TRABAJO 2 FRANCISCO MACHO TOLEDO

PARTE 1: INSTALACIÓN Y CONFIGURACIÓN DE APACHE

1. Actualizar el sistema

```
vboxuser@ArquitecturaFMT1:~$ sudo apt update && sudo apt upgrade -y
```

```
vboxuser@ArquitecturaFMT1:~$ sudo apt update && sudo apt upgrade -y
[sudo] password for vboxuser:
Hit:1 http://es.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:3 http://es.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:4 http://es.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:5 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [1,213 kB]
Get:6 http://es.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1,490 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [202 kB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.5 kB]
Get:9 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [8,748 B
Get:10 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [1,967
Get:11 http://es.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [287 kB]
Get:12 http://es.archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [175 kB]
Get:13 http://es.archive.ubuntu.com/ubuntu noble-updates/main amd64 c-n-f Metadata [15.3
Get:14 http://es.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [2,068
Get:15 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [448 kB
Get:16 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212
Get:17 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [882 kB]
Get:18 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [196 kB]
Get:19 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.3 k
Get:20 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [18
Get:21 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [5,844
Get:22 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212
80% [14 Packages 1,991 kB/2,068 kB 96%]
```

2. Instalar Apache2

```
vboxuser@ArquitecturaFMT1:~$ sudo apt install apache2 -y
```

```
vboxuser@ArquitecturaFMT1:~$ sudo apt install apache2 -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
apache2 is already the newest version (2.4.58-1ubuntu8.8).
The following packages were automatically installed and are no longer required:
  libgl1-amber-dri libglapi-mesa libllvm17t64 python3-netifaces
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 3 not upgraded.
vboxuser@ArquitecturaFMT1:~$ S
```

3. Configurar Apache en puerto 8080

```
vboxuser@ArquitecturaFMT1:~$ sudo nano /etc/apache2/ports.conf
```

```
vboxuser@ArquitecturaFMT1: ~
  GNU nano 7.2                                  /etc/apache2/ports.conf *
# If you just change the port or add more ports here, you will likely also
# have to change the VirtualHost statement in
# /etc/apache2/sites-enabled/000-default.conf

Listen 8080

<IfModule ssl_module>
        Listen 443
</IfModule>

<IfModule mod_gnutls.c>
        Listen 443
</IfModule>
```

4. Modificar el VirtualHost

```
vboxuser@ArquitecturaFMT1:~$ sudo nano /etc/apache2/sites-available/000-default.conf
```

```
  GNU nano 7.2                          /etc/apache2/sites-available/000-default.conf *
<VirtualHost *:8080>
        # The ServerName directive sets the request scheme, hostname and port that
        # the server uses to identify itself. This is used when creating
        # redirection URLs. In the context of virtual hosts, the ServerName
        # specifies what hostname must appear in the request's Host: header to
        # match this virtual host. For the default virtual host (this file) this
        # value is not decisive as it is used as a last resort host regardless.
        # However, you must set it for any further virtual host explicitly.
        #ServerName www.example.com

        ServerAdmin webmaster@localhost
        DocumentRoot /var/www/html

        # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
        # error, crit, alert, emerg.
        # It is also possible to configure the loglevel for particular
        # modules, e.g.
        #LogLevel info ssl:warn

        ErrorLog ${APACHE_LOG_DIR}/error.log
        CustomLog ${APACHE_LOG_DIR}/access.log combined

        # For most configuration files from conf-available/, which are
        # enabled or disabled at a global level, it is possible to
        # include a line for only one particular virtual host. For example the
        # following line enables the CGI configuration for this host only
        # after it has been globally disabled with "a2disconf".
        #Include conf-available/serve-cgi-bin.conf
```

5. Instalar PHP

```
vboxuser@ArquitecturaFMT1:~$ sudo apt install php libapache2-mod-php -y
```

```
vboxuser@ArquitecturaFMT1:~$ sudo apt install php libapache2-mod-php -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
php is already the newest version (2:8.3+93ubuntu2).
libapache2-mod-php is already the newest version (2:8.3+93ubuntu2).
The following packages were automatically installed and are no longer required:
  libgl1-amber-dri libglapi-mesa libllvm17t64 python3-netifaces
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 3 not upgraded.
vboxuser@ArquitecturaFMT1:~$
```

6. Reiniciar Apache

```
vboxuser@ArquitecturaFMT1:~$ sudo systemctl restart apache2
```

```
vboxuser@ArquitecturaFMT1:~$ sudo systemctl restart apache2
vboxuser@ArquitecturaFMT1:~$
```

