

# How to Install Liquid Galaxy on Virtual Machines

By Otávio Oliveira

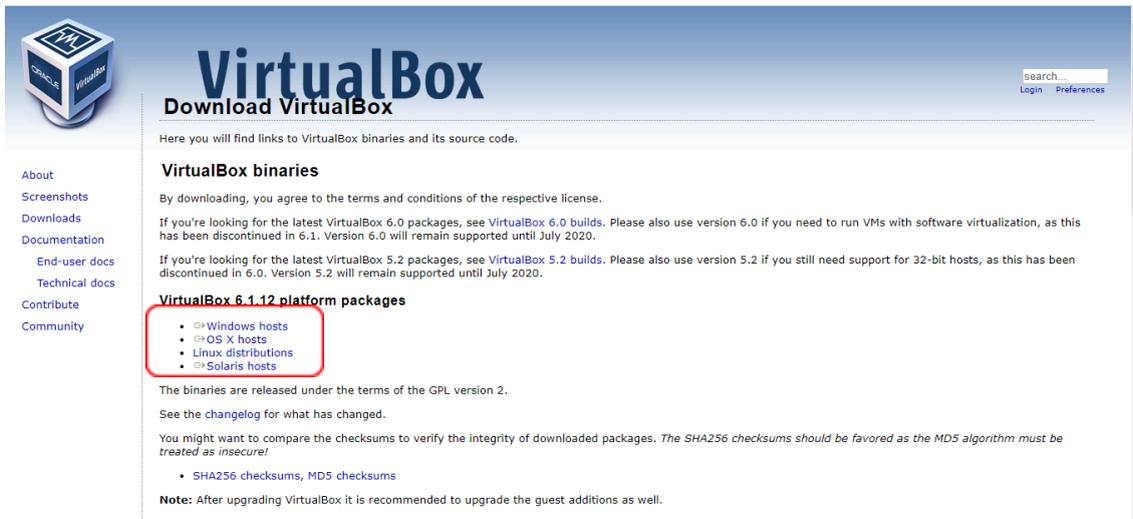
To install the Liquid Galaxy system on Virtual Machines follow the steps below

Download VirtualBox from the developer's website <https://www.virtualbox.org/>



The screenshot shows the VirtualBox.org homepage. At the top left is the VirtualBox logo. The main heading is "VirtualBox" with the sub-heading "Welcome to VirtualBox.org!". Below this is a paragraph describing VirtualBox as a powerful x86 and AMD64/Intel64 virtualization product. A large blue button in the center says "Download VirtualBox 6.1". To the right is a "News Flash" section with several entries, including "New July 14th, 2020, 2020 VirtualBox 6.1.12 released!". A left sidebar contains navigation links like "About", "Screenshots", "Downloads", "Documentation", "End-user docs", "Technical docs", "Contribute", and "Community".

Click Download and then select your operating system



The screenshot shows the "Download VirtualBox" page on VirtualBox.org. The main heading is "Download VirtualBox". Below it, there is text explaining that users will find links to binaries and source code. A section titled "VirtualBox binaries" contains information about the latest 6.0 and 5.2 packages. A red box highlights the "VirtualBox 6.1.12 platform packages" section, which lists four options: "Windows hosts", "OS X hosts", "Linux distributions", and "Solaris hosts". Below this, there is a "Note" section recommending to upgrade guest additions.

Also download the extension package, with this package you can use USB devices and other types of external drivers.

Screenshots  
Downloads  
Documentation  
End-user docs  
Technical docs  
Contribute  
Community

By downloading, you agree to the terms and conditions of the respective license.

If you're looking for the latest VirtualBox 6.0 packages, see [VirtualBox 6.0 builds](#). Please also use version 6.0 if you need to run VMs with software virtualization, as this has been discontinued in 6.1. Version 6.0 will remain supported until July 2020.

If you're looking for the latest VirtualBox 5.2 packages, see [VirtualBox 5.2 builds](#). Please also use version 5.2 if you still need support for 32-bit hosts, as this has been discontinued in 6.0. Version 5.2 will remain supported until July 2020.

**VirtualBox 6.1.12 platform packages**

- Windows hosts
- OS X hosts
- Linux distributions
- Solaris hosts

The binaries are released under the terms of the GPL version 2.

See the [changelog](#) for what has changed.

You might want to compare the checksums to verify the integrity of downloaded packages. *The SHA256 checksums should be favored as the MD5 algorithm must be treated as insecure!*

- SHA256 checksums, MD5 checksums

**Note:** After upgrading VirtualBox it is recommended to upgrade the guest additions as well.

**VirtualBox 6.1.12 Oracle VM VirtualBox Extension Pack**

- All supported platforms

Support for USB 2.0 and USB 3.0 devices, VirtualBox RDP, disk encryption, NVMe and PXE boot for Intel cards. See [this chapter from the User Manual](#) for an introduction to this Extension Pack. The Extension Pack binaries are released under the [VirtualBox Personal Use and Evaluation License \(PUEL\)](#). Please install the same version extension pack as your installed version of VirtualBox.

**VirtualBox 6.1.12 Software Developer Kit (SDK)**

- All platforms

[User Manual](#)

After downloading both files, also download the ISO image of the Ubuntu 16.04 operating system <https://releases.ubuntu.com/16.04/>

Ubuntu 16.04.7 LTS (Xenial Xerus)

### Select an image

Ubuntu is distributed on two types of images described below.

<p><b>Desktop image</b></p> <p>The desktop image allows you to try Ubuntu without changing your computer at all, and at your option to install it permanently later. This type of image is what most people will want to use. You will need at least 384MiB of RAM to install from this image.</p>	<p><a href="#">64-bit PC (AMD64) desktop image</a></p> <p>Choose this if you have a computer based on the AMD64 or EM64T architecture (e.g., Athlon64, Opteron, EM64T Xeon, Core 2). Choose this if you are at all unsure.</p> <p><a href="#">32-bit PC (i386) desktop image</a></p> <p>For almost all PCs. This includes most machines with Intel/AMD/etc type processors and almost all computers that run Microsoft Windows, as well as newer Apple Macintosh systems based on Intel processors.</p>
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Download the system compatible with the characteristics of your computer.

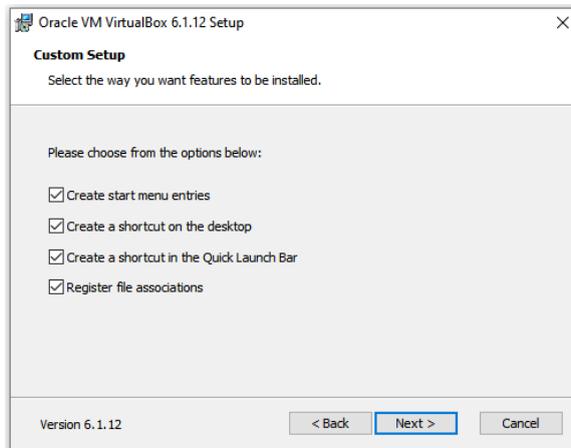
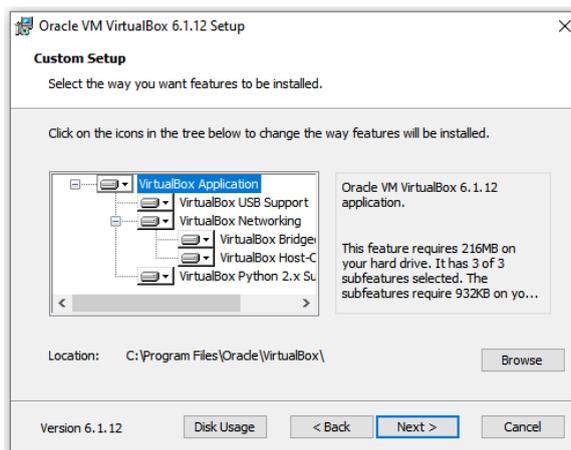
# Now install VirtualBox

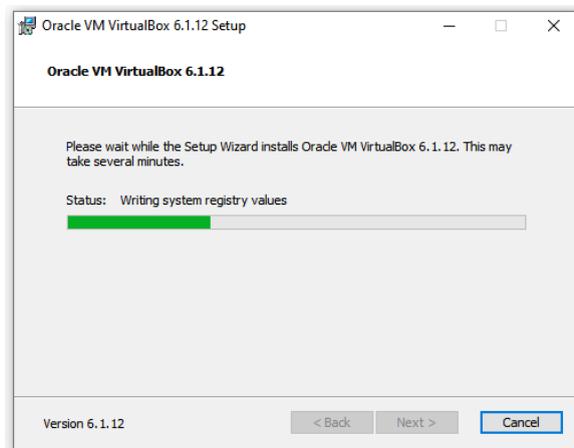
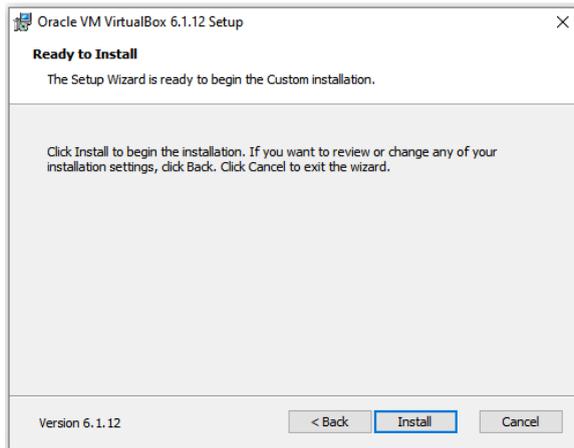
File Name	Date	Type	Size
VirtualBox-6.1.12-139181-Win	18/08/2020 18:15	Aplicativo	105.076 KB
Oracle_VM_VirtualBox_Extension_Pack-6.1.12	18/08/2020 18:12	VirtualBox Extensi...	10.881 KB

Double-click to start the installation



Just click on NEXT until the end of the installation, none of the additional settings need to be changed

