

# Laboratory 1

## MSK Docker installation and image deploy

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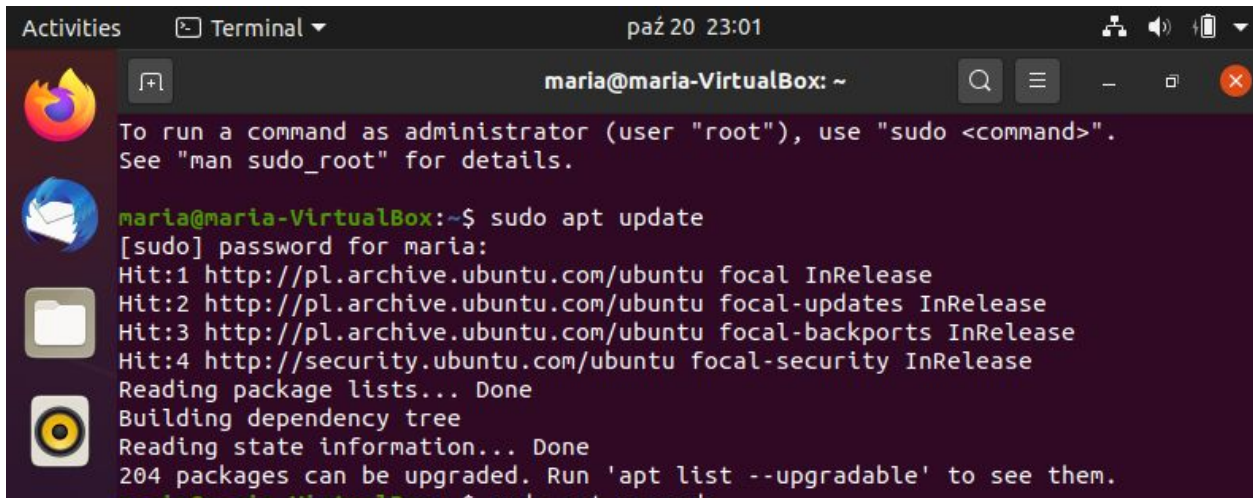
Objective:

Install Docker and get the enough knowledge to deploy images into the Docker tool.

Introduction:

Docker is a set of platform as a service products that use OS-level virtualization to deliver software in packages called containers. Containers are isolated from one another and bundle their own software, libraries and configuration files; they can communicate with each other through well-defined channels. In this laboratory we need to get enough knowledge to deploy images in docker containers.

1) The first step is update our ubuntu with the command **sudo apt update**



```
Activities  Terminal  paż 20 23:01
maria@maria-VirtualBox: ~
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
maria@maria-VirtualBox:~$ sudo apt update
[sudo] password for maria:
Hit:1 http://pl.archive.ubuntu.com/ubuntu focal InRelease
Hit:2 http://pl.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:3 http://pl.archive.ubuntu.com/ubuntu focal-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu focal-security InRelease
Reading package lists... Done
Building dependency tree
Reading state information... Done
204 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

2) After we need to upgrade our system with the command **sudo apt upgrade**

