```
F
                          root@ubuntu2: /home/vboxuser/Desktop
                                                             Q
vboxuser@ubuntu2:~/Desktop$ sudo su
[sudo] password for vboxuser:
root@ubuntu2:/home/vboxuser/Desktop# sudo apt update && sudo apt upgrade -y
Get:1 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Hit:2 http://es.archive.ubuntu.com/ubuntu noble InRelease
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 [1,21
3 kB]
Get:6 http://es.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1,4
Get:7 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [202
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 Package
s [1,967 kB]
Get:11 http://es.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [28
7 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 Metada
```

Este comando actualiza la lista de paquetes y mejora el sistema a las ultimas versiones

```
root@ubuntu2:/home/vboxuser/Desktop# 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 package was automatically installed and is no longer required:
   libllvm19
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 7 not upgraded.
root@ubuntu2:/home/vboxuser/Desktop#
```

Instala el servidor web Apache en su sistema

```
root@ubuntu2: /home/vboxuser/Desktop
                                                                Q
 GNU nano 7.2
                                /etc/apache2/ports.conf
  If you just change the port or add more ports here, you will likely also
Listen 8080
<IfModule ssl_module>
        Listen 443
</IfModule>
<IfModule mod_gnutls.c>
        Listen 443
</IfModule>
                                [ Read 13 lines ]
  Help
             ^O Write Out ^W Where Is
                                                       T Execute
                                                                    ^C Location
   Exit
             ^R Read File ^\ Replace
                                        ^U Paste
                                                         Justify
                                                                      Go To Line
```

Abre el archivo de configuracion de puertos .

```
root@ubuntu2: /home/vboxuser/Desktop
                                                               Q
 GNU nano 7.2
                    /etc/apache2/sites-available/000-default.conf
<VirtualHost *:8080>
        # The ServerName directive sets the request scheme, hostname and port t	imes
        # match this virtual host. For the default virtual host (this file) this
        #ServerName www.example.com
        ServerAdmin webmaster@localhost
       DocumentRoot /var/www/html
        ErrorLog ${APACHE_LOG_DIR}/error.log
                                [ Read 29 lines ]
               Write Out ^W Where Is
  Help
                                           Cut
                                                        Execute
                                                                      Location
  Exit
                Read File
                                           Paste
                                                         Justify
                                                                      Go To Line
                             Replace
```

```
root@ubuntu2:/home/vboxuser/Desktop# 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 package was automatically installed and is no longer required:
   libllvm19
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 7 not upgraded.
root@ubuntu2:/home/vboxuser/Desktop#
```

Instala php y su módulo para funcionar con apache

```
root@ubuntu2:/home/vboxuser/Desktop# sudo systemctl restart apache2
root@ubuntu2:/home/vboxuser/Desktop#
```

Reinicia apache para aplicar los cambios

```
root@ubuntu2:/home/vboxuser/Desktop# sudo systemctl status apache2
apache2.service - The Apache HTTP Server
    Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: >
    Active: active (running) since Fri 2025-10-10 07:55:34 UTC; 51s ago
      Docs: https://httpd.apache.org/docs/2.4/
    Process: 14154 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/S>
   Main PID: 14160 (apache2)
     Tasks: 6 (limit: 4603)
    Memory: 11.2M (peak: 11.8M)
       CPU: 44ms
    CGroup: /system.slice/apache2.service
             —14160 /usr/sbin/apache2 -k start
             —14162 /usr/sbin/apache2 -k start
             -14163 /usr/sbin/apache2 -k start
             —14164 /usr/sbin/apache2 -k start
              -14165 /usr/sbin/apache2 -k start
             Oct 10 07:55:34 ubuntu2 systemd[1]: Starting apache2.service - The Apache HTTP >
Oct 10 07:55:34 ubuntu2 apachectl[14159]: AH00558: apache2: Could not reliably
Oct 10 07:55:34 ubuntu2 systemd[1]: Started apache2.service - The Apache HTTP S>
lines 1-20/20 (END)
```

Comprueba que apache funciona bien en el puerto 8080

```
root@ubuntu2:/home/vboxuser/Desktop# echo "<?php phpinfo(); ?>" | sudo tee /var/
www/html/info.php
<?php phpinfo(); ?>
root@ubuntu2:/home/vboxuser/Desktop#
```

crea un archivo para mostrar información del servidor apache instalado.

```
root@ubuntu2:/home/vboxuser/Desktop# curl http://localhost:8080/info.php
Command 'curl' not found, but can be installed with:
snap install curl # version 8.16.0, or
apt install curl # version 8.5.0-2ubuntu10.6
See 'snap info curl' for additional versions.
root@ubuntu2:/bome/yboxuser/Desktop#
```

