

TRABAJO PRACTICO FINAL

BLOG PERSONAL



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Comisión: 5K3

Legajo: 33463

Año: 2023

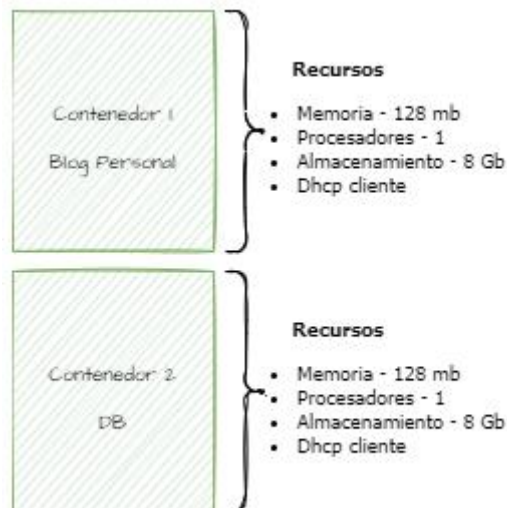
Caso de Estudio: Blog Personal

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

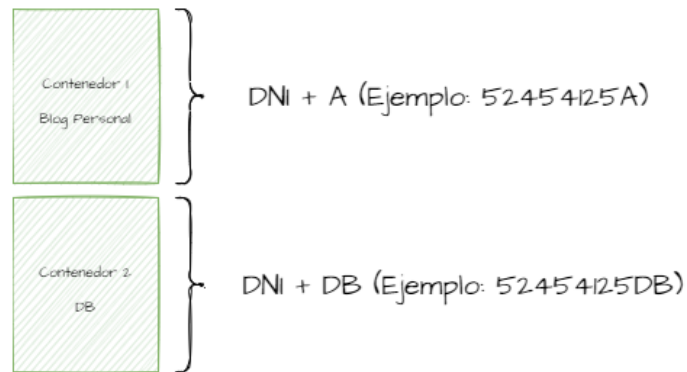
1. Datos Personales
2. Imagen personal del alumno
3. Informe del desarrollo e implementación del TPF disponible en formato PDF

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.

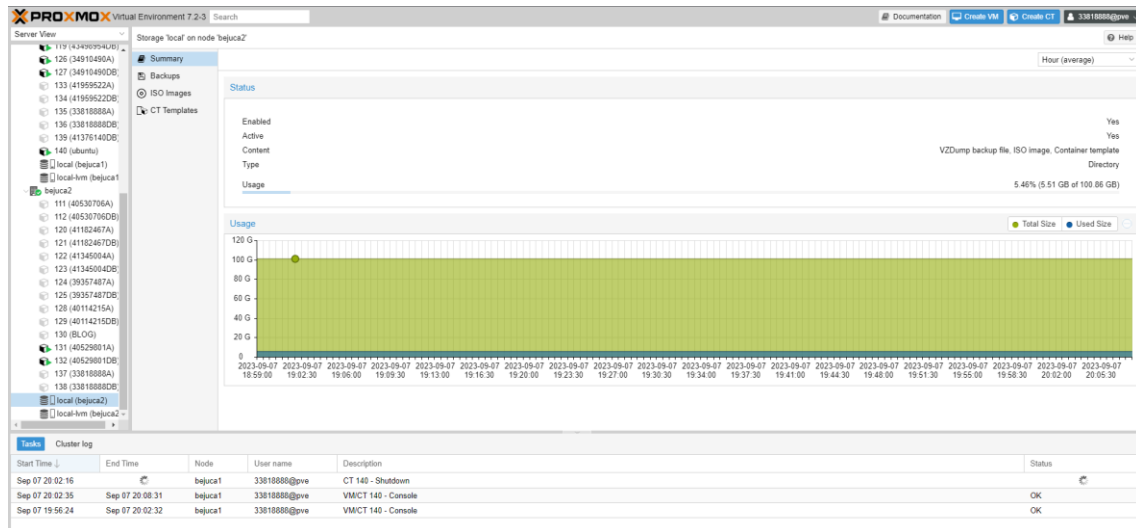


Para colocar el nombre a los contenedores, el alumno deberá utilizar las siguientes especificaciones:



Pasamos a la creación de nuestros contenedores

Contenedor A



Create LXC Container

General Template Disks CPU Memory Network DNS Confirm

Node: bejuca2 Resource Pool: [dropdown]

CT ID: 137 Password: [password field]

Hostname: 33818888A Confirm password: [password field]

Unprivileged container: ☒ SSH public key: [text field]

Nesting: ☒ [Load SSH Key File](#)

[Help](#) Advanced ☐ [Back](#) [Next](#)

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 IPv4: ☐ Static ☒ DHCP

MAC address: auto IPv4/CIDR:

Bridge: vmbri0 Gateway (IPv4):

VLAN Tag: no VLAN IPv6: ☐ Static ☒ DHCP ☐ SLAAC

Rate limit (MB/s): unlimited IPv6/CIDR:

Firewall: ☒ 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 | 33818888A |
| memory | 128 |
| net0 | name=eth0, bridge=vbr0, 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 | 137 |

☐ Start after created

Advanced ☐ Back Finish

Task viewer: CT 137 - Create

Output Status

Stop

```

Logical volume "vm-137-disk-0" created.
Creating filesystem with 2097152 4k blocks and 524288 inodes
Filesystem UUID: 407304a-9ee6-4eb6-8844-3d372aa32615
Superblock backups stored on blocks:
32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632
extracting archive /var/lib/vz/template/cache/ubuntu-20.04-standard_20.04-1_amd64.tar.gz
Total bytes read: 669050880 (639MiB, 35MiB/s)
Detected container architecture: amd64
Creating SSH host key 'ssh_host_rsa_key' - this may take some time ...
done: SHA256:Z5n9v5ytl7J/2F1C2EdUzQ44DDVUD6OnDcyeJ8Ive0 root@33818888A
Creating SSH host key 'ssh_host_dsa_key' - this may take some time ...
done: SHA256:r1Q9D7P8EGmhFLDsRKW5COj0Xy2vVpou8Q8l0m0TfA root@33818888A
Creating SSH host key 'ssh_host_ecdsa_key' - this may take some time ...
done: SHA256:LPJANv8W6q2L/n5UpctD3XqF3V4N+3TQA2dkAmpVobc root@33818888A
Creating SSH host key 'ssh_host_ed25519_key' - this may take some time ...
done: SHA256:s0UXENgTUnTJ7b4yr/3qnaQF3yG4/6KVVvD8YnIs root@33818888A
TASK OK
  
```

Creamos el Contenedor B

Create: LXC Container

General Template Disks CPU Memory Network DNS Confirm

Node: bejuca2 Resource Pool:

CT ID: 138 Password: *****

Hostname: 33818888DB Confirm password: *****

Unprivileged container: ☒ SSH public key:

Nesting: ☒ Load SSH Key File

Help Advanced ☐ Back Next

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-hvm

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: IPv4: ☐ Static ☒ DHCP

MAC address: IPv4/CIDR:

Bridge: Gateway (IPv4):

VLAN Tag: IPv6: ☐ Static ☒ DHCP ☐ SLAAC

Rate limit (MB/s): IPv6/CIDR:

Firewall: ☒ Gateway (IPv6):

[Help](#) Advanced ☐ [Back](#) [Next](#)

Create: LXC Container

General Template Disks CPU Memory Network **DNS** Confirm

DNS domain:

DNS servers:

Advanced ☐ [Back](#) [Next](#)

