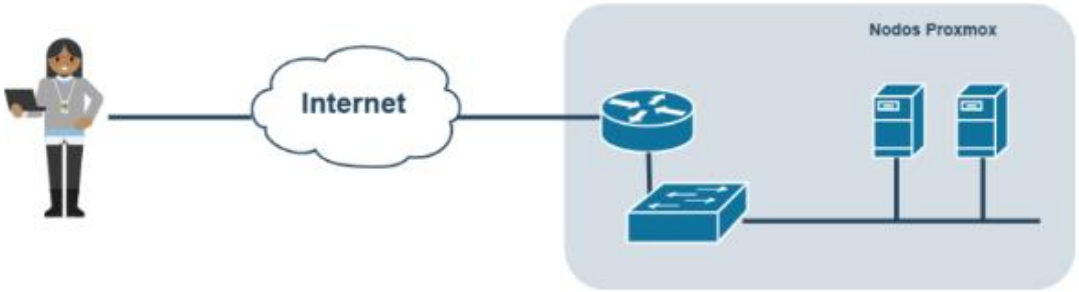
TRABAJO PRACTICO FINAL

BLOG PERSONAL



DIAZ CARLOS ALBERTO

Comisión: 5K3

Legajo: 33463

Año: 2023

Cátedra de Virtualizacion
Ingeniería en Sistemas de Información

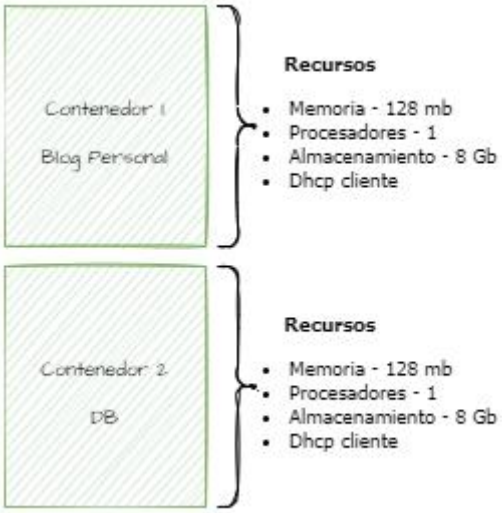
Caso de Estudio: Blog Personal

El alumno deberá implementar un servicio de Blog Personal, el cual deberá incluir las siguientes especificaciones:

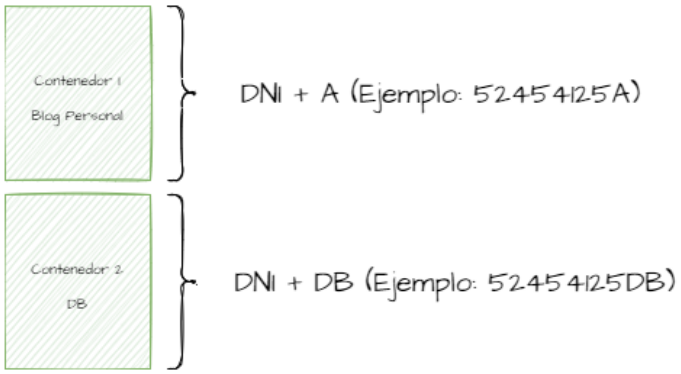
1. Datos Personales
2. Imagen personal del alumno
3. Informe del desarrollo e implementación del TPF disponible en formato PDF

Deberá implementar lo solicitado sobre la siguiente infraestructura:

La topología que se utiliza está representada en el gráfico adjunto. La misma consta de un acceso vía internet a través de la dirección https://319e02b588a6.sn.mynetname.net:9991/
El alumno deberá cumplimentar las siguientes especificaciones.

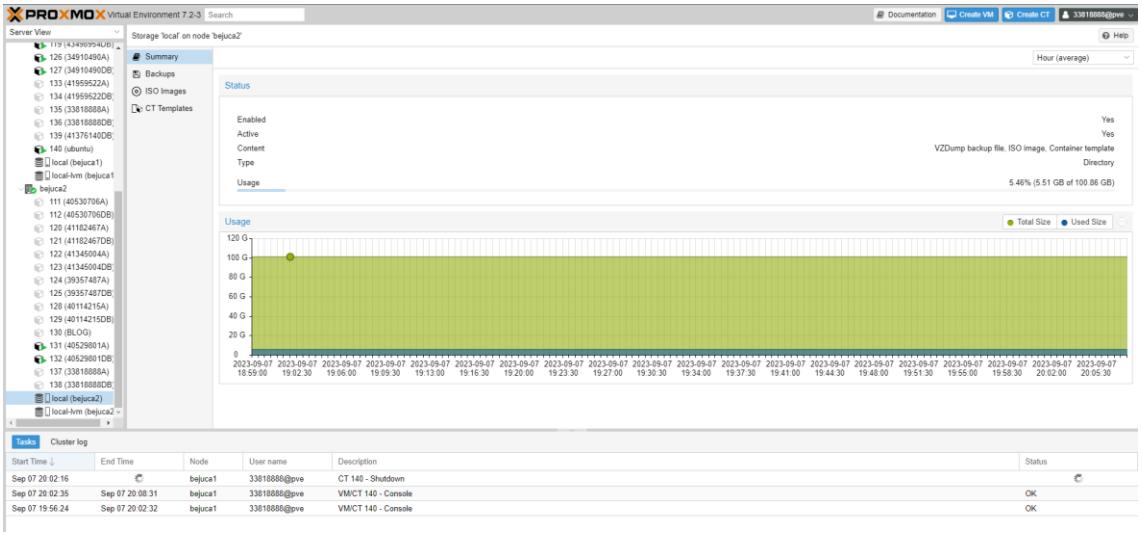


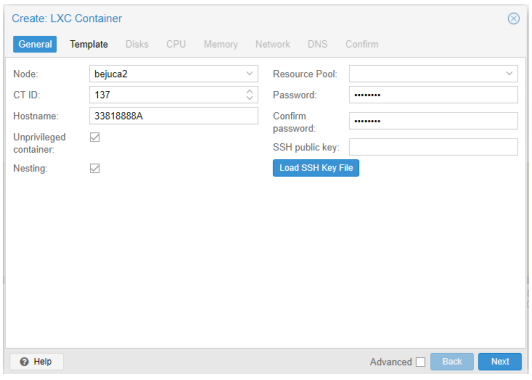
Para colocar el nombre a los contenedores, el alumno deberá utilizar las siguientes especificaciones:

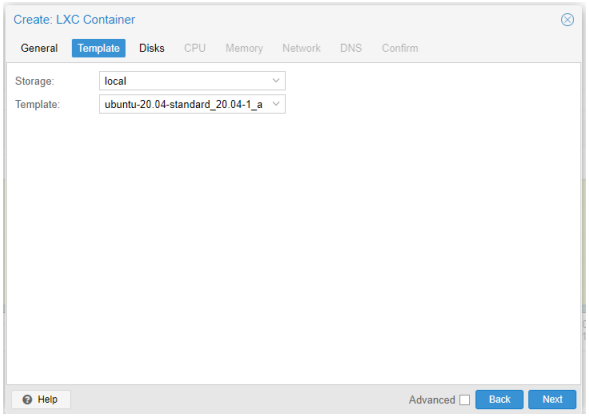


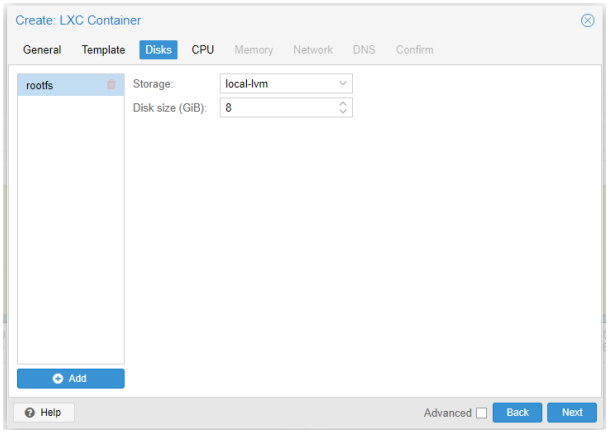
Pasamos a la creación de nuestros contenedores

