1. sudo apt update && sudo apt upgrade -y

```
vboxuser@ubuntu2:~$ sudo apt update && sudo apt upgrade -y
[sudo] password for vboxuser:
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
16 packages can be upgraded. Run 'apt list --upgradable' to see them.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following package was automatically installed and is no longer required:
  libllvm19
Use 'sudo apt autoremove' to remove it.
The following upgrades have been deferred due to phasing:
  libnss-systemd libpam-systemd libsystemd-shared libsystemd0 libudev1
  libwireplumber-0.4-0 systemd systemd-dev systemd-hwe-hwdb systemd-oomd
  systemd-resolved systemd-sysv systemd-timesyncd tcpdump udev wireplumber
0 upgraded, 0 newly installed, 0 to remove and 16 not upgraded.
vboxuser@ubuntu2:~$
```

2. sudo apt install apache2 -y

```
vboxuser@ubuntu2:~$ 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 16 not upgraded.
```

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

```
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>




                          [ Read 13 lines ]
^G Help       ^O Write Out ^W Where Is ^K Cut      ^T Execute  ^C Locati
^X Exit       ^R Read File ^\ Replace  ^U Paste    ^J Justify  ^/ Go To
```

4. 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 t>
        # 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
                          [ Read 29 lines ]
^G Help       ^O Write Out ^W Where Is ^K Cut      ^T Execute  ^C Location
^X Exit       ^R Read File ^\ Replace  ^U Paste    ^J Justify  ^/ Go To Line
```

5. sudo apt install php libapache2-mod-php -y

```
vboxuser@ubuntu2:~$ 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 16 not upgraded.
```

6. sudo systemctl restart apache2

```
vboxuser@ubuntu2:~$ sudo systemctl restart apache2
```

7. sudo systemctl status apache2

```
0 upgraded, 0 newly installed, 0 to remove and 16 not upgraded.
vboxuser@ubuntu2:~$ sudo systemctl restart apache2
vboxuser@ubuntu2:~$ 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 07:17:32 UTC; 28s ago
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 23148 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/S>
   Main PID: 23154 (apache2)
      Tasks: 6 (limit: 9132)
     Memory: 10.6M (peak: 11.5M)
        CPU: 47ms
     CGroup: /system.slice/apache2.service
             ├─23154 /usr/sbin/apache2 -k start
             ├─23156 /usr/sbin/apache2 -k start
             ├─23157 /usr/sbin/apache2 -k start
             ├─23158 /usr/sbin/apache2 -k start
             ├─23159 /usr/sbin/apache2 -k start
             └─23160 /usr/sbin/apache2 -k start

Oct 10 07:17:32 ubuntu2 systemd[1]: Starting apache2.service - The Apache HTTP >
Oct 10 07:17:32 ubuntu2 apachectl[23153]: AH00558: apache2: Could not reliably >
Oct 10 07:17:32 ubuntu2 systemd[1]: Started apache2.service - The Apache HTTP S>
lines 1-20/20 (END)
```