```
Ubuntu20 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal paź 20 23:02
maria@maria-VirtualBox: ~
204 packages can be upgraded. Run 'apt list --upgradable' to see them.
maria@maria-VirtualBox:~$ sudo apt upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
Use 'sudo apt autoremove' to remove it.
The following packages will be upgraded:
  alsa-ucm-conf apport apport-gtk aptdaemon aptdaemon-data base-files
  bind9-dnsutils bind9-host bind9-libs bolt bsdtls busybox-initramfs
  busybox-static cheese cheese-common command-not-found cpp-9
  evolution-data-server evolution-data-server-common fdisk file-roller
  firefox fonts-noto-mono fonts-opensymbol gcc-10-base gcc-9-base gdb
  gdbserver gdm3 ghostscript ghostscript-x gir1.2-gdm-1.0
  gir1.2-javascriptcoregtk-4.0 gir1.2-mutter-6 gir1.2-packagekitglib-1.0
  gir1.2-webkit2-4.0 gnome-shell gnome-shell-common
  gnome-shell-extension-desktop-icons gstreamer1.0-packagekit im-config
  initramfs-tools initramfs-tools-bin initramfs-tools-core
  language-selector-common language-selector-gnome libasound2-data
  libatopology2 libblkid1 libbrotli1 libc-bin libc6 libc6-dbg libcamel-1.2-62
  libcurl1-0 libcheese-gtk25 libcheese8 libcryptsetup12 libcurl3-gnutls
  libcurl4 libdns-export1109 libebook-1.2-10 libebook-1.2-20
  libebook-contacts-1.2-3 libecal-2.0-1 libedata-book-1.2-26
  libedata-cal-2.0-1 libedataserver-1.2-24 libedataserverui-1.2-2 libegl1
  libfdisk1 libfprint-2-2 libfprint-2-tod1 libfreerdp-client2-2 libfreerdp2-2
  libfreetype6 libgcc-s1 libgdm1 libgl1 libgles2 libglvnd0 libglx0
  libgnutls30 libgomp1 libgs9 libgs9-common libgssdp-1.2-0 libgupnp-1.2-0
  libinput-bin libinput10 libisc-export1105 libjavascriptcoregtk-4.0-18
```

### 3) Instalar el comando **curl**

```
maria@maria-VirtualBox:~$ sudo apt install curl
[sudo] password for maria:
sudo: apt: command not found
maria@maria-VirtualBox:~$ sudo apt install curl
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
Use 'sudo apt autoremove' to remove it.
The following NEW packages will be installed:
  curl
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 161 kB of archives.
After this operation, 411 kB of additional disk space will be used.
Get:1 http://pl.archive.ubuntu.com/ubuntu focal-updates/main amd64 curl amd64 7.68.0-1ubuntu2.2 [161 kB]
Fetched 161 kB in 0s (1 467 kB/s)
Selecting previously unselected package curl.
(Reading database ... 180123 files and directories currently installed.)
Preparing to unpack .../curl_7.68.0-1ubuntu2.2_amd64.deb ...
Unpacking curl (7.68.0-1ubuntu2.2) ...
Setting up curl (7.68.0-1ubuntu2.2) ...
Processing triggers for man-db (2.9.1-1) ...
maria@maria-VirtualBox:~$
```

### 4) Run the **curl** command for linux



```

Processing triggers for man-db (2.9.1-1) ...
maria@maria-VirtualBox:~$ curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube_latest_amd64.deb
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           %             %             Dload  Upload   Total   Spent    Left   Speed
100 20.0M  100 20.0M    0     0  7758k      0  0:00:02  0:00:02 --:--:-- 7755k
maria@maria-VirtualBox:~$

```

5) We check we have the package we need