Mira que apache vaya bien con el contenido php.

```
root@ubuntu2:/home/vboxuser/Desktop# 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 package was automatically installed and is no longer required:
libllvm19
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 7 not upgraded.
root@ubuntu2:/home/vboxuser/Desktop#
```

Instala el servidor nginx en el sistema

```
# Please see /usr/share/doc/nginx-doc/examples/ for more detailed examples.
##

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

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

    # Note: You should disable gzip for SSL traffic.
    # See: https://bugs.debian.org/773332

# Read up on ssl_ciphers to ensure a secure configuration.
    # See: https://bugs.debian.org/765782

    [Wrote 91 lines]

*G Help **O Write Out **M Where Is **K Cut **T Execute **C Location**
```

```
root@ubuntu2:/home/vboxuser/Desktop# echo "<h1>Servidor Nginx</h1>Funcionando
en puerto 8081" | sudo tee /usr/share/nginx/html/index.html
<h1>Servidor Nginx</h1>Funcionando en puerto 8081
root@ubuntu2:/home/vboxuser/Desktop#
```

Crea una pagina HTML que sea identificada por nginx

```
reinicia nginx
```

```
root@ubuntu2:/home/vboxuser/Desktop# 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: en>
     Active: active (running) since Fri 2025-10-10 08:07:13 UTC; 31s ago
      Docs: man:nginx(8)
    Process: 14259 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_proc>
    Process: 14260 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (>
   Main PID: 14262 (nginx)
      Tasks: 5 (limit: 4603)
     Memory: 5.0M (peak: 5.6M)
        CPU: 19ms
     CGroup: /system.slice/nginx.service
              -14262 "nginx: master process /usr/sbin/nginx -g daemon on; maste>
              —14263 "nginx: worker process
              —14264 "nginx: worker process"
              —14265 "nginx: worker process"
—14266 "nginx: worker process"
Oct 10 08:07:13 ubuntu2 systemd[1]: Starting nginx.service - A high performance>
Oct 10 08:07:13 ubuntu2 systemd[1]: Started nginx.service - A high performance >
lines 1-19/19 (END)
```

Comprueba que funciona nginx en el puerto 8081

```
root@ubuntu2:/home/vboxuser/Desktop# curl http://localhost:8081
Command 'curl' not found, but can be installed with:
snap install curl # version 8.16.0, or
apt install curl # version 8.5.0-2ubuntu10.6
See 'snap info curl' for additional versions.
root@ubuntu2:/home/vboxuser/Desktop#
```

Revisa que nginx funciona bien en el servidor HTML

```
root@ubuntu2:/home/vboxuser/Desktop# sudo apt install -y debian-keyring debian-a
rchive-keyring apt-transport-https curl
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following package was automatically installed and is no longer required:
  libllvm19
Use 'sudo apt autoremove' to remove it.
The following NEW packages will be installed:
  apt-transport-https curl debian-archive-keyring debian-keyring
0 upgraded, 4 newly installed, 0 to remove and 7 not upgraded.
Need to get 31.7 MB of archives.
After this operation, 33.9 MB of additional disk space will be used.
Get:1 http://es.archive.ubuntu.com/ubuntu noble-updates/universe amd64 apt-trans
port-https all 2.8.3 [3,970 B]
Get:2 http://es.archive.ubuntu.com/ubuntu noble-updates/main amd64 curl amd64 8.
5.0-2ubuntu10.6 [226 kB]
Get:3 http://es.archive.ubuntu.com/ubuntu noble/universe amd64 debian-archive-ke
yring all 2023.4ubuntu1 [168 kB]
Get:4 http://es.archive.ubuntu.com/ubuntu noble/universe amd64 debian-keyring al
l 2023.12.24 [31.3 MB]
                                                                  2,978 kB/s 0s
```

Instalo las siguientes herramientas para poder añadir repositorios externos

```
root@ubuntu2:/home/vboxuser/Desktop# curl -1sLf 'https://dl.cloudsmith.io/public
/caddy/stable/gpg.key' | sudo gpg --dearmor -o /usr/share/keyrings/caddy-stable-
archive-Keyring.gpg
root@ubuntu2:/home/vboxuser/Desktop#
root@ubuntu2:/home/vboxuser/Desktop# curl -1sLf 'https://dl.cloudsmith.io/public
/caddy/stable/debian.deb.txt' | sudo tee /etc/apt/sources.List.d/caddy-stable.Li
st
tee: /etc/apt/sources.List.d/caddy-stable.List: No such file or directory
# 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
root@ubuntu2:/home/vboxuser/Desktop#
```