7. Verificar estado de Apache

```
vboxuser@ArquitecturaFMT1:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
     Active: active (running) since Wed 2025-10-08 07:50:20 UTC; 1min 7s ago
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 42907 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
   Main PID: 42911 (apache2)
      Tasks: 6 (limit: 5770)
     Memory: 10.6M (peak: 11.2M)
        CPU: 53ms
     CGroup: /system.slice/apache2.service
             ├─42911 /usr/sbin/apache2 -k start
             ├─42913 /usr/sbin/apache2 -k start
             ├─42914 /usr/sbin/apache2 -k start
             ├─42915 /usr/sbin/apache2 -k start
             ├─42916 /usr/sbin/apache2 -k start
             └─42917 /usr/sbin/apache2 -k start

Oct 08 07:50:20 ArquitecturaFMT1 systemd[1]: Starting apache2.service - The Apache HTTP Server...
Oct 08 07:50:20 ArquitecturaFMT1 apachectl[42910]: AH00558: apache2: Could not reliably determine the server's fully qu>
Oct 08 07:50:20 ArquitecturaFMT1 systemd[1]: Started apache2.service - The Apache HTTP Server.
lines 1-20/20 (END)
```

```
vboxuser@ArquitecturaFMT1:~$ sudo netstat -tulpn | grep 8080
tcp6       0      0 :::8080                 :::*                    LISTEN      42911/apache2
vboxuser@ArquitecturaFMT1:~$ curl http://localhost:8080
<h1>Hola Mundo desde Nginx</h1><p>Servidor funcionando correctamente</p>
vboxuser@ArquitecturaFMT1:~$ curl -i http://localhost:8080·
curl: (3) URL rejected: Port number was not a decimal number between 0 and 65535
vboxuser@ArquitecturaFMT1:~$ curl -i http://localhost:8080
HTTP/1.1 200 OK
Date: Wed, 08 Oct 2025 07:55:32 GMT
Server: Apache/2.4.58 (Ubuntu)
Last-Modified: Wed, 01 Oct 2025 08:56:01 GMT
ETag: "49-6401509b20c0b"
Accept-Ranges: bytes
Content-Length: 73
Vary: Accept-Encoding
Content-Type: text/html

<h1>Hola Mundo desde Nginx</h1><p>Servidor funcionando correctamente</p>
vboxuser@ArquitecturaFMT1:~$
```

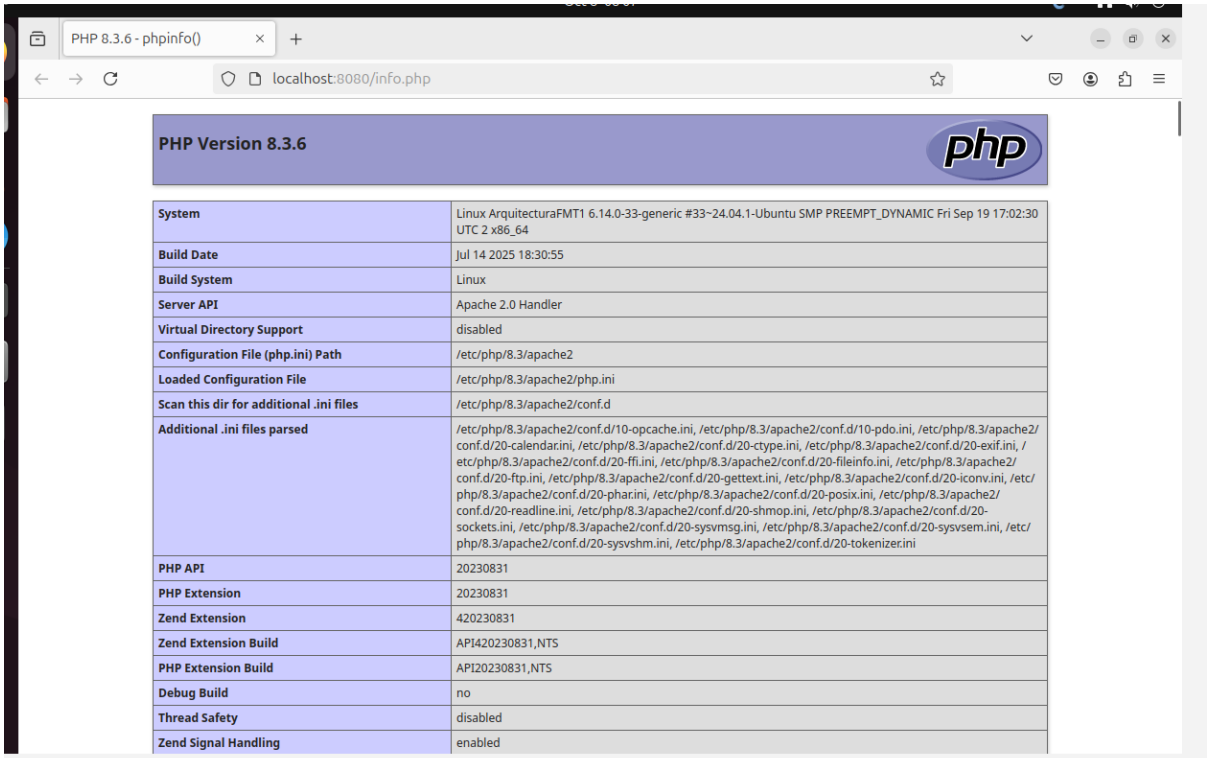
8. Crear archivo PHP de prueba

```
vboxuser@ArquitecturaFMT1:~$ echo "<?php phpinfo(); ?>" | sudo tee /var/www/html/info.php
```

```
vboxuser@ArquitecturaFMT1:~$ echo "<?php phpinfo(); ?>" | sudo tee /var/www/html/info.php
<?php phpinfo(); ?>
vboxuser@ArquitecturaFMT1:~$
```