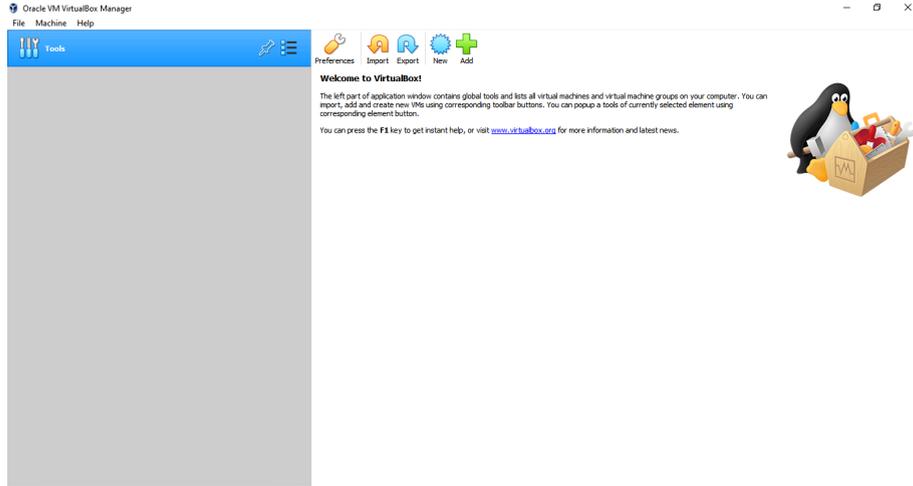




Wait for installation



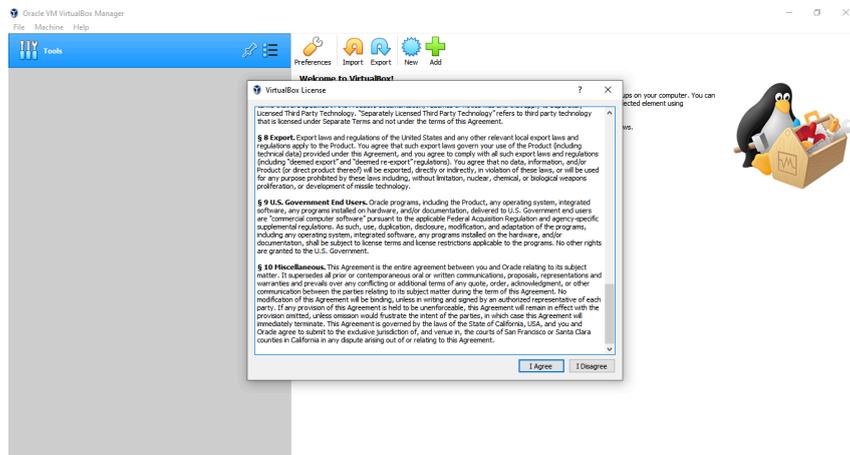
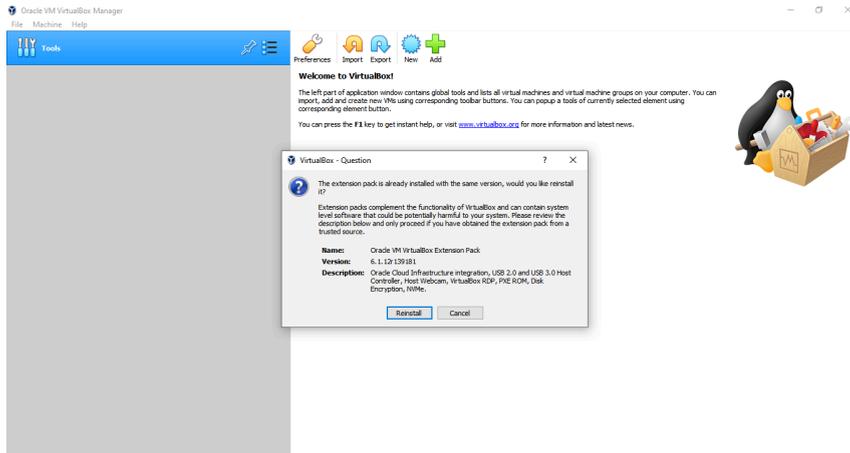
# VirtualBox is now installed!



## Close VirtualBox and get ready to install the extension package

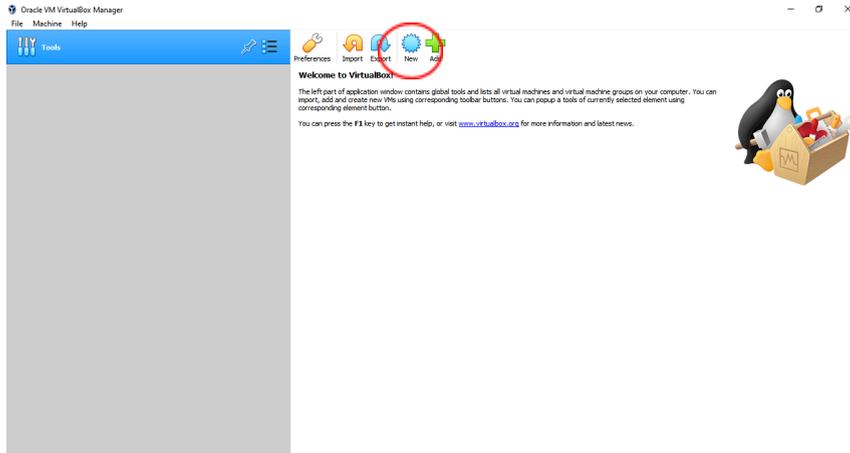
Name	Created	Type	Size
VirtualBox-6.1.12-139181-Win	18/08/2020 18:15	Aplicativo	105.076 KB
Oracle_VM_VirtualBox_Extension_Pack-6.1.12	18/08/2020 18:12	VirtualBox Extensi...	10.881 KB

## Double click on the extension package, VirtualBox will open, just click on REINSTALL

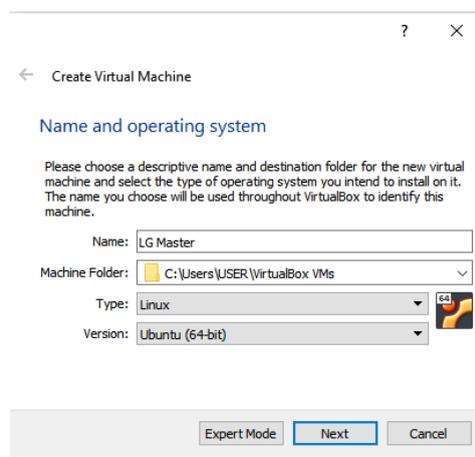


## Read and accept the terms

# Installing the first Virtual Machine



Click New

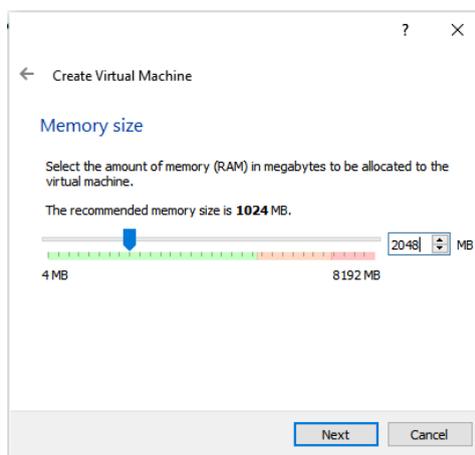


Name: You can give any name you want

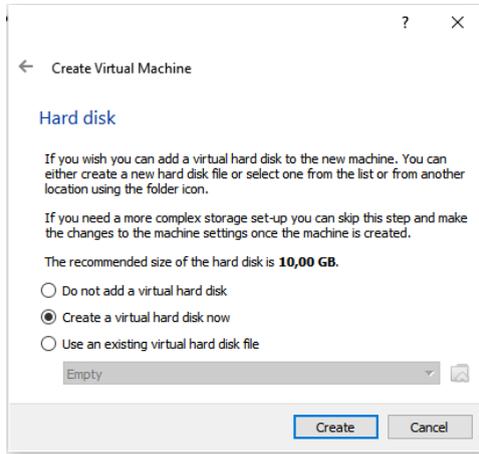
Type: Linux

Version: Ubuntu (64-bit) or Ubuntu (32-bit)

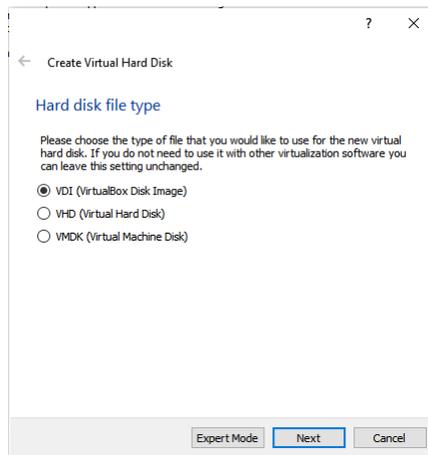
Click NEXT



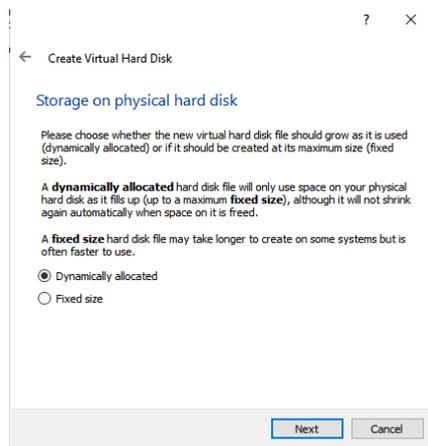
it is recommended to leave at least 2G of RAM, that is, your machine needs to have at least 8G of total ram so that the system can work minimally with the virtual machines running simultaneously. Click NEXT



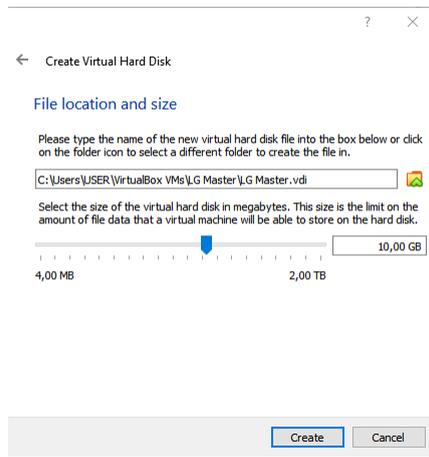
Click Create



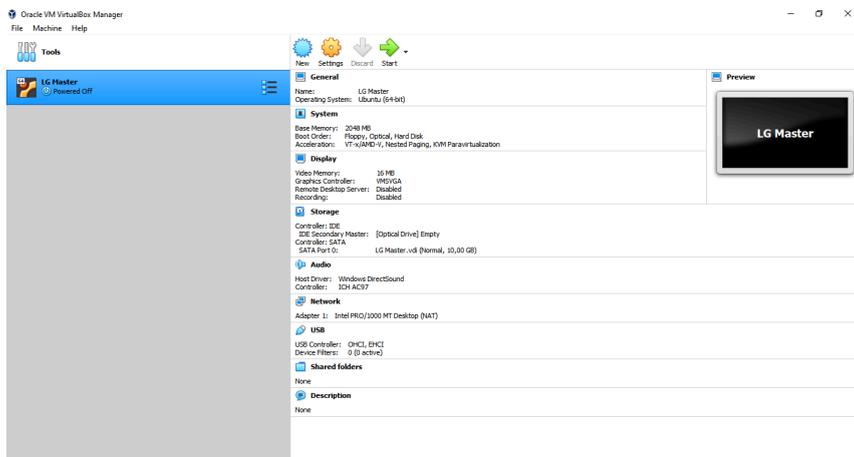
Click NEXT



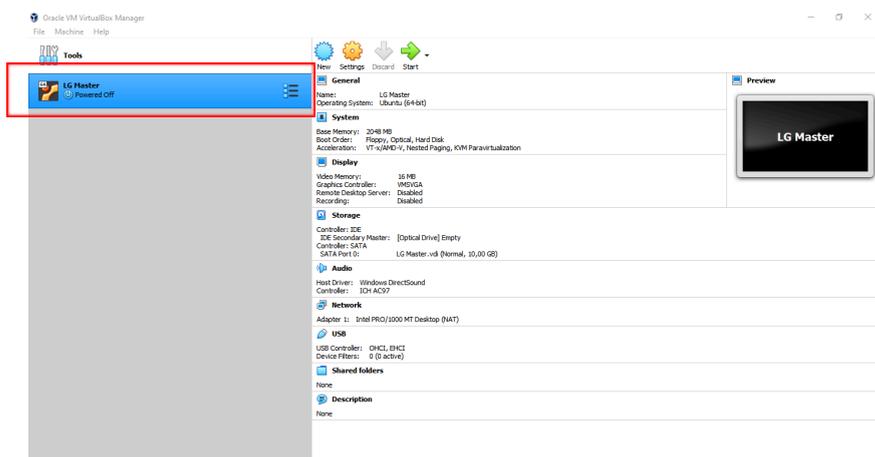
Click NEXT



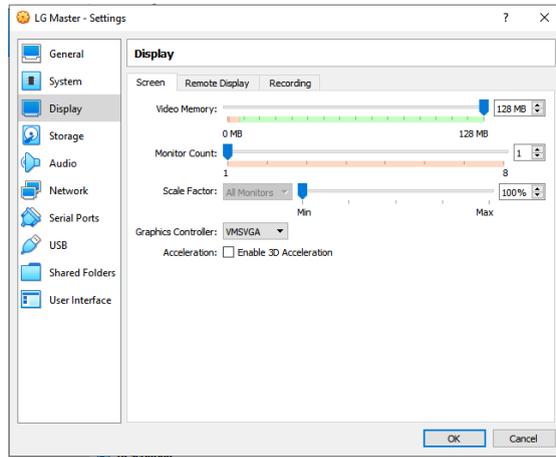
The recommended minimum memory space is 10GB but you can increase this size as you wish.