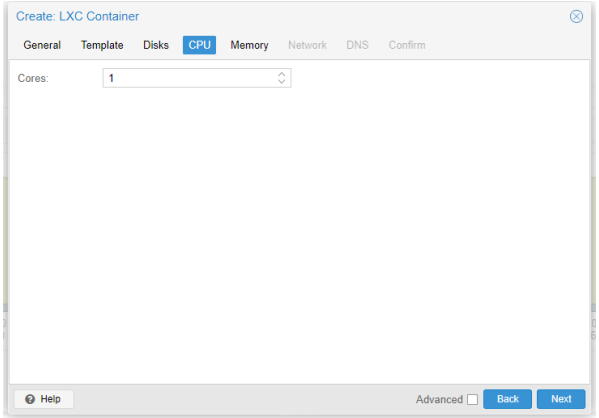
Contenedor A

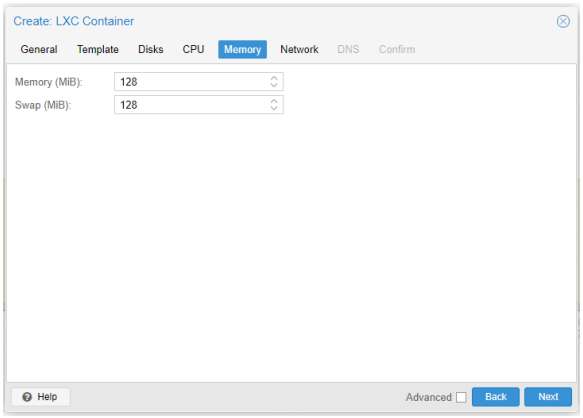


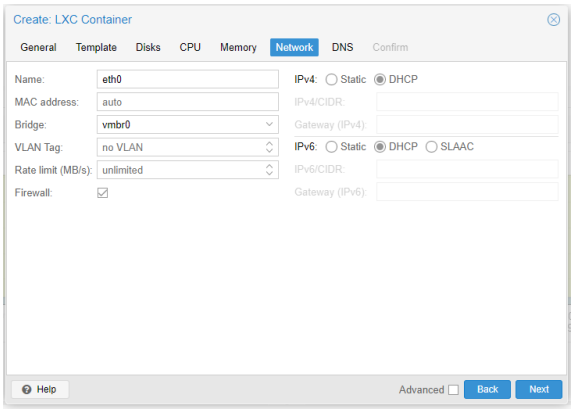


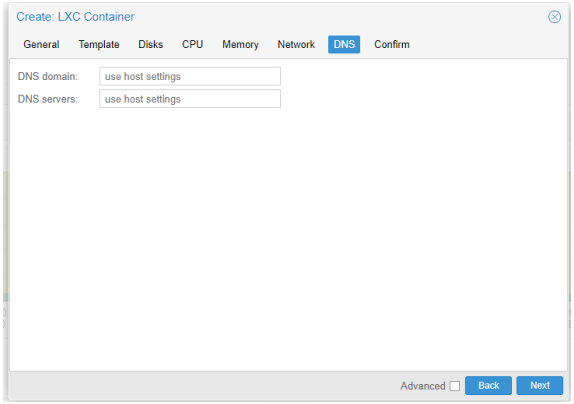

Create: LXC Container
General
Template
Disks
CPU
Memory
Network
DNS
Confirm
Storage:
local
Template:
ubuntu-20.04-standard_20.04-1_a
Help
Advanced
Back
Next

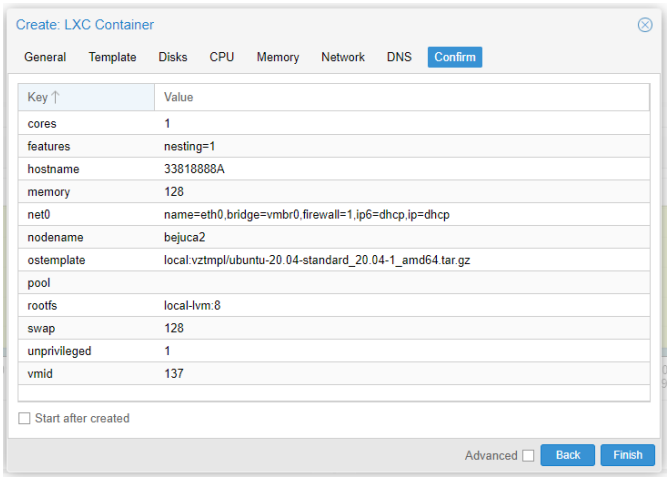

Create: LXC Container
General
Template
Disks
CPU
Memory
Network
DNS
Confirm
rootfs
Storage:
local-lvm
Disk size (GiB):
8
Add
Help
Advanced
Back
Next

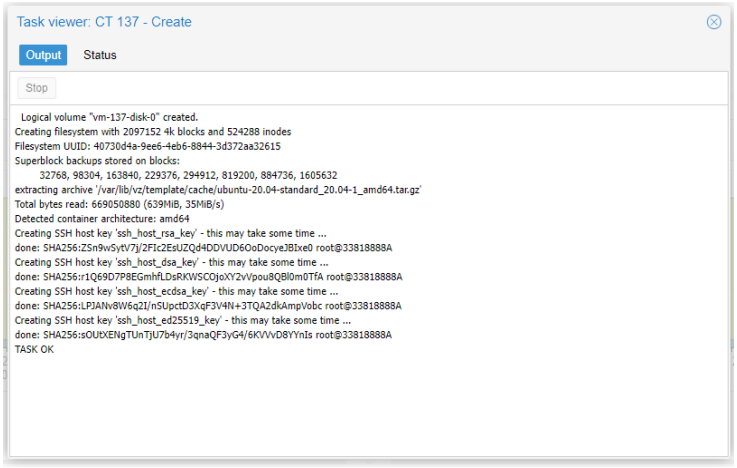

Create: LXC Container
General
Template
Disks
CPU
Memory
Network
DNS
Confirm
Cores:
1
Help
Advanced
Back
Next


Create: LXC Container
General
Template
Disks
CPU
Memory
Network
DNS
Confirm
Memory (MiB):
128
Swap (MiB):
128
Help
Advanced
Back
Next

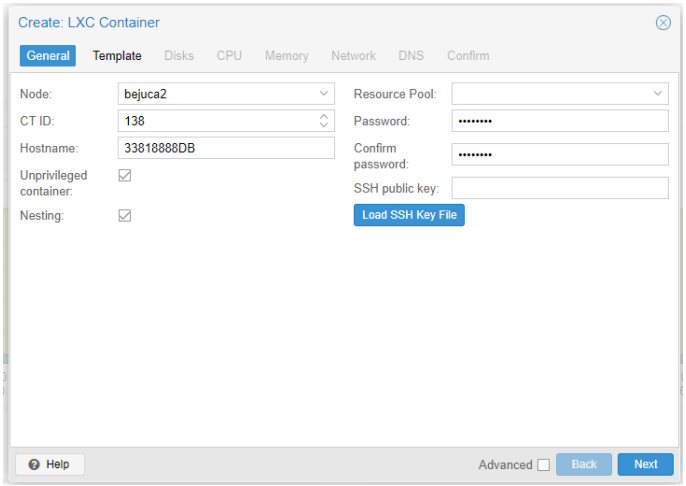

Create: LXC Container
General
Template
Disks
CPU
Memory
Network
DNS
Confirm
Name:
eth0
MAC address:
auto
Bridge:
vmbr0
VLAN Tag:
no VLAN
Rate limit (MB/s):
unlimited
Firewall:
IPv4:
Static
DHCP
IPv4/CIDR:
Gateway (IPv4):
IPv6:
Static
DHCP
SLAAC
IPv6/CIDR:
Gateway (IPv6):
Help
Advanced
Back
Next

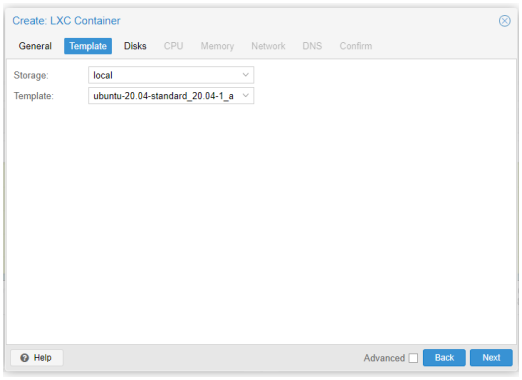

Create: LXC Container
General
Template
Disks
CPU
Memory
Network
DNS
Confirm
DNS domain:
use host settings
DNS servers:
use host settings
Advanced
Back
Next