9. Probar Apache desde terminal

```
vboxuser@ArquitecturaFMT1:~$ curl http://localhost:8080/info.php
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"><head>
<style type="text/css">
body {background-color: #fff; color: #222; font-family: sans-serif;}
pre {margin: 0; font-family: monospace;}
a:link {color: #009; text-decoration: none; background-color: #fff;}
a:hover {text-decoration: underline;}
table {border-collapse: collapse; border: 0; width: 934px; box-shadow: 1px 2px 3px rgba(0, 0, 0
.center {text-align: center;}
.center table {margin: 1em auto; text-align: left;}
.center th {text-align: center !important;}
td, th {border: 1px solid #666; font-size: 75%; vertical-align: baseline; padding: 4px 5px;}
th {position: sticky; top: 0; background: inherit;}
h1 {font-size: 150%;}
h2 {font-size: 125%;}
h2 a:link, h2 a:visited{color: inherit; background: inherit;}
.p {text-align: left;}
.e {background-color: #ccf; width: 300px; font-weight: bold;}
.h {background-color: #99c; font-weight: bold;}
.v {background-color: #ddd; max-width: 300px; overflow-x: auto; word-wrap: break-word;}
.v i {color: #999;}
img {float: right; border: 0;}
hr {width: 934px; background-color: #ccc; border: 0; height: 1px;}
:root {--php-dark-grey: #333; --php-dark-blue: #4F5B93; --php-medium-blue: #8892BF; --php-light
ent-purple: #793862}@media (prefers-color-scheme: dark) {
  body {background: var(--php-dark-grey); color: var(--php-light-blue)}
  .h td, td.e, th {border-color: #606A90}
  td {border-color: #505153}
  .e {background-color: #404A77}
  .h {background-color: var(--php-dark-blue)}
  .v {background-color: var(--php-dark-grey)}
  hr {background-color: #505153}
```



System	Linux ArquitecturaFMT1 6.14.0-33-generic #33~24.04.1-Ubuntu SMP PREEMPT_DYNAMIC Fri Sep 19 17:02:30 UTC 2 x86_64
Build Date	Jul 14 2025 18:30:55
Build System	Linux
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php/8.3/apache2
Loaded Configuration File	/etc/php/8.3/apache2/php.ini
Scan this dir for additional .ini files	/etc/php/8.3/apache2/conf.d
Additional .ini files parsed	/etc/php/8.3/apache2/conf.d/10-opcache.ini, /etc/php/8.3/apache2/conf.d/10-pdo.ini, /etc/php/8.3/apache2/conf.d/20-calendar.ini, /etc/php/8.3/apache2/conf.d/20-ctype.ini, /etc/php/8.3/apache2/conf.d/20-exif.ini, /etc/php/8.3/apache2/conf.d/20-ffi.ini, /etc/php/8.3/apache2/conf.d/20-fileinfo.ini, /etc/php/8.3/apache2/conf.d/20-ftp.ini, /etc/php/8.3/apache2/conf.d/20-gettext.ini, /etc/php/8.3/apache2/conf.d/20-iconv.ini, /etc/php/8.3/apache2/conf.d/20-phar.ini, /etc/php/8.3/apache2/conf.d/20-posix.ini, /etc/php/8.3/apache2/conf.d/20-readline.ini, /etc/php/8.3/apache2/conf.d/20-shmop.ini, /etc/php/8.3/apache2/conf.d/20-sockets.ini, /etc/php/8.3/apache2/conf.d/20-sysvmsg.ini, /etc/php/8.3/apache2/conf.d/20-sysvsem.ini, /etc/php/8.3/apache2/conf.d/20-sysvshm.ini, /etc/php/8.3/apache2/conf.d/20-tokenizer.ini
PHP API	20230831
PHP Extension	20230831
Zend Extension	420230831
Zend Extension Build	API420230831,NTS
PHP Extension Build	API20230831,NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled

PARTE 2: INSTALACIÓN Y CONFIGURACIÓN DE NGINX

1. Instalar Nginx

```
vboxuser@ArquitecturaFMT1:~$ sudo apt install nginx -y
```

```
vboxuser@ArquitecturaFMT1:~$ sudo apt install nginx -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
nginx is already the newest version (1.24.0-2ubuntu7.5).
The following packages were automatically installed and are no longer required:
  libgl1-amber-dri libglapi-mesa libllvm17t64 python3-netifaces
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 3 not upgraded.
vboxuser@ArquitecturaFMT1:~$
```