```
vboxuser@ubuntu2:~$ sudo netstat -tulpn | grep 8080
tcp6       0      0 :::8080                 :::*                    LISTEN
23154/apache2
```
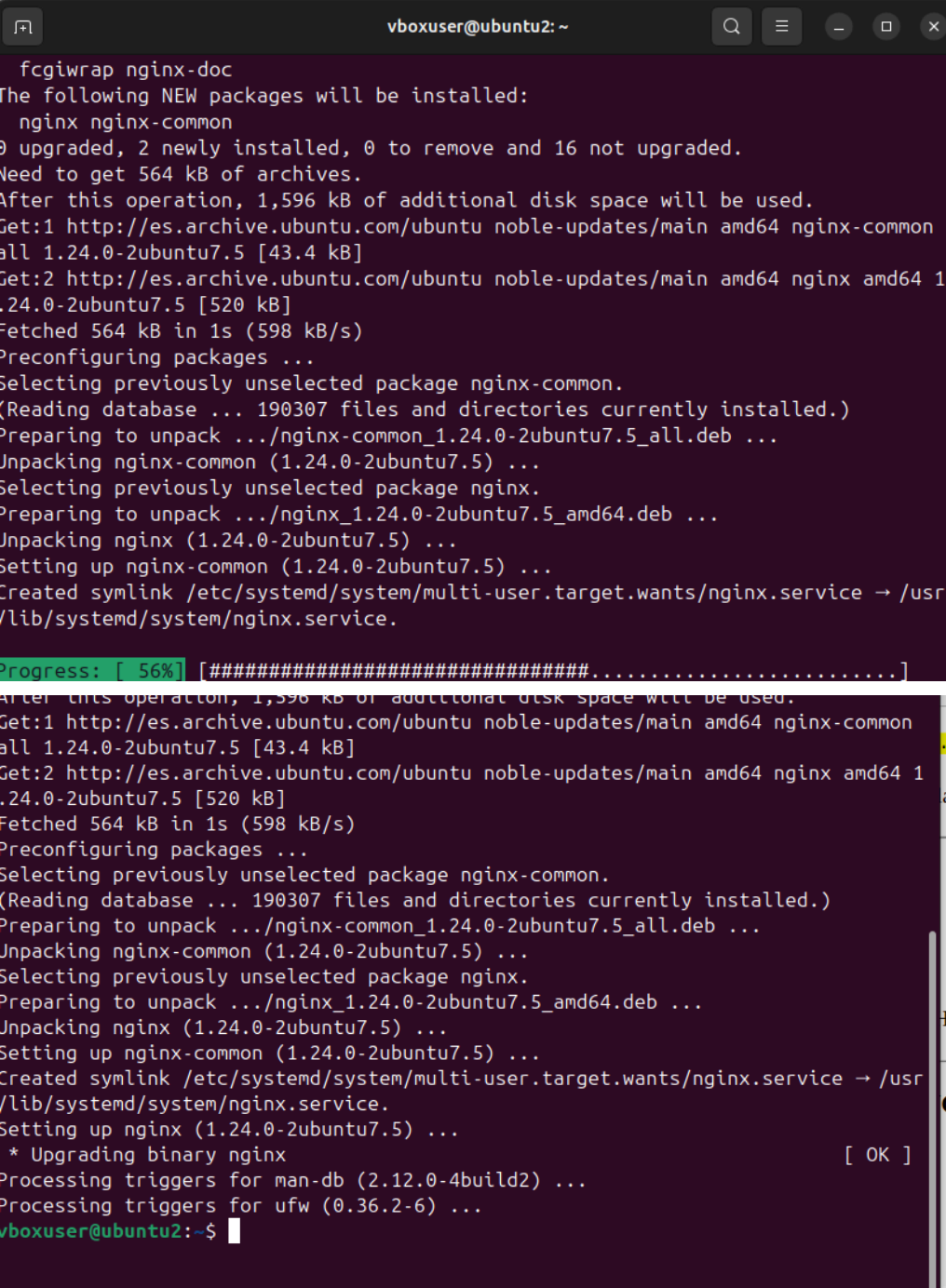
8. echo "" | sudo tee /var/www/html/info.php
9. curl http://localhost:8080/info.php

```
d></tr>
</table>
<table>
<tr class="h"><th colspan="1">Debian Packaging</th></tr>
<tr><td class="e">Ondřej Surý </td></tr>
</table>
<h2>PHP License</h2>
<table>
<tr class="v"><td>
<p>
This program is free software; you can redistribute it and/or modify it under th
e terms of the PHP License as published by the PHP Group and included in the dis
tribution in the file:  LICENSE
</p>
<p>This program is distributed in the hope that it will be useful, but WITHOUT A
NY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR
 A PARTICULAR PURPOSE.
</p>
<p>If you did not receive a copy of the PHP license, or have any questions about
 PHP licensing, please contact license@php.net.
</p>
</td></tr>
</table>
</div></body></html>vboxuser@ubuntu2:~$
```

PARTE 2.

1. sudo apt install nginx -y


```
 fcgiwrap nginx-doc
The following NEW packages will be installed:
  nginx nginx-common
0 upgraded, 2 newly installed, 0 to remove and 16 not upgraded.
Need to get 564 kB of archives.
After this operation, 1,596 kB of additional disk space will be used.
Get:1 http://es.archive.ubuntu.com/ubuntu noble-updates/main amd64 nginx-common
all 1.24.0-2ubuntu7.5 [43.4 kB]
Get:2 http://es.archive.ubuntu.com/ubuntu noble-updates/main amd64 nginx amd64 1
.24.0-2ubuntu7.5 [520 kB]
Fetched 564 kB in 1s (598 kB/s)
Preconfiguring packages ...
Selecting previously unselected package nginx-common.
(Reading database ... 190307 files and directories currently installed.)
Preparing to unpack .../nginx-common_1.24.0-2ubuntu7.5_all.deb ...
Unpacking nginx-common (1.24.0-2ubuntu7.5) ...
Selecting previously unselected package nginx.
Preparing to unpack .../nginx_1.24.0-2ubuntu7.5_amd64.deb ...
Unpacking nginx (1.24.0-2ubuntu7.5) ...
Setting up nginx-common (1.24.0-2ubuntu7.5) ...
Created symlink /etc/systemd/system/multi-user.target.wants/nginx.service → /usr
/lib/systemd/system/nginx.service.

