

## PARTE 1: INSTALACIÓN Y CONFIGURACIÓN DE APACHE

### 1. Actualizar el sistema

Comando:

```
sudo apt update && sudo apt upgrade -y
```

```
hector@hector-virtualbox:~$ sudo apt update && sudo apt upgrade -y
[sudo] contraseña para hector:
Des:1 http://deb.debian.org/debian trixie InRelease [140 kB]
Des:2 http://security.debian.org/debian-security trixie-security InRelease [43,4 kB]
Des:3 http://deb.debian.org/debian trixie-updates InRelease [47,3 kB]
Des:4 http://deb.debian.org/debian trixie-backports InRelease [54,0 kB]
Des:5 http://security.debian.org/debian-security trixie-security/main Sources [91,5 kB]
Des:6 http://deb.debian.org/debian trixie/main Translation-es [278 kB]
Des:7 http://security.debian.org/debian-security trixie-security/non-free-firmware Sources [69,2 kB]
Des:8 http://deb.debian.org/debian trixie-updates/main Sources [2.788 B]
Des:9 http://security.debian.org/debian-security trixie-security/main amd64 Packages [69,2 kB]
Des:10 http://security.debian.org/debian-security trixie-security/main Translation-en [45,2 kB]
Des:11 http://deb.debian.org/debian trixie-updates/main amd64 Packages [5.412 B]
Des:12 http://deb.debian.org/debian trixie-updates/main Translation-en [4.096 B]
Des:13 http://security.debian.org/debian-security trixie-security/non-free-firmware amd64 Packages [69,2 kB]
Des:14 http://security.debian.org/debian-security trixie-security/non-free-firmware Translation-en [45,2 kB]
Des:15 http://deb.debian.org/debian trixie-backports/non-free-firmware Sources [1.052 B]
Des:16 http://deb.debian.org/debian trixie-backports/main Sources [81,7 kB]
Des:17 http://deb.debian.org/debian trixie-backports/main amd64 Packages [102 kB]
Des:18 http://deb.debian.org/debian trixie-backports/main Translation-en [78,8 kB]
Des:19 http://deb.debian.org/debian trixie-backports/non-free-firmware amd64 Packages [3.648 B]
Des:20 http://deb.debian.org/debian trixie-backports/non-free-firmware Translation-en [2.712 B]
Descargados 1.054 kB en 10s (103 kB/s)
Se pueden actualizar 113 paquetes. Ejecute «apt list --upgradable» para verlos.
Upgrading:
cups                firefox-esr-l10n-fa  firefox-esr-l10n-pt-pt  libjavascriptcoregtk-1.6-0
cups-client         firefox-esr-l10n-fi  firefox-esr-l10n-ro     libmagickcore-7.q16-10
cups-common         firefox-esr-l10n-fr  firefox-esr-l10n-ru     libmagickcore-7.q16-10
cups-core-devel     firefox-esr-l10n-es-es  firefox-esr-l10n-es-es  libmagickcore-7.q16-10
```

### 2. Instalar Apache2

Comando:

```
sudo apt install apache2 -y
```

```
hector@hector-virtualbox:~$ sudo apt install apache2 -y
Installing:
  apache2

Installing dependencies:
  apache2-bin  apache2-utils  libaprutil1-dbd-sqlite3  libaprutil1-tools
  apache2-data  libapr1t64  libaprutil1-ldap  liblua5.4-0

Paquetes sugeridos:
  apache2-doc  apache2-suexec-pristine | apache2-suexec-custom  ufw

Summary:
  Upgrading: 0, Installing: 9, Removing: 0, Not Upgrading: 0
  Download size: 2.371 kB
  Space needed: 8.488 kB / 10,1 GB available

0% [Trabajando]
```

### 3. Configurar Apache en puerto 8080

Comando:

```
sudo nano /etc/apache2/ports.conf
```

Descripción: Abre el archivo de configuración de puertos. Cambia Listen 80 por Listen 8080.

```
GNU nano 8.4 /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

Comando:

```
sudo nano /etc/apache2/sites-available/000-default.conf
```

Descripción: Cambia <VirtualHost\*:80> por <VirtualHost\*:8080>.