Añade el repositorio oficial de caddy a tu sistema

```
root@ubuntu2:/home/vboxuser/Desktop# sudo apt update && sudo apt install caddy -
Hit:1 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:2 http://es.archive.ubuntu.com/ubuntu noble InRelease
Hit:3 http://es.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:4 http://es.archive.ubuntu.com/ubuntu noble-backports InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
7 packages can be upgraded. Run 'apt list --upgradable' to see them.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following package was automatically installed and is no longer required:
  libllvm19
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
 libnss3-tools
The following NEW packages will be installed:
 caddy libnss3-tools
0 upgraded, 2 newly installed, 0 to remove and 7 not upgraded.
Need to get 11.2 MB of archives.
```

## actualiza paquetes e instala caddy

```
root@ubuntu2:/home/vboxuser/Desktop# sudo mkdir -p /var/www/caddy
root@ubuntu2:/home/vboxuser/Desktop#
```

## Crea un directorio para los archivos de caddy

```
root@ubuntu2:/home/vboxuser/Desktop# echo "· Bienvenido a Caddy" | sudo tee /var /www/caddy/README.md
· Bienvenido a Caddy
root@ubuntu2:/home/vboxuser/Desktop# echo "" | sudo tee -a /var/www/caddy/README
.md

root@ubuntu2:/home/vboxuser/Desktop# echo "Este servidor esta funcionando correc tamente." |sudo tee -a /var/www/caddy/README.md
Este servidor esta funcionando correctamente.
root@ubuntu2:/home/vboxuser/Desktop# echo "## Caracteristicas" | sudo tee -a /var/www/caddy/README.md
## Caracteristicas

root@ubuntu2:/home/vboxuser/Desktop# echo "- Servidor moderno" | sudo tee -a /var/www/caddy/README.md
- Servidor moderno
root@ubuntu2:/home/vboxuser/Desktop#
```

```
root@ubuntu2:/home/vboxuser/Desktop# echo "- HTPPS automatico" | sudo tee -a /va r/www/caddy/README.md
- HTPPS automatico
root@ubuntu2:/home/vboxuser/Desktop# echo "- Facil configuracion" | sudo tee -a /var/www/caddy/README.md
- Facil configuracion
root@ubuntu2:/home/vboxuser/Desktop#
```

Crea un archivo MACKDOWN con contenido de ejemplo

```
root@ubuntu2:/home/vboxuser/Desktop# curl -o /tmp/test-image.jpg "https://www.py
thon.org/static/apple-touch-icon-144x144-precomposed.png"
 % Total
           % Received % Xferd Average Speed
                                             Time
                                                    Time
                                                             Time Current
                              Dload Upload
                                             Total
                                                             Left Speed
                                                    Spent
                    0
                                        0 --:--:--
100 7382 100 7382
                           0
                               101k
root@ubuntu2:/home/vboxuser/Desktop# sudo mv /tmp/test-image.jpg /var/www/caddy/
test.jpg
root@ubuntu2:/home/vboxuser/Desktop#
```

Descarga una imagen de prueba para verificar que Caddy sirve para archivos estaticos.

```
GNU nano 7.2 /etc/caddy/caddyfile

:8082 {
    root * /var/www/caddy
    file_server browse

    @markdown path *.md
    header @markdown Content-Type text/plain
}
```

```
oot@ubuntu2:/home/vboxuser/Desktop# sudo systemctl status caddy
 caddy.service - Caddy
      Loaded: loaded (/usr/lib/systemd/system/caddy.service; enabled; preset: e>
      Active: active (running) since Fri 2025-10-10 09:06:10 UTC; 4s ago
        Docs: https://caddyserver.com/docs/
   Main PID: 17039 (caddy)
       Tasks: 9 (limit: 4603)
      Memory: 7.1M (peak: 7.4M)
         CPU: 37ms
      CGroup: /system.slice/caddy.service
               -17039 /usr/bin/caddy run --environ --config /etc/caddy/Caddyfile
Oct 10 09:06:10 ubuntu2 caddy[17039]: {"level":"info","ts":1760087170.5743196,>
Oct 10 09:06:10 ubuntu2 caddy[17039]: {"level":"warn","ts":1760087170.5747628,
Oct 10 09:06:10 ubuntu2 caddy[17039]: {"level":"info","ts":1760087170.5764894,
Oct 10 09:06:10 ubuntu2 caddy[17039]: {"level":"info","ts":1760087170.5767927,
Oct 10 09:06:10 ubuntu2 caddy[17039]: {"level":"info","ts":1760087170.5769682,
Oct 10 09:06:10 ubuntu2 caddy[17039]: {"level":"info","ts":1760087170.5769844,
Oct 10 09:06:10 ubuntu2 caddy[17039]: {"level":"info","ts":1760087170.5768235,
Oct 10 09:06:10 ubuntu2 caddy[17039]: {"level":"info","ts":1760087170.5771909,
Oct 10 09:06:10 ubuntu2 caddy[17039]: {"level":"info","ts":1760087170.5774806,>
Oct 10 09:06:10 ubuntu2 systemd[1]: Started caddy.service - Caddy.
lines 1-21/21 (END)
```