Progress: [ 56%] [##############################.........................]
```

```
After this operation, 1,596 kB of additional disk space will be used.
Get:1 http://es.archive.ubuntu.com/ubuntu noble-updates/main amd64 nginx-common
all 1.24.0-2ubuntu7.5 [43.4 kB]
Get:2 http://es.archive.ubuntu.com/ubuntu noble-updates/main amd64 nginx amd64 1
.24.0-2ubuntu7.5 [520 kB]
Fetched 564 kB in 1s (598 kB/s)
Preconfiguring packages ...
Selecting previously unselected package nginx-common.
(Reading database ... 190307 files and directories currently installed.)
Preparing to unpack .../nginx-common_1.24.0-2ubuntu7.5_all.deb ...
Unpacking nginx-common (1.24.0-2ubuntu7.5) ...
Selecting previously unselected package nginx.
Preparing to unpack .../nginx_1.24.0-2ubuntu7.5_amd64.deb ...
Unpacking nginx (1.24.0-2ubuntu7.5) ...
Setting up nginx-common (1.24.0-2ubuntu7.5) ...
Created symlink /etc/systemd/system/multi-user.target.wants/nginx.service → /usr
/lib/systemd/system/nginx.service.
Setting up nginx (1.24.0-2ubuntu7.5) ...
 * Upgrading binary nginx                                              [ OK ]
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for ufw (0.36.2-6) ...
vboxuser@ubuntu2:~$
```

2. sudo nano /etc/nginx/sites-available/default

```
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
        #
        # Self signed certs generated by the ssl-cert package
        # Don't use them in a production server!
        #
```

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

```
vboxuser@ubuntu2:~$ 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>
```

4. sudo systemctl restart nginx

```
vboxuser@ubuntu2:~$ sudo systemctl restart nginx
```

5. sudo systemctl status nginx

```
<h1>Servidor Nginx</h1><p>Funcionando en puerto 8081</p>
vboxuser@ubuntu2:~$ sudo systemctl restart nginx
vboxuser@ubuntu2:~$ 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 07:32:35 UTC; 34s ago
       Docs: man:nginx(8)
    Process: 24247 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_proc>
    Process: 24248 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (>
   Main PID: 24250 (nginx)
      Tasks: 6 (limit: 9132)
     Memory: 4.3M (peak: 5.1M)
        CPU: 22ms
     CGroup: /system.slice/nginx.service
             ├─24250 "nginx: master process /usr/sbin/nginx -g daemon on; maste>
             ├─24251 "nginx: worker process"
             ├─24252 "nginx: worker process"
             ├─24253 "nginx: worker process"
             ├─24254 "nginx: worker process"
             └─24255 "nginx: worker process"

Oct 10 07:32:35 ubuntu2 systemd[1]: Starting nginx.service - A high performance>
Oct 10 07:32:35 ubuntu2 systemd[1]: Started nginx.service - A high performance >
lines 1-20/20 (END)
```

```
vboxuser@ubuntu2:~$ sudo netstat -tulpn | grep 8081
tcp        0      0 0.0.0.0:8081            0.0.0.0:*               LISTEN
24250/nginx: master
tcp6       0      0 :::8081                 :::*                    LISTEN
24250/nginx: master
```

6. curl http://localhost:8081

```
vboxuser@ubuntu2:~$ curl http://localhost:8081
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.or
g/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
  <!--
    Modified from the Debian original for Ubuntu
    Last updated: 2022-03-22
    See: https://launchpad.net/bugs/1966004
  -->
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
    <title>Apache2 Ubuntu 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;
```

PARTE 3.

1. sudo apt install -y debian-keyring debian-archive-keyring apt-transport-https curl

```
  </body>
</html>
vboxuser@ubuntu2:~$ ^C
vboxuser@ubuntu2:~$ sudo apt install -y debian-keyring debian-archive-keyring ap
t-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 debian-archive-keyring debian-keyring
0 upgraded, 3 newly installed, 0 to remove and 16 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-trans
port-https all 2.8.3 [3,970 B]
Get:2 http://es.archive.ubuntu.com/ubuntu noble/universe amd64 debian-archive-ke
yring all 2023.4ubuntu1 [168 kB]
Get:3 http://es.archive.ubuntu.com/ubuntu noble/universe amd64 debian-keyring al
l 2023.12.24 [31.3 MB]
26% [3 debian-keyring 4,886 kB/31.3 MB 16%]
```