```
GNU nano 8.4 /etc/apache2/sites-available/000-default.com
<VirtualHost *:8080>
    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/html

    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined
</VirtualHost>
```

### 5. Instalar PHP

Comando:

```
sudo apt install php libapache2-mod-php -y
```

```
hector@hector-virtualbox:~$ sudo apt install php libapache2-mod-php -y
Installing:
  libapache2-mod-php  php

Installing dependencies:
  libapache2-mod-php8.4  php-common  php8.4  php8.4-cli  php8.4-common  php8.4-opcache  php8.4-readline

Paquetes sugeridos:
  php-pear

Summary:
  Upgrading: 0, Installing: 9, Removing: 0, Not Upgrading: 0
  Download size: 4.922 kB
  Space needed: 23,8 MB / 10,1 GB available
0% [Trabajando]
```

### 6. Reiniciar Apache

Comando:

```
sudo systemctl restart apache2
```

```
hector@hector-virtualbox:~$ sudo systemctl restart apache2
hector@hector-virtualbox:~$
```

## 7. Verificar estado de Apache

Comando:

`sudo systemctl status apache2`

```
hector@hector-virtualbox:~$ 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 2025-11-05 10:38:32 CET; 41s ago
     Invocation: a5b929fcfdab4a72ab4691a0a2fd19bf
       Docs: https://httpd.apache.org/docs/2.4/
   Process: 21936 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
    Main PID: 21939 (apache2)
       Tasks: 6 (limit: 4538)
      Memory: 11.9M (peak: 12.5M)
         CPU: 35ms
    CGroup: /system.slice/apache2.service
            └─21939 /usr/sbin/apache2 -k start
              └─21941 /usr/sbin/apache2 -k start
                └─21942 /usr/sbin/apache2 -k start
                  └─21943 /usr/sbin/apache2 -k start
                    └─21944 /usr/sbin/apache2 -k start
                      └─21945 /usr/sbin/apache2 -k start

nov 05 10:38:32 hector-virtualbox systemd[1]: Starting apache2.service - The Apache HTTP Server...
nov 05 10:38:32 hector-virtualbox apachectl[21938]: AH00558: apache2: Could not reliably determine the server's
nov 05 10:38:32 hector-virtualbox systemd[1]: Started apache2.service - The Apache HTTP Server.
lines 1-21/21 (END)
```

Comando adicional para verificar puerto: `sudo netstat -tulpn | grep apache2`

```
hector@hector-virtualbox:~$ sudo netstat -tulpn | grep apache2
tcp6      0      0 :::8080          :::*              LISTEN     21939/apache2
hector@hector-virtualbox:~$
```

## 8. Crear archivo PHP de prueba

Comando:

`echo "<?php phpinfo(); ?>" | sudo tee /var/www/html/info.php`

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

## 9. Probar Apache desde terminal

Comando:

`curl http://localhost:8080/info.php`

```
Archivo  Editar  Ver  Terminal  Pestañas  Ayuda
hector@hector-virtualbox:~$ 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 {color: inherit;}
a:hover {text-decoration: none;}
table {border-collapse: collapse; border: 0; width: 934px; box-shadow: 1px 2px 3px rgba(0, 0, 0, 0.2);}
.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 {text-decoration: none;}
h2 > a:hover {text-decoration: underline;}
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-blue: #E2E4EF;
rple: #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}
}
</style>
<title>PHP 8.4.11 - phpinfo()</title><meta name="ROBOTS" content="NOINDEX,NOFOLLOW,NOARCHIVE" /></head>
<body><div class="center">
```

## PARTE 2: INSTALACIÓN Y CONFIGURACIÓN DE NGINX

### 1. Instalar Nginx

Comando:

```
sudo apt install nginx -y
```

```
hector@hector-virtualbox:~$ sudo apt install nginx -y
Installing:
  nginx

Installing dependencies:
  nginx-common

Paquetes sugeridos:
  fcgiwrap  nginx-doc

Summary:
  Upgrading: 0, Installing: 2, Removing: 0, Not Upgrading: 0
  Download size: 717 kB
  Space needed: 1.891 kB / 10,1 GB available

0% [Trabajando]
```

### 2. Configurar Nginx en puerto 8081

Comando:

```
sudo nano /etc/nginx/sites-available/default
```

Descripción: Abre la configuración por defecto. Cambia listen 80 por listen 8081.