```

maria@maria-VirtualBox:~$ ll
total 20612
drwxr-xr-x 17 maria maria 4096 paź 21 00:00 ./
drwxr-xr-x  3 root root 4096 paź 20 22:20 ../
-rw-r--r--  1 maria maria    0 paź 20 23:34 .bash_history
-rw-r--r--  1 maria maria  220 paź 20 22:20 .bash_logout
-rw-r--r--  1 maria maria 3771 paź 20 22:20 .bashrc
drwx----- 13 maria maria 4096 paź 20 22:53 .cache/
drwx----- 12 maria maria 4096 paź 20 23:50 .config/
drwxr-xr-x  2 maria maria 4096 paź 20 22:40 Desktop/
drwxr-xr-x  2 maria maria 4096 paź 20 22:40 Documents/
drwxr-xr-x  2 maria maria 4096 paź 20 22:40 Downloads/
drwx-----  3 maria maria 4096 paź 20 23:43 .gnupg/
drwxr-xr-x  3 maria maria 4096 paź 20 22:40 .local/
-rw-rw-r--  1 maria maria 21021818 paź 21 00:00 minikube_latest_amd64.deb
drwx-----  5 maria maria 4096 paź 20 22:48 .mozilla/
drwxr-xr-x  2 maria maria 4096 paź 20 22:40 Music/
drwxr-xr-x  2 maria maria 4096 paź 20 22:40 Pictures/
-rw-r--r--  1 maria maria  807 paź 20 22:20 .profile
drwxr-xr-x  2 maria maria 4096 paź 20 22:40 Public/
drwxr-xr-x  3 maria maria 4096 paź 20 22:53 snap/
drwx-----  2 maria maria 4096 paź 20 22:55 .ssh/
-rw-r--r--  1 maria maria    0 paź 20 22:55 .sudo_as_admin_successful
drwxr-xr-x  2 maria maria 4096 paź 20 22:40 Templates/
drwxr-xr-x  2 maria maria 4096 paź 20 22:40 Videos/

```

6) Run the command **sudo dpkg -i minikube\_latest\_amd64.deb** for get the package

```

maria@maria-VirtualBox:~$ sudo dpkg -i minikube_latest_amd64.deb
Selecting previously unselected package minikube.
(Reading database ... 180130 files and directories currently installed.)
Preparing to unpack minikube_latest_amd64.deb ...
Unpacking minikube (1.14.0) ...
Setting up minikube (1.14.0) ...

```

7) We need start our minikube services

```

maria@maria-VirtualBox:~$ minikube start
😊 minikube v1.14.0 on Ubuntu 20.04 (vbox/amd64)
👉 Unable to pick a default driver. Here is what was considered, in preference
order:
  ■ docker: Not installed: exec: "docker": executable file not found in $PATH
  ■ kvm2: Not installed: exec: "virsh": executable file not found in $PATH
  ■ none: Not installed: exec: "docker": executable file not found in $PATH
  ■ podman: Not installed: exec: "podman": executable file not found in $PATH
  ■ virtualbox: Not installed: unable to find VBoxManage in $PATH
  ■ vmware: Not installed: exec: "docker-machine-driver-vmware": executable f
ile not found in $PATH

❌ Exiting due to DRV_NOT_DETECTED: No possible driver was detected. Try speci
fying --driver, or see https://minikube.sigs.k8s.io/docs/start/

```

We need to install linux to run our minikube so we will install docker

8) Install docker services with the command **sudo apt install docker**

```
maria@maria-VirtualBox:~$ sudo apt install docker
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  wmdocker
The following NEW packages will be installed:
  docker wmdocker
0 upgraded, 2 newly installed, 0 to remove and 0 not upgraded.
Need to get 14,3 kB of archives.
After this operation, 58,4 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://pl.archive.ubuntu.com/ubuntu focal/universe amd64 wmdocker amd64 1
.5-2 [13,0 kB]
Get:2 http://pl.archive.ubuntu.com/ubuntu focal/universe amd64 docker all 1.5-2
 [1 316 B]
Fetched 14,3 kB in 0s (87,2 kB/s)
Selecting previously unselected package wmdocker.
(Reading database ... 180131 files and directories currently installed.)
Preparing to unpack .../wmdocker_1.5-2_amd64.deb ...
Unpacking wmdocker (1.5-2) ...
Selecting previously unselected package docker.
Preparing to unpack .../archives/docker_1.5-2_all.deb ...
Unpacking docker (1.5-2) ...
```

9) Install the certificates