```
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-trans
port-https all 2.8.3 [3,970 B]
Get:2 http://es.archive.ubuntu.com/ubuntu noble/universe amd64 debian-archive-ke
yring all 2023.4ubuntu1 [168 kB]
Get:3 http://es.archive.ubuntu.com/ubuntu noble/universe amd64 debian-keyring al
l 2023.12.24 [31.3 MB]
Fetched 31.5 MB in 9s (3,606 kB/s)
Selecting previously unselected package apt-transport-https.
(Reading database ... 190354 files and directories currently installed.)
Preparing to unpack .../apt-transport-https_2.8.3_all.deb ...
Unpacking apt-transport-https (2.8.3) ...
Selecting previously unselected package debian-archive-keyring.
Preparing to unpack .../debian-archive-keyring_2023.4ubuntu1_all.deb ...
Unpacking debian-archive-keyring (2023.4ubuntu1) ...
Selecting previously unselected package debian-keyring.
Preparing to unpack .../debian-keyring_2023.12.24_all.deb ...
Unpacking debian-keyring (2023.12.24) ...
Setting up apt-transport-https (2.8.3) ...
Setting up debian-archive-keyring (2023.4ubuntu1) ...
Setting up debian-keyring (2023.12.24) ...
curl: try 'curl --help' or 'curl --manual' for more information
vboxuser@ubuntu2:~$
```

2. 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

```
vboxuser@ubuntu2:~$ 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' | s
udo tee /etc/apt/sources.list.d/caddy-stable.list
gpg: directory '/root/.gnupg' created
gpg: keybox '/root/.gnupg/pubring.kbx' created
gpg: WARNING: no command supplied.  Trying to guess what you mean ...
usage: gpg [options] [filename]
```

3. sudo apt update && sudo apt install caddy -y

```
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
6 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 16 not upgraded.
Need to get 11.2 MB of archives.
After this operation, 41.2 MB of additional disk space will be used.
Get:1 http://es.archive.ubuntu.com/ubuntu noble/main amd64 libnss3-tools amd64 2
3.98-1build1 [615 kB]
Get:2 http://es.archive.ubuntu.com/ubuntu noble-updates/universe amd64 caddy amd
64 2.6.2-6ubuntu0.24.04.3 [10.5 MB]
33% [2 caddy 4,040 kB/10.5 MB 38%]
```

```
 caddy libnss3-tools
0 upgraded, 2 newly installed, 0 to remove and 16 not upgraded.
Need to get 11.2 MB of archives.
After this operation, 41.2 MB of additional disk space will be used.
Get:1 http://es.archive.ubuntu.com/ubuntu noble/main amd64 libnss3-tools amd64 2
:3.98-1build1 [615 kB]
Get:2 http://es.archive.ubuntu.com/ubuntu noble-updates/universe amd64 caddy amd
64 2.6.2-6ubuntu0.24.04.3 [10.5 MB]
Fetched 11.2 MB in 3s (3,743 kB/s)
Selecting previously unselected package libnss3-tools.
(Reading database ... 190390 files and directories currently installed.)
Preparing to unpack .../libnss3-tools_2%3a3.98-1build1_amd64.deb ...
Unpacking libnss3-tools (2:3.98-1build1) ...
Selecting previously unselected package caddy.
Preparing to unpack .../caddy_2.6.2-6ubuntu0.24.04.3_amd64.deb ...
Unpacking caddy (2.6.2-6ubuntu0.24.04.3) ...
Setting up libnss3-tools (2:3.98-1build1) ...
Setting up caddy (2.6.2-6ubuntu0.24.04.3) ...
Created symlink /etc/systemd/system/multi-user.target.wants/caddy.service → /usr
/lib/systemd/system/caddy.service.
Processing triggers for man-db (2.12.0-4build2) ...
```

4. sudo mkdir -p /var/www/caddy
5.

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

```
vboxuser@ubuntu2:~$ echo "# Bienvenido a Caddy" | sudo tee
/var/www/caddy/README.md
# Bienvenido a Caddy
vboxuser@ubuntu2:~$ echo "" | sudo tee -a /var/www/caddy/RE
ADME.md

vboxuser@ubuntu2:~$ echo "Este servidor está funcionando co
rrectamente." | sudo tee -a /var/www/caddy/README.md
Este servidor está funcionando correctamente.
vboxuser@ubuntu2:~$ echo "" | sudo tee -a /var/www/caddy/RE
ADME.md

vboxuser@ubuntu2:~$ echo "## Características" | sudo tee -a
 /var/www/caddy/README.md
## Características
vboxuser@ubuntu2:~$ echo "- Servidor moderno" | sudo tee -a
 /var/www/caddy/README.md
- Servidor moderno
vboxuser@ubuntu2:~$ echo "- HTTPS automático" | sudo tee -a
 /var/www/caddy/README.md
- HTTPS automático
vboxuser@ubuntu2:~$ echo "- Fácil configuración" | sudo tee
 -a /var/www/caddy/README.md
- Fácil configuración
```

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