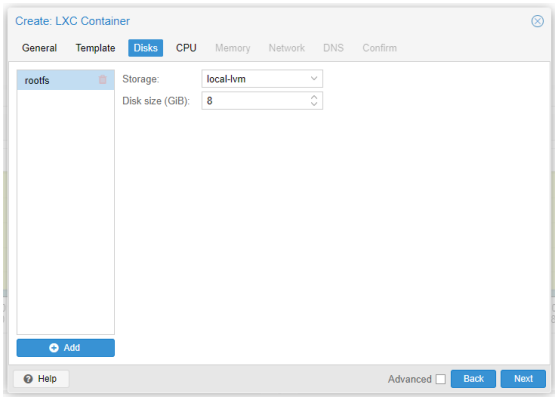


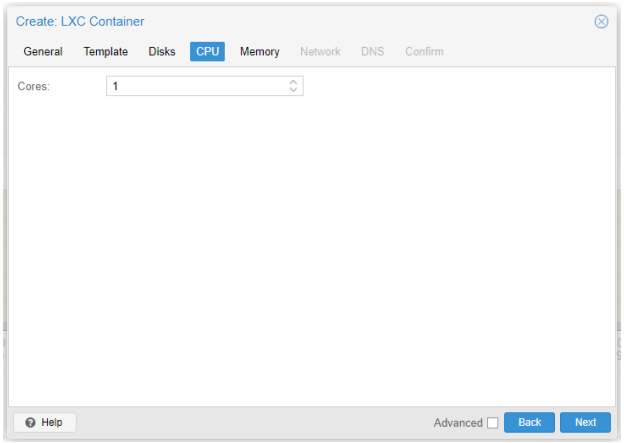


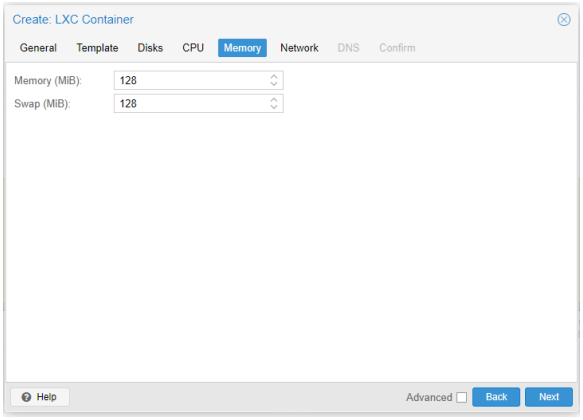
Creamos el Contenedor B

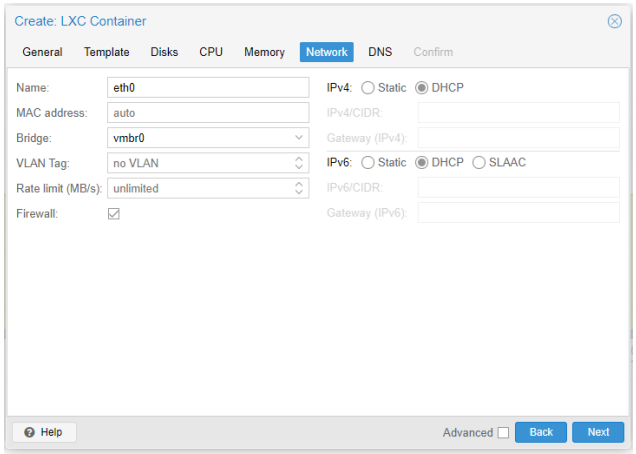


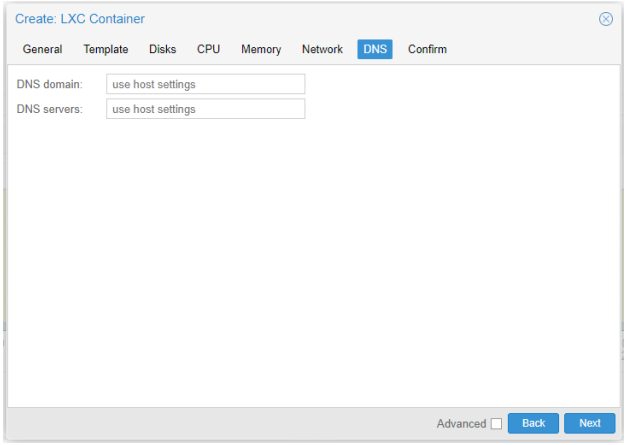

Create: LXC Container
General
Template
Disks
CPU
Memory
Network
DNS
Confirm
Storage:
local
Template:
ubuntu-20.04-standard_20.04-1_a
Help
Advanced
Back
Next

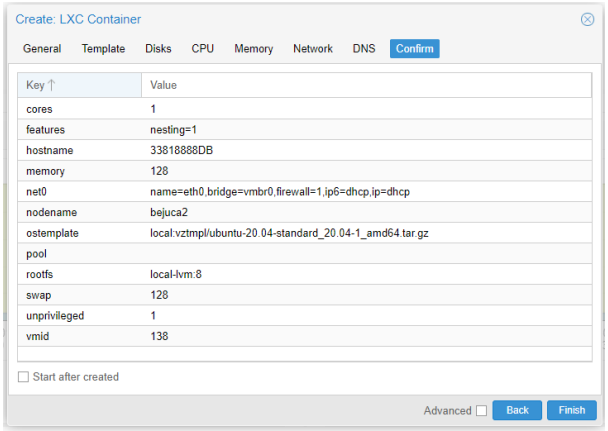

Create: LXC Container
General
Template
Disks
CPU
Memory
Network
DNS
Confirm
rootfs
Storage:
local-lvm
Disk size (GiB):
8
Add
Help
Advanced
Back
Next

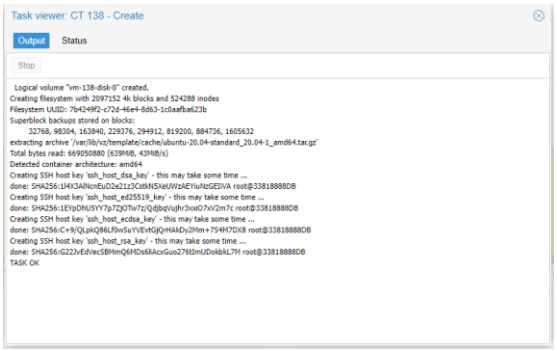

Create: LXC Container
General
Template
Disks
CPU
Memory
Network
DNS
Confirm
Cores:
1
Help
Advanced
Back
Next


Create: LXC Container
General
Template
Disks
CPU
Memory
Network
DNS
Confirm
Memory (MiB):
128
Swap (MiB):
128
Help
Advanced
Back
Next


Create: LXC Container
General
Template
Disks
CPU
Memory
Network
DNS
Confirm
Name:
eth0
MAC address:
auto
Bridge:
vmbr0
VLAN Tag:
no VLAN
Rate limit (MB/s):
unlimited
Firewall:
IPv4:
Static
DHCP
IPv4/CIDR:
Gateway (IPv4):
IPv6:
Static
DHCP
SLAAC
IPv6/CIDR:
Gateway (IPv6):
Help
Advanced
Back
Next


Create: LXC Container
General
Template
Disks
CPU
Memory
Network
DNS
Confirm
DNS domain:
use host settings
DNS servers:
use host settings
Advanced
Back
Next

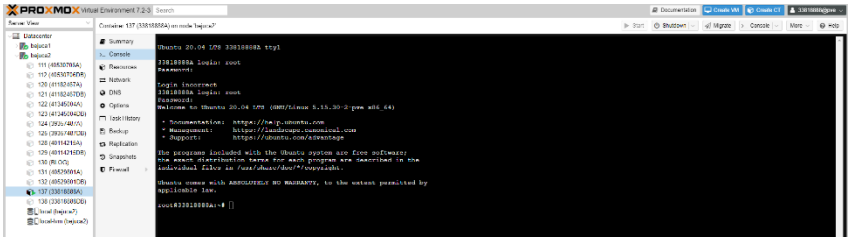

Create: LXC Container
General
Template
Disks
CPU
Memory
Network
DNS
Confirm
Key
Value
cores 1
features nesting=1
hostname 33818888DB
memory 128
net0 name=eth0,bridge=vmbr0,firewall=1,ip6=dhcp,ip=dhcp
nodename bejuca2
ostemplate local:vztmpl/ubuntu-20.04-standard_20.04-1_amd64.tar.gz
pool
rootfs local-lvm:8
swap 128
unprivileged 1
vmid 138
Start after created
Advanced
Back
Finish



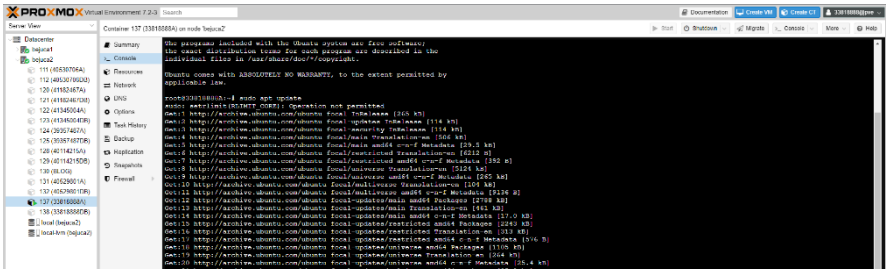
Ingresamos a nuestro conteneder A

usuario: root

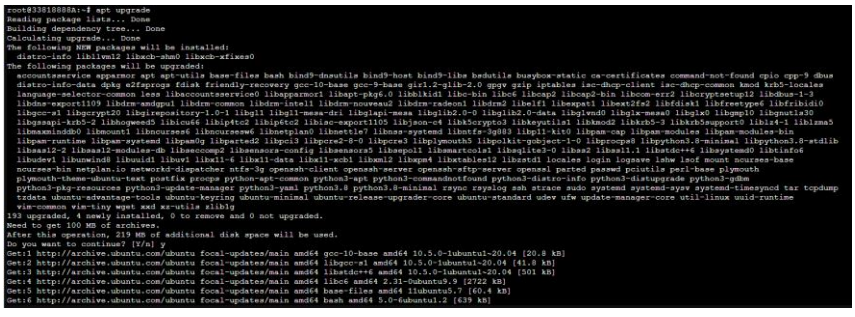
contraseña: 33818888



sudo apt update



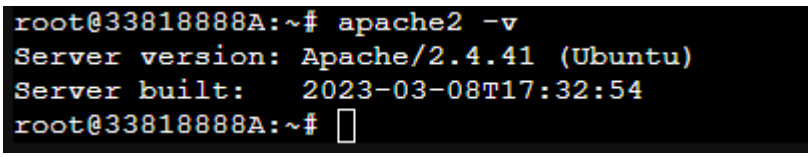
apt upgrade



Instalamos apache2

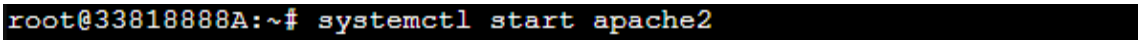
sudo apt install apache2

apache2 -v

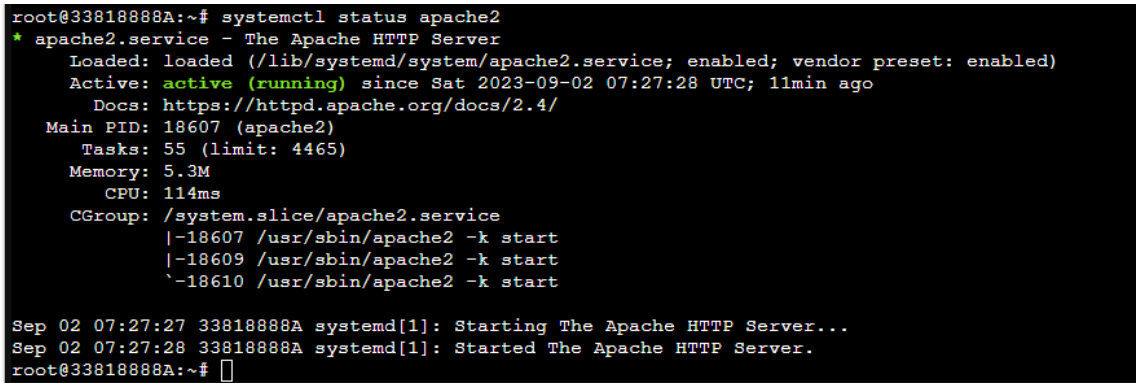


Luego ejecutamos los siguientes comandos para iniciar apache y configurar que inicie con el arranque “systemctl start apache2” y “systemctl enable apache2”