```
server {
    listen 8081 default_server;
    listen [::]:8081 default_server;
```

### 3. Crear página HTML personalizada

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

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

### 4. Reiniciar Nginx

Comando:

```
sudo systemctl restart nginx
```

```
hector@hector-virtualbox:~$ sudo systemctl restart nginx
hector@hector-virtualbox:~$
```

## 5. Verificar estado de Nginx

Comando:

`sudo systemctl status nginx`

```
hector@hector-virtualbox:~$ 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 2025-11-05 11:00:20 CET; 1min 44s ago
 Invocation: 0789a398a7d44549810f533b36926820
    Docs: man:nginx(8)
   Process: 22355 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_process on; (code=exited, stat
   Process: 22357 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (code=exited, status=0/SUCC
 Main PID: 22359 (nginx)
    Tasks: 5 (limit: 4538)
   Memory: 3.9M (peak: 4.3M)
      CPU: 27ms
   CGroup: /system.slice/nginx.service
           └─22359 "nginx: master process /usr/sbin/nginx -g daemon on; master_process on;"
             └─22360 "nginx: worker process"
               └─22361 "nginx: worker process"
                 └─22362 "nginx: worker process"
                   └─22363 "nginx: worker process"

nov 05 11:00:19 hector-virtualbox systemd[1]: Starting nginx.service - A high performance web server and
nov 05 11:00:20 hector-virtualbox systemd[1]: Started nginx.service - A high performance web server and a
lines 1-20/20 (END)
```

Comando adicional para verificar puerto:

`sudo netstat -tulpn | grep nginx`

```
hector@hector-virtualbox:~$ sudo netstat -tulpn | grep nginx
tcp        0      0 0.0.0.0:8081          0.0.0.0:*            LISTEN     22359/nginx: master
tcp6       0      0 :::8081              :::*                  LISTEN     22359/nginx: master
hector@hector-virtualbox:~$
```

## 6. Probar Nginx desde terminal

Comando:

`curl http://localhost:8081`

```
hector@hector-virtualbox:~$ curl http://localhost:8081
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-tr
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
    <title>Apache2 Debian Default Page: It works</title>
    <style type="text/css" media="screen">
      * {
        margin: 0px 0px 0px 0px;
        padding: 0px 0px 0px 0px;
      }

      body, html {
        padding: 3px 3px 3px 3px;

        background-color: #D8DBE2;

        font-family: Verdana, sans-serif;
        font-size: 11pt;
        text-align: center;
      }

      div.main_page {
        position: relative;
        display: table;

        width: 800px;

        margin-bottom: 3px;
        margin-left: auto;
        margin-right: auto;
        padding: 0px 0px 0px 0px;

        border-width: 2px;
        border-color: #212738;
```

## PARTE 3: INSTALACIÓN Y CONFIGURACIÓN DE CADDY

### 1. Instalar dependencias necesarias

Comando:

```
sudo apt install -y debian-keyring debian-archive-keyring apt-transport-https curl
```

```
hector@hector-virtualbox:~$ sudo apt install -y debian-keyring debian-archive-keyring apt-transport-https
debian-archive-keyring ya está en su versión más reciente (2025.1).
curl ya está en su versión más reciente (8.14.1-2).
fijado curl como instalado manualmente.
Installing:
  apt-transport-https  debian-keyring

Summary:
  Upgrading: 0, Installing: 2, Removing: 0, Not Upgrading: 0
  Download size: 33,8 MB
  Space needed: 35,7 MB / 10,1 GB available

Des:1 http://deb.debian.org/debian trixie/main amd64 apt-transport-https all 3.0.3 [38,6 kB]
Des:2 http://deb.debian.org/debian trixie/main amd64 debian-keyring all 2025.07.26 [33,8 MB]
Descargados 33,8 MB en 11s (3.179 kB/s)
Seleccionando el paquete apt-transport-https previamente no seleccionado.
(Leyendo la base de datos ... 220221 ficheros o directorios instalados actualmente.)
Preparando para desempaquetar .../apt-transport-https_3.0.3_all.deb ...
Desempaquetando apt-transport-https (3.0.3) ...
Seleccionando el paquete debian-keyring previamente no seleccionado.
Preparando para desempaquetar .../debian-keyring_2025.07.26_all.deb ...
Desempaquetando debian-keyring (2025.07.26) ...
Configurando apt-transport-https (3.0.3) ...
Configurando debian-keyring (2025.07.26) ...
hector@hector-virtualbox:~$
```

### 2. Agregar repositorio de Caddy

Comando:

```
curl -1sLf 'https://dl.cloudsmith.io/public/caddy/stable/gpg.key' | sudo gpg --dearmor -o
/usr/share/keyrings/caddy-stable-archive-keyring.gpg curl -1sLf
'https://dl.cloudsmith.io/public/caddy/stable/debian.deb.txt' | sudo tee
/etc/apt/sources.list.d/caddy-stable.list
```

```
hector@hector-virtualbox:~$ curl -1sLf 'https://dl.cloudsmith.io/public/caddy/stable/gpg.key' | sudo gpg --dearmor -o /usr/share/keyrings/caddy-stable-archive-keyring.gpg
hector@hector-virtualbox:~$ curl -1sLf 'https://dl.cloudsmith.io/public/caddy/stable/debian.deb.txt' | sudo tee /etc/apt/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/deb/debian any-version main

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

### 3. Actualizar e instalar Caddy

Comando:

```
sudo apt update && sudo apt install caddy -y
```

```
hector@hector-virtualbox:~$ sudo apt update && sudo apt install caddy -y
Des:1 http://deb.debian.org/debian trixie InRelease [140 kB]
Obj:2 http://security.debian.org/debian-security trixie-security InRelease
Obj:3 http://deb.debian.org/debian trixie-updates InRelease
Obj:4 http://deb.debian.org/debian trixie-backports InRelease
Des:5 https://dl.cloudsmith.io/public/caddy/stable/deb/debian any-version InRelease [14,8 kB]
Des:6 https://dl.cloudsmith.io/public/caddy/stable/deb/debian any-version/main amd64 Packages [4.329 B]
Descargados 160 kB en 11s (14,5 kB/s)
Todos los paquetes están actualizados.
Installing:
  caddy

Summary:
  Upgrading: 0, Installing: 1, Removing: 0, Not Upgrading: 0
  Download size: 16,0 MB
  Space needed: 44,5 MB / 9.975 MB available

Des:1 https://dl.cloudsmith.io/public/caddy/stable/deb/debian any-version/main amd64 caddy amd64 2.10.2 [16,0 MB]
Descargados 16,0 MB en 10s (1.536 kB/s)
Seleccionando el paquete caddy previamente no seleccionado.
(Leyendo la base de datos ... 220238 ficheros o directorios instalados actualmente.)
Preparando para desempaquetar .../caddy_2.10.2_amd64.deb ...
Desempaquetando caddy (2.10.2) ...
Configurando caddy (2.10.2) ...
Created symlink '/etc/systemd/system/multi-user.target.wants/caddy.service' -> '/usr/lib/systemd/system/caddy.service'.
Procesando disparadores para man-db (2.13.1-1) ...
hector@hector-virtualbox:~$
```



#### 4. Crear directorio para Caddy

Comando:

```
sudo mkdir -p /var/www/caddy
```

```
hector@hector-virtualbox:~$ sudo mkdir -p /var/www/caddy
hector@hector-virtualbox:~$
```

#### 5. Crear archivo Markdown de prueba

Comando:

```
echo "# Bienvenido a Caddy" | sudo tee /var/www/caddy/README.md
echo "" | sudo tee -a /var/www/caddy/README.md
echo "Este servidor está funcionando correctamente." | sudo tee -a
/var/www/caddy/README.md
echo "" | sudo tee -a /var/www/caddy/README.md
echo "## Características" | sudo tee -a /var/www/caddy/README.md
echo "- Servidor moderno" | sudo tee -a /var/www/caddy/README.md
echo "- HTTPS automático" | sudo tee -a /var/www/caddy/README.md
echo "- Fácil configuración" | sudo tee -a /var/www/caddy/README.md
```

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

```
hector@hector-virtualbox:~$ echo "" | sudo tee -a /var/www/caddy/README.md
```

