

ARQUITECTURA EN LA NUBE - ADMINISTRACIÓN REMOTA DE SERVIDORES WEB EN AWS A TRAVÉS DE SSH



Hecho por Juan Medrano

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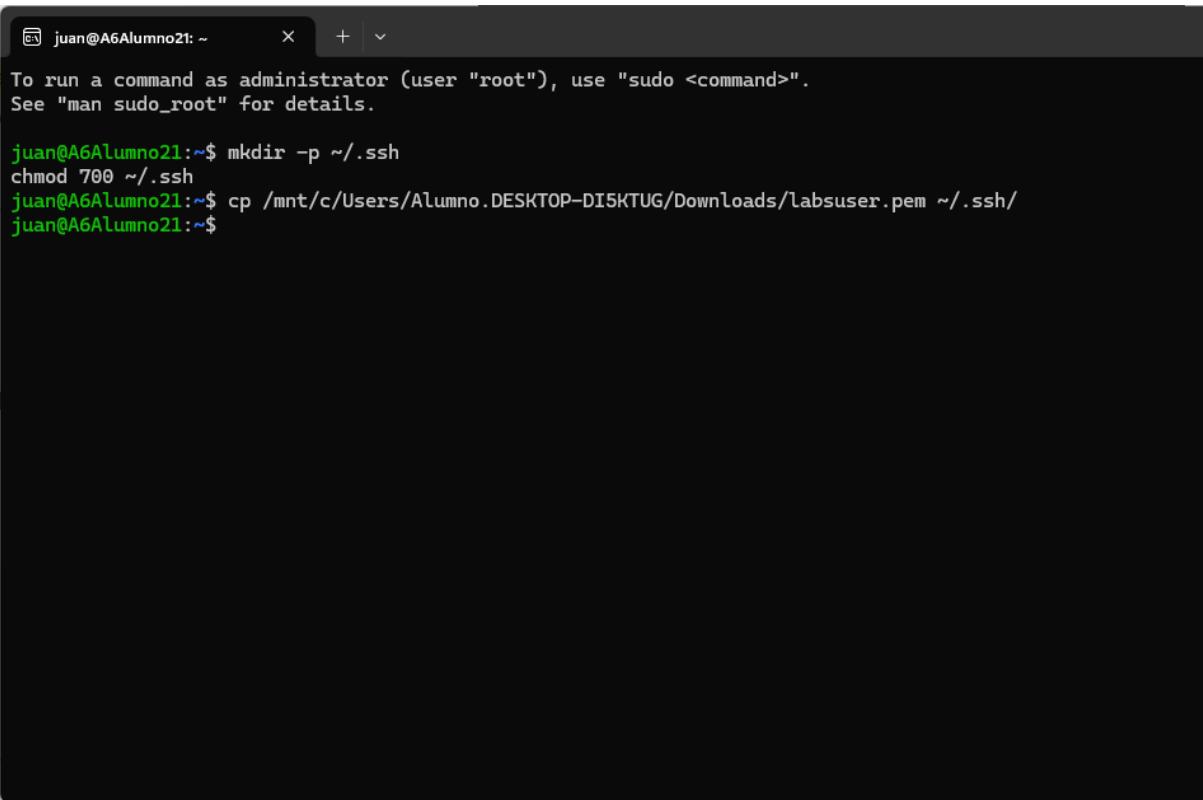
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SECCIÓN 1 — PREPARACIÓN DEL ENTORNO Y CONEXIÓN REMOTA (WSL + SSH + AWS)

La administración remota de servidores en la nube requiere disponer de un entorno Linux funcional. Para ello se utilizó **Windows Subsystem for Linux (WSL2)**, que permite ejecutar herramientas de administración como SSH, curl y los comandos necesarios para la interacción con la instancia EC2.

1.1 Verificación y preparación de WSL

Se comprobó el estado de WSL, su versión instalada y la correcta inicialización del entorno. Se creó el directorio `~/.ssh` con permisos adecuados para almacenar claves privadas de acceso seguro.