2. Configurar Nginx en puerto 8081

```
vboxuser@ArquitecturaFMT1:~$ sudo nano /etc/nginx/sites-available/default
```

```
# Default server configuration
#
server {
        listen 8081 default_server;
        listen [::]:8081 default_server;

        # SSL configuration
        #
        # listen 443 ssl default_server;
        # listen [::]:443 ssl default_server;
```

3. Crear página HTML personalizada

```
vboxuser@ArquitecturaFMT1:~$ echo "<h1>Servidor Nginx</h1><p>Funcionando en puerto 8081</p>" | sudo tee /usr/share/nginx
/html/index.html
```

```
vboxuser@ArquitecturaFMT1:~$ echo "<h1>Servidor Nginx</h1><p>Fu
/html/index.html
<h1>Servidor Nginx</h1><p>Funcionando en puerto 8081</p>
vboxuser@ArquitecturaFMT1:~$
```

4. Reiniciar Nginx

```
vboxuser@ArquitecturaFMT1:~$ sudo systemctl restart nginx
```

```
vboxuser@ArquitecturaFMT1:~$ sudo systemctl restart nginx
vboxuser@ArquitecturaFMT1:~$
```

5. Verificar estado de Nginx y 6. Probar Nginx desde terminal

```
vboxuser@ArquitecturaFMT1:~$ sudo systemctl status nginx
● nginx.service - A high performance web server and a reverse proxy server
     Loaded: loaded (/usr/lib/systemd/system/nginx.service; enabled; preset: enabled)
     Active: active (running) since Wed 2025-10-08 08:22:50 UTC; 1min 13s ago
       Docs: man:nginx(8)
    Process: 44240 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
    Process: 44242 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
   Main PID: 44243 (nginx)
      Tasks: 5 (limit: 5770)
     Memory: 3.7M (peak: 4.2M)
        CPU: 17ms
     CGroup: /system.slice/nginx.service
             ├─44243 "nginx: master process /usr/sbin/nginx -g daemon on; master_process on;"
             ├─44244 "nginx: worker process"
             ├─44245 "nginx: worker process"
             ├─44246 "nginx: worker process"
             └─44247 "nginx: worker process"

Oct 08 08:22:50 ArquitecturaFMT1 systemd[1]: Starting nginx.service - A high performance web server and a reverse proxy>
Oct 08 08:22:50 ArquitecturaFMT1 systemd[1]: Started nginx.service - A high performance web server and a reverse proxy >
lines 1-19/19 (END)
```

```
vboxuser@ArquitecturaFMT1:~$ sudo netstat -tulpn | grep 8081
tcp        0      0 0.0.0.0:8081            0.0.0.0:*               LISTEN      44243/nginx: master
tcp6       0      0 :::8081                 :::*                    LISTEN      44243/nginx: master
vboxuser@ArquitecturaFMT1:~$ curl http://localhost:8081/index.html
<h1>Hola Mundo desde Nginx</h1><p>Servidor funcionando correctamente</p>
vboxuser@ArquitecturaFMT1:~$
```

PARTE 3: INSTALACIÓN Y CONFIGURACIÓN DE CADDY

1. Instalar dependencias necesarias

```
vboxuser@ArquitecturaFMT1:~$ sudo apt install -y debian-keyring debian-archive-keyring apt-transport-https curl
```

```
vboxuser@ArquitecturaFMT1:~$ sudo apt install -y debian-keyring debian-archive-keyring ap
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
curl is already the newest version (8.5.0-2ubuntu10.6).
The following packages were automatically installed and are no longer required:
  libgl1-amber-dri libglapi-mesa libllvm17t64 python3-netifaces
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  apt-transport-https debian-archive-keyring debian-keyring
0 upgraded, 3 newly installed, 0 to remove and 3 not upgraded.
Need to get 31.5 MB of archives.
After this operation, 33.4 MB of additional disk space will be used.
Get:1 http://es.archive.ubuntu.com/ubuntu noble-updates/universe amd64 apt-transport-http
Get:2 http://es.archive.ubuntu.com/ubuntu noble/universe amd64 debian-archive-keyring all
Get:3 http://es.archive.ubuntu.com/ubuntu noble/universe amd64 debian-keyring all 2023.1
39% [3 debian-keyring 9,836 kB/31.3 MB 31%]
```