systemctl start apache2



systemctl status apache2



systemctl enable apache2

```
root@33818888A:~# systemctl enable apache2
Synchronizing state of apache2.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable apache2
root@33818888A:~#
```

apt install net-tools

```
root@33818888A:~# apt install net-tools
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  net-tools
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 196 kB of archives.
After this operation, 864 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 net-tools amd64 1.60+git20180626.aebd88e-1ubuntu1 [196 kB]
Fetched 196 kB in 3s (77.3 kB/s)
Selecting previously unselected package net-tools.
(Reading database ... 20357 files and directories currently installed.)
Preparing to unpack .../net-tools_1.60+git20180626.aebd88e-1ubuntu1_amd64.deb ...
Unpacking net-tools (1.60+git20180626.aebd88e-1ubuntu1) ...
Setting up net-tools (1.60+git20180626.aebd88e-1ubuntu1) ...
Processing triggers for man-db (2.9.1-1) ...
```

ifconfig

```
root@33818888A:~# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.77.198  netmask 255.255.255.0  broadcast 192.168.77.255
        inet6 fe80::c464:2ff:fedf:2cc  prefixlen 64  scopeid 0x20<link>
        ether c6:64:02:df:02:cc  txqueuelen 1000  (Ethernet)
        RX packets 173382  bytes 254027285 (254.0 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 81475  bytes 6649503 (6.6 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

root@33818888A:~#
```

Por lo general apache escucha por el puerto 80 las peticiones, para asegurarnos ejecutamos el siguiente comando

ss -tlnp | grep apache

```
root@33818888A:~# ss -tlnp | grep apache
LISTEN    0         511                *:80
```

Ahora debemos asegurarnos de que las reglas de cortafuego están habilitadas para acceder/salir del puerto 80. Primero debemos instalar “UFW” (Uncomplicated Firewall) que es un cortafuegos de fácil uso desarrollado por Ubuntu.

apt install ufw

```
root@33818888A:~# apt install ufw
Reading package lists... Done
Building dependency tree
Reading state information... Done
ufw is already the newest version (0.36-6ubuntu1.1).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@33818888A:~#
```

Ahora habilitamos el tráfico entrante en el puerto 80 con el comando

ufw allow 80/tcp

```
root@33818888A:~# ufw allow 80/tcp
Rules updated
Rules updated (v6)
root@33818888A:~#
```

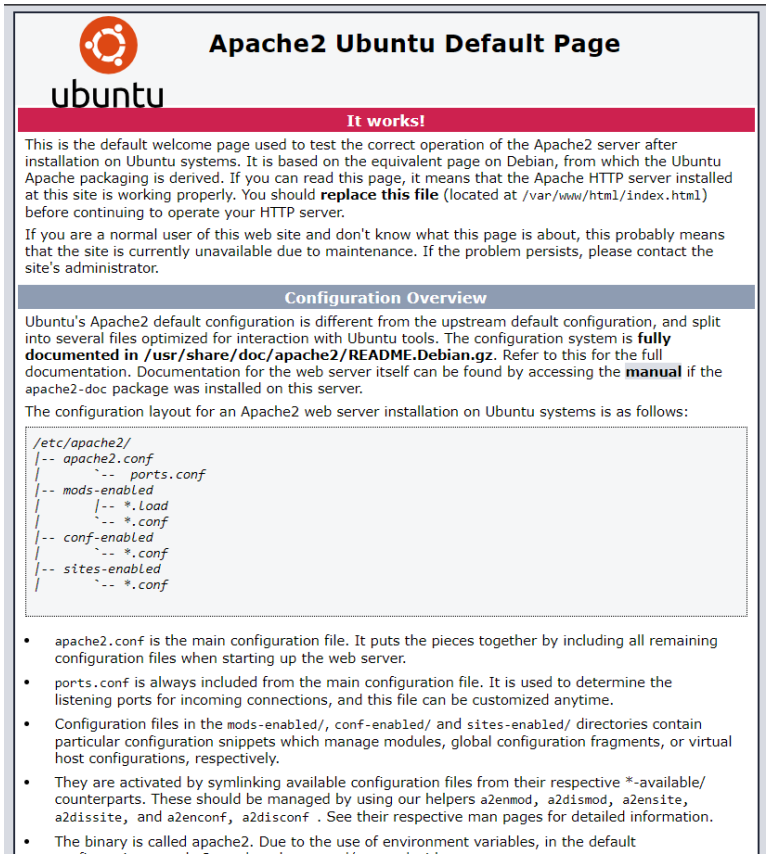
Activamos ufw con el comando

ufw enable

```
root@33818888A:~# ufw enable
Firewall is active and enabled on system startup
root@33818888A:~#
```

El siguiente paso es pedir la redirección de puertos

319e02b588a6.sn.mynetname.net:8017



Con el link podemos ingresar al contenedor del frontend A puerto 80

Si aparece la página de inicio del servicio apache que instalamos indica que hicimos bien la instalación.

Notamos que la pagina se encuentra en el directorio “var/www/html/”

```
root@33818888A:~# cd "../var/www/html"
root@33818888A:/var/www/html# ls
index.html
```

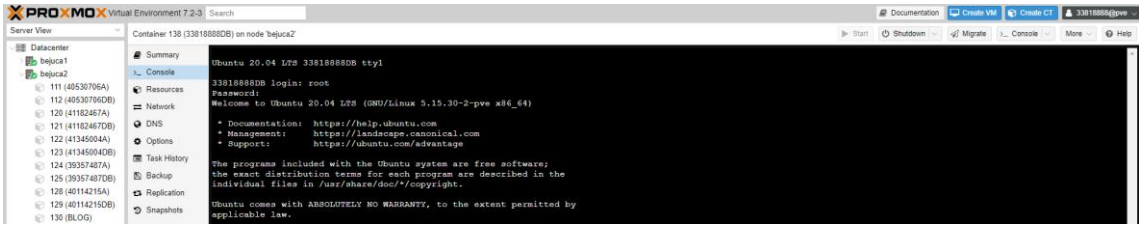
Para poder subir nuestra foto primero subimos a drive, copiamos sus enlaces y lo agregamos al contenedor con el comando wget-o nombre.pdf + link drive. Con ls listamos el contenido de la carpeta

```
root@33818888A:/var/www/html# wget -o perfil.jpg https://drive.google.com/file/d/1hrQC8ZcSIeA8xyBP8Bisc2_EqG7H0oy2/view?usp=drive_link
```

Igual estos pasos lo hice con github más adelante.

Configuración del contenedor B donde se encuentra la base de datos

Primero iniciamos sesión con usuario root y contraseña 33818888



sudo apt update

```
root@33818888DB:~# sudo apt update
sudo: setrlimit(RLIMIT_CORE): Operation not permitted
Get:1 http://archive.ubuntu.com/ubuntu focal InRelease [265 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal/main Translation-en [506 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal/main amd64 c-n-f Metadata [29.5 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal/restricted Translation-en [6212 B]
Get:7 http://archive.ubuntu.com/ubuntu focal/restricted amd64 c-n-f Metadata [392 B]
Get:8 http://archive.ubuntu.com/ubuntu focal/universe Translation-en [5124 kB]
Get:9 http://archive.ubuntu.com/ubuntu focal/universe amd64 c-n-f Metadata [265 kB]
Get:10 http://archive.ubuntu.com/ubuntu focal/multiverse Translation-en [104 kB]
Get:11 http://archive.ubuntu.com/ubuntu focal/multiverse amd64 c-n-f Metadata [9136 B]
Get:12 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [2788 kB]
Get:13 http://archive.ubuntu.com/ubuntu focal-updates/main Translation-en [461 kB]
Get:14 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 c-n-f Metadata [17.0 kB]
Get:15 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [2243 kB]
Get:16 http://archive.ubuntu.com/ubuntu focal-updates/restricted Translation-en [313 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 c-n-f Metadata [576 B]
Get:18 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [1105 kB]
```

apt upgrade

```
root@33818888DB:~# sudo apt update
sudo: setrlimit(RLIMIT_CORE): Operation not permitted
Get:1 http://archive.ubuntu.com/ubuntu focal InRelease [265 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal/main Translation-en [506 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal/main amd64 c-n-f Metadata [29.5 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal/restricted Translation-en [6212 B]
Get:7 http://archive.ubuntu.com/ubuntu focal/restricted amd64 c-n-f Metadata [392 B]
Get:8 http://archive.ubuntu.com/ubuntu focal/universe Translation-en [5124 kB]
Get:9 http://archive.ubuntu.com/ubuntu focal/universe amd64 c-n-f Metadata [265 kB]
Get:10 http://archive.ubuntu.com/ubuntu focal/multiverse Translation-en [104 kB]
Get:11 http://archive.ubuntu.com/ubuntu focal/multiverse amd64 c-n-f Metadata [9136 B]
Get:12 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [2788 kB]
Get:13 http://archive.ubuntu.com/ubuntu focal-updates/main Translation-en [461 kB]
Get:14 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 c-n-f Metadata [17.0 kB]
Get:15 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [2243 kB]
Get:16 http://archive.ubuntu.com/ubuntu focal-updates/restricted Translation-en [313 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 c-n-f Metadata [576 B]
Get:18 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [1105 kB]
Get:19 http://archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [264 kB]
Get:20 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [25.4 kB]
Get:21 http://archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 Packages [25.8 kB]
Get:22 http://archive.ubuntu.com/ubuntu focal-updates/multiverse Translation-en [7484 B]
```