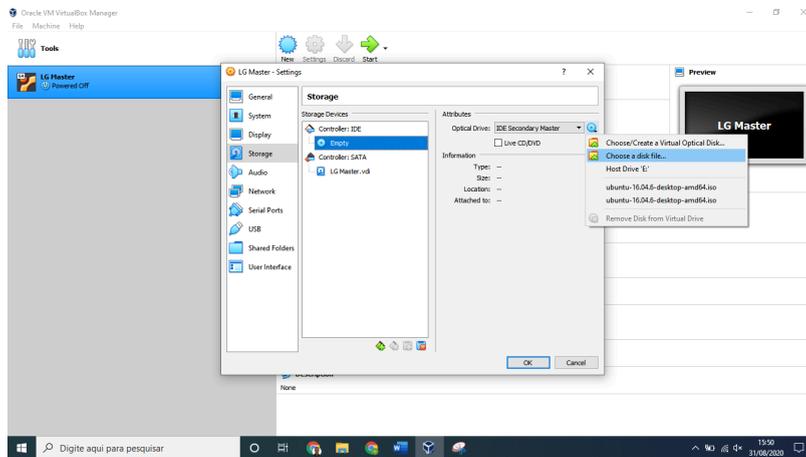
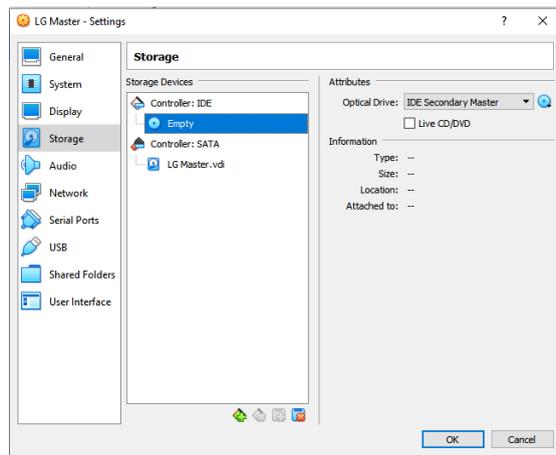
It is now necessary to configure the Virtual machine before proceeding with the installation.



With the virtual machine selected click on SETTINGS



Set the video memory pointer to the maximum

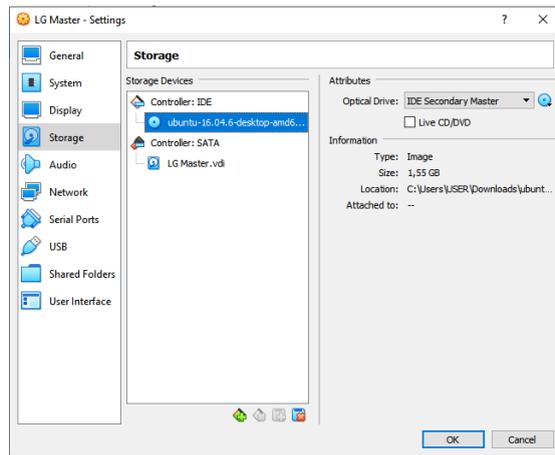


In STORAGE, click EMPTY and then CHOOSE A DISK FILE, as shown in the image.

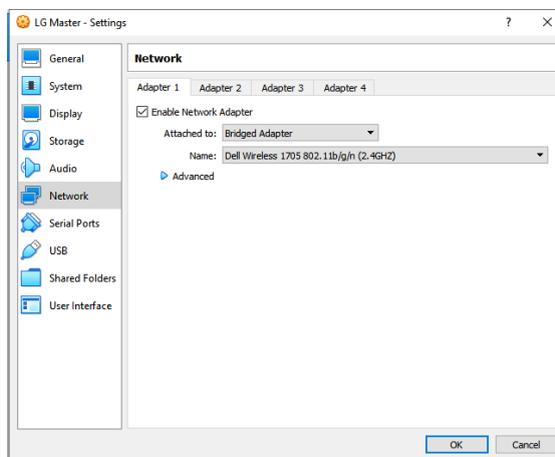
Browse to the directory where you saved the UBUNTU 16.04 ISO image



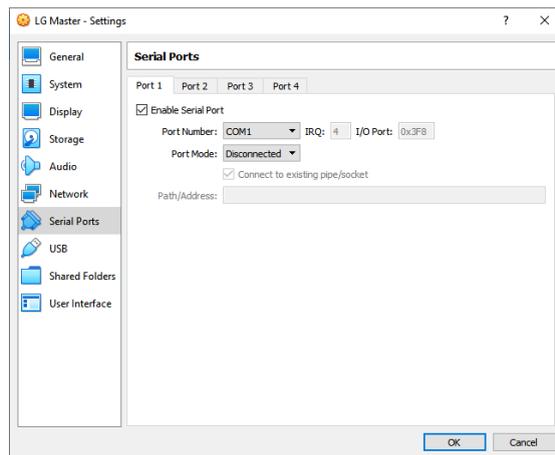
After selecting the ISO image the screen should look like this:



Click on NETWORK and select the bridge mode, as shown in the image

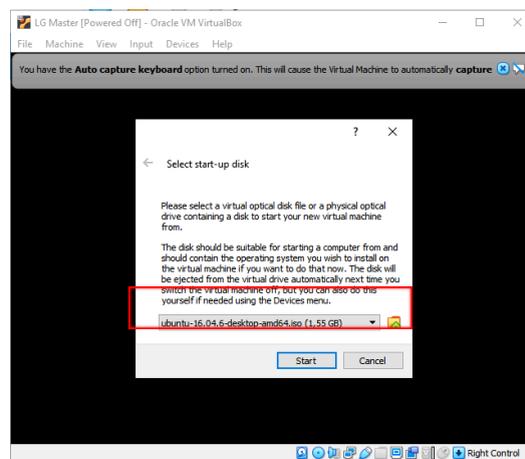
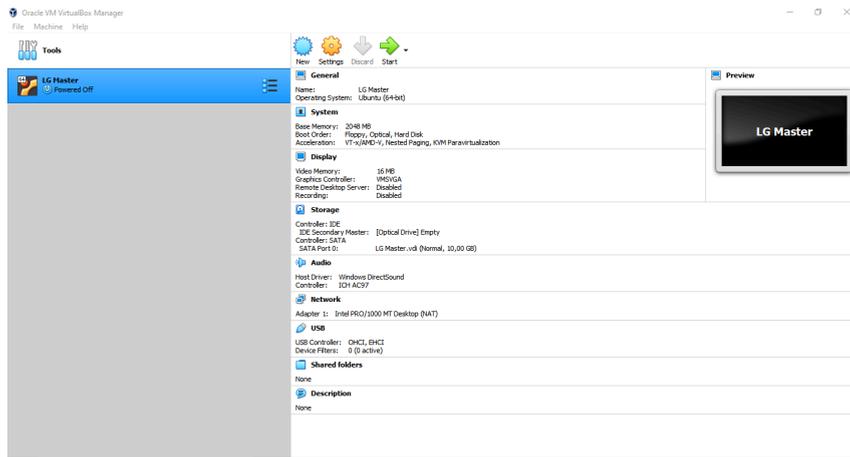


If you are going to use Serial devices on your virtual machine, enable the Serial ports. **FOR THE ARDUINO CONTROLLER PROJECT FOR LIQUID GALAXY THIS STEP IS MANDATORY**

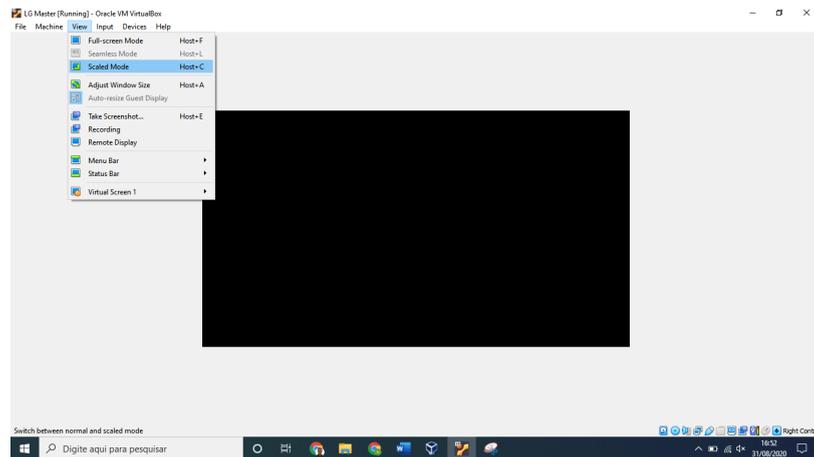


Click OK

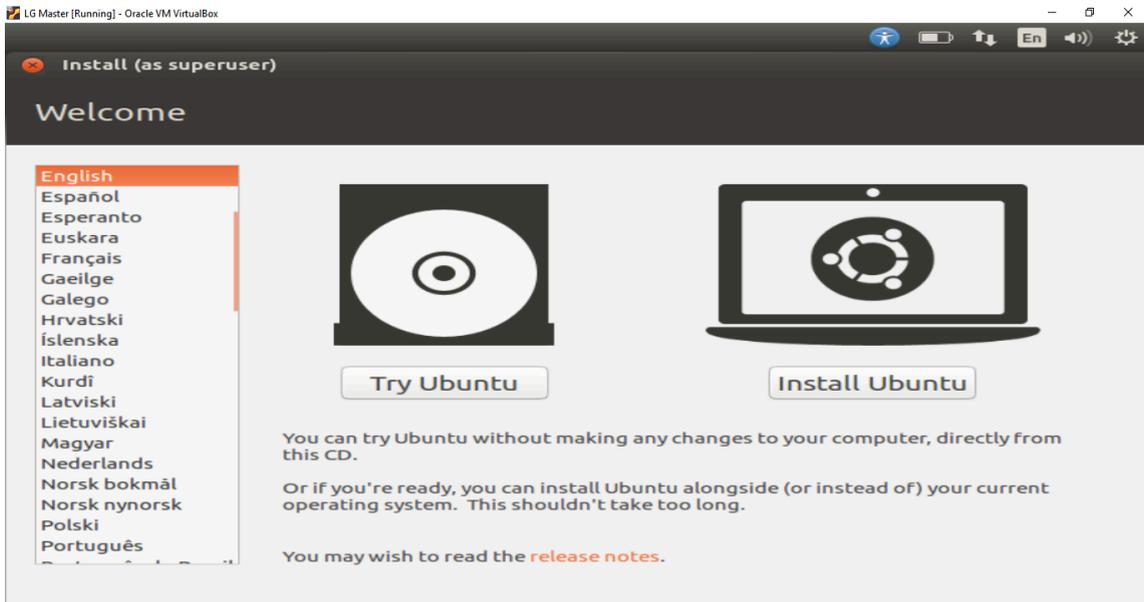
With the virtual machine selected click on START