2. Agregar repositorio de Caddy

```
vboxuser@ArquitecturaFMT1:~$ curl -1sLf 'https://dl.cloudsmith.io/public/caddy/stable/gpg.key' | sudo gpg --
dearmor -o /usr/share/keyrings/caddy-stable-archive-keyring.gpg
```

```
vboxuser@ArquitecturaFMT1:~$ curl -1sLf 'https://dl.cloudsmith.io/public/caddy/stable/gpg.key' | sudo gpg --dearmor -o /
usr/share/keyrings/caddy-stable-archive-keyring.gpg
vboxuser@ArquitecturaFMT1:~$ curl -1sLf 'https://dl.cloudsmith.io/public/caddy/stable/gpg.key' | sudo gpg --dearmor -o /
usr/share/keyrings/caddy-stable-archive-keyring.gpg
File '/usr/share/keyrings/caddy-stable-archive-keyring.gpg' exists. Overwrite? (y/N) n
Enter new filename:
gpg: signal Interrupt caught ... exiting

vboxuser@ArquitecturaFMT1:~$
```

```
vboxuser@ArquitecturaFMT1:~$ curl -1sLf 'https://dl.cloudsmith.io/public/caddy/stable/debian.deb.txt' | sudo
tee /etc/apt/sources.list.d/caddy-stable.list
```

```
vboxuser@ArquitecturaFMT1:~$ curl -1sLf 'https://dl.cloudsmith.io/public/caddy/stable/debian.deb.txt' | sudo tee /et
t/sources.list.d/caddy-stable.list
# Source: Caddy
# Site: https://github.com/caddyserver/caddy
# Repository: Caddy / stable
# Description: Fast, multi-platform web server with automatic HTTPS


deb [signed-by=/usr/share/keyrings/caddy-stable-archive-keyring.gpg] https://dl.cloudsmith.io/public/caddy/stable/de
bian any-version main

deb-src [signed-by=/usr/share/keyrings/caddy-stable-archive-keyring.gpg] https://dl.cloudsmith.io/public/caddy/stabl
b/debian any-version main
vboxuser@ArquitecturaFMT1:~$
```

3. Actualizar e instalar Caddy

```
vboxuser@ArquitecturaFMT1:~$ sudo apt update && sudo apt install caddy -y
```

```
vboxuser@ArquitecturaFMT1:~$ sudo apt update && sudo apt install caddy -y
Get:1 https://dl.cloudsmith.io/public/caddy/stable/deb/debian any-version InRelease [14.8 kB]
Hit:2 http://es.archive.ubuntu.com/ubuntu noble InRelease
Hit:3 http://es.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:4 http://security.ubuntu.com/ubuntu noble-security InRelease
Get:5 https://dl.cloudsmith.io/public/caddy/stable/deb/debian any-version/main amd64 Packages
Hit:6 http://es.archive.ubuntu.com/ubuntu noble-backports InRelease
Fetched 19.1 kB in 1s (25.4 kB/s)
```

4. Crear directorio para Caddy

```
vboxuser@ArquitecturaFMT1:~$ sudo mkdir -p /var/www/caddy
```

```
vboxuser@ArquitecturaFMT1:~$ sudo mkdir -p /var/www/caddy
vboxuser@ArquitecturaFMT1:~$
```

5. Crear archivo Markdown de prueba

```
vboxuser@ArquitecturaFMT1:~$ echo "# Bienvenido a Caddy" | sudo tee /var/www/caddy/README.md
# Bienvenido a Caddy
vboxuser@ArquitecturaFMT1:~$ echo "" | sudo tee -a /var/www/caddy/README.md

vboxuser@ArquitecturaFMT1:~$ echo "Este servidor está funcionando correctamente." | sudo tee -a /var/www/caddy/README.md
Este servidor está funcionando correctamente.
vboxuser@ArquitecturaFMT1:~$ echo "" | sudo tee -a /var/www/caddy/README.md

vboxuser@ArquitecturaFMT1:~$ echo "## Características" | sudo tee -a /var/www/caddy/README.md
## Características
vboxuser@ArquitecturaFMT1:~$ echo "- Servidor moderno" | sudo tee -a /var/www/caddy/README.md
- Servidor moderno
vboxuser@ArquitecturaFMT1:~$ echo "- HTTPS automático" | sudo tee -a /var/www/caddy/README.md
- HTTPS automático
vboxuser@ArquitecturaFMT1:~$ echo "- Fácil configuración" | sudo tee -a /var/www/caddy/README.md
- Fácil configuración
vboxuser@ArquitecturaFMT1:~$
```

6. Crear imagen de prueba

```
vboxuser@ArquitecturaFMT1:~$ curl -o /tmp/test-image.jpg "https://www.python.org/static/apple-touch-icon-144x144-precomposed.png"
```

```
vboxuser@ArquitecturaFMT1:~$ curl -o /tmp/test-image.jpg "https://www.python.org/static/apple-touch-icon-144x144-precomposed.png"
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  7382  100  7382    0     0  66297      0 --:--:-- --:--:-- --:--:-- 66504
vboxuser@ArquitecturaFMT1:~$
```

```
vboxuser@ArquitecturaFMT1:~$ sudo mv /tmp/test-image.jpg /var/www/caddy/test.jpg
vboxuser@ArquitecturaFMT1:~$
```