```
maria@maria-VirtualBox:~$ sudo apt install apt-transport-https ca-certificates
curl software-properties-common
Reading package lists... Done
Building dependency tree
Reading state information... Done
ca-certificates is already the newest version (20190110ubuntu1.1).
ca-certificates set to manually installed.
curl is already the newest version (7.68.0-1ubuntu2.2).
software-properties-common is already the newest version (0.98.9.2).
software-properties-common set to manually installed.
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
Use 'sudo apt autoremove' to remove it.
The following NEW packages will be installed:
  apt-transport-https
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 1 708 B of archives.
After this operation, 160 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://pl.archive.ubuntu.com/ubuntu focal-updates/universe amd64 apt-tran
sport-https all 2.0.2ubuntu0.1 [1 708 B]
Fetched 1 708 B in 0s (16,4 kB/s)
Selecting previously unselected package apt-transport-https.
(Reading database ... 180141 files and directories currently installed.)
Preparing to unpack .../apt-transport-https_2.0.2ubuntu0.1_all.deb ...
Unpacking apt-transport-https (2.0.2ubuntu0.1) ...
Setting up apt-transport-https (2.0.2ubuntu0.1) ...
```

10) Add the key to protect



```
373
maria@maria-VirtualBox:~$ curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -
OK
maria@maria-VirtualBox:~$
```

11) We run the following command

```
maria@maria-VirtualBox:~$ sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu bionic stable"
Hit:1 http://pl.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://pl.archive.ubuntu.com/ubuntu focal-updates InRelease [111 kB]
Get:3 http://security.ubuntu.com/ubuntu focal-security InRelease [107 kB]
Get:4 http://pl.archive.ubuntu.com/ubuntu focal-backports InRelease [98,3 kB]
Get:5 http://pl.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [617 kB]
Get:6 http://pl.archive.ubuntu.com/ubuntu focal-updates/main i386 Packages [353 kB]
Get:7 http://pl.archive.ubuntu.com/ubuntu focal-updates/main Translation-en [155 kB]
Get:8 http://pl.archive.ubuntu.com/ubuntu focal-updates/main amd64 DEP-11 Metadata [229 kB]
Get:9 http://pl.archive.ubuntu.com/ubuntu focal-updates/main amd64 c-n-f Metadata [10,4 kB]
Get:10 http://pl.archive.ubuntu.com/ubuntu focal-updates/universe i386 Packages [505 kB]
Get:11 http://pl.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [671 kB]
Get:12 http://pl.archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [127 kB]
Get:13 http://pl.archive.ubuntu.com/ubuntu focal-updates/universe amd64 DEP-11 Metadata [202 kB]
Get:14 http://pl.archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [12,3 kB]
Get:15 http://pl.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 DEP-11 Metadata [2468 B]
```

12) We running the command update to get the latest version

```
maria@maria-VirtualBox:~$ sudo apt update
Hit:1 http://pl.archive.ubuntu.com/ubuntu focal InRelease
Hit:2 http://pl.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:3 http://pl.archive.ubuntu.com/ubuntu focal-backports InRelease
Hit:4 https://download.docker.com/linux/ubuntu bionic InRelease
Hit:5 http://security.ubuntu.com/ubuntu focal-security InRelease
Reading package lists... Done
Building dependency tree
Reading state information... Done
```

The second part is to install Docker and deploy an images.

1) Install docker with the command **docker-ce**

```

maria@maria-VirtualBox:~$ sudo apt install docker-ce
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libfprint-2-tod1
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  aufs-tools cgroupfs-mount containerd.io docker-ce-cli git git-man
  liberror-perl pigz
Suggested packages:
  git-daemon-run | git-daemon-sysvinit git-doc git-el git-email git-gui gitk
  gitweb git-cvs git-mediawiki git-svn
The following NEW packages will be installed:
  aufs-tools cgroupfs-mount containerd.io docker-ce docker-ce-cli git git-man
  liberror-perl pigz
0 upgraded, 9 newly installed, 0 to remove and 7 not upgraded.
Need to get 96,7 MB of archives.
After this operation, 448 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://pl.archive.ubuntu.com/ubuntu focal/universe amd64 pigz amd64 2.4-1
[57,4 kB]
Get:2 http://pl.archive.ubuntu.com/ubuntu focal/universe amd64 aufs-tools amd64
1:4.14+20190211-1ubuntu1 [104 kB]
Get:3 http://pl.archive.ubuntu.com/ubuntu focal/universe amd64 cgroupfs-mount a
ll 1.4 [6 320 B]
Get:4 http://pl.archive.ubuntu.com/ubuntu focal/main amd64 liberror-perl all 0.
17029-1 [26,5 kB]

```

- 2) Review the docker status with the command