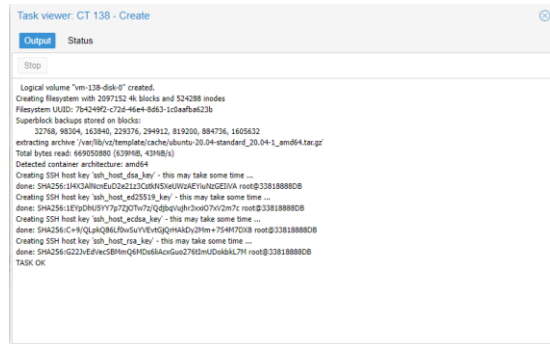
Create: LXC Container

General Template Disks CPU Memory Network DNS **Confirm**

| Key ↑ | Value |
|--------------|---|
| cores | 1 |
| features | nesting=1 |
| hostname | 33818888DB |
| memory | 128 |
| net0 | name=eth0,bridge=vbr0,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

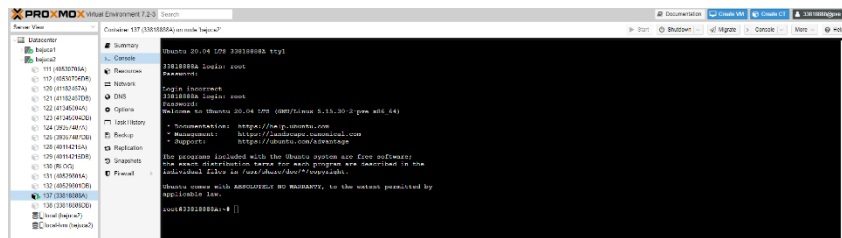
Advanced ☐ [Back](#) [Finish](#)



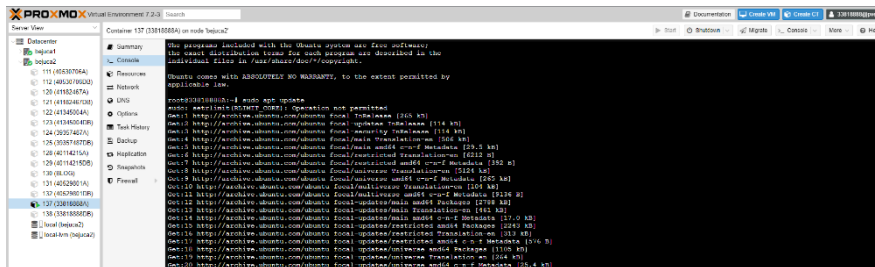
Ingresamos a nuestro contenedor A

```
usuario: root
```

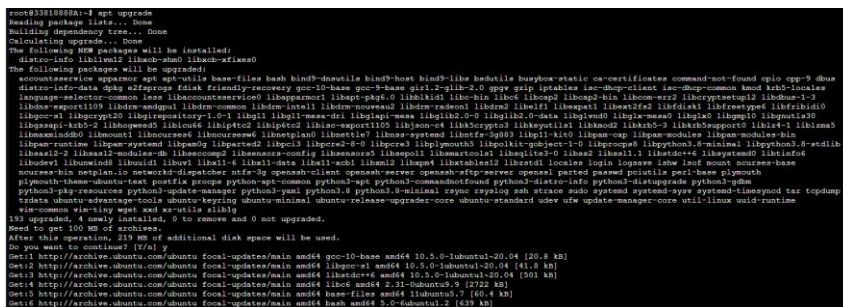
contraseña: 33818888



```
sudo apt update
```



apt upgrade



Instalamos apache2

sudo apt install apache2

```
root@33818888A:~# sudo 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 libgdbm-compat4
  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 libperl5.30 libroken18-heimdal librtmp1 libssh-4 libwind0-heimdal perl perl-modules-5.30
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser perl-doc libterm-readline-gnu-perl | libterm-readline-perl-perl make libdb-dev-perl
  liblocale-codes-perl
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 libgdbm-compat4
  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 libperl5.30 libroken18-heimdal librtmp1 libssh-4 libwind0-heimdal perl perl-modules-5.30
0 upgraded, 30 newly installed, 0 to remove and 0 not upgraded.
Need to get 10.6 MB of archives.
After this operation, 60.3 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 perl-modules-5.30 all 5.30.0-9ubuntu0.4 [2739 kB]
183 (1 perl-modules-5.30 2356 kb/2739 kb 86%)
```

apache2 -v

```
root@33818888A:~# apache2 -v
Server version: Apache/2.4.41 (Ubuntu)
Server built: 2023-03-08T17:32:54
root@33818888A:~#
```