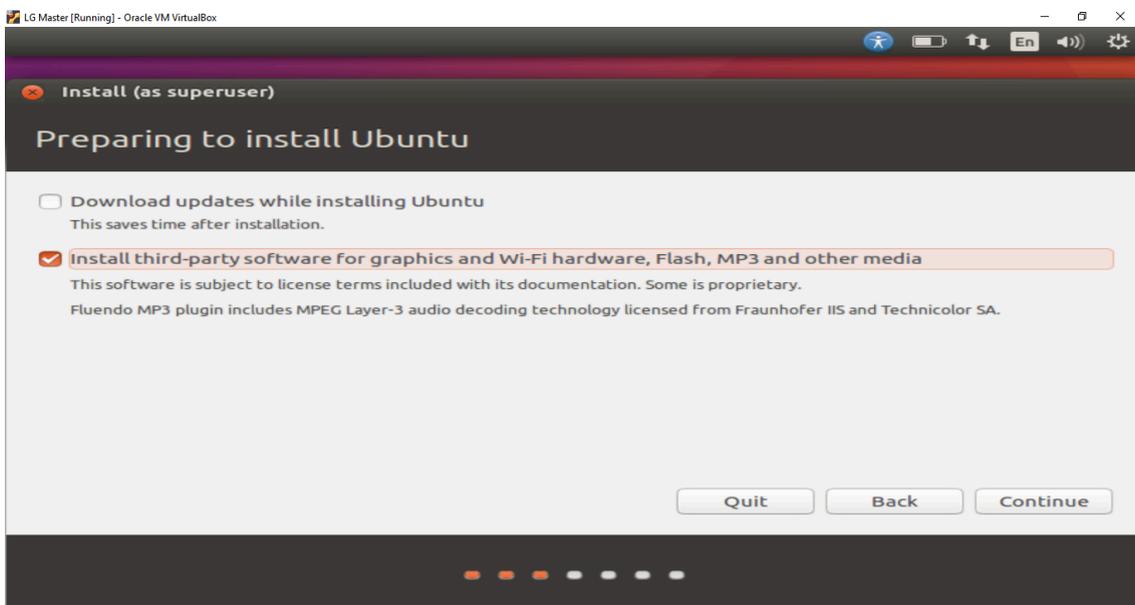
Select the iso image to be installed (UBUNTU 16.04). Click START



Select the scale mode so you can occupy the entire screen

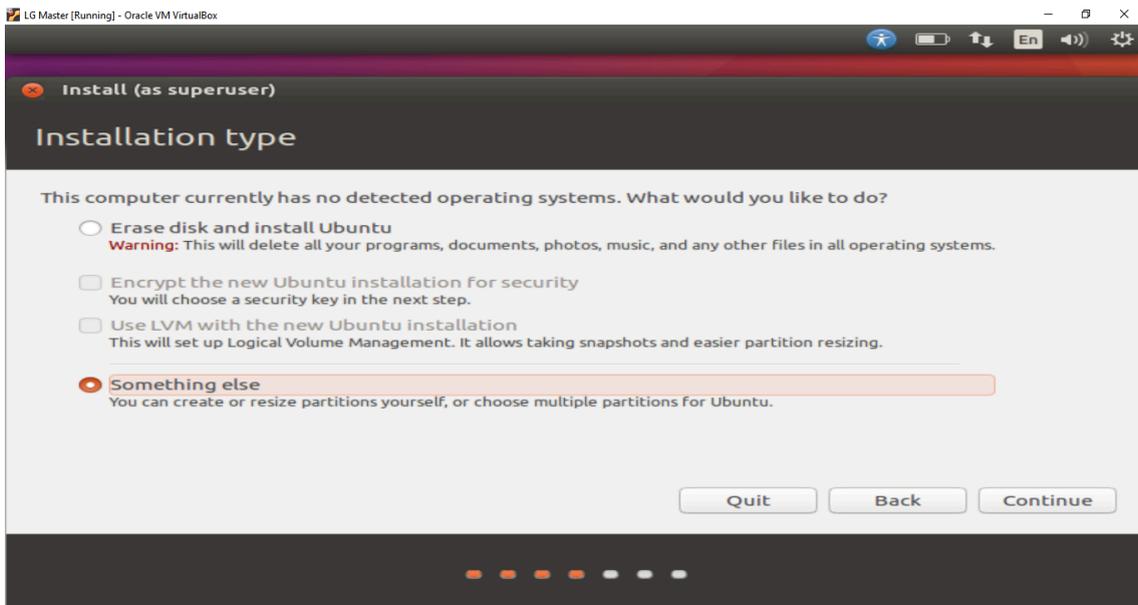


Select your language and click INSTALL UBUNTU

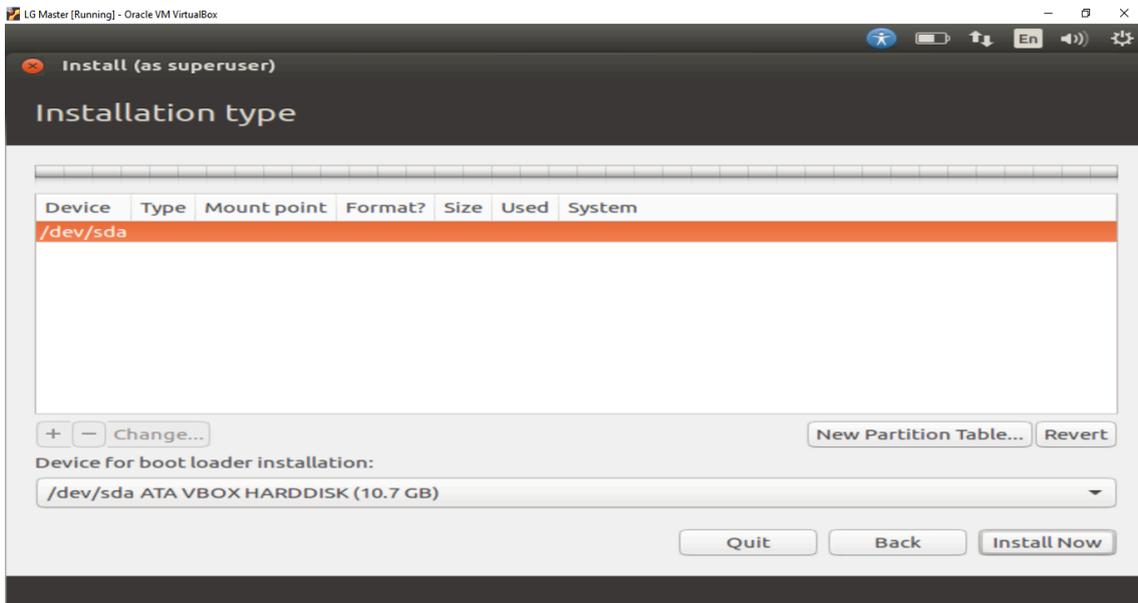


Select only the second checkbox

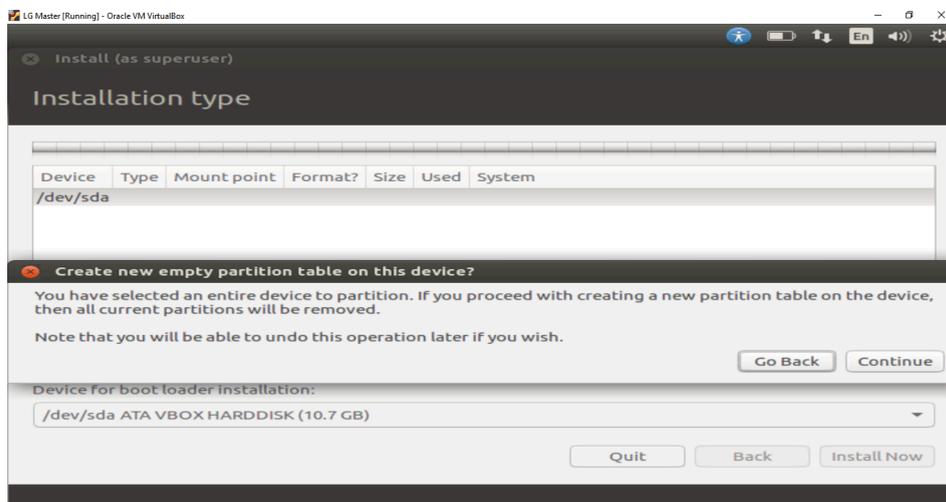
## Select the last checkbox



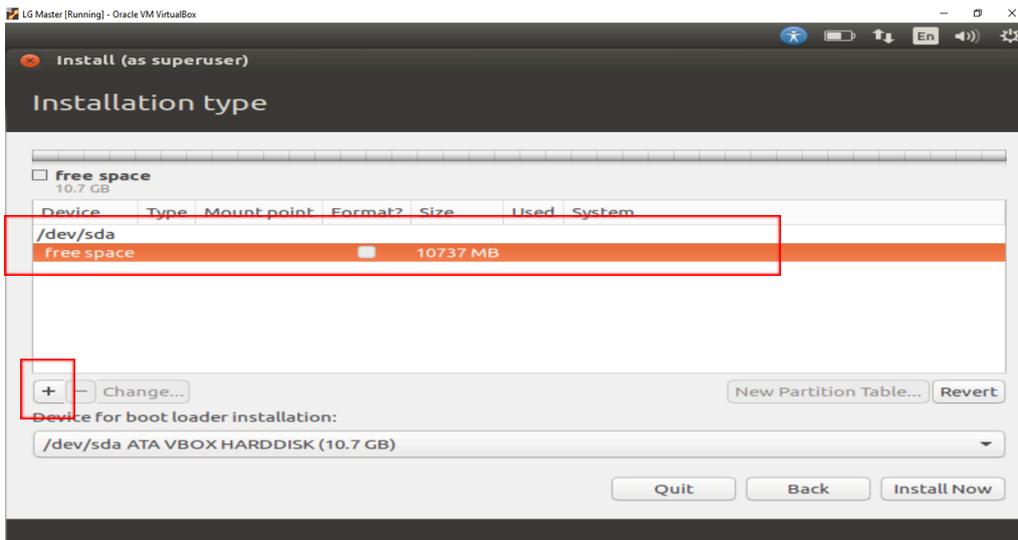
## Click NEW PARTITION TABLE



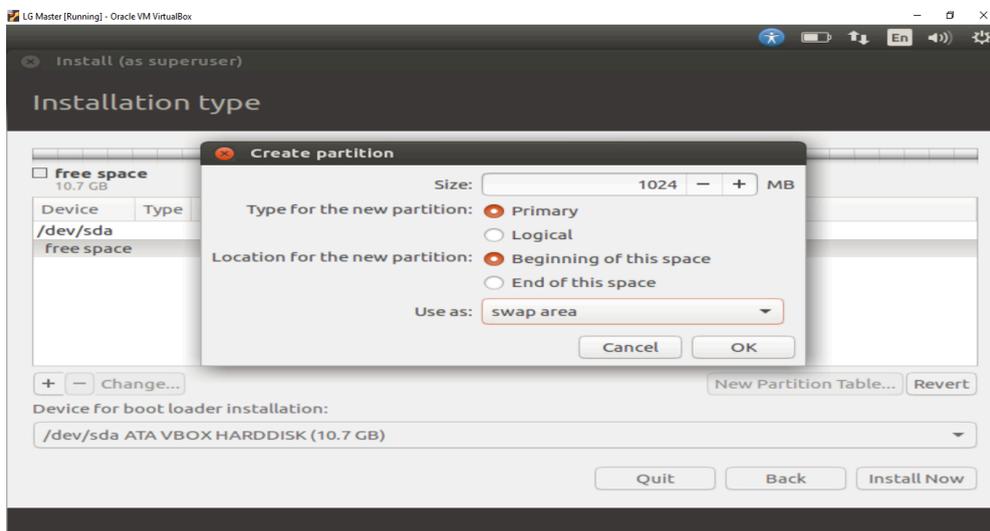
## CONTINUE



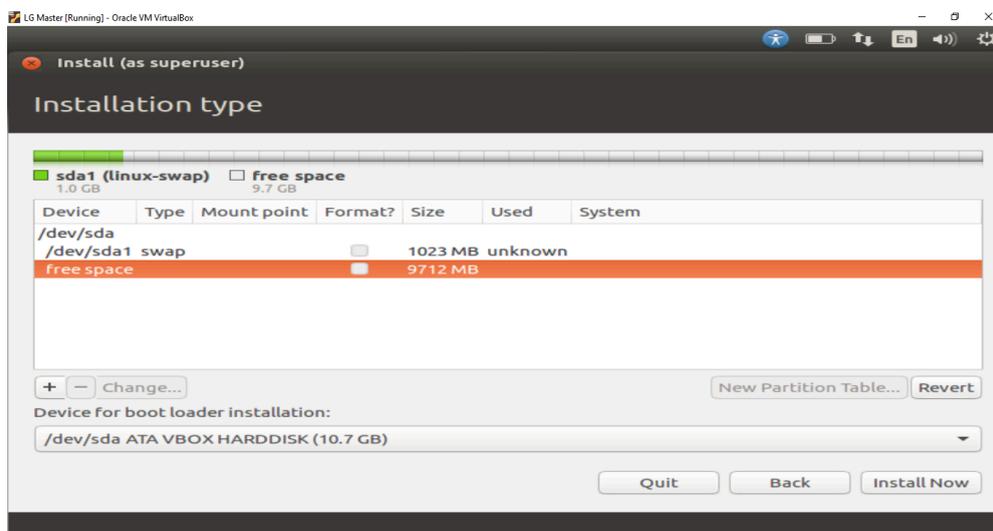
Select the new free space created and click the MORE button