```

maria@maria-VirtualBox:~$ sudo systemctl status docker
● docker.service - Docker Application Container Engine
   Loaded: loaded (/lib/systemd/system/docker.service; enabled; vendor prese
   Active: active (running) since Wed 2020-10-21 14:27:20 CEST; 6min ago
   TriggeredBy: ● docker.socket
     Docs: https://docs.docker.com
    Main PID: 8636 (dockerd)
      Tasks: 8
     Memory: 36.4M
    CGroup: /system.slice/docker.service
            └─8636 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/con

paź 21 14:27:19 maria-VirtualBox dockerd[8636]: time="2020-10-21T14:27:19.7091>
paź 21 14:27:19 maria-VirtualBox dockerd[8636]: time="2020-10-21T14:27:19.7092>
paź 21 14:27:19 maria-VirtualBox dockerd[8636]: time="2020-10-21T14:27:19.7092>
paź 21 14:27:19 maria-VirtualBox dockerd[8636]: time="2020-10-21T14:27:19.7094>
paź 21 14:27:19 maria-VirtualBox dockerd[8636]: time="2020-10-21T14:27:19.9223>
paź 21 14:27:20 maria-VirtualBox dockerd[8636]: time="2020-10-21T14:27:20.1125>
paź 21 14:27:20 maria-VirtualBox dockerd[8636]: time="2020-10-21T14:27:20.2157>
paź 21 14:27:20 maria-VirtualBox dockerd[8636]: time="2020-10-21T14:27:20.2161>
paź 21 14:27:20 maria-VirtualBox systemd[1]: Started Docker Application Contai
paź 21 14:27:20 maria-VirtualBox dockerd[8636]: time="2020-10-21T14:27:20.2806>
lines 1-21/21 (END)

```

- 3) We need run the command **docker ps** with sudo permission for get the right information

```

maria@maria-VirtualBox:~$ sudo docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED
STATUS            PORTS              NAMES
maria@maria-VirtualBox:~$

```

- 4) We add our user as super user to run docker with the command `sudo usermod -aG docker ${USER}` and after make a reboot we can notice the command works without super user



```

maria@maria-VirtualBox:~$ docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED
STATUS            PORTS              NAMES
maria@maria-VirtualBox:~$

```

5) Check the docker status

```

maria@maria-VirtualBox:~$ sudo systemctl status docker
● docker.service - Docker Application Container Engine
   Loaded: loaded (/lib/systemd/system/docker.service; enabled; vendor pre
   Active: active (running) since Wed 2020-10-21 20:39:03 CEST; 1min 3s a
   TriggeredBy: ● docker.socket
     Docs: https://docs.docker.com
    Main PID: 15705 (dockerd)
      Tasks: 8
     Memory: 34.7M
    CGroup: /system.slice/docker.service
            └─15705 /usr/bin/dockerd -H fd:// --containerd=/run/containerd