Instalamos apache2 con el comando

apt install apache2

```
root@33818888DB:~# apt install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap libasn1-8-heimdal libbrotli1 libcurl4 libgssapi3-heimdal
  libhcrypto4-heimdal libheimbase1-heimdal libheimntlm0-heimdal libhx509-5-heimdal libjansson4 libkrb5-26-heimdal libldap-2.4-2 libldap-common liblua5.2-0 libnghttp2-14
  libroken18-heimdal librtmp1 libssh-4 libwind0-heimdal
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap libasn1-8-heimdal libbrotli1 libcurl4 libgssapi3-heimdal
  libhcrypto4-heimdal libheimbase1-heimdal libheimntlm0-heimdal libhx509-5-heimdal libjansson4 libkrb5-26-heimdal libldap-2.4-2 libldap-common liblua5.2-0 libnghttp2-14
  libroken18-heimdal librtmp1 libssh-4 libwind0-heimdal
0 upgraded, 26 newly installed, 0 to remove and 0 not upgraded.
Need to get 104 kB/3643 kB of archives.
After this operation, 14.1 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libaprutil1 amd64 1.6.1-4ubuntu2.2 [85.1 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libaprutil1-dbd-sqlite3 amd64 1.6.1-4ubuntu2.2 [10.5 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libaprutil1-ldap amd64 1.6.1-4ubuntu2.2 [8752 B]
Fetched 104 kB in 1s (76.3 kB/s)
```

systemctl status apache2

```
root@33818888DB:~# systemctl status apache2
* apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
     Active: active (running) since Sun 2023-09-10 21:05:51 UTC; 4min 3s ago
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 3999 (apache2)
      Tasks: 55 (limit: 4465)
     Memory: 6.3M
        CPU: 87ms
     CGroup: /system.slice/apache2.service
             |-3999 /usr/sbin/apache2 -k start
             |-4001 /usr/sbin/apache2 -k start
             `-4002 /usr/sbin/apache2 -k start

Sep 10 21:05:50 33818888DB systemd[1]: Starting The Apache HTTP Server...
Sep 10 21:05:51 33818888DB systemd[1]: Started The Apache HTTP Server.
root@33818888DB:~#
```

systemctl start apache2

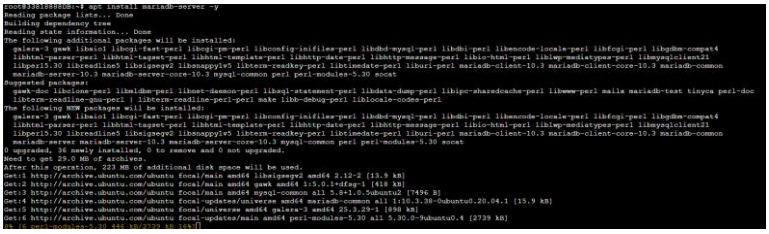
```
root@33818888DB:~# systemctl start apache2
```

systemctl enable apache2

```
root@33818888DB:~# systemctl enable apache2
Synchronizing state of apache2.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable apache2
root@33818888DB:~#
```

Instalamos mariadb

apt install mariadb-server -y



Para saber la versión de mariadb usamos

mariadb -v

```
root@33818888DB:~# mariadb -v
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 36
Server version: 10.3.38-MariaDB-0ubuntu0.20.04.1 Ubuntu 20.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Reading history-file /root/.mysql_history
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]>
```

Iniciamos el servicio mariadb

systemctl start mariadb

```
root@33818888DB:~# systemctl start mariadb
```

```
root@33818888DB:~# systemctl enable mariadb
```

Y para terminar de configurar ejecutamos el comando

mysql_secure_installation

Nos pedirá que ingresemos la contraseña del usuario, y que asignemos una nueva para ingresar a MariaDB.

```
root@33818888DB:~# mysql_secure_installation

NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MariaDB
      SERVERS IN PRODUCTION USE!  PLEASE READ EACH STEP CAREFULLY!

In order to log into MariaDB to secure it, we'll need the current
password for the root user.  If you've just installed MariaDB, and
you haven't set the root password yet, the password will be blank,
so you should just press enter here.

Enter current password for root (enter for none):
```

```
root@33818888DB:~# mysql_secure_installation

NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MariaDB
      SERVERS IN PRODUCTION USE!  PLEASE READ EACH STEP CAREFULLY!

In order to log into MariaDB to secure it, we'll need the current
password for the root user.  If you've just installed MariaDB, and
you haven't set the root password yet, the password will be blank,
so you should just press enter here.

Enter current password for root (enter for none):
OK, successfully used password, moving on...

Setting the root password ensures that nobody can log into the MariaDB
root user without the proper authorisation.

You already have a root password set, so you can safely answer 'n'.

Change the root password? [Y/n] n
 ... skipping.

By default, a MariaDB installation has an anonymous user, allowing anyone
to log into MariaDB without having to have a user account created for
them.  This is intended only for testing, and to make the installation
go a bit smoother.  You should remove them before moving into a
production environment.

Remove anonymous users? [Y/n] Y
 ... Success!
```

apt install net-tools

```
root@33818888DB:~# apt install net-tools
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  net-tools
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 196 kB of archives.
After this operation, 864 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 net-tools amd64 1.60+git20180626.aebd88e-1ubuntu1 [196 kB]
Fetched 196 kB in 1s (161 kB/s)
Selecting previously unselected package net-tools.
(Reading database ... 20527 files and directories currently installed.)
Preparing to unpack .../net-tools_1.60+git20180626.aebd88e-1ubuntu1_amd64.deb ...
Unpacking net-tools (1.60+git20180626.aebd88e-1ubuntu1) ...
Setting up net-tools (1.60+git20180626.aebd88e-1ubuntu1) ...
Processing triggers for man-db (2.9.1-1) ...
Progress: [ 50%] [#########################################################################################################################################################################################]
```

Para saber el ip del contenedor B usamos ifconfig

```
root@33818888DB:~# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.77.197  netmask 255.255.255.0  broadcast 192.168.77.255
        inet6 fe80::8466:bff:feaf:8859  prefixlen 64  scopeid 0x20<link>
        ether 86:66:0b:af:88:59  txqueuelen 1000  (Ethernet)
        RX packets 164489  bytes 241019605 (241.0 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 85371  bytes 6715137 (6.7 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

Ejecutamos

apt install ufw -y

Con ufw podremos habilitar de manera sencilla el tráfico entrante al puerto 3306, que es el puerto por el que mariaDB ejecuta el servicio de base de datos.

```
root@33818888DB:~# apt install ufw -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
ufw is already the newest version (0.36-6ubuntu1.1).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

ufw allow 3306/tcp

```
root@33818888DB:~# ufw allow 3306/tcp
Rules updated
Rules updated (v6)
root@33818888DB:~#
```

ufw enable

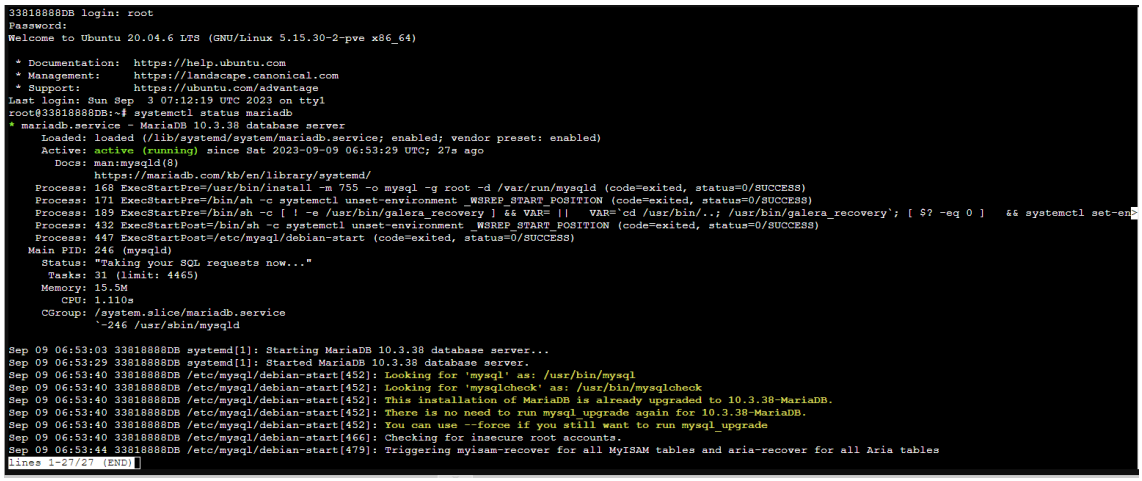
```
root@33818888DB:~# ufw enable
Firewall is active and enabled on system startup
root@33818888DB:~#
```

Nos dirigimos al contenedor B donde tenemos la base de datos

Chequeamos el estado de maría DB con el comando

systemctl status mariadb

Tiene que estar como active (runing)