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

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

systemctl status apache2

```
root@33818888A:~# systemctl status apache2
* apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Sat 2023-09-02 07:27:28 UTC; 11min ago
     Docs: https://httpd.apache.org/docs/2.4/
    Main PID: 18607 (apache2)
      Tasks: 55 (limit: 4465)
     Memory: 5.3M
        CPU: 114ms
    CGroup: /system.slice/apache2.service
            └─18607 /usr/sbin/apache2 -k start
              └─18609 /usr/sbin/apache2 -k start
                └─18610 /usr/sbin/apache2 -k start

Sep 02 07:27:27 33818888A systemd[1]: Starting The Apache HTTP Server...
Sep 02 07:27:28 33818888A systemd[1]: Started The Apache HTTP Server.
root@33818888A:~#
```

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) ...
root@33818888A:~#
```

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:~#
```

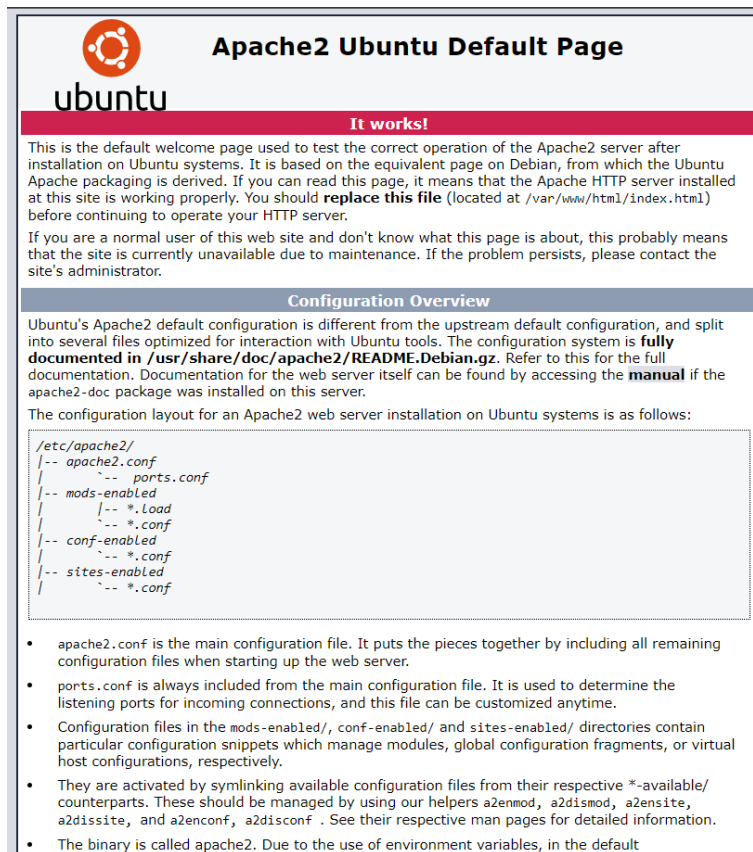
Activamos ufw con el comando

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



Apache2 Ubuntu Default Page

It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in `/usr/share/doc/apache2/README.Debian.gz`**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the `apache2-doc` package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/
|-- apache2.conf
|   |-- ports.conf
|-- mods-enabled
|   |-- *.Load
|   |-- *.conf
|-- conf-enabled
|   |-- *.conf
|-- sites-enabled
|   |-- *.conf
```

- `apache2.conf` is the main configuration file. It puts the pieces together by including all remaining configuration files when starting up the web server.
- `ports.conf` is always included from the main configuration file. It is used to determine the listening ports for incoming connections, and this file can be customized anytime.
- Configuration files in the `mods-enabled/`, `conf-enabled/` and `sites-enabled/` directories contain particular configuration snippets which manage modules, global configuration fragments, or virtual host configurations, respectively.
- They are activated by symlinking available configuration files from their respective `*-available/` counterparts. These should be managed by using our helpers `a2enmod`, `a2dismod`, `a2ensite`, `a2dissite`, and `a2enconf`, `a2disconf`. See their respective man pages for detailed information.
- The binary is called `apache2`. Due to the use of environment variables, in the default

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_EgG7H0oy2/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@33818888B:~# sudo apt update
sudo: setlimit (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]
```

apt upgrade

```
root@33818888B:~# sudo apt upgrade
sudo: setlimit (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
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-ubuntu2.2 [55.1 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libaprutil1-dbd-sqlite3 amd64 1.6.1-ubuntu2.2 [10.5 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libaprutil1-ldap amd64 1.6.1-ubuntu2.2 [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