paź 21 20:39:02 maria-VirtualBox dockerd[15705]: time="2020-10-21T20:39:02.
paź 21 20:39:02 maria-VirtualBox dockerd[15705]: time="2020-10-21T20:39:02.
paź 21 20:39:02 maria-VirtualBox dockerd[15705]: time="2020-10-21T20:39:02.
paź 21 20:39:02 maria-VirtualBox dockerd[15705]: time="2020-10-21T20:39:02.
paź 21 20:39:03 maria-VirtualBox dockerd[15705]: time="2020-10-21T20:39:03.
paź 21 20:39:03 maria-VirtualBox dockerd[15705]: time="2020-10-21T20:39:03.
paź 21 20:39:03 maria-VirtualBox dockerd[15705]: time="2020-10-21T20:39:03.
paź 21 20:39:03 maria-VirtualBox dockerd[15705]: time="2020-10-21T20:39:03.
paź 21 20:39:03 maria-VirtualBox systemd[1]: Started Docker Application Cor
paź 21 20:39:03 maria-VirtualBox dockerd[15705]: time="2020-10-21T20:39:03.
lines 1-21/21 (END)

```

6) Deploy the application hello-world

```

maria@maria-VirtualBox:~$ docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
0e03bdc26d7: Pull complete
Digest: sha256:8c5aeeb6a5f3ba4883347d3747a7249f491766ca1caa47e5da5dfcf6b9b7
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
   (amd64)
3. The Docker daemon created a new container from that image which runs the
   executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it
   to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/

```

7) Search application in ubuntu and make the properly installations

```

maria@maria-VirtualBox:~$ docker search ubuntu
NAME                                STARS                                OFFICIAL    DESCRIPTION
ubuntu                             11427                                [OK]        Ubuntu is a Debian-based Linux operating system. It is the most popular Linux distribution for servers and desktops.
dorowu/ubuntu-desktop-lxde-vnc    469                                  [OK]        Docker image to provide a desktop environment with Lubuntu 14.04 LTS and VNC interface.
rastasheep/ubuntu-sshd            249                                  [OK]        Dockerized SSH server, built on top of official Ubuntu image.
consol/ubuntu-xfce-vnc            227                                  [OK]        Ubuntu container image with Xfce desktop environment and VNC interface.
ubuntu-upstart                    110                                  [OK]        Upstart is an event-driven replacement for SysVinit.
neurodebian                       72                                   [OK]        NeuroDebian provides a Debian-based Linux distribution for neuroscience research.
1and1internet/ubuntu-16-nginx-php-phpmyadmin-mysql-5 50                                  [OK]        ubuntu-16-nginx-php-phpmyadmin-mysql-5
hpmyadmin-mysql-5                44                                   [OK]        debootstrap --variant=minbase --components=minbase
i386/ubuntu                       24                                   [OK]        Ubuntu is a Debian-based Linux operating system. It is the most popular Linux distribution for servers and desktops.
nuagebec/ubuntu                  14                                   [OK]        Simple always updated Ubuntu docker images with latest updates.
1and1internet/ubuntu-16-apache-php-5.6 14                                  [OK]        ubuntu-16-apache-php-5.6
1and1internet/ubuntu-16-apache-php-7.0 13                                  [OK]        ubuntu-16-apache-php-7.0

```

```

maria@maria-VirtualBox:~$ docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
d72e567cc804: Pull complete
0f3630e5ff08: Pull complete
b6a83d81d1f4: Pull complete
Digest: sha256:bc2f7250f69267c9c6b66d7b6a81a54d3878bb85f1ebb5f951c896d13e6ba
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest

```

```

maria@maria-VirtualBox:~$ docker run -it ubuntu
root@aeced1d23c876:/# apt update
Get:1 http://security.ubuntu.com/ubuntu focal-security InRelease [107 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal InRelease [265 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates InRelease [111 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal-backports InRelease [98.3 kB]
Get:5 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [84.4 kB]
Get:6 http://security.ubuntu.com/ubuntu focal-security/universe amd64 Packages [630 kB]
Get:7 http://archive.ubuntu.com/ubuntu focal/multiverse amd64 Packages [177 kB]
Get:8 http://archive.ubuntu.com/ubuntu focal/main amd64 Packages [1275 kB]
Get:9 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 Packages [1170 B]
Get:10 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [408 kB]
Get:11 http://archive.ubuntu.com/ubuntu focal/universe amd64 Packages [11.3 MB]
Get:12 http://archive.ubuntu.com/ubuntu focal/restricted amd64 Packages [33.4 kB]
Get:13 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [103 kB]
Get:14 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [782 kB]
Get:15 http://archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 Packages [21.6 kB]
Get:16 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [840 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal-backports/universe amd64 Packages [4277 B]
Fetched 16.2 MB in 10s (1607 kB/s)

```