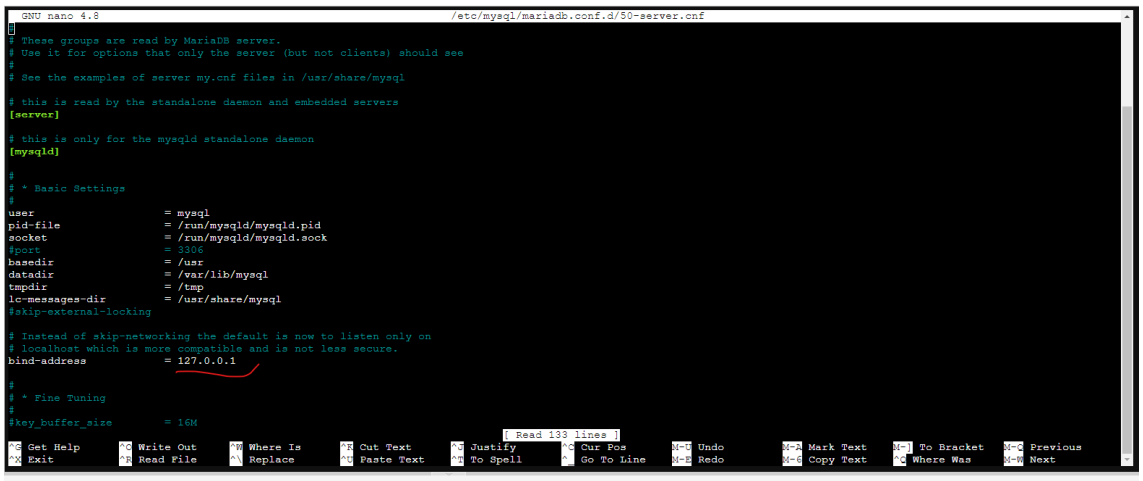


Pasamos a configurar la base de datos. Por defecto está configurado para que solo permita conexiones desde el mismo host, es de 127.0.0.1. Debemos cambiar a 0.0.0.0 para escuchar todas las direcciones IP en la línea blind-adress

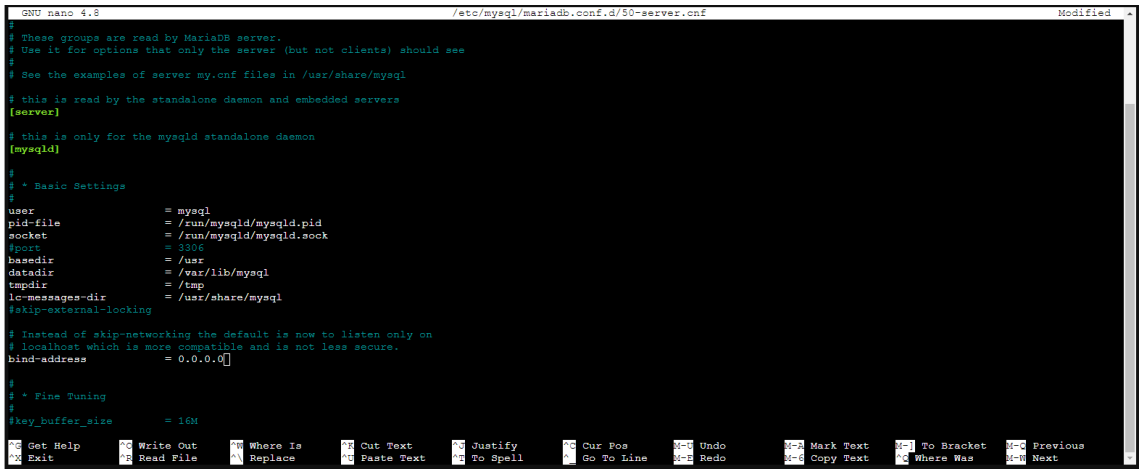
Con el comando

nano /etc/mysql/mariadb.conf.d/50-server.cnf

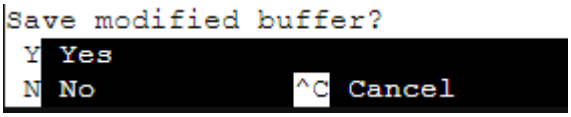
Podemos acceder a nano y hacer esos cambios



En bind-address cambiamos a 0.0.0.0, se lo trabaja como un txt.

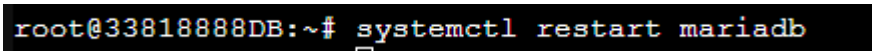


Presionamos control + x y luego confirmamos con Y. Luego presionamos la tecla Enter.



Reiniciamos el servicio de la base de datos con

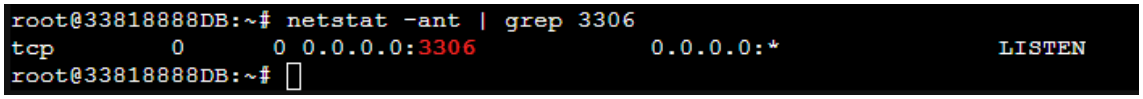
systemctl restar mariadb

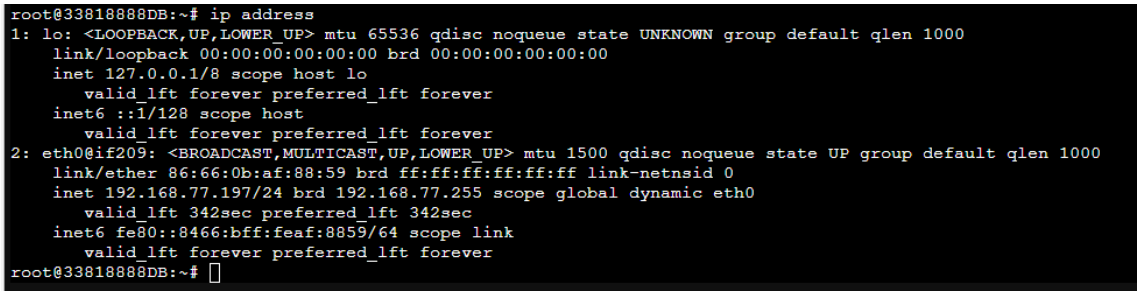


Para saber si se cambió el bind-address a 0.0.0.0 usamos el comando

netstat -ant | grep 3306

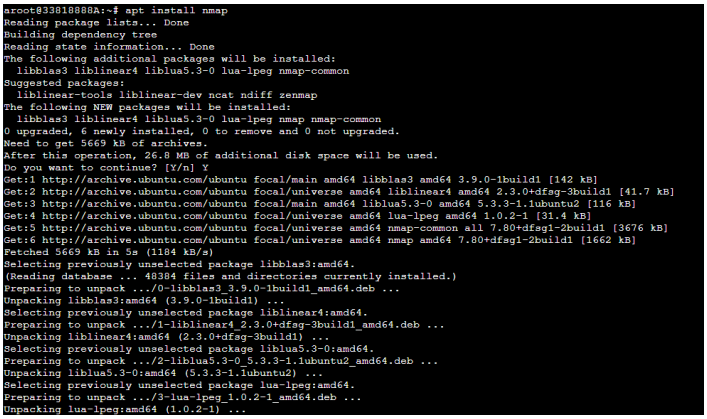
Para poner el comando es (alt + 124 = |)





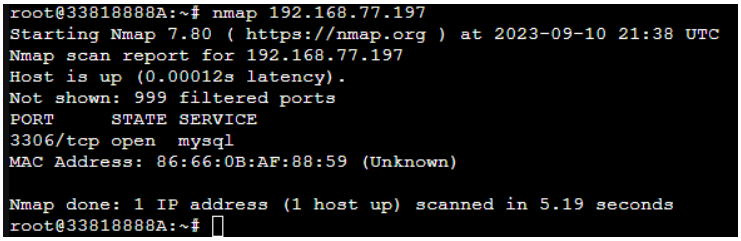
Volvemos al contendor A y ejecutamos el comando apt install nmap ara escanear los puertos abiertos en la dirección ip del contenederB donde se encuentra la base datos

apt install nmap



Ahora hacemos un nmap al ip del contenedor B que es donde tenemos la base de datos.

nmap 192.168.77.197



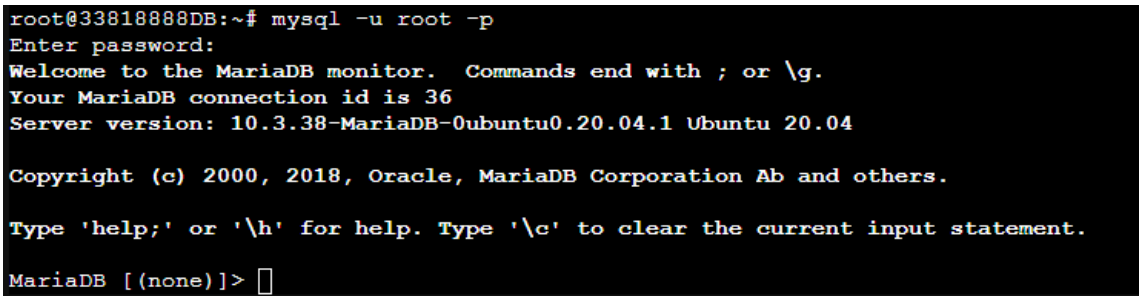
Observamos que3306/tcp open mysql se encuentra abierta.