```

[illegible]

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 authorization.

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) ...

```

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 maria DB con el comando

systemctl status mariadb

Tiene que estar como active (running)


```

33818888DB login: root
Password:
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.30-2-pve x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage
Last login: Sun Sep  3 07:12:19 UTC 2023 on tty1
root@33818888DB:~# systemctl status mariadb
* mariadb.service - MariaDB 10.3.38 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset: enabled)
   Active: active (running) since Sat 2023-09-09 06:53:29 UTC; 27s ago
     Docs: man:mysqld(8)
           https://mariadb.com/kb/en/library/systemd/
   Process: 168 ExecStartPre=/usr/bin/install -m 755 -o mysql -g root -d /var/run/mysqld (code=exited, status=0/SUCCESS)
   Process: 171 ExecStartPre=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited, status=0/SUCCESS)
   Process: 189 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && VAR= || VAR='cd /usr/bin/.; /usr/bin/galera_recovery'; [ $? -eq 0 ] && systemctl set-en
   Process: 432 ExecStartPost=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited, status=0/SUCCESS)
   Process: 447 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0/SUCCESS)
  Main PID: 246 (mysqld)
    Status: "Taking your SQL requests now..."
     Tasks: 31 (limit: 4465)
    Memory: 15.3M
       CPU: 1.110s
    CGroup: /system.slice/mariadb.service
           └─246 /usr/sbin/mysqld

Sep 09 06:53:03 33818888DB systemd[1]: Starting MariaDB 10.3.38 database server...
Sep 09 06:53:29 33818888DB systemd[1]: Started MariaDB 10.3.38 database server.
Sep 09 06:53:40 33818888DB /etc/mysql/debian-start[452]: Looking for 'mysql' as: /usr/bin/mysql
Sep 09 06:53:40 33818888DB /etc/mysql/debian-start[452]: Looking for 'mysqlcheck' as: /usr/bin/mysqlcheck
Sep 09 06:53:40 33818888DB /etc/mysql/debian-start[452]: This installation of MariaDB is already upgraded to 10.3.38-MariaDB.
Sep 09 06:53:40 33818888DB /etc/mysql/debian-start[452]: There is no need to run mysql upgrade again for 10.3.38-MariaDB.
Sep 09 06:53:40 33818888DB /etc/mysql/debian-start[452]: You can use --force if you still want to run mysql upgrade
Sep 09 06:53:40 33818888DB /etc/mysql/debian-start[466]: Checking for insecure root accounts.
Sep 09 06:53:44 33818888DB /etc/mysql/debian-start[479]: Triggering myisam-recover for all MyISAM tables and aria-recover for all Aria tables
Hint: See 'man systemctl'

```

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 bind-address

Con el comando

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

Podemos acceder a nano y hacer esos cambios