Verifica que caddy sirve correctamente en los archivos Markdown

```
root@ubuntu2:/home/vboxuser/Desktop# sudo apt install certbot python3-certbot-a
pache - v
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following package was automatically installed and is no longer required:
  libllvm19
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  augeas-lenses libaugeas0 python3-acme python3-augeas python3-certbot
  python3-configargparse python3-icu python3-josepy python3-openssl
  python3-parsedatetime python3-rfc3339
Suggested packages:
  augeas-doc python-certbot-doc python3-certbot-nginx augeas-tools
  python-acme-doc python-certbot-apache-doc python-openssl-doc
  python3-openssl-dbg
The following NEW packages will be installed:
```

Instala Cerbot y su integracion con Apache para gestionar certificados SSL

## crea un certificado autofirmado para practicar HTTPS localmente

```
root@ubuntu2:/home/vboxuser/Desktop# 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
root@ubuntu2:/home/vboxuser/Desktop#
```

## activa el modulo ssl para https en apache

```
root@ubuntu2:/home/vboxuser/Desktop# systemctl reload apache2
root@ubuntu2:/home/vboxuser/Desktop# sudo a2ensite default-ssl.conf
Site default-ssl already enabled
root@ubuntu2:/home/vboxuser/Desktop#

Apache en puerto
8080
```

aplica todos los cambios de configuracion SSL

root@ubuntu2:/home/vboxuser/Desktop# sudo systemctl restart apache2

```
Troot@ubuntu2:/home/vboxuser/Desktop# curl -i -k https://localhost:8443
HTTP/1.1 200 OK
Date: Fri, 10 Oct 2025 09:23:56 GMT
Server: Apache/2.4.58 (Ubuntu)
Last-Modified: Fri, 03 Oct 2025 08:03:44 GMT
ETag: "48-6403c8a64b471"
Accept-Ranges: bytes
Content-Length: 72
Vary: Accept-Encoding
Content-Type: text/html

<h1>Hola Mundo desde Nginx</h1>Servidor funcionando correctamente
Apache en puerto

Apach
```

Muestra el estado de los tres servidores simultaneamente

```
root@ubuntu2:/home/vboxuser/Desktop# sudo netstat -tulpn | grep -E '8080|8081|8082|8443'
tcp
           0
                  0 0.0.0.0:8081
                                            0.0.0.0:*
                                                                     LISTEN
                                                                                  14262/nginx: master
tcp6
           0
                                                                     LISTEN
                                                                                  14262/nginx: master
                                                                                  17824/apache2
           0
                                                                     LISTEN
tcp6
tcp6
           0
                  0 :::8
                                                                     LISTEN
                                                                                  17039/caddy
           0
                  0 :::8
                                                                     LISTEN
                                                                                 17824/apache2
tcp6
root@ubuntu2:/home/vboxuser/Desktop#
```

Lista la imagen donde estan escuchando los servidores

```
root@ubuntu2:/home/vboxuser/Desktop# curl http://localhost:8443
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>400 Bad Request</title>
</head><body>
<h1>Bad Request</h1>
Your browser sent a request that this server could not understand.<br />
Reason: You're speaking plain HTTP to an SSL-enabled server port.<br/>
Instead use the HTTPS scheme to access this URL, please.<br/>

<hr>
<hr>
<address>Apache/2.4.58 (Ubuntu) Server at 10.0.0.116 Port 8443</address>
</body></html>
root@ubuntu2:/home/vboxuser/Desktop#
```

Verifica que cada servidor responde correctamente