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

```
hector@hector-virtualbox:~$ echo "" | sudo tee -a /var/www/caddy/README.md
```

```
hector@hector-virtualbox:~$ echo "## Características" | sudo tee -a /var/www/caddy/README.md
## Características
```

```
hector@hector-virtualbox:~$ echo "- Servidor moderno" | sudo tee -a /var/www/caddy/README.md
- Servidor moderno
```

```
hector@hector-virtualbox:~$ echo "- HTTPS automático" | sudo tee -a /var/www/caddy/README.md
- HTTPS automático
```

```
hector@hector-virtualbox:~$ echo "- Fácil configuración" | sudo tee -a /var/www/caddy/README.md
- Fácil configuración
```

#### 6. Crear imagen de prueba (cuidado WSL hay que hacer ajustes)

Comando:

```
curl -o /tmp/test-image.jpg "https://www.python.org/static/apple-touch-icon-144x144-precomposed.png"
sudo mv /tmp/test-image.jpg /var/www/caddy/test.jpg
```

```
hector@hector-virtualbox:~$ curl -o /tmp/test-image.jpg "https://www.python.org/static/apple-touch-icon-144x144-precomposed.png"
h"
sudo mv /tmp/test-image.jpg /var/www/caddy/test.jpg
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total     Spent    Left     Speed
100 7382  100 7382    0     0  1465      0  0:00:05  0:00:05 --:--:-- 1966
hector@hector-virtualbox:~$
```

#### 7. Crear Caddyfile personalizado

Comando:

```
sudo nano /etc/caddy/Caddyfile
```

```
hector@hector-virtualbox:~$ sudo nano /etc/caddy/Caddyfile
```

Escribe el siguiente contenido: :8082 { root \* /var/www/caddy file\_server browse  
@markdown path \*.md header @markdown Content-Type text/plain }

```
GNU nano 8.4 /etc/caddy/Caddyfile
:8082 {
  root * /var/www/caddy
  file_server browse
  @markdown path *.md
  header @markdown Content-Type text/plain
}
```

## 8. Reiniciar Caddy

Comando:

sudo systemctl restart caddy

```
hector@hector-virtualbox:~$ sudo systemctl restart caddy
```

## 9. Verificar estado de Caddy

Comando:

sudo systemctl status caddy

```
hector@hector-virtualbox:~$ sudo systemctl status caddy
● caddy.service - Caddy
   Loaded: loaded (/usr/lib/systemd/system/caddy.service; enabled; preset: enabled)
   Active: active (running) since Wed 2025-11-05 14:43:21 CET; 37s ago
  Invocation: 672e506ad9234e8db8428cfc44a27427
     Docs: https://caddyserver.com/docs/
   Main PID: 2879 (caddy)
      Tasks: 10 (limit: 4538)
     Memory: 13.4M (peak: 14.1M)
        CPU: 63ms
     CGroup: /system.slice/caddy.service
            └─2879 /usr/bin/caddy run --environ --config /etc/caddy/Caddyfile

nov 05 14:43:21 hector-virtualbox caddy[2879]: {"level":"info","ts":1762350201.1357284,"logger":"admin","msg":"admin endpoint>
nov 05 14:43:21 hector-virtualbox caddy[2879]: {"level":"warn","ts":1762350201.1359365,"logger":"http","msg":"HTTP/2 skipped >
nov 05 14:43:21 hector-virtualbox caddy[2879]: {"level":"warn","ts":1762350201.1359766,"logger":"http","msg":"HTTP/3 skipped >
nov 05 14:43:21 hector-virtualbox caddy[2879]: {"level":"info","ts":1762350201.1359804,"logger":"http.log","msg":"server runn>
nov 05 14:43:21 hector-virtualbox caddy[2879]: {"level":"info","ts":1762350201.1362665,"msg":"autosaved config (load with --r>
nov 05 14:43:21 hector-virtualbox caddy[2879]: {"level":"info","ts":1762350201.1363144,"logger":"tls.cache.maintenance","msg">
nov 05 14:43:21 hector-virtualbox caddy[2879]: {"level":"info","ts":1762350201.1363432,"msg":"serving initial configuration"}
nov 05 14:43:21 hector-virtualbox systemd[1]: Started caddy.service - Caddy.
nov 05 14:43:21 hector-virtualbox caddy[2879]: {"level":"info","ts":1762350201.1402788,"logger":"tls","msg":"storage cleaning>
nov 05 14:43:21 hector-virtualbox caddy[2879]: {"level":"info","ts":1762350201.140331,"logger":"tls","msg":"finished cleaning>
lines 1-22/22 (END)
```