7. Crear Caddyfile personalizado

```
vboxuser@ArquitecturaFMT1:~$ sudo nano /etc/caddy/Caddyfile
vboxuser@ArquitecturaFMT1:~$
```

```
  GNU nano 7.2                                                /etc/cadd
# The Caddyfile is an easy way to configure your Caddy web se
#
# Unless the file starts with a global options block, the fir
# uncommented line is always the address of your site.
#
# To use your own domain name (with automatic HTTPS), first m
# sure your domain's A/AAAA DNS records are properly pointed
# this machine's public IP, then replace ":80" below with you
# domain name.

:8082 {
        # Set this path to your site's directory.
        root * /var/www/caddy

        # Enable the static file server.
        file_server browse

        @markdown path *.md
        header @markdown Content-Type text/plain
        # Another common task is to set up a reverse proxy:
        # reverse_proxy localhost:8080

        # Or serve a PHP site through php-fpm:
        # php_fastcgi localhost:9000
}

# Refer to the Caddy docs for more information:
```

8. Reiniciar Caddy

```
vboxuser@ArquitecturaFMT1:~$ sudo systemctl restart caddy
vboxuser@ArquitecturaFMT1:~$
```

9,10 y 11 Verificar estado de Caddy

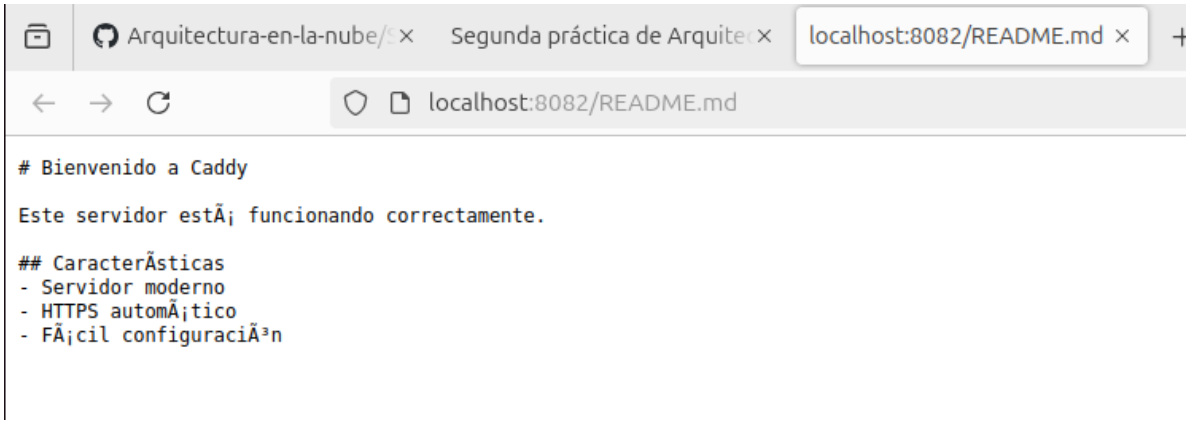
```
vboxuser@ArquitecturaFMT1:~$ sudo systemctl status caddy
● caddy.service - Caddy
     Loaded: loaded (/usr/lib/systemd/system/caddy.service; enabled; preset: enabled)
     Active: active (running) since Wed 2025-10-08 09:07:38 UTC; 42s ago
       Docs: https://caddyserver.com/docs/
   Main PID: 48620 (caddy)
      Tasks: 9 (limit: 5770)
     Memory: 11.7M (peak: 12.0M)
        CPU: 101ms
     CGroup: /system.slice/caddy.service
             └─48620 /usr/bin/caddy run --environ --config /etc/caddy/Caddyfile

Oct 08 09:07:38 ArquitecturaFMT1 caddy[48620]: {"level":"info","ts":1759914458.2087762,"logger":"admin","msg":"admin en>
Oct 08 09:07:38 ArquitecturaFMT1 caddy[48620]: {"level":"warn","ts":1759914458.2090333,"logger":"http","msg":"HTTP/2 sk>
Oct 08 09:07:38 ArquitecturaFMT1 caddy[48620]: {"level":"warn","ts":1759914458.2090416,"logger":"http","msg":"HTTP/3 sk>
Oct 08 09:07:38 ArquitecturaFMT1 caddy[48620]: {"level":"info","ts":1759914458.2090435,"logger":"http.log","msg":"serve>
Oct 08 09:07:38 ArquitecturaFMT1 caddy[48620]: {"level":"info","ts":1759914458.209105,"logger":"tls.cache.maintenance",>
Oct 08 09:07:38 ArquitecturaFMT1 caddy[48620]: {"level":"info","ts":1759914458.2091918,"msg":"autosaved config (load wi>
Oct 08 09:07:38 ArquitecturaFMT1 caddy[48620]: {"level":"info","ts":1759914458.209595,"msg":"serving initial configurat>
Oct 08 09:07:38 ArquitecturaFMT1 systemd[1]: Started caddy.service - Caddy.
Oct 08 09:07:38 ArquitecturaFMT1 caddy[48620]: {"level":"info","ts":1759914458.2130728,"logger":"tls","msg":"storage cl>
Oct 08 09:07:38 ArquitecturaFMT1 caddy[48620]: {"level":"info","ts":1759914458.213123,"logger":"tls","msg":"finished cl>
lines 1-21/21 (END)
```

```
vboxuser@ArquitecturaFMT1:~$ sudo netstat -tulpn | grep 8082
tcp6       0      0 :::8082                 :::*                    LISTEN      4
vboxuser@ArquitecturaFMT1:~$ curl http://localhost:8082/README.md
# Bienvenido a Caddy

Este servidor está funcionando correctamente.

## Características
- Servidor moderno
- HTTPS automático
- Fácil configuración
vboxuser@ArquitecturaFMT1:~$
```