```

GNU nano 4.8 /etc/mysql/mariadb.conf.d/50-server.cnf
#
# These groups are read by MariaDB server.
# Use it for options that only the server (but not clients) should see
#
# See the examples of server my.cnf files in /usr/share/mysql
#
# This is read by the standalone daemon and embedded servers
[server]
#
# This is only for the mysqld standalone daemon
[mysqld]
#
# * Basic Settings
#
user                = mysql
pid-file            = /run/mysqld/mysqld.pid
socket              = /run/mysqld/mysqld.sock
port               = 3306
basedir            = /usr
datadir            = /var/lib/mysql
tmpdir             = /tmp
lc-messages-dir    = /usr/share/mysql
skip-external-look
#
# Instead of skip-networking the default is now to listen only on
# localhost which is more compatible and is not less secure.
bind-address        = 127.0.0.1
#
# * Fine Tuning
#
key_buffer_size     = 16M

```

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

```
GNU nano 4.8 /etc/mysql/mariadb.conf.d/50-server.cnf Modified
#
# These groups are read by MariaDB server.
# Use it for options that only the server (but not clients) should see
#
# See the examples of server my.cnf files in /usr/share/mysql
#
# this is read by the standalone daemon and embedded servers
[server]
#
# this is only for the mysqld standalone daemon
[mysqld]
#
# * Basic Settings
#
user                = mysql
pid-file            = /run/mysqld/mysqld.pid
socket              = /run/mysqld/mysqld.sock
port                = 3306
basedir             = /usr
datadir             = /var/lib/mysql
tmpdir              = /tmp
lc-messages-dir     = /usr/share/mysql
skip-external-locking
#
# Instead of skip-networking the default is now to listen only on
# localhost which is more compatible and is not less secure.
bind-address        = 0.0.0.0
#
# * Fine Tuning
#
key_buffer_size     = 16M
```

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

```
Save modified buffer?
Y Yes
N No ^C Cancel
```

Reiniciamos el servicio de la base de datos con

systemctl restart mariadb

```
root@33818888DB:~# systemctl restart 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 = |)

```
root@33818888DB:~# netstat -ant | grep 3306
tcp        0      0 0.0.0.0:3306 0.0.0.0:*        LISTEN
root@33818888DB:~#
```

```
root@33818888DB:~# ip address
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0@if209: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether 86:66:0b:af:88:59 brd ff:ff:ff:ff:ff:ff link-netnsid 0
    inet 192.168.77.197/24 brd 192.168.77.255 scope global dynamic eth0
        valid_lft 342sec preferred_lft 342sec
    inet6 fe80::8466:bff:feaf:8859/64 scope link
        valid_lft forever preferred_lft forever
root@33818888DB:~#
```

Volvemos al contenedor 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

```
root@33818888A:~# apt install nmap
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libblas3 liblinear4 liblua5.3-0 lua-lpeg nmap-common
Suggested packages:
  liblinear-tools liblinear-dev ncst ndiff zenmap
The following NEW packages will be installed:
  libblas3 liblinear4 liblua5.3-0 lua-lpeg nmap nmap-common
0 upgraded, 6 newly installed, 0 to remove and 0 not upgraded.
Need to get 5669 kb of archives.
After this operation, 26.8 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 libblas3 amd64 3.9.0-1build1 [142 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal/universe amd64 liblinear4 amd64 2.3.0+dfsg-3build1 [41.7 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal/main amd64 liblua5.3-0 amd64 5.3.3-1.ubuntu2 [116 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal/universe amd64 lua-lpeg amd64 1.0.2-1 [31.4 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal/universe amd64 nmap-common all 7.80+dfsg1-2build1 [3676 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal/universe amd64 nmap amd64 7.80+dfsg1-2build1 [1662 kB]
Fetched 5669 kB in 5s (1184 kB/s)
Selecting previously unselected package libblas3:amd64.
(Reading database ... 48384 files and directories currently installed.)
Preparing to unpack .../0-libblas3_3.9.0-1build1_amd64.deb ...
Unpacking libblas3:amd64 (3.9.0-1build1) ...
Selecting previously unselected package liblinear4:amd64.
Preparing to unpack .../1-liblinear4_2.3.0+dfsg-3build1_amd64.deb ...
Unpacking liblinear4:amd64 (2.3.0+dfsg-3build1) ...
Selecting previously unselected package liblua5.3-0:amd64.
Preparing to unpack .../2-liblua5.3-0_5.3.3-1.ubuntu2_amd64.deb ...
Unpacking liblua5.3-0:amd64 (5.3.3-1.ubuntu2) ...
Selecting previously unselected package lua-lpeg:amd64.
Preparing to unpack .../3-lua-lpeg_1.0.2-1_amd64.deb ...
Unpacking lua-lpeg:amd64 (1.0.2-1) ...
```