```
vboxuser@ubuntu2:~$ curl -o /tmp/test-image.jpg "https://ww
w.python.org/static/apple-touch- icon-144x144-precomposed.p
ng"
curl: (3) URL rejected: Malformed input to a URL function
vboxuser@ubuntu2:~$ sudo mv /tmp/test-image.jpg /var/www/ca
ddy/test.jpg
mv: cannot stat '/tmp/test-image.jpg': No such file or dire
ctory
```

7. sudo nano /etc/caddy/Caddyfile

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

:8082 {
        root * /var/www/caddy

        file_server browse

        @markdown path *.md

        header @markdown Content-Type text/plain
}

# Refer to the Caddy docs for more information:
# https://caddyserver.com/docs/caddyfil
```

8. sudo systemctl restart caddy
9. sudo systemctl status caddy

```
vboxuser@ubuntu2:~$ sudo netstat -tulpn | grep 8082
tcp6       0       0 :::8082                  :::*
        LISTEN        25805/caddy
```

10. curl http://localhost:8082/

```
owerCase();
            if (nameVal.indexOf(q) !== -1) {
                el.style.display = '';
            } else {
                el.style.display = 'none';
            }
        });
    }

    function localizeDatetime(e, index, ar) {
        if (e.textContent === undefined) {
            return;
        }
        var d = new Date(e.getAttribute('datetime'));
        if (isNaN(d)) {
            d = new Date(e.textContent);
            if (isNaN(d)) {
                return;
            }
        }
        e.textContent = d.toLocaleString([], {day: "2-d
igit", month: "2-digit", year: "numeric", hour: "2-digit",
minute: "2-digit", second: "2-digit"});
    }
    var timeList = Array.prototype.slice.call(document.
getElementsByTagName("time"));
    timeList.forEach(localizeDatetime);
    </script>
</body>

</html>
vboxuser@ubuntu2:~$
```
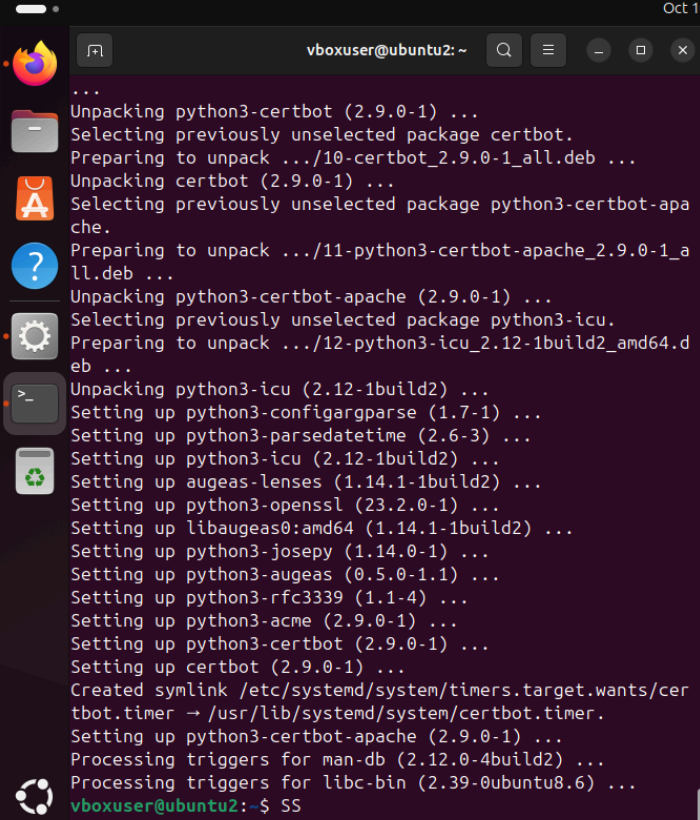
11. curl http://localhost:8082/README.md

```
vboxuser@ubuntu2:~$ curl http://localhost:8082/README.md
# Bienvenido a Caddy

Este servidor está funcionando correctamente.

## Características
- Servidor moderno
- HTTPS automático
- Fácil configuración
```

PARTE 4.