Comando adicional para verificar puerto: sudo netstat -tulpn | grep caddy

```
hector@hector-virtualbox:~$ sudo netstat -tulpn | grep caddy
tcp        0      0 127.0.0.1:2019        0.0.0.0:*           LISTEN      2879/caddy
tcp6       0      0 :::8082                :::*                 LISTEN      2879/caddy
hector@hector-virtualbox:~$
```



## 10. Probar Caddy desde terminal

Comando:

curl <http://localhost:8082/>

```
hector@hector-virtualbox:~$ curl http://localhost:8082/

<!DOCTYPE html>
<html>
  <head>
    <title></title>
    <link rel="canonical" href="/" />
    <meta charset="utf-8">
    <meta name="color-scheme" content="light dark">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <style nonce="fed3ff42-928b-4788-abf8-c889c355f461">
    * { padding: 0; margin: 0; box-sizing: border-box; }
  </style>
  <body>
    <div>
      <img alt="Caddy logo" />
      <div>
        <h1>Caddy</h1>
        <h2>Web Server</h2>
        <h3>by Matthew Fisher</h3>
      </div>
    </div>
  </body>
</html>
```

## 11. Probar archivo Markdown

Comando:

curl <http://localhost:8082/README.md>

```
hector@hector-virtualbox:~$ curl http://localhost:8082/README.md
# Bienvenido a Caddy

Este servidor está funcionando correctamente.

## Características
- Servidor moderno
- HTTPS automático
- Fácil configuración
hector@hector-virtualbox:~$
```

```
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 []:hectoritogorrrion@gmail.com
```

### 3. Habilitar módulo SSL en Apache

Comando:

`sudo a2enmod ssl`

```
hector@hector-virtualbox:~$ 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 certificates.
To activate the new configuration, you need to run:
    systemctl restart apache2
hector@hector-virtualbox:~$
```

### 4. Cambiar puerto SSL

Comando:

`sudo nano /etc/apache2/ports.conf`

Descripción: Añade la línea Listen 8443 para que Apache escuche HTTPS en puerto 8443.

```
GNU nano 8.4 /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>

Listen 8443
```

### 5. Modificar VirtualHost SSL

Comando:

`sudo nano /etc/apache2/sites-available/default-ssl.conf`

Cambia `<VirtualHost *:443>` por `<VirtualHost *:8443>`

```
GNU nano 8.4 /etc/apache2/sites-available/default-ssl.conf
<VirtualHost *:8443>
    ServerAdmin webmaster@localhost

    DocumentRoot /var/www/html

    # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
```

## 6. Habilitar sitio SSL

Comando:

```
sudo a2ensite default-ssl.conf
```

```
hector@hector-virtualbox:~$ sudo a2ensite default-ssl.conf
Enabling site default-ssl.
To activate the new configuration, you need to run:
    systemctl reload apache2
hector@hector-virtualbox:~$
```

## 7. Reiniciar Apache

Comando:

```
sudo systemctl restart apache2
```

```
hector@hector-virtualbox:~$ sudo systemctl restart apache2
hector@hector-virtualbox:~$
```

## 8. Verificar HTTPS

Comando:

```
curl -i -k https://localhost:8443
```

```
hector@hector-virtualbox:~$ curl -i -k https://localhost:8443
HTTP/1.1 200 OK
Date: Thu, 06 Nov 2025 09:00:05 GMT
Server: Apache/2.4.65 (Debian)
Last-Modified: Wed, 05 Nov 2025 09:24:12 GMT
ETag: "29cf-642d582eba357"
Accept-Ranges: bytes
Content-Length: 10703
Vary: Accept-Encoding
Content-Type: text/html

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transi
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
    <title>Apache2 Debian Default Page: It works</title>
    <style type="text/css" media="screen">
      * {
        margin: 0px 0px 0px 0px;
        padding: 0px 0px 0px 0px;
      }

      body, html {
        padding: 3px 3px 3px 3px;

        background-color: #D8DBE2;

        font-family: Verdana, sans-serif;
        font-size: 11pt;
        text-align: center;
      }

      div.main_page {
        position: relative;
        display: table;

        width: 800px;
```

