contact the professor he has USB-Memory sticks as a backup.

## 3 Installation

Install virtual box. The install is more or less automatic.

In Virtual box, you have to create a virtual machine for Linux.

```
Machine > New
```

In the window "Create a new Virtual machine",

```
Name: "Ubuntu - CS Basics"
Type: "Linux"
Version: Ubuntu (64 bits)
```

If you do not find *Ubuntu (64 bits)* in the list of possible architecture, you have to try to reboot your machine (the real one). If the problem persists, it means that your BIOS is misconfigured.

Memory size depends on your computer (the host). 1024MB is recommended, it is a minimum. If your computer has more than 8 GB of RAM, you should select 2GB (i.e. 2048 MB) your system will work better.

You have to create a new virtual disk wich type is VDI (the default one) and which size is dynamically allocated. Select 16GB for the size of the disk.

In VirtualBox, you have to start the new virtual machine. Click on the name of the machine and then the "start" button.

You then select the iso file downloaded from the Ubuntu web site. Start installation. Select "Download update while installing" and "install third party software".

You can *erase disk and install Ubuntu*, since the disk is virtual it will not erase anything.

Select a Swiss keyboard with the right language (you should test special chars).

You have to create a user. This password must be secure but you also have to remember it. A secure password is at least 10 characters long, contains Capital letters (not at the begining of the word), contains numbers and special chars like -*%&/()=?!$-.:;

Before doing anything on your computer, you need to update and upgrade all installed packages, start a terminal ("Term" in the search window):

```
$ sudo apt-get update
$ sudo apt-get upgrade
```

You will need to do this, each time you start your machine, to be sure to have allways uptodate packages.

## 4 Install Node-Red

You will use the Linux package manager to install the following softwares:

- Node.js

- Node-Red

**Install softwares**    Execute the following commands inside a terminal:

```
$ sudo apt−get update
$ sudo apt−get upgrade −y
$ sudo apt−get install nodejs
$ sudo apt install npm
$ sudo npm install −g −−unsafe−perm node−red node−red−admin
$ sudo ufw allow 1880
```

**Start Node-Red**  Now you can start the node-red program

```
$ node−red
```

You can start a browser inside your virtual machine. Connect to the following URL:
`http://localhost:1880/`

**Enable Node-Red in your host system**  In the Virtual Box, chose Settings, Network, Adapter1, Advanced, Port Forwarding.

Add a new rule. Give a name "nodered" host port 1880, guest port 1880.

Restart your virtual machine.

Restart node-red (in the terminal).

Test the url `http://localhost:1880/`. You can program the server installed inside the virtual machine!

We will work next week with Node-Red.