1. sudo apt install certbot python3-certbot-apache -y

```
Get:9 http://es.archive.ubuntu.com/ubuntu noble/universe am
d64 python3-parsedatetime all 2.6-3 [32.8 kB]
Get:10 http://es.archive.ubuntu.com/ubuntu noble/universe a
md64 python3-certbot all 2.9.0-1 [267 kB]
Get:11 http://es.archive.ubuntu.com/ubuntu noble/universe a
md64 certbot all 2.9.0-1 [89.2 kB]
Get:12 http://es.archive.ubuntu.com/ubuntu noble/universe a
md64 python3-certbot-apache all 2.9.0-1 [128 kB]
Get:13 http://es.archive.ubuntu.com/ubuntu noble/main amd64
 python3-icu amd64 2.12-1build2 [534 kB]
Fetched 1,705 kB in 2s (1,099 kB/s)
Preconfiguring packages ...
Selecting previously unselected package augeas-lenses.
(Reading database ... 190470 files and directories currentl
y installed.)
Preparing to unpack .../00-augeas-lenses_1.14.1-1build2_all
.deb ...
Unpacking augeas-lenses (1.14.1-1build2) ...
Selecting previously unselected package libaugeas0:amd64.
Preparing to unpack .../01-libaugeas0_1.14.1-1build2_amd64.
deb ...
Unpacking libaugeas0:amd64 (1.14.1-1build2) ...
Selecting previously unselected package python3-openssl.
Preparing to unpack .../02-python3-openssl_23.2.0-1_all.deb
 ...
Unpacking python3-openssl (23.2.0-1) ...
Selecting previously unselected package python3-josepy.
Preparing to unpack .../03-python3-josepy_1.14.0-1_all.deb
...
Unpacking python3-josepy (1.14.0-1) ...

Progress: [ 15%] [#####............................]
```

```
...
Unpacking python3-certbot (2.9.0-1) ...
Selecting previously unselected package certbot.
Preparing to unpack .../10-certbot_2.9.0-1_all.deb ...
Unpacking certbot (2.9.0-1) ...
Selecting previously unselected package python3-certbot-apa
che.
Preparing to unpack .../11-python3-certbot-apache_2.9.0-1_a
ll.deb ...
Unpacking python3-certbot-apache (2.9.0-1) ...
Selecting previously unselected package python3-icu.
Preparing to unpack .../12-python3-icu_2.12-1build2_amd64.d
eb ...
Unpacking python3-icu (2.12-1build2) ...
Setting up python3-configargparse (1.7-1) ...
Setting up python3-parsedatetime (2.6-3) ...
Setting up python3-icu (2.12-1build2) ...
Setting up augeas-lenses (1.14.1-1build2) ...
Setting up python3-openssl (23.2.0-1) ...
Setting up libaugeas0:amd64 (1.14.1-1build2) ...
Setting up python3-josepy (1.14.0-1) ...
Setting up python3-augeas (0.5.0-1.1) ...
Setting up python3-rfc3339 (1.1-4) ...
Setting up python3-acme (2.9.0-1) ...
Setting up python3-certbot (2.9.0-1) ...
Setting up certbot (2.9.0-1) ...
Created symlink /etc/systemd/system/timers.target.wants/cer
tbot.timer → /usr/lib/systemd/system/certbot.timer.
Setting up python3-certbot-apache (2.9.0-1) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.6) ...
vboxuser@ubuntu2:~$ SS
```

2. sudo openssl req -x509 -nodes -days 365 -newkey rsa:2048 -keyout /etc/ssl/private/apache-selfsigned.key -out /etc/ssl/certs/apache-selfsigned.crt

```
vboxuser@ubuntu2:~$ sudo openssl req -x509 -nodes -days 365
 -newkey rsa:2048 -keyout /etc/ssl/private/apache-selfsigne
d.key -out /etc/ssl/certs/apache-selfsigned.crt
...+..+.......++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++*......+..+.+..+...+....+++++++++++++++
++++++++++++++++++++++++++++++++++++++++++++*........
.....++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++
.......+..+...+.+.........+...+...+.......+........+++++
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
*.++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++*..+......+...+............+.....+........+....
..+....+...+.......+.......+.+..+.............+...+.....
.+........+..........+.......+........+......+.+.......+
...+...++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++++
-----
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 Distinguish
ed 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]:S
```

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

3. sudo a2enmod ssl

```
vboxuser@ubuntu2:~$ 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 confi
gure SSL and create self-signed certificates.
To activate the new configuration, you need to run:
  systemctl restart apache2
```