Retornamos al **CONTENEDOR B**

Ahora accedemos a mariaDB con el comando

mysql -u root -p

Ingresamos la contraseña configurada **(3381888)** porque al instalar mariadb no la cambie deje la que estaba. Usamos la de root



Pasamos a crear la base de datos

create database + nombre de la bd;

y mostramos con

show databases;

```
MariaDB [(none)]> create database prueba;
Query OK, 1 row affected (0.110 sec)
```

```
MariaDB [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| prueba             |
+--------------------+
4 rows in set (0.000 sec)

MariaDB [(none)]>
```

Pasamos a usar la BD para crear una tabla con el comando use + nombre de la base de datos.

```
MariaDB [(none)]> use prueba
Database changed
MariaDB [prueba]>
```

Creamos una tabla alumnos con los campos legajo, nombre y apellido

```
Database changed
MariaDB [prueba]> create table alumnos(legajo int NOT NULL, apellido varchar(50), nombre varchar(50));
Query OK, 0 rows affected (0.627 sec)

MariaDB [prueba]>
```

Mostramos la tabla alumnos

```
MariaDB [prueba]> show tables;
+----------------+
| Tables_in_prueba |
+----------------+
| alumnos        |
+----------------+
1 row in set (0.001 sec)

MariaDB [prueba]>
```

Para detallar más la tabla alumno, podemos usar el comando describe

```
MariaDB [prueba]> describe alumnos;
+----------+-------------+------+-----+---------+-------+
| Field    | Type        | Null | Key | Default | Extra |
+----------+-------------+------+-----+---------+-------+
| legajo   | int(11)     | NO   |     | NULL    |       |
| apellido | varchar(50) | YES  |     | NULL    |       |
| nombre   | varchar(50) | YES  |     | NULL    |       |
+----------+-------------+------+-----+---------+-------+
3 rows in set (0.128 sec)

MariaDB [prueba]>
```

Procedemos a cargar los registros de los alumnos en este caso solamente voy a cargar tres a modo de ejemplo

```
MariaDB [prueba]> insert into alumnos values (33463, 'Diaz', 'Carlos');
Query OK, 1 row affected (0.110 sec)

MariaDB [prueba]> insert into alumnos values (33464, 'Diaz', 'Joses');
Query OK, 1 row affected (0.057 sec)

MariaDB [prueba]> insert into alumnos values (3465, 'Diaz', 'Geronimo');
Query OK, 1 row affected (0.058 sec)

MariaDB [prueba]>
```

```
MariaDB [prueba]> SELECT * FROM alumnos;
+--------+----------+----------+
| legajo | apellido | nombre   |
+--------+----------+----------+
|  33463 | Diaz     | Carlos   |
|  33464 | Diaz     | Joses    |
|   3465 | Diaz     | Geronimo |
+--------+----------+----------+
3 rows in set (0.075 sec)
```

Para corregir el legajo del alumno Geronimo usamos el comando **UPDATE**

```
MariaDB [prueba]> update alumnos set legajo=33465 where nombre='Geronimo';
Query OK, 1 row affected (0.082 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [prueba]> SELECT * FROM alumnos;
+--------+----------+----------+
| legajo | apellido | nombre   |
+--------+----------+----------+
|  33463 | Diaz     | Carlos   |
|  33464 | Diaz     | Joses    |
|  33465 | Diaz     | Geronimo |
+--------+----------+----------+
3 rows in set (0.000 sec)

MariaDB [prueba]>
```

Ahora debemos crear un usuario para acceder de forma remota a la base de datos con el siguiente comando

grant all on *.* to 'NOMBRE'@'IPCONTENEDORA' identified by 'CONTRASEÑA' with grant option;

Donde grant all on *.* (indica que se otorgaran los permisos en todas las bases de datos y en todas las tablas)

NOMBRE (carlos)

IPCONTENEDORA (192.168.77.198)

CONTRASEÑA: 1234

```
MariaDB [prueba]> GRANT ALL ON *.* to 'carlos'@192.168.77.198 IDENTIFIED BY '1234' WITH GRANT OPTION;
Query OK, 0 rows affected (0.168 sec)

MariaDB [prueba]>
```

Actualizamos los privilegios en mariaDB

```
MariaDB [prueba]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.020 sec)
```

Ahora instalamos php, salimos de maría db con la palabra exit

apt install php

```
root@33818888DB:~# apt install php
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils libapache2-mod-php7.4 libapr1 libapr
  libgssapi3-heimdal libhcrypto4-heimdal libheimbase1-heimdal libheimntlm0-heimdal li
  liblua5.2-0 libnghttp2-14 libroken18-heimdal librtmp1 libssh-4 libwind0-heimdal php
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser php-pear
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils libapache2-mod-php7.4 libapr1 libapr
  libgssapi3-heimdal libhcrypto4-heimdal libheimbase1-heimdal libheimntlm0-heimdal li
  liblua5.2-0 libnghttp2-14 libroken18-heimdal librtmp1 libssh-4 libwind0-heimdal php
  php7.4-readline
0 upgraded, 35 newly installed, 0 to remove and 0 not upgraded.
Need to get 7674 kB of archives.
After this operation, 32.1 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 libapr1 amd64 1.6.5-1ubuntu1
Ign:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libaprutil1 amd64 1.6
```

```
Get:11 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libheimntlm0-heimdal amd64 7.7.0+dfsg-1ubuntu1.4 [15.1 kB]
Get:12 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libgssapi3-heimdal amd64 7.7.0+dfsg-1ubuntu1.4 [96.5 kB]
Get:13 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libldap-common all 2.4.49+dfsg-2ubuntu1.9 [16.6 kB]
Get:14 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libldap-2.4-2 amd64 2.4.49+dfsg-2ubuntu1.9 [155 kB]
Ign:15 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libaprutil1-ldap amd64 1.6.1-4ubuntu2.1
Get:16 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libbrotli1 amd64 1.0.7-6ubuntu0.1 [267 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libnghttp2-14 amd64 1.40.0-1ubuntu0.1 [78.5 kB]
Get:18 http://archive.ubuntu.com/ubuntu focal/main amd64 librtmp1 amd64 2.4+20151223.gitfa8646d.1-2build1 [54.9 kB]
Get:19 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libssh-4 amd64 0.9.3-2ubuntu2.3 [170 kB]
Get:20 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libcurl4 amd64 7.68.0-1ubuntu2.19 [235 kB]
Get:21 http://archive.ubuntu.com/ubuntu focal/main amd64 libjansson4 amd64 2.12-1build1 [28.9 kB]
Get:22 http://archive.ubuntu.com/ubuntu focal/main amd64 liblua5.2-0 amd64 5.2.4-1.1build3 [106 kB]
Get:23 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 apache2-bin amd64 2.4.41-4ubuntu3.14 [1182 kB]
Get:24 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 apache2-data all 2.4.41-4ubuntu3.14 [158 kB]
Get:25 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 apache2-utils amd64 2.4.41-4ubuntu3.14 [84.4 kB]
Get:26 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 apache2 amd64 2.4.41-4ubuntu3.14 [95.6 kB]
Get:27 http://archive.ubuntu.com/ubuntu focal/main amd64 php-common all 2:75 [11.9 kB]
Get:28 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-common amd64 7.4.3-4ubuntu2.19 [983 kB]
Get:29 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-json amd64 7.4.3-4ubuntu2.19 [19.2 kB]
Get:30 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-opcache amd64 7.4.3-4ubuntu2.19 [198 kB]
Get:31 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-readline amd64 7.4.3-4ubuntu2.19 [12.6 kB]
Get:32 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-cli amd64 7.4.3-4ubuntu2.19 [1426 kB]
Get:33 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libapache2-mod-php7.4 amd64 7.4.3-4ubuntu2.19 [1369 kB]
Get:34 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4 all 7.4.3-4ubuntu2.19 [9236 B]
Get:35 http://archive.ubuntu.com/ubuntu focal/main amd64 php all 2:7.4+75 [2712 B]
Err:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libaprutil1 amd64 1.6.1-4ubuntu2.1
  404  Not Found [IP: 91.189.91.81 80]
Err:3 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libaprutil1-dbd-sqlite3 amd64 1.6.1-4ubuntu2.1
  404  Not Found [IP: 91.189.91.81 80]
Err:15 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libaprutil1-ldap amd64 1.6.1-4ubuntu2.1
  404  Not Found [IP: 91.189.91.81 80]
Fetched 7570 kB in 6s (1248 kB/s)
E: Failed to fetch http://archive.ubuntu.com/ubuntu/pool/main/a/apr-util/libaprutil1_1.6.1-4ubuntu2.1_amd64.deb  404  Not Found [IP: 91.189.91.81 80]
E: Failed to fetch http://archive.ubuntu.com/ubuntu/pool/main/a/apr-util/libaprutil1-dbd-sqlite3_1.6.1-4ubuntu2.1_amd64.deb  404  Not Found [IP: 91.189.91.81 80]
E: Failed to fetch http://archive.ubuntu.com/ubuntu/pool/main/a/apr-util/libaprutil1-ldap_1.6.1-4ubuntu2.1_amd64.deb  404  Not Found [IP: 91.189.91.81 80]
E: Unable to fetch some archives, maybe run apt-get update or try with --fix-missing?
root@33818888DB:~#
```

Desde el contenedor A

Instalamos PHP y su librería apache2 y de mariaDB con el siguiente comando

apt install php libapache2-mod php.7.4

```
root@33818888A:~# apt install php libapache2-mod-php php7.4-mysql
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libapache2-mod-php7.4 php7.4 php7.4-cli php7.4-common php7.4-json php7.4-opcache php7.4-readline
Suggested packages:
  php-pear
The following NEW packages will be installed:
  libapache2-mod-php libapache2-mod-php7.4 php php7.4 php7.4-cli php7.4-common php7.4-json php7.4-mysql php7.4-opcache php7.4-readline
0 upgraded, 10 newly installed, 0 to remove and 0 not upgraded.
Need to get 4143 kB of archives.
After this operation, 18.4 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-common amd64 7.4.3-4ubuntu2.19 [983 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-json amd64 7.4.3-4ubuntu2.19 [19.2 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-opcache amd64 7.4.3-4ubuntu2.19 [198 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-readline amd64 7.4.3-4ubuntu2.19 [12.6 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-cli amd64 7.4.3-4ubuntu2.19 [1426 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libapache2-mod-php7.4 amd64 7.4.3-4ubuntu2.19 [1369 kB]
Get:7 http://archive.ubuntu.com/ubuntu focal/main amd64 libapache2-mod-php all 2:7.4+75 [2836 B]
Get:8 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4 all 7.4.3-4ubuntu2.19 [9236 B]
Get:9 http://archive.ubuntu.com/ubuntu focal/main amd64 php all 2:7.4+75 [2712 B]
Get:10 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-mysql amd64 7.4.3-4ubuntu2.19 [121 kB]
Fetched 4143 kB in 3s (1265 kB/s)
Selecting previously unselected package php7.4-common.
```