PARTE 4: CONFIGURACIÓN DE HTTPS CON CERTBOT EN APACHE

1. Instalar Certbot y el plugin de Apache

```
vboxuser@ArquitecturaFMT1:~$ sudo apt install certbot python3-certbot-apache -y
```

```
vboxuser@ArquitecturaFMT1:~$ sudo apt install certbot python3-certbot-apache -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libgl1-amber-dri libglapi-mesa libllvm17t64 python3-netifaces
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  augeas-lenses libaugeas0 python3-acme python3-augeas python3-certbot python3-c
  python3-josepy python3-openssl python3-parsedatetime python3-rfc3339
Suggested packages:
  augeas-doc python-certbot-doc python3-certbot-nginx augeas-tools python-acme-c
  python-openssl-doc python3-openssl-dbg
The following NEW packages will be installed:
```

2. Verificar dominio o usar localhost

```
vboxuser@ArquitecturaFMT1:~$ sudo openssl req -x509 -nodes -days 365 -newkey rsa:2048 -keyout /etc/ssl/private/apache-se
lfsigned.key -out /etc/ssl/certs/apache-selfsigned.cr
```

```
vboxuser@ArquitecturaFMT1:~$ sudo openssl req -x509 -nodes -days 365 -newkey rsa:2048 -keyout /
lfsigned.key -out /etc/ssl/certs/apache-selfsigned.cr
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You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:ES
State or Province Name (full name) [Some-State]:Madrid
Locality Name (eg, city) []:Madrid
Organization Name (eg, company) [Internet Widgits Pty Ltd]:
Organizational Unit Name (eg, section) []:
Common Name (e.g. server FQDN or YOUR name) []:localhost
Email Address []:francis@gmail.com
vboxuser@ArquitecturaFMT1:~$
```

3. Habilitar módulo SSL en Apache

```
vboxuser@ArquitecturaFMT1:~$ sudo a2enmod ssl
Considering dependency mime for ssl:
Module mime already enabled
Considering dependency socache_shmcb for ssl:
Enabling module socache_shmcb.
Enabling module ssl.
See /usr/share/doc/apache2/README.Debian.gz on how to configure SSL and create self-signed cer
To activate the new configuration, you need to run:
  systemctl restart apache2
vboxuser@ArquitecturaFMT1:~$
```

4. Crear configuración SSL para Apache

```
vboxuser@ArquitecturaFMT1:~$ sudo nano /etc/apache2/sites-available/default-ssl.conf
```

5. Cambiar puerto SSL

```
vboxuser@ArquitecturaFMT1:~$ sudo nano /etc/apache2/ports.conf
```

```
  GNU nano 7.2
# If you just change the por
# have to change the Virtual
# /etc/apache2/sites-enablec

Listen 8443

<IfModule ssl_module>
        Listen 443
</IfModule>

<IfModule mod_gnutls.c>
        Listen 443
</IfModule>
```

6. Modificar VirtualHost SSL

```
vboxuser@ArquitecturaFMT1:~$ sudo nano /etc/apache2/sites-available/default-ssl.conf
```

```
 GNU nano 7.2                                  /etc/apache2/sites-a
<VirtualHost *:8443>
        ServerAdmin webmaster@localhost

        DocumentRoot /var/www/html

        # Available loglevels: trace8, ..., trace1, debug, i
        # error, crit, alert, emerg.
        # It is also possible to configure the loglevel for
        # modules, e.g.
        #LogLevel info ssl:warn

        ErrorLog ${APACHE_LOG_DIR}/error.log
```

7. Habilitar sitio SSL

```
vboxuser@ArquitecturaFMT1:~$ sudo a2ensite default-ssl.conf
```

```
vboxuser@ArquitecturaFMT1:~$ sudo a2ensite default-ssl.conf
[sudo] password for vboxuser:
Site default-ssl already enabled
vboxuser@ArquitecturaFMT1:~$
```

8. Reiniciar Apache

```
vboxuser@ArquitecturaFMT1:~$ sudo systemctl restart apache2
```

```
vboxuser@ArquitecturaFMT1:~$ sudo systemctl restart apache2
vboxuser@ArquitecturaFMT1:~$
```

9. Verificar HTTPS

```
vboxuser@ArquitecturaFMT1:~$ curl -i -k https://localhost:8443
HTTP/1.1 200 OK
Date: Wed, 08 Oct 2025 10:12:11 GMT
Server: Apache/2.4.58 (Ubuntu)
Last-Modified: Wed, 01 Oct 2025 08:56:01 GMT
ETag: "49-6401509b20c0b"
Accept-Ranges: bytes
Content-Length: 73
Vary: Accept-Encoding
Content-Type: text/html

<h1>Hola Mundo desde Nginx</h1><p>Servidor funcionando correctamente</p>
vboxuser@ArquitecturaFMT1:~$
```