```

root@aeed1d23c876:/# apt install nodejs
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  ca-certificates libc-ares2 libicu66 libnghttp2-14 libnode64 libssl1.1
  libuv1 nodejs-doc openssl tzdata
Suggested packages:
  npm
The following NEW packages will be installed:
  ca-certificates libc-ares2 libicu66 libnghttp2-14 libnode64 libssl1.1
  libuv1 nodejs nodejs-doc openssl tzdata
0 upgraded, 11 newly installed, 0 to remove and 4 not upgraded.
Need to get 17.9 MB of archives.
After this operation, 74.5 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 libssl1.1 amd64 1.1.1f-1ubuntu2 [1318 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal/main amd64 openssl amd64 1.1.1f-1ubuntu2 [621 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 ca-certificates all 20190110ubuntu1.1 [145 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 tzdata all 2021a-0ubuntu0.20.04 [293 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal/main amd64 libicu66 amd64 66.1-2ubuntu2 [8520 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libuv1 amd64 1.40.0-1ubuntu0.20.04.1 [153 kB]

```

8) Make a commit of the application

```

maria@maria-VirtualBox:~$ docker commit -m "added Node.js" -a "maria" 8873ed2c
b6e maria/ubuntu-nodejs
sha256:04acc49a5c773b5f37b0c776a452deca86be7f2c45e6a2813e4a979486825779
maria@maria-VirtualBox:~$

```

9) Make a tag of the application with the docker hub user.

```

maria@maria-VirtualBox:~$ docker images

```

REPOSITORY	TAG	IMAGE ID	CREATED
SIZE			
maria/ubuntu-nodejs	latest	04acc49a5c77	2 minutes ago
13.3kB			
ubuntu	latest	9140108b62dc	3 weeks ago
72.9MB			
hello-world	latest	bf756fb1ae65	9 months ago
13.3kB			

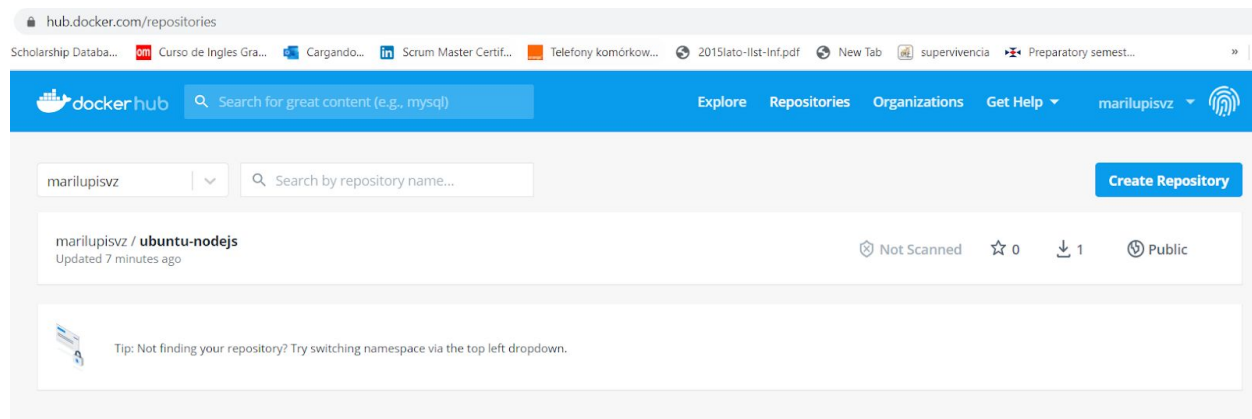
```