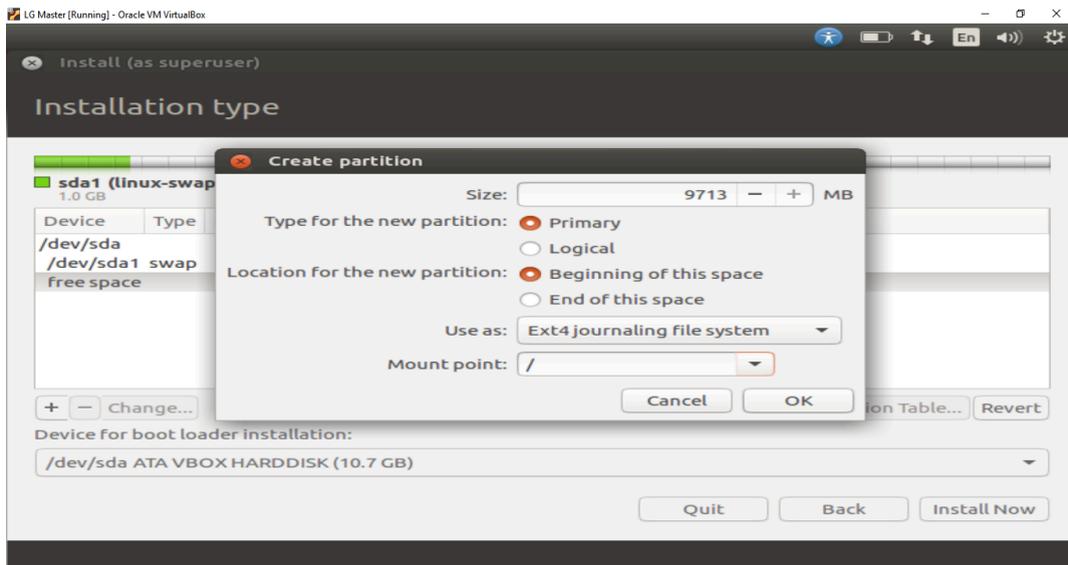
Separate 1GB for MEMORY SWAP and click OK



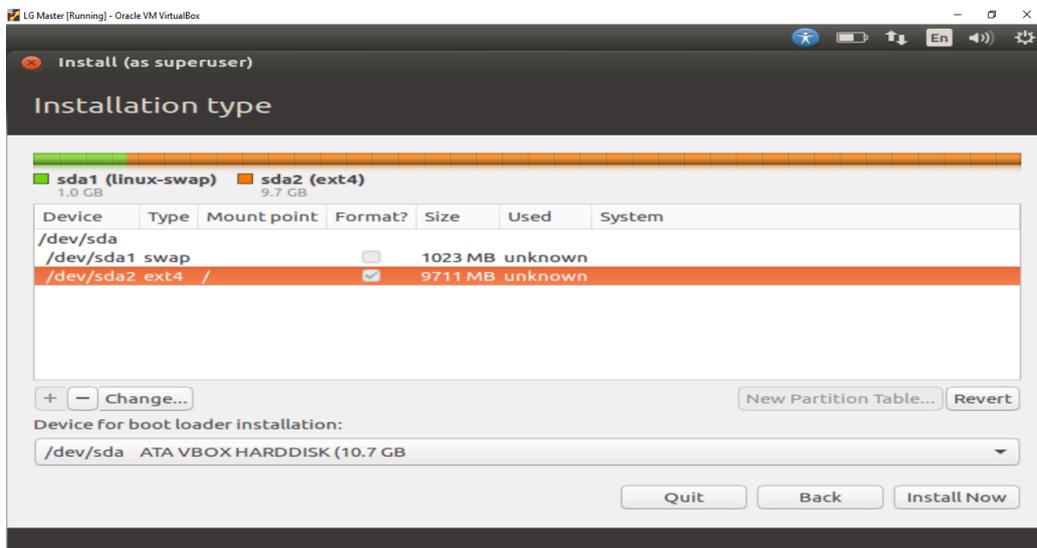
Select the free partition and click the MORE button again



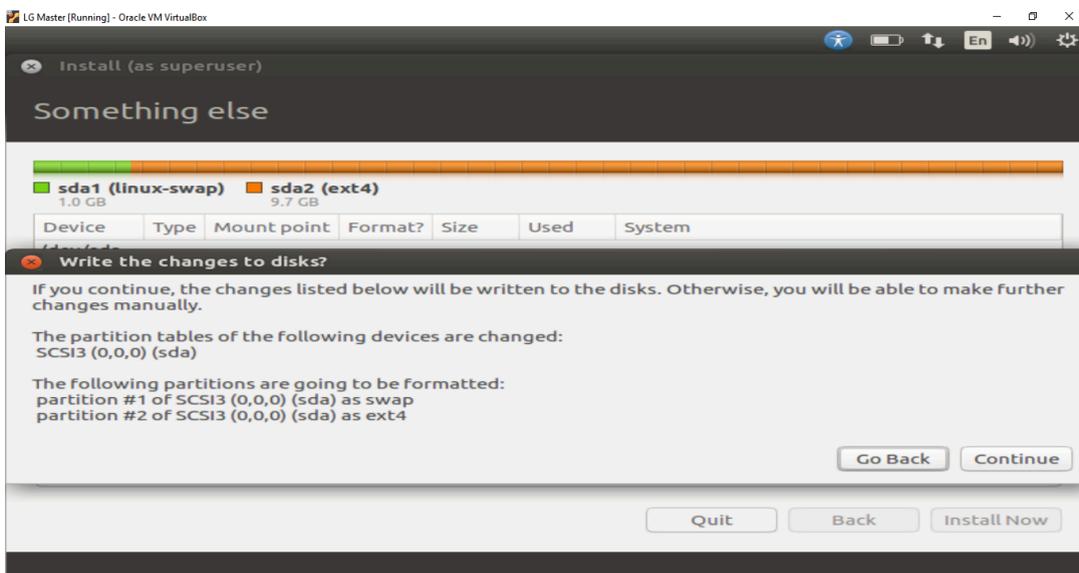
Configure according to the image below. Click OK