PARTE 5: VERIFICACIÓN FINAL DE LOS TRES SERVIDORES

1. Verificar que todos los servicios están activos

```
vboxuser@ArquitecturaFMT1:~$ sudo systemctl status apache2 nginx caddy
```

```
vboxuser@ArquitecturaFMT1:~$ sudo systemctl status apache2 nginx caddy
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
     Active: active (running) since Wed 2025-10-08 10:11:04 UTC; 3min 51s ago
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 51888 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
   Main PID: 51891 (apache2)
      Tasks: 7 (limit: 5770)
     Memory: 13.1M (peak: 13.5M)
        CPU: 96ms
     CGroup: /system.slice/apache2.service
             ├─51891 /usr/sbin/apache2 -k start
             ├─51893 /usr/sbin/apache2 -k start
             ├─51894 /usr/sbin/apache2 -k start
             ├─51895 /usr/sbin/apache2 -k start
             ├─51896 /usr/sbin/apache2 -k start
             ├─51897 /usr/sbin/apache2 -k start
             └─52112 /usr/sbin/apache2 -k start

Oct 08 10:11:04 ArquitecturaFMT1 systemd[1]: Starting apache2.service - The Apache HTTP Server...
Oct 08 10:11:04 ArquitecturaFMT1 apachectl[51890]: AH00558: apache2: Could not reliably determine
Oct 08 10:11:04 ArquitecturaFMT1 systemd[1]: Started apache2.service - The Apache HTTP Server.

● nginx.service - A high performance web server and a reverse proxy server
     Loaded: loaded (/usr/lib/systemd/system/nginx.service; enabled; preset: enabled)
     Active: active (running) since Wed 2025-10-08 08:22:50 UTC; 1h 52min ago
       Docs: man:nginx(8)
   Main PID: 44243 (nginx)
      Tasks: 5 (limit: 5770)
     Memory: 3.8M (peak: 4.2M)
        CPU: 18ms
     CGroup: /system.slice/nginx.service
lines 1-31
```

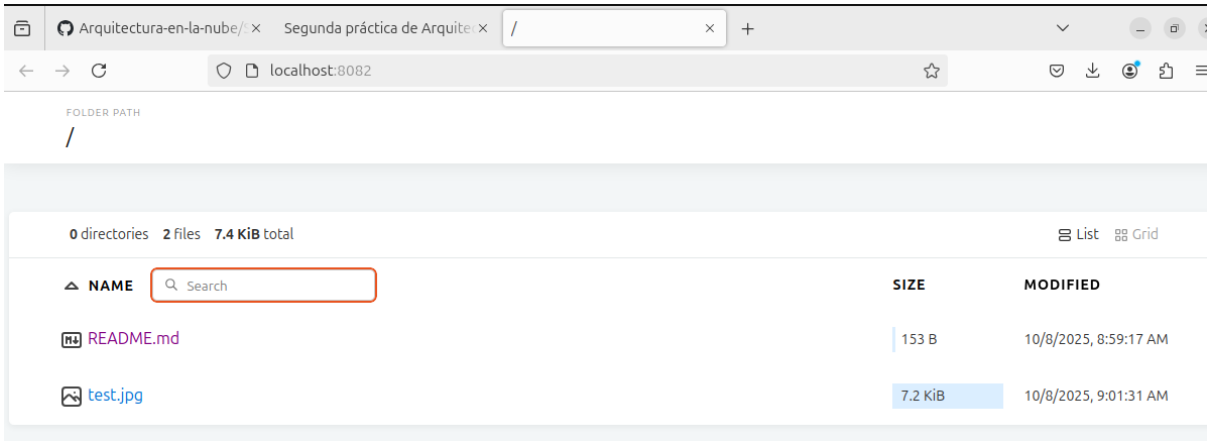
2. Verificar puertos en uso

```
vboxuser@ArquitecturaFMT1:~$ sudo netstat -tulpn | grep -E '8080|8081|8082|8443'
```

3. Probar todos los servidores

```
vboxuser@ArquitecturaFMT1:~$ curl http://localhost:8082

<!DOCTYPE html>
<html>
        <head>
                <title>/</title>
                <link rel="canonical" href="//"  />
                <meta charset="utf-8">
                <meta name="color-scheme" content="light dar
```




```
vboxuser@ArquitecturaFMT1:~$ curl http://localhost:8081
<h1>Hola Mundo desde Nginx</h1><p>Servidor funcionando correctamente</p>
vboxuser@ArquitecturaFMT1:~$
```


```
vboxuser@ArquitecturaFMT1:~$ curl -k https://localhost:8443
<h1>Hola Mundo desde Nginx</h1><p>Servidor funcionando correctamente</p>
vboxuser@ArquitecturaFMT1:~$
```