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

nmap 192.168.77.197

```
root@33818888A:~# nmap 192.168.77.197
Starting Nmap 7.80 ( https://nmap.org ) at 2023-09-10 21:38 UTC
Nmap scan report for 192.168.77.197
Host is up (0.00012s latency).
Not shown: 999 filtered ports
PORT      STATE SERVICE
3306/tcp  open  mysql
MAC Address: 86:66:0B:AF:88:59 (Unknown)

Nmap done: 1 IP address (1 host up) scanned in 5.19 seconds
root@33818888A:~#
```

Observamos que 3306/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

```
root@33818888DB:~# mysql -u root -p
Enter password:
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.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]>
```

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 maria 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 libaprutil1 libgssapi3-heimdal libhcrypto4-heimdal libheimbase1-heimdal libheimntlm0-heimdal libidn2-0 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 libaprutil1 libgssapi3-heimdal libhcrypto4-heimdal libheimbase1-heimdal libheimntlm0-heimdal libidn2-0 liblua5.2-0 libnghttp2-14 libroken18-heimdal librtmp1 libssh-4 libwind0-heimdal php
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 1.6.5-1ubuntu1.1 [16.6 kB]
Ign:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 libaprutil1 amd64 1.6.1-4ubuntu2.1

```

```

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 [36.5 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.gitfa86441.2build1 [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 libjson4 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 mysql
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:~#
```

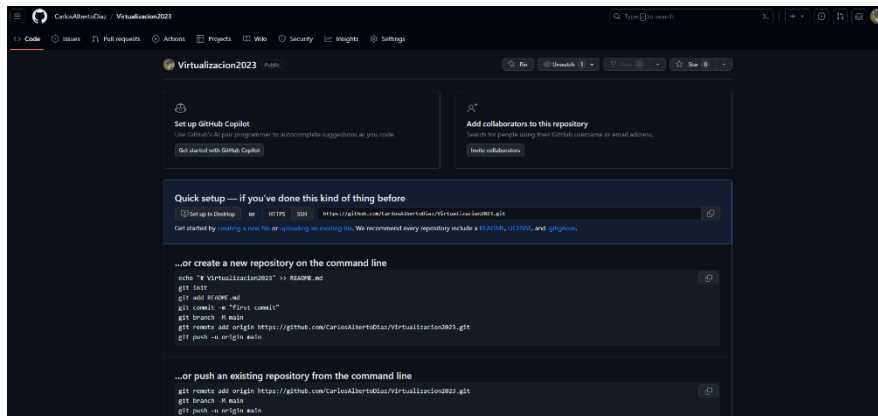
Instalamos git con el comando

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

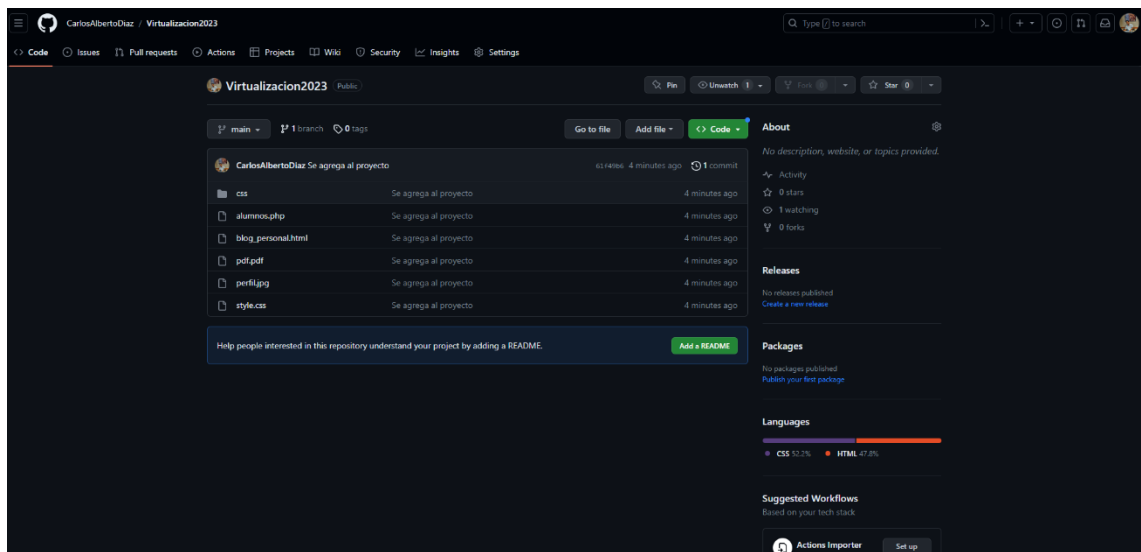
Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023 (master)
$ git branch -M main

Carlos@DESKTOP-BDF17C3 MINGW64 ~/Pictures/Vritualizacion2023 (main)
$ git remote add origin https://github.com/CarlosAlbertoDiaz/Vritualizacion2023.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/Vritualizacion2023.git
 * [new branch]      main -> main
branch 'main' set up to track 'origin/main'.

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

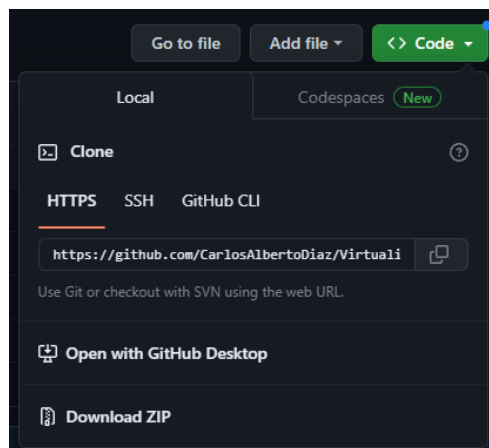
```



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# 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 - 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#
```

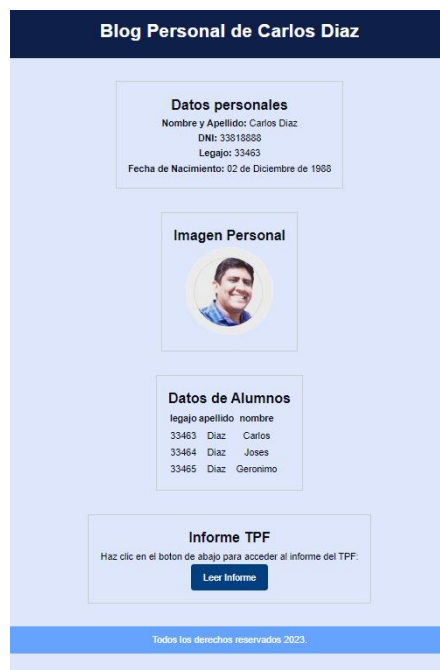
Con el comando `cp` copiamos los archivos a su respectiva ruta. Con el comando `mkdir` creamos las carpetas `archivo` para el pdf y otra carpeta `img` para la foto de perfil

```
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.



Pila tecnológica