Select the installation line as shown in the image and click INSTALL NOW



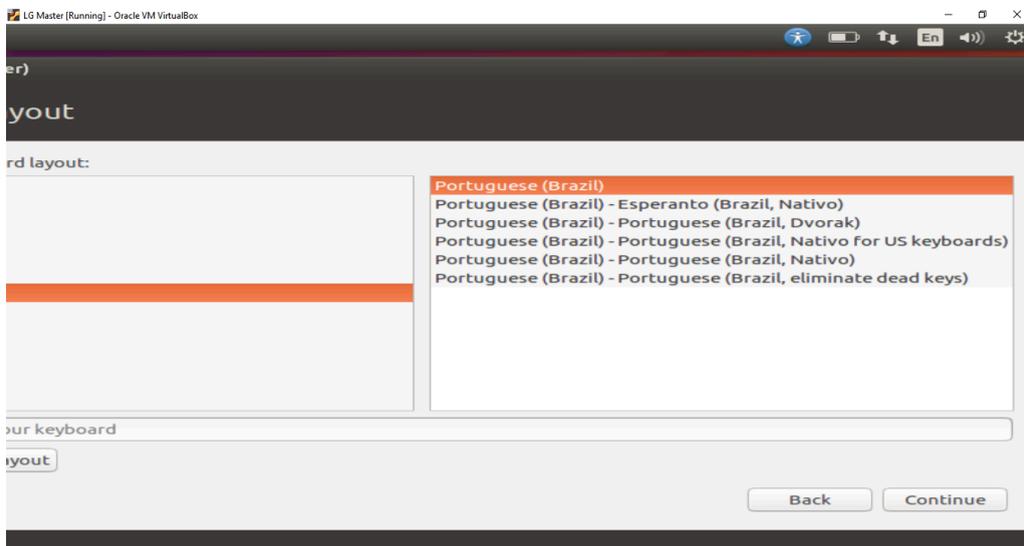
Click CONTINUE



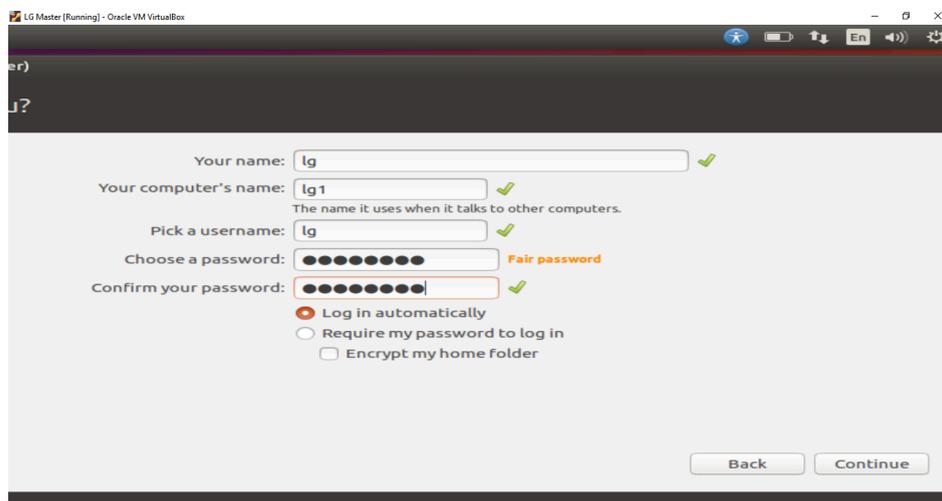
## Select time zone



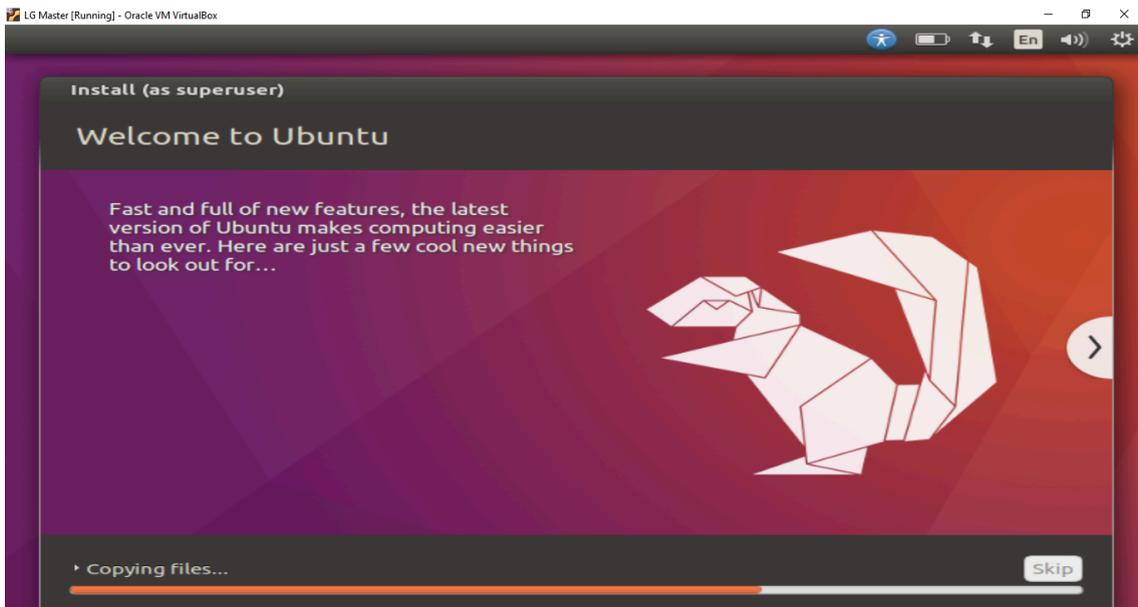
## Select the keyboard format



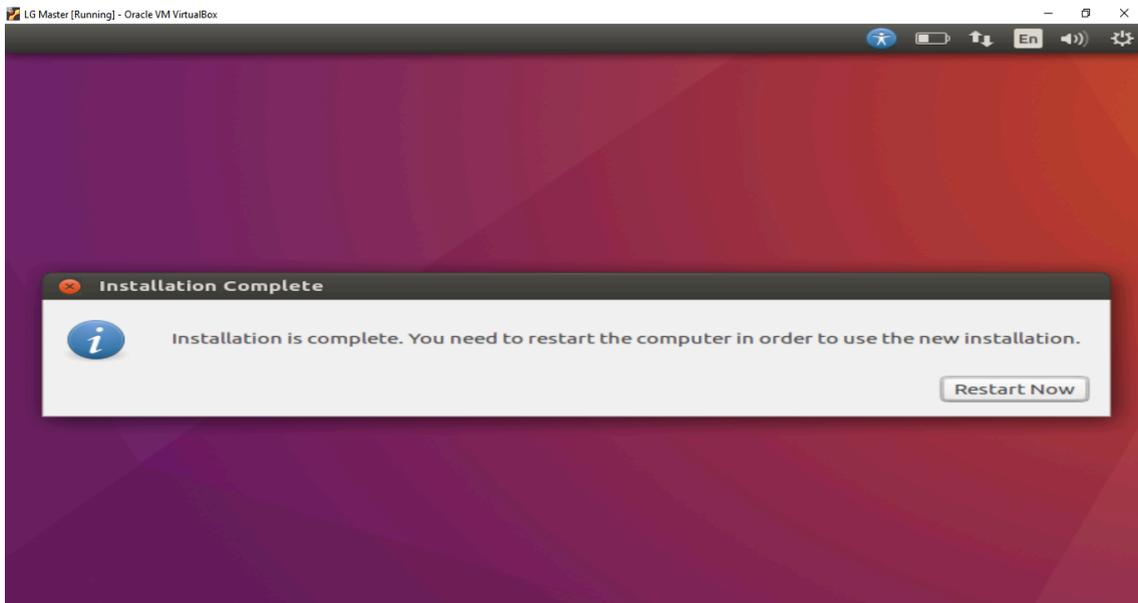
Much attention in this step. The computer name must be lg1 for the master, lg2 and lg3 for the slaves. YOUR NAME and PICK A USERNAME must always be lg



Wait for the installation. This process takes a few minutes.



Click TESTART NOW

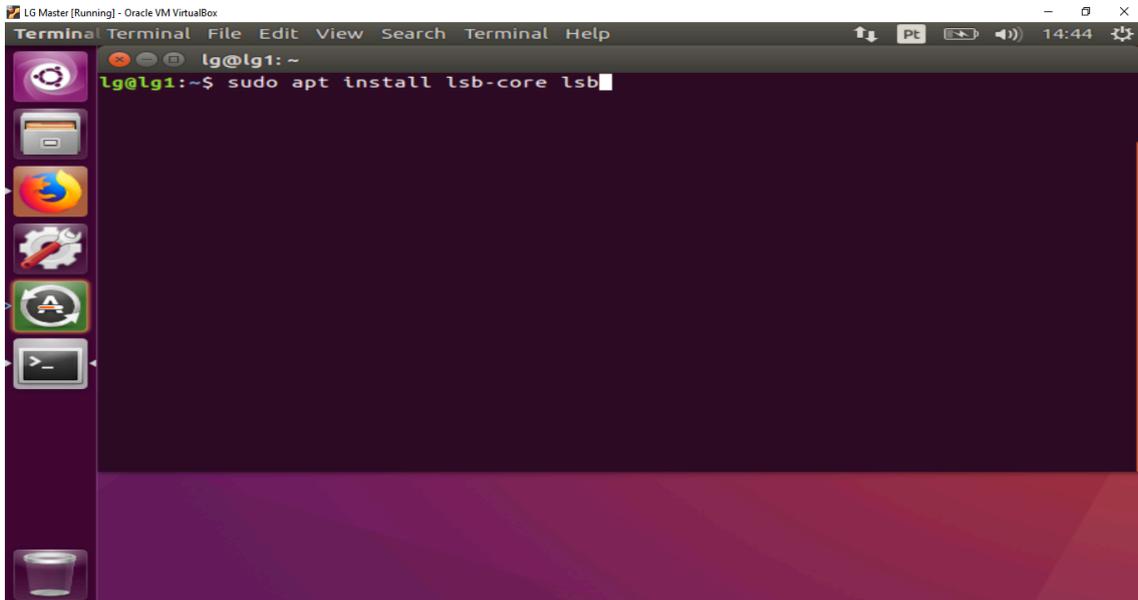


Access the Liquid Galaxy project repository on GitHub

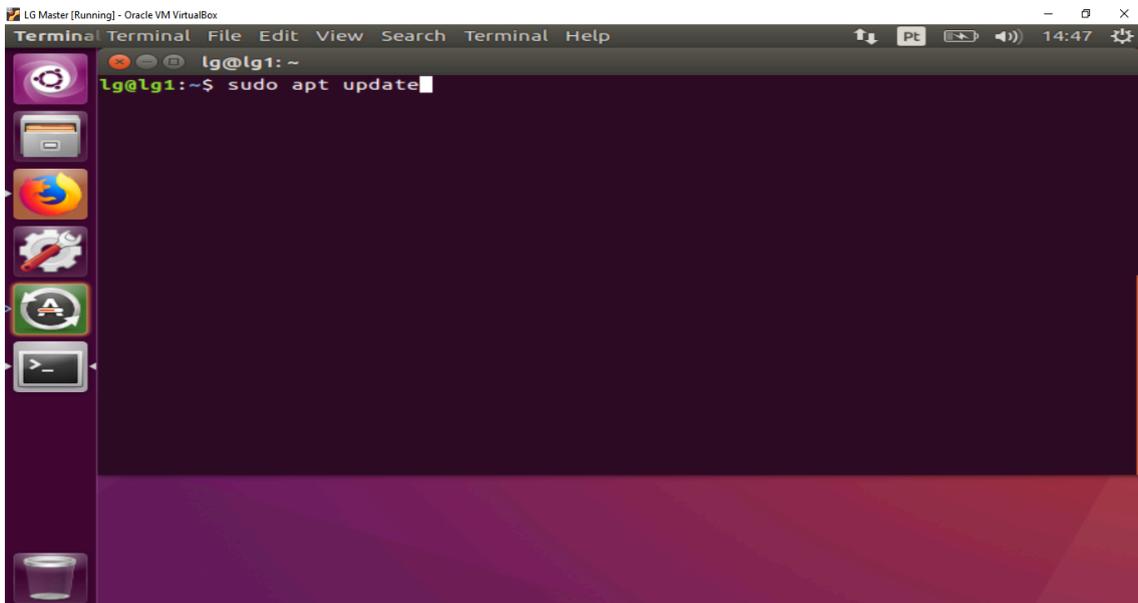
<https://github.com/LiquidGalaxyLAB/liquid-galaxy>

Open a terminal (**CTRL + Alt + t**)

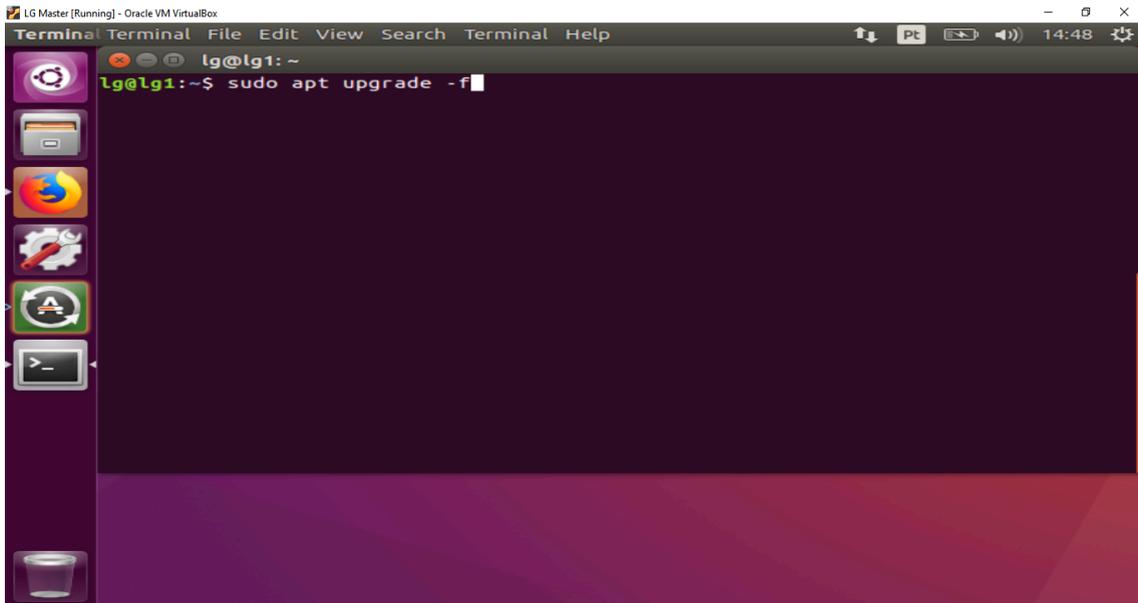
```
$ sudo apt install lsb-core lsb
```



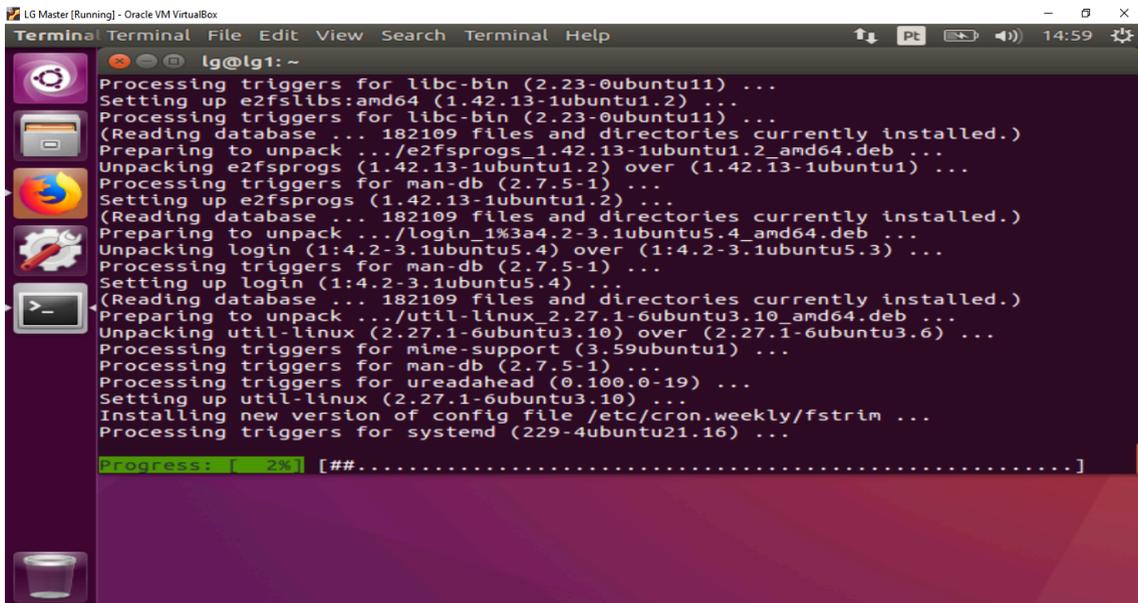
```
$ sudo apt update
```



```
$ sudo apt upgrade -f
```