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

```
/etc/apache2/sites-available/default-ssl.conf
        # following line enables the CGI configuration for>
        # after it has been globally disabled with "a2disc>
        #Include conf-available/serve-cgi-bin.conf

        #   SSL Engine Switch:
        #   Enable/Disable SSL for this virtual host.
        SSLEngine on

        #   A self-signed (snakeoil) certificate can be cr>
        #   the ssl-cert package. See
        #   /usr/share/doc/apache2/README.Debian.gz for mo>
        #   If both key and certificate are stored in the >
        #   SSLCertificateFile directive is needed.
        SSLCertificateFile      /etc/ssl/certs/ssl-cert-sn>
        SSLCertificateKeyFile   /etc/ssl/private/ssl-cert->
        SSLCertificateFile /etc/ssl/certs/apache-selfsigne>
        SSLCertificateKeyFile /etc/ssl/private/apache-self>


        #   Server Certificate Chain:
        #   Point SSLCertificateChainFile at a file contai>
        #   concatenation of PEM encoded CA certificates w>
        #   certificate chain for the server certificate. >
        #   the referenced file can be the same as SSLCert>
        #   when the CA certificates are directly appended>
        #   certificate for convinience.
        #SSLCertificateChainFile /etc/apache2/ssl.crt/serv>


^G Help        ^O Write Out  ^W Where Is   ^K Cut
^X Exit        ^R Read File  ^\ Replace    ^U Paste
```

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

```
  GNU nano 7.2        /etc/apache2/ports.conf
# If you just change the port or add more ports here, you >
# have to change the VirtualHost statement in
# /etc/apache2/sites-enabled/000-default.conf

Listen 8080
Listen 8443

<IfModule ssl_module>
        Listen 443
</IfModule>

<IfModule mod_gnutls.c>
        Listen 443
</IfModule>
```
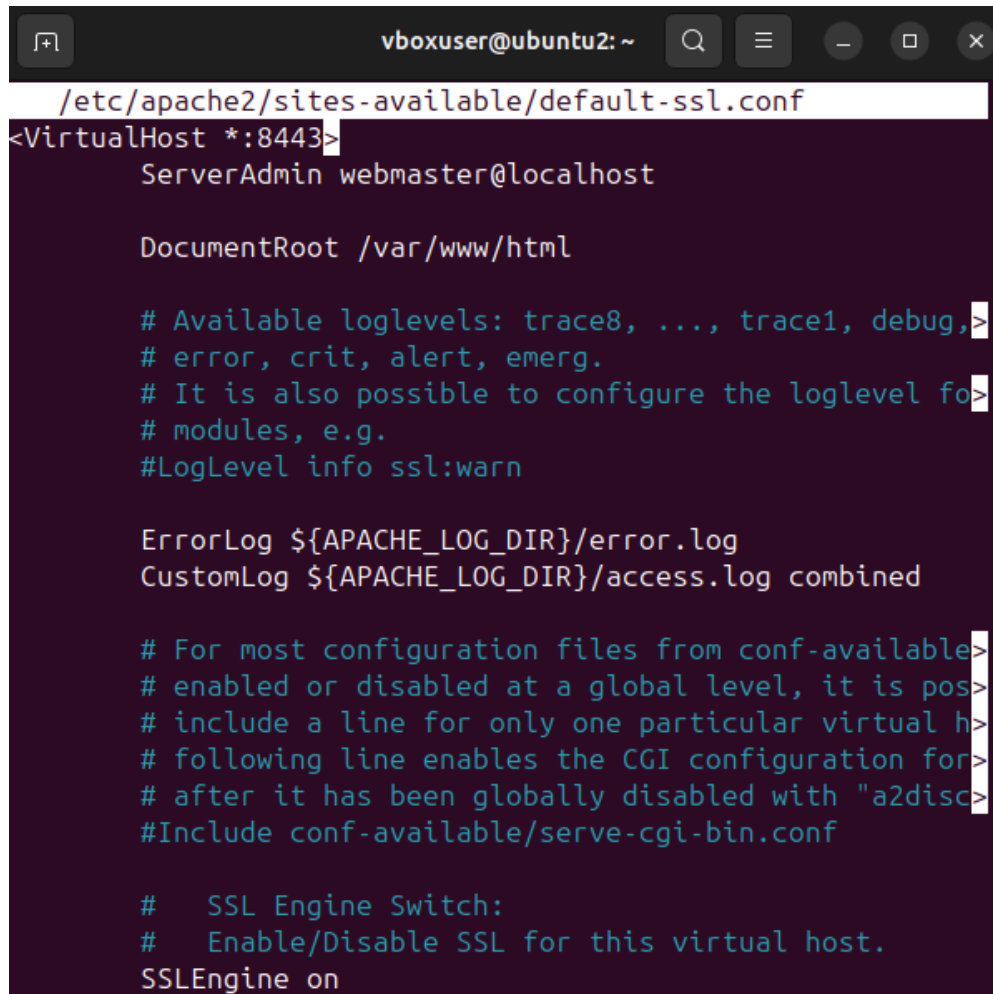
6. sudo nano /etc/apache2/sites-available/default-ssl.conf