Habilitamos el módulo mysql en PHP y reiniciamos el servicio de apache2

```
root@33818888A:~# phpenmod mysqli
root@33818888A:~# service apache2 restart
```

Para confirmar que instalamos php para apache ejecutamos el comando

apachectl -M

```
root@33818888A:~# apachectl -M
Loaded Modules:
 core_module (static)
 so_module (static)
 watchdog_module (static)
 http_module (static)
 log_config_module (static)
 logio_module (static)
 version_module (static)
 unixd_module (static)
 access_compat_module (shared)
 alias_module (shared)
 auth_basic_module (shared)
 authn_core_module (shared)
 authn_file_module (shared)
 authz_core_module (shared)
 authz_host_module (shared)
 authz_user_module (shared)
 autoindex_module (shared)
 deflate_module (shared)
 dir_module (shared)
 env_module (shared)
 filter_module (shared)
 mime_module (shared)
 mpm_prefork_module (shared)
 negotiation_module (shared)
 php7_module (shared)
 reqtimeout_module (shared)
 setenvif_module (shared)
 status_module (shared)
root@33818888A:~#
```

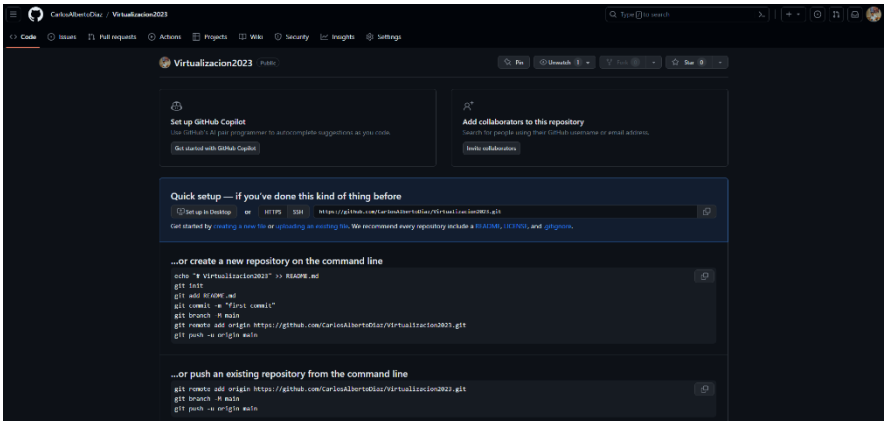
Instalamos git con el comando

En /var/www/html nos paramos en ese directorio e instalamos git

apt-get instal git-all

Subimos nuestra carpeta a un repositorio para después clonarlo a nuestro contenedorA y trabajar desde ahí

Primero creamos nuestro repositorio en git hub.



Y después lo subimos con git

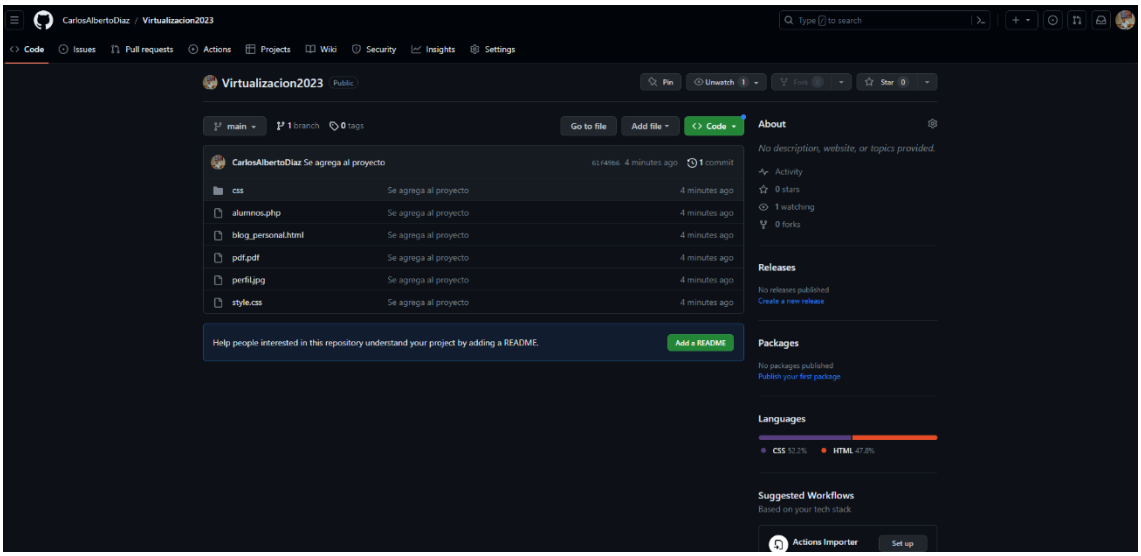
```
Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023
$ git init
Initialized empty Git repository in C:/Users/Carlos/Pictures/Vritualizacion2023/
.git/

Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023 (master)
$ git status
On branch master

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        alumnos.php
        blog_personal.html
        css/
        pdf.pdf
        perfil.jpg
        style.css

nothing added to commit but untracked files present (use "git add" to track)

Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023 (master)
$ git add .
```

```
Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023 (master)
$ git commit -m "Se agrega al proyecto"
Author identity unknown

*** Please tell me who you are.

Run

  git config --global user.email "you@example.com"
  git config --global user.name "Your Name"

to set your account's default identity.
Omit --global to set the identity only in this repository.

fatal: unable to auto-detect email address (got 'Carlos@DESKTOP-BDF17C3.(none)')

Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023 (master)
$
```

```
Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023 (master)
$ git config --global user.email carlosalbertodiazutn@gmail.com
```

```
Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023 (master)
$ git config --global user.name CarlosAlbertoDiaz
```

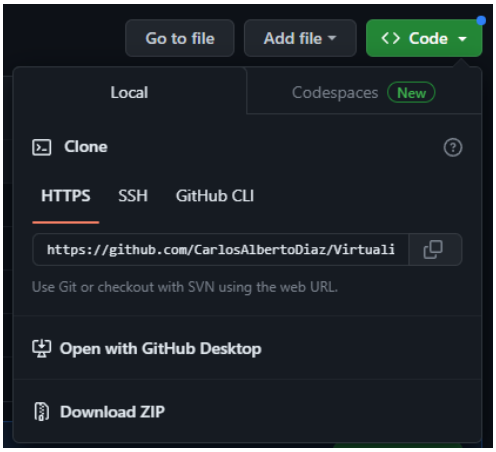
```
Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023 (master)
$ git commit -m "Se agrega al proyecto"
[master (root-commit) 61f49b6] Se agrega al proyecto
 6 files changed, 211 insertions(+)
 create mode 100644 alumnos.php
 create mode 100644 blog_personal.html
 create mode 100644 css/style.css
 create mode 100644 pdf.pdf
 create mode 100644 perfil.jpg
 create mode 100644 style.css

Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023 (master)
$ git branch -M main

Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023 (main)
$ git remote add origin https://github.com/CarlosAlbertoDiaz/Virtualizacion2023.
git

Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023 (main)
$ git push -u origin main
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 24 threads
Compressing objects: 100% (6/6), done.
Writing objects: 100% (8/8), 1.24 MiB | 988.00 KiB/s, done.
Total 8 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/CarlosAlbertoDiaz/Virtualizacion2023.git
 * [new branch]      main -> main
branch 'main' set up to track 'origin/main'.

Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023 (main)
$
```



Nos ubicamos con los comandos

```
root@33818888A:~# cd "../var/www"
root@33818888A:/var/www#
```

Y clonamos el repositorio




```
root@33818888A:/var/www# git clone https://github.com/CarlosAlbertoDiaz/Virtualizacion2023.git
Cloning into 'Virtualizacion2023'...
remote: Enumerating objects: 8, done.
remote: Counting objects: 100% (8/8), done.
remote: Compressing objects: 100% (6/6), done.
remote: Total 8 (delta 0), reused 8 (delta 0), pack-reused 0
Unpacking objects: 100% (8/8), 1.24 MiB | 1.32 MiB/s, done.
root@33818888A:/var/www#
root@33818888A:/var/www# ls
Virtualizacion2023  html
root@33818888A:/var/www# cd Virtualizacion2023
root@33818888A:/var/www/Virtualizacion2023# ls
alumnos.php  blog_personal.html  css  pdf.pdf  perfil.jpg  style.css
root@33818888A:/var/www/Virtualizacion2023#
```

Eliminamos la carpeta html para dejar la que clonamos con git con el comando

rm -r html

```
root@33818888A:/var/www# ls
Virtualizacion2023  html
root@33818888A:/var/www# rm -r html
root@33818888A:/var/www# ls
Virtualizacion2023
root@33818888A:/var/www#
```

```
root@33818888A:/var/www# mv Virtualizacion2023 html
root@33818888A:/var/www# ls
html
root@33818888A:/var/www#
```

Con el comando cp copiamos los archivos a su respectiva ruta. Con el comando mkdir creamos las carpetas archivo para el pdf y otra carpeta img para la foto de perfil

cp nombreArchivo.extension directorioDestino
mv nombreArchivo.extension directorioDestino

Para eliminar un fichero usamos rm + nombre del archivo

```
root@33818888A:/var/www/html# ls
archivo  css  img  index.php
root@33818888A:/var/www/html#
```

Ya tenemos acceso a nuestro blog.

http://319e02b588a6.sn.mynetname.net:8017/

Pila tecnológica