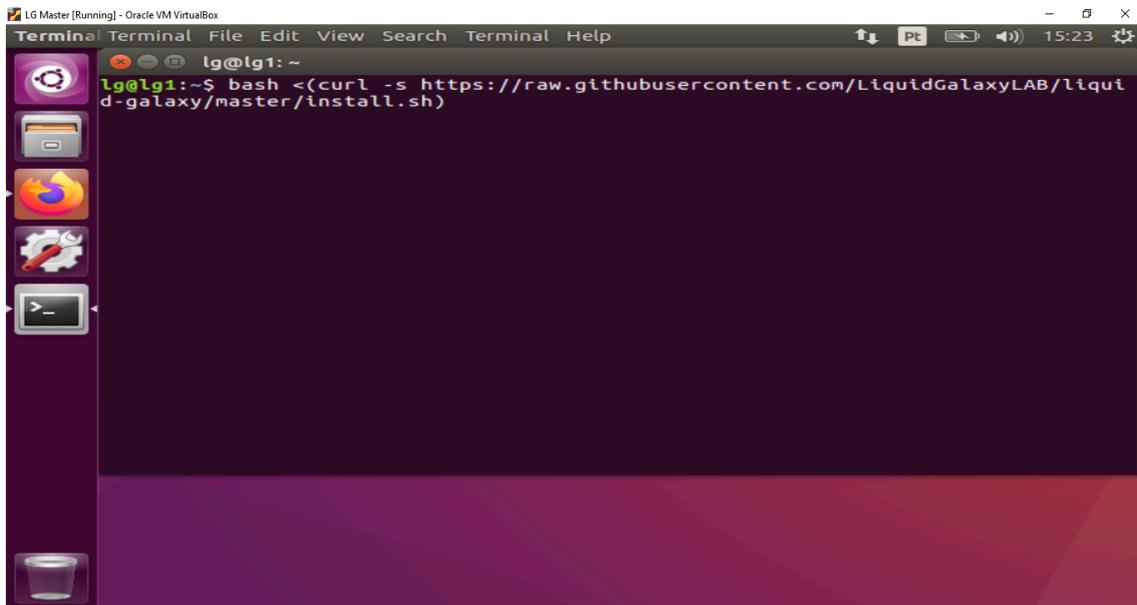


The upgrade process takes a few minutes.



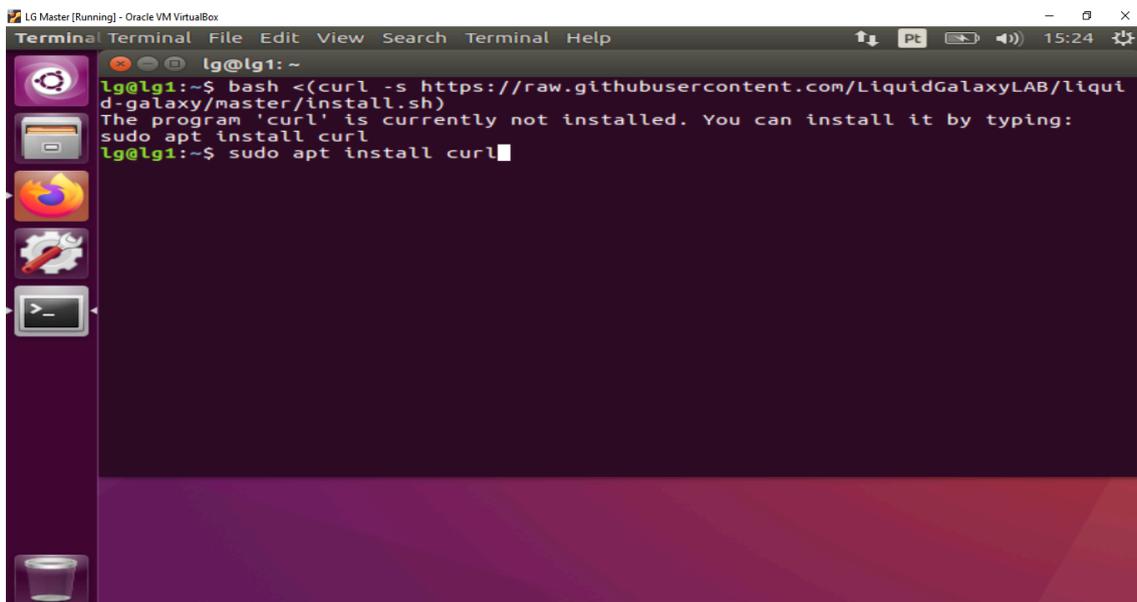
# Installing Liquid Galaxy

```
$ bash <(curl -s https://raw.githubusercontent.com/LiquidGalaxyLAB/liquid-galaxy/master/install.sh)
```



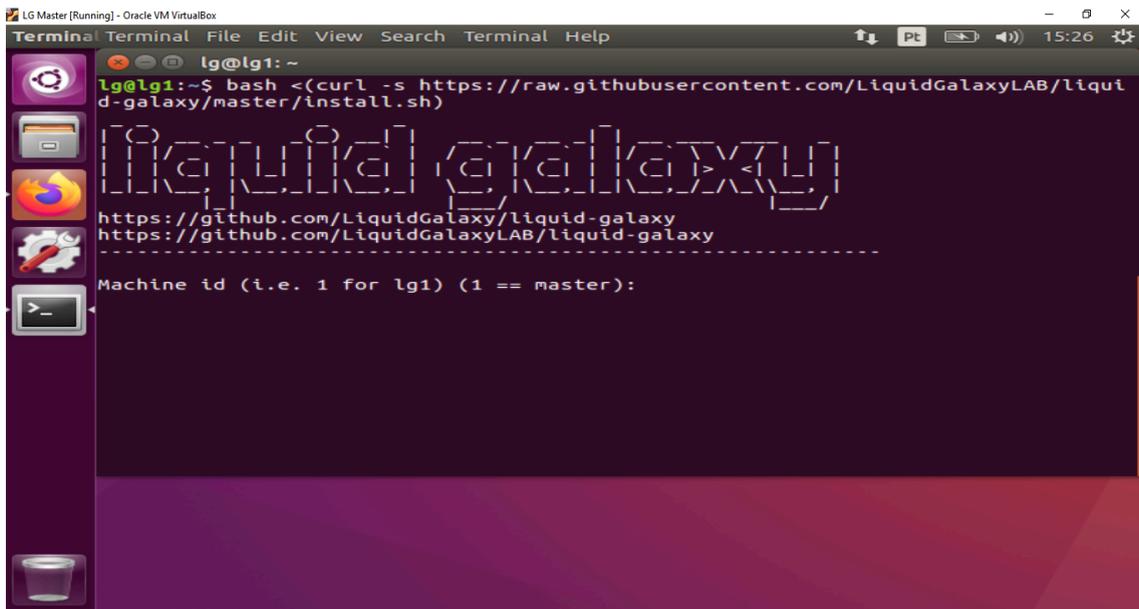
A terminal window titled "LG Master [Running] - Oracle VM VirtualBox" with a menu bar (Terminal, File, Edit, View, Search, Terminal, Help) and system icons (Pt, network, volume, 15:23). The prompt is "lg@lg1: ~". The command entered is "bash <(curl -s https://raw.githubusercontent.com/LiquidGalaxyLAB/liquid-galaxy/master/install.sh)". The terminal background is dark purple with a vertical sidebar on the left containing icons for a gear, a folder, a Firefox browser, a gear with a pencil, a terminal, and a trash can.

If you don't have CURL installed this message will be displayed, just install CURL with the command: `sudo apt install curl`

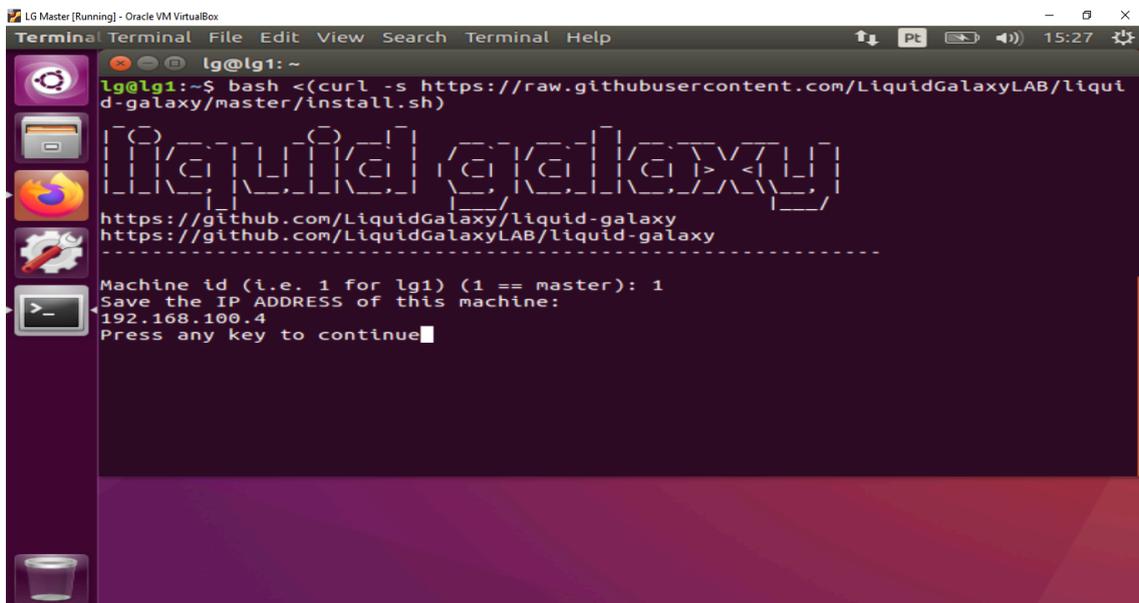


A terminal window titled "LG Master [Running] - Oracle VM VirtualBox" with a menu bar (Terminal, File, Edit, View, Search, Terminal, Help) and system icons (Pt, network, volume, 15:24). The prompt is "lg@lg1: ~". The command entered is "bash <(curl -s https://raw.githubusercontent.com/LiquidGalaxyLAB/liquid-galaxy/master/install.sh)". The output is "The program 'curl' is currently not installed. You can install it by typing: sudo apt install curl". The prompt then changes to "lg@lg1:~\$ sudo apt install curl". The terminal background is dark purple with a vertical sidebar on the left containing icons for a gear, a folder, a Firefox browser, a gear with a pencil, a terminal, and a trash can.