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

        DocumentRoot /var/www/html

        # Available loglevels: trace8, ..., trace1, debug,>
        # error, crit, alert, emerg.
        # It is also possible to configure the loglevel fo>
        # 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>
        # enabled or disabled at a global level, it is pos>
        # include a line for only one particular virtual h>
        # following line enables the CGI configuration for>
        # after it has been globally disabled with "a2disc>
        #Include conf-available/serve-cgi-bin.conf

        #   SSL Engine Switch:
        #   Enable/Disable SSL for this virtual host.
        SSLEngine on
```
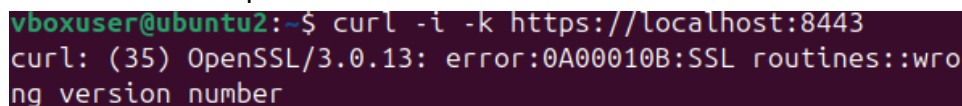
7. sudo a2ensite default-ssl.conf
8. sudo systemctl restart apache2
9. curl -i -k https://localhost:8443

```
vboxuser@ubuntu2:~$ curl -i -k https://localhost:8443
curl: (35) OpenSSL/3.0.13: error:0A00010B:SSL routines::wro
ng version number
```

PARTE 5.

1. sudo systemctl status apache2 nginx

```
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/apache2.servi
     Active: active (running) since Fri 2025-10-10 08:21:5
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 26667 ExecStart=/usr/sbin/apachectl start (co
   Main PID: 26673 (apache2)
      Tasks: 6 (limit: 9132)
     Memory: 11.1M (peak: 11.5M)
        CPU: 66ms
     CGroup: /system.slice/apache2.service
             ├─26673 /usr/sbin/apache2 -k start
             ├─26675 /usr/sbin/apache2 -k start
             ├─26676 /usr/sbin/apache2 -k start
             ├─26677 /usr/sbin/apache2 -k start
             ├─26678 /usr/sbin/apache2 -k start
             └─26679 /usr/sbin/apache2 -k start

Oct 10 08:21:56 ubuntu2 systemd[1]: Starting apache2.servi
Oct 10 08:21:56 ubuntu2 apachectl[26672]: AH00558: apache2
Oct 10 08:21:56 ubuntu2 systemd[1]: Started apache2.servic

● nginx.service - A high performance web server and a reve
     Loaded: loaded (/usr/lib/systemd/system/nginx.service
     Active: active (running) since Fri 2025-10-10 07:32:3
       Docs: man:nginx(8)
   Main PID: 24250 (nginx)
      Tasks: 6 (limit: 9132)
     Memory: 4.4M (peak: 5.1M)
        CPU: 24ms
     CGroup: /system.slice/nginx.service
             ├─24250 "nginx: master process /usr/sbin/ngin
```

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

```
vboxuser@ubuntu2:~$ sudo netstat -tulpn | grep -E '8080|80
1|8082|8443'
tcp        0      0 0.0.0.0:8081            0.0.0.0:*
         LISTEN      24250/nginx: master
tcp6       0      0 :::8443                 :::*
         LISTEN      26673/apache2
tcp6       0      0 :::8080                 :::*
         LISTEN      26673/apache2
tcp6       0      0 :::8081                 :::*
         LISTEN      24250/nginx: master
tcp6       0      0 :::8082                 :::*
         LISTEN      25805/caddy
```

3. curl http://localhost:8080
   curl http://localhost:8081
   curl http://localhost:8082
   curl -k https://localhost:8443

```
            } else {
                el.style.display = 'none';
            }
        });
    }

    function localizeDatetime(e, index, ar) {
        if (e.textContent === undefined) {
            return;
        }
        var d = new Date(e.getAttribute('datetime'));
        if (isNaN(d)) {
            d = new Date(e.textContent);
            if (isNaN(d)) {
                return;
            }
        }
        e.textContent = d.toLocaleString([], {day: "2-d
igit", month: "2-digit", year: "numeric", hour: "2-digit",
inute: "2-digit", second: "2-digit"});
    }
    var timeList = Array.prototype.slice.call(document.
etElementsByTagName("time"));
    timeList.forEach(localizeDatetime);
    </script>
/body>

/html>
url: (6) Could not resolve host: curl
url: (35) OpenSSL/3.0.13: error:0A00010B:SSL routines::wro
g version number
```