## PARTE 5: VERIFICACIÓN FINAL DE LOS TRES SERVIDORES

### 1. Verificar que todos los servicios están activos

Comando para verificar Apache:

- `sudo systemctl status apache2`

```
hector@hector-virtualbox:~$ 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 Thu 2025-11-06 09:58:46 CET; 5min ago
 Invocation: f88a89460208457b8ef1bfecd7ecef01
    Docs: https://httpd.apache.org/docs/2.4/
  Process: 1976 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
 Main PID: 1979 (apache2)
    Tasks: 6 (limit: 4538)
   Memory: 19.8M (peak: 20M)
      CPU: 111ms
   CGroup: /system.slice/apache2.service
           └─1979 /usr/sbin/apache2 -k start
             └─1981 /usr/sbin/apache2 -k start
               └─1982 /usr/sbin/apache2 -k start
                 └─1983 /usr/sbin/apache2 -k start
                   └─1984 /usr/sbin/apache2 -k start
                     └─1985 /usr/sbin/apache2 -k start

nov 06 09:58:46 hector-virtualbox systemd[1]: Starting apache2.service - The Apache HTTP Server...
nov 06 09:58:46 hector-virtualbox apachectl[1978]: AH00558: apache2: Could not reliably determine the server's
nov 06 09:58:46 hector-virtualbox systemd[1]: Started apache2.service - The Apache HTTP Server.
lines 1-21/21 (END)
```

Comando para verificar puerto de Apache:

- `sudo netstat -tulpn | grep apache2`

```
hector@hector-virtualbox:~$ sudo netstat -tulpn | grep apache2
tcp6      0      0  :::8443                :::*                    LISTEN     1979/apache2
tcp6      0      0  :::443                  :::*                    LISTEN     1979/apache2
tcp6      0      0  :::8080                  :::*                    LISTEN     1979/apache2
hector@hector-virtualbox:~$
```

Comando para verificar Nginx:

- `sudo systemctl status nginx`

```
hector@hector-virtualbox:~$ 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 Thu 2025-11-06 09:52:12 CET; 13min ago
 Invocation: aa7ab6e822f948bb83e3b340051049b0
    Docs: man:nginx(8)
  Process: 874 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
  Process: 876 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
 Main PID: 882 (nginx)
    Tasks: 5 (limit: 4538)
   Memory: 6.1M (peak: 6.5M)
      CPU: 46ms
   CGroup: /system.slice/nginx.service
           └─882 "nginx: master process /usr/sbin/nginx -g daemon on; master_process on;"
             └─883 "nginx: worker process"
               └─884 "nginx: worker process"
                 └─885 "nginx: worker process"
                   └─886 "nginx: worker process"

nov 06 09:52:12 hector-virtualbox systemd[1]: Starting nginx.service - A high performance web server and a reverse proxy server...
nov 06 09:52:12 hector-virtualbox systemd[1]: Started nginx.service - A high performance web server and a reverse proxy server.
lines 1-20/20 (END)
```

Comando para verificar puerto de Nginx:

- `sudo netstat -tulpn | grep nginx`

```
hector@hector-virtualbox:~$ sudo netstat -tulpn | grep nginx
tcp      0      0  0.0.0.0:8081              0.0.0.0:*              LISTEN     882/nginx: master p
tcp6     0      0  :::8081                  :::*                    LISTEN     882/nginx: master p
hector@hector-virtualbox:~$
```

Comando para verificar Caddy:

- `sudo systemctl status caddy`

```
hector@hector-virtualbox:~$ sudo systemctl status caddy
● caddy.service - Caddy
   Loaded: loaded (/usr/lib/systemd/system/caddy.service; enabled; preset: enabled)
   Active: active (running) since Thu 2025-11-06 09:52:12 CET; 14min ago
  Invocation: 31066a26a7104a209a34a7e85230d62a
     Docs: https://caddyserver.com/docs/
   Main PID: 872 (caddy)
      Tasks: 9 (limit: 4538)
     Memory: 53.1M (peak: 55M)
        CPU: 260ms
    CGroup: /system.slice/caddy.service
           └─872 /usr/bin/caddy run --environ --config /etc/caddy/Caddyfile

nov 06 09:52:12 hector-virtualbox caddy[872]: {"level":"info","ts":1762419132.650674,"logger":"admin","msg":"s
nov 06 09:52:12 hector-virtualbox caddy[872]: {"level":"info","ts":1762419132.652691,"logger":"tls.cache.main
nov 06 09:52:12 hector-virtualbox caddy[872]: {"level":"warn","ts":1762419132.6548452,"logger":"http","msg":"t
nov 06 09:52:12 hector-virtualbox caddy[872]: {"level":"info","ts":1762419132.6551976,"logger":"http.log","ms
nov 06 09:52:12 hector-virtualbox caddy[872]: {"level":"info","ts":1762419132.6584108,"msg":"autosaved config
nov 06 09:52:12 hector-virtualbox caddy[872]: {"level":"info","ts":1762419132.6587439,"msg":"serving initial
nov 06 09:52:12 hector-virtualbox systemd[1]: Started caddy.service - Caddy.
nov 06 09:52:12 hector-virtualbox caddy[872]: {"level":"info","ts":1762419132.6650903,"logger":"tls","msg":"st
nov 06 09:52:12 hector-virtualbox caddy[872]: {"level":"info","ts":1762419132.665133,"logger":"tls","msg":"fi
lines 1-22/22 (END)
```

Comando para verificar puerto de Caddy:

- `sudo netstat -tulpn | grep caddy`

```
hector@hector-virtualbox:~$ sudo netstat -tulpn | grep caddy
tcp        0      0 127.0.0.1:2019        0.0.0.0:*             LISTEN      872/caddy
tcp6       0      0 :::8082               :::*                   LISTEN      872/caddy
hector@hector-virtualbox:~$
```

2. Verificar puertos en uso (todos simultáneamente)

Comando:

`sudo netstat -tulpn | grep -E '8080|8081|8082|8443'`

```
hector@hector-virtualbox:~$ sudo netstat -tulpn | grep -E '8080|8081|8082|8443'
tcp        0      0 0.0.0.0:8081          0.0.0.0:*             LISTEN      882/nginx: master p
tcp6       0      0 :::8443               :::*                   LISTEN      1979/apache2
tcp6       0      0 :::8080               :::*                   LISTEN      1979/apache2
tcp6       0      0 :::8081               :::*                   LISTEN      882/nginx: master p
tcp6       0      0 :::8082               :::*                   LISTEN      872/caddy
hector@hector-virtualbox:~$
```



```
hector@hector-virtualbox:~$ curl http://localhost:8082
<!DOCTYPE html>
<html>
  <head>
    <title></title>
    <link rel="canonical" href="/" />
    <meta charset="utf-8">
    <meta name="color-scheme" content="light dark">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
<style nonce="b0566c1c-3fc3-4f63-8e5f-450c410f3105">
* { padding: 0; margin: 0; box-sizing: border-box; }

body {
  font-family: Inter, system-ui, sans-serif;
  font-size: 16px;
  text-rendering: optimizespeed;
  background-color: #f3f6f7;
  min-height: 100vh;
}

img,
svg {
  vertical-align: middle;
  z-index: 1;
}

img {
  max-width: 100%;
  max-height: 100%;
  border-radius: 5px;
}

td img {
  max-width: 1.5em;
  max-height: 2em;
  object-fit: cover;
}
```

```
hector@hector-virtualbox:~$ curl -i -k https://localhost:8443
HTTP/1.1 200 OK
Date: Thu, 06 Nov 2025 09:14:44 GMT
Server: Apache/2.4.65 (Debian)
Last-Modified: Wed, 05 Nov 2025 09:24:12 GMT
ETag: "29cf-642d582eba357"
Accept-Ranges: bytes
Content-Length: 10703
Vary: Accept-Encoding
Content-Type: text/html

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
    <title>Apache2 Debian Default Page: It works</title>
    <style type="text/css" media="screen">
      *
      {
        margin: 0px 0px 0px 0px;
        padding: 0px 0px 0px 0px;
      }
    </style>
    body, html {
      padding: 3px 3px 3px 3px;
      background-color: #D8DBE2;
      font-family: Verdana, sans-serif;
      font-size: 11pt;
      text-align: center;
    }
    div.main_page {
      position: relative;
      display: table;
      width: 800px;
```