After installing CURL proceed with the installation of LIQUID GALAXY



```
lg@lg1:~  
lg@lg1:~$ bash <(curl -s https://raw.githubusercontent.com/LiquidGalaxyLAB/liquid-galaxy/master/install.sh)  
Liquid Galaxy  
https://github.com/LiquidGalaxy/liquid-galaxy  
https://github.com/LiquidGalaxyLAB/liquid-galaxy  
-----  
Machine id (i.e. 1 for lg1) (1 == master):  
1
```

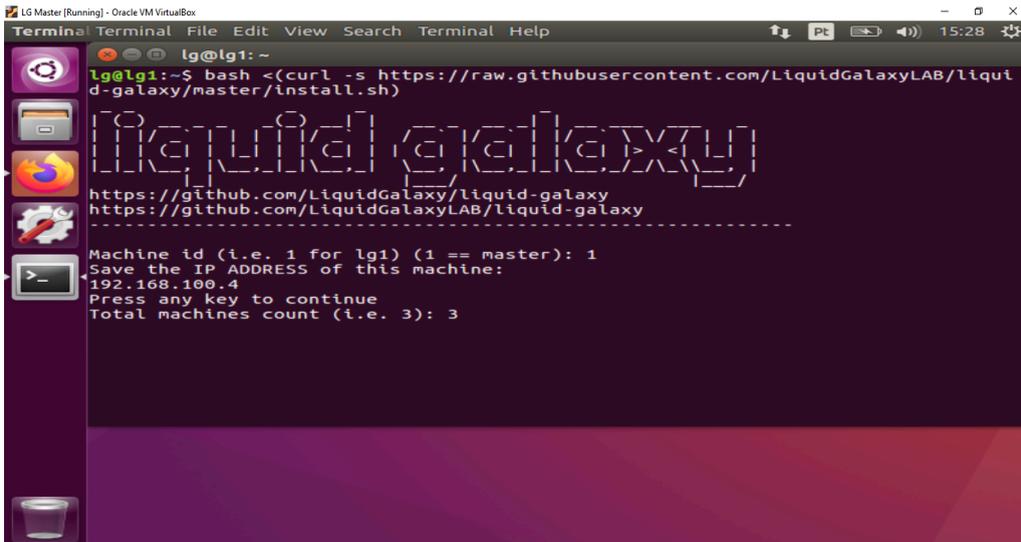


```
lg@lg1:~  
lg@lg1:~$ bash <(curl -s https://raw.githubusercontent.com/LiquidGalaxyLAB/liquid-galaxy/master/install.sh)  
Liquid Galaxy  
https://github.com/LiquidGalaxy/liquid-galaxy  
https://github.com/LiquidGalaxyLAB/liquid-galaxy  
-----  
Machine id (i.e. 1 for lg1) (1 == master): 1  
Save the IP ADDRESS of this machine:  
192.168.100.4  
Press any key to continue
```

Choose number 1 for the MASTER computer and 2 and 3 for the slaves

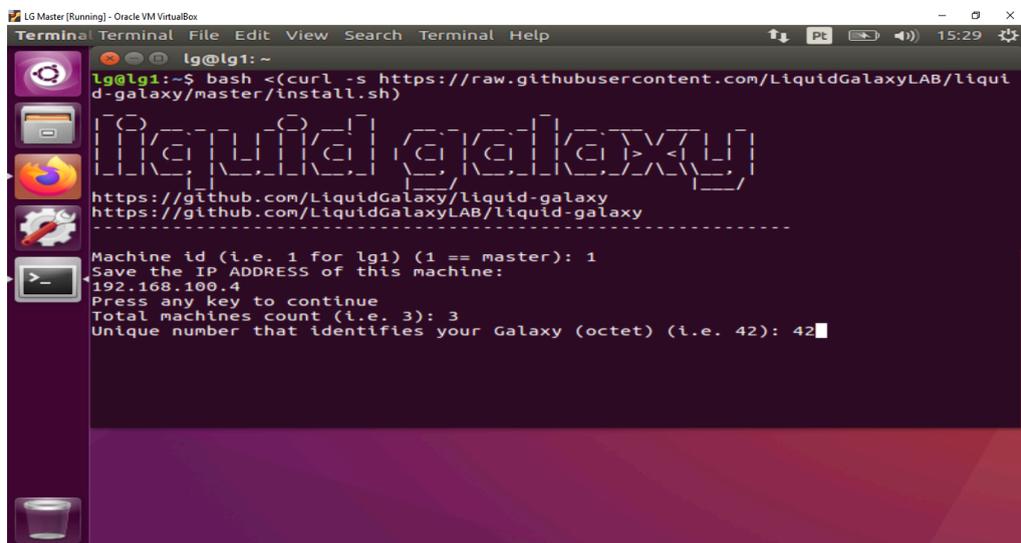
Save the IP number of the master pc

## Total machines 3



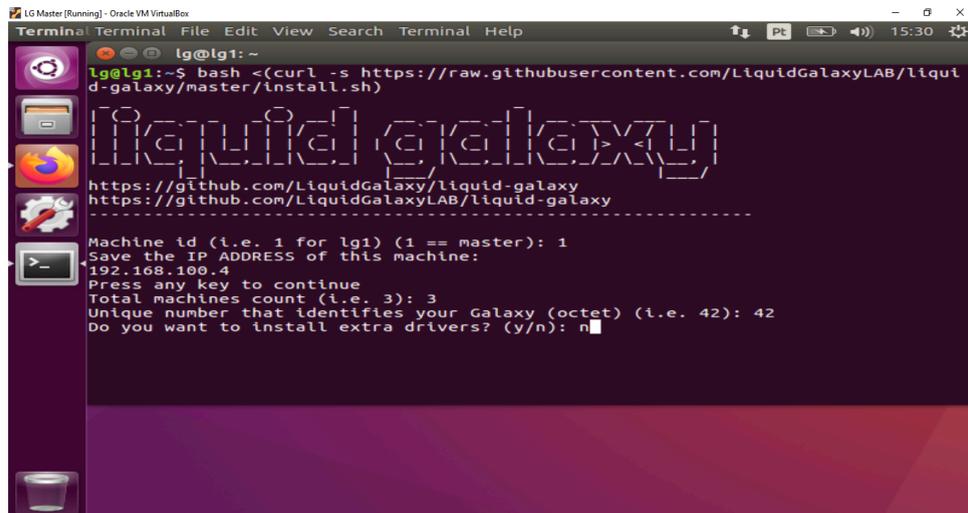
```
lg@lg1:~$ bash <(curl -s https://raw.githubusercontent.com/LiquidGalaxyLAB/liquid-galaxy/master/install.sh)
Liquid Galaxy
https://github.com/LiquidGalaxy/liquid-galaxy
https://github.com/LiquidGalaxyLAB/liquid-galaxy
-----
Machine id (i.e. 1 for lg1) (1 == master): 1
Save the IP ADDRESS of this machine:
192.168.100.4
Press any key to continue
Total machines count (i.e. 3): 3
```

## OCTET: 42



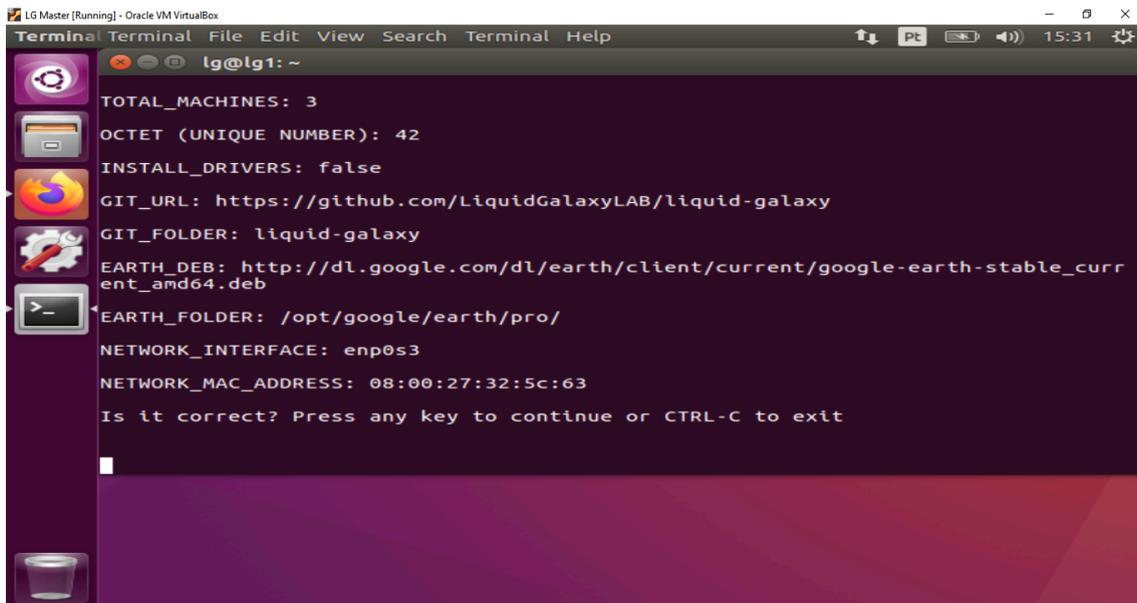
```
lg@lg1:~$ bash <(curl -s https://raw.githubusercontent.com/LiquidGalaxyLAB/liquid-galaxy/master/install.sh)
Liquid Galaxy
https://github.com/LiquidGalaxy/liquid-galaxy
https://github.com/LiquidGalaxyLAB/liquid-galaxy
-----
Machine id (i.e. 1 for lg1) (1 == master): 1
Save the IP ADDRESS of this machine:
192.168.100.4
Press any key to continue
Total machines count (i.e. 3): 3
Unique number that identifies your Galaxy (octet) (i.e. 42): 42
```

To install additional drivers, type the letter n



```
lg@lg1:~$ bash <(curl -s https://raw.githubusercontent.com/LiquidGalaxyLAB/liquid-galaxy/master/install.sh)
Liquid Galaxy
https://github.com/LiquidGalaxy/liquid-galaxy
https://github.com/LiquidGalaxyLAB/liquid-galaxy
-----
Machine id (i.e. 1 for lg1) (1 == master): 1
Save the IP ADDRESS of this machine:
192.168.100.4
Press any key to continue
Total machines count (i.e. 3): 3
Unique number that identifies your Galaxy (octet) (i.e. 42): 42
Do you want to install extra drivers? (y/n): n
```

Press any key to continue



```
lg@lg1: ~
TOTAL_MACHINES: 3
OCTET (UNIQUE NUMBER): 42
INSTALL_DRIVERS: false
GIT_URL: https://github.com/LiquidGalaxyLAB/liquid-galaxy
GIT_FOLDER: liquid-galaxy
EARTH_DEB: http://dl.google.com/dl/earth/client/current/google-earth-stable_curr
ent_amd64.deb
EARTH_FOLDER: /opt/google/earth/pro/
NETWORK_INTERFACE: enp0s3
NETWORK_MAC_ADDRESS: 08:00:27:32:5c:63
Is it correct? Press any key to continue or CTRL-C to exit
```

After installation, the side toolbar will be hidden and Google Earth will open automatically.

To continue with the installation of the slaves, keep the master machine open at all times.

Slaves need to connect to the master to complete their installations.

The complete process can be seen here:

[https://www.youtube.com/watch?v=8R\\_KnPPeRQ&t=16s](https://www.youtube.com/watch?v=8R_KnPPeRQ&t=16s)