maria@maria-VirtualBox:~$ docker commit -m "added Node.js" -a "maria" 01a6ec92a
c2e maria/ubuntu-nodejs
sha256:6830309eb15c724177a303180bcfd423f957fa1f1af56f3a3c879ddc2c69dfb
maria@maria-VirtualBox:~$ docker images
REPOSITORY                                TAG                IMAGE ID
CREATED                                SIZE
maria/ubuntu-nodejs                      latest             6830309eb15c
26 seconds ago                          166MB
docker-registry-marilupisvz/ubuntu-nodejs latest             eb71121075e9
11 hours ago                            13.3kB
ubuntu                                  latest             9140108b62dc
3 weeks ago                             72.9MB
hello-world                             latest             bf756fb1ae65
9 months ago                            13.3kB
maria@maria-VirtualBox:~$ docker login -u marilupisvz
Password:
WARNING! Your password will be stored unencrypted in /home/maria/.docker/config
.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded

```

10) Finally we can check in our browser the application.



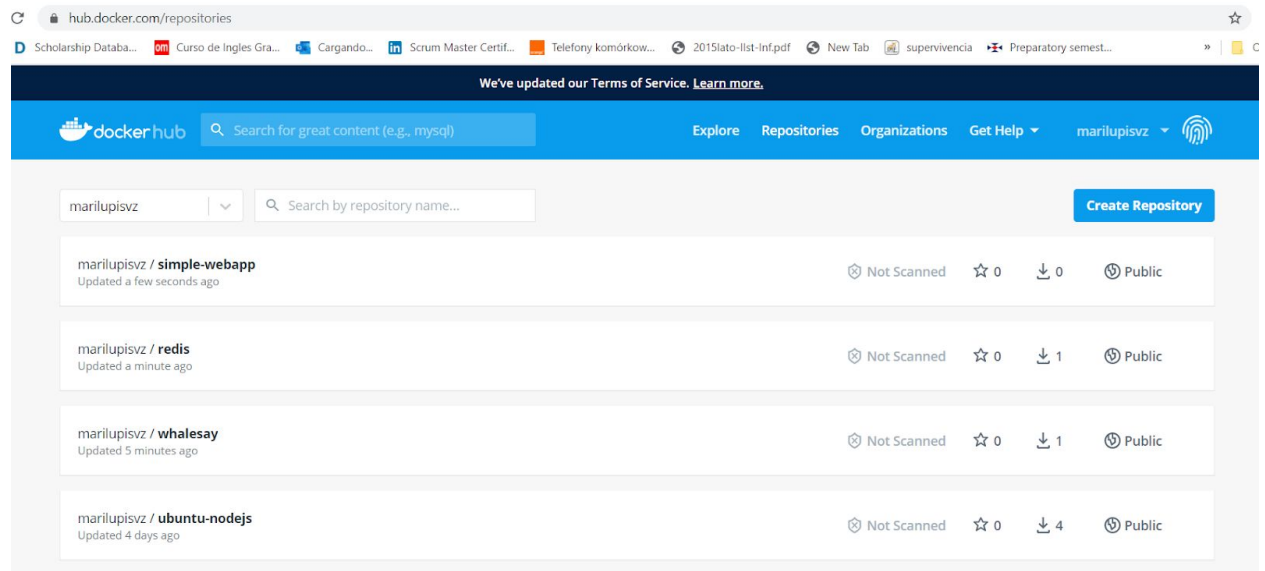
11) This process from steps 6 to 10 I made with different images, the result is



```
maria@maria-VirtualBox:~$ docker run docker/whalesay cowsay Hello World!
```

And also the first web app





## Conclusion:

This laboratory allow me to better understand the working of docker and run some images, and also review important aspects about the docker architecture. The objectives of the laboratory are satisfactory because I deployed several images into the docker hub and installed the different components.