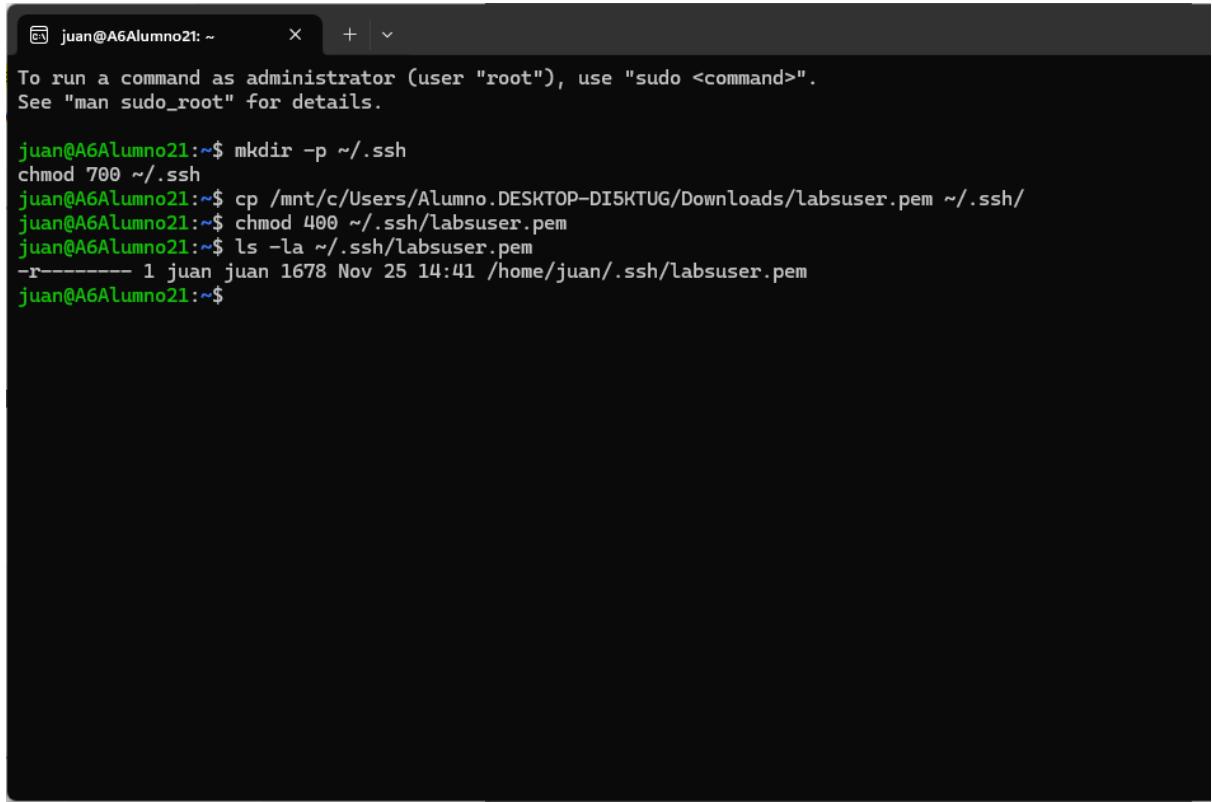
```
juan@A6Alumno21:~$ mkdir -p ~/.ssh
chmod 700 ~/.ssh
juan@A6Alumno21:~$ cp /mnt/c/Users/Alumno.DESKTOP-DI5KTUG/Downloads/labsuser.pem ~/.ssh/
juan@A6Alumno21:~$
```

1.2 Descarga y preparación de la clave PEM

AWS requiere una clave privada PEM para realizar autenticación SSH.

Se descargó la clave desde AWS, se movió al directorio `~/.ssh/` y se aseguraron permisos restrictivos con:

```
chmod 400 ~/.ssh/clave.pem
```



```
juan@A6Alumno21:~$ mkdir -p ~/.ssh
chmod 700 ~/.ssh
juan@A6Alumno21:~$ cp /mnt/c/Users/Alumno.DESKTOP-DI5KTUG/Downloads/labsuser.pem ~/.ssh/
juan@A6Alumno21:~$ chmod 400 ~/.ssh/labsuser.pem
juan@A6Alumno21:~$ ls -la ~/.ssh/labsuser.pem
-r----- 1 juan juan 1678 Nov 25 14:41 /home/juan/.ssh/labsuser.pem
juan@A6Alumno21:~$
```

1.3 Creación de la instancia EC2

En la consola de AWS se lanzó una instancia EC2 basada en Ubuntu 22.04 con tipo t2.micro. Se configuró un Security Group permitiendo los puertos:

- **22** → SSH
- **8080** → Apache HTTP
- **8081** → Nginx

- **8082** → Caddy
- **8443** → Apache HTTPS

1.4 Selección de la AMI (Imagen del Sistema Operativo)

En este paso se selecciona la AMI (Amazon Machine Image) que define el sistema operativo base de la instancia EC2.

The screenshot shows a web browser window with multiple tabs open. The active tab is titled "Panel | EC2 | us-east-1". The main content area displays the AWS Academy interface, specifically the "Content" section of a course module. On the right side of the interface, there is a "Cloud Access" panel. This panel includes sections for "AWS CLi", "Cloud Labs", and "AWS SSO". Under "Cloud Labs", it shows session details: "Remaining session time: 03:55:09(236 minutes)", "Session started at: 2025-11-25T09:27:30-0800", and "Session to end at: 2025-11-25T09:27:41-0800". It also indicates "Accumulated lab time: 00:04:00 (4 minutes)" and "No running instance". Below these, there are buttons for "SSH key", "Download PEM", "Download PPK", and "AWS SSO". A table provides account and region information:

AWSAccountID	533267356151
Region	us-east-1

At the bottom of the interface, there are navigation buttons: "Anterior" (Previous) and "Siguiente" (Next).

1.5 Selección del tipo de instancia

Aquí se selecciona el tipo de instancia (en este caso t2.micro), adecuado para prácticas y dentro del nivel gratuito.

The screenshot shows the AWS EC2 console interface. On the left, there's a sidebar with navigation links for EC2 services like Instances, Images, and Elastic Block Store. The main content area has several sections: 'Recursos' (Resources) showing 0 instances, 0 load balancers, 0 capacity reservations, 0 elastic IP addresses, 0 auto-scaling groups, 1 security group, 0 hosts dedicated, 0 instances, 0 key pairs, 0 volumes, and 1 snapshot; 'Lanzar la instancia' (Launch instance) with a 'Lanzar la instancia' button; 'Estado del servicio' (Service status) showing 'Este servicio funciona con normalidad.'; 'Zonas' (Regions) listing availability zones: us-east-1a, us-east-1b, us-east-1c, us-east-1d, us-east-1e, and us-east-1f, each associated with an ID (use1-az1 through use1-az5); 'Alarms de instancia' (Instance alarms) with 0 alarms; 'Eventos programados' (Scheduled events) showing 'No hay eventos programados'; and 'Información adicional' (Additional information) with links to documentation and support. A tooltip for 'Color de la cuenta' (Account color) is visible at the top right, explaining how to define colors for accounts.

1.6 Configuración de red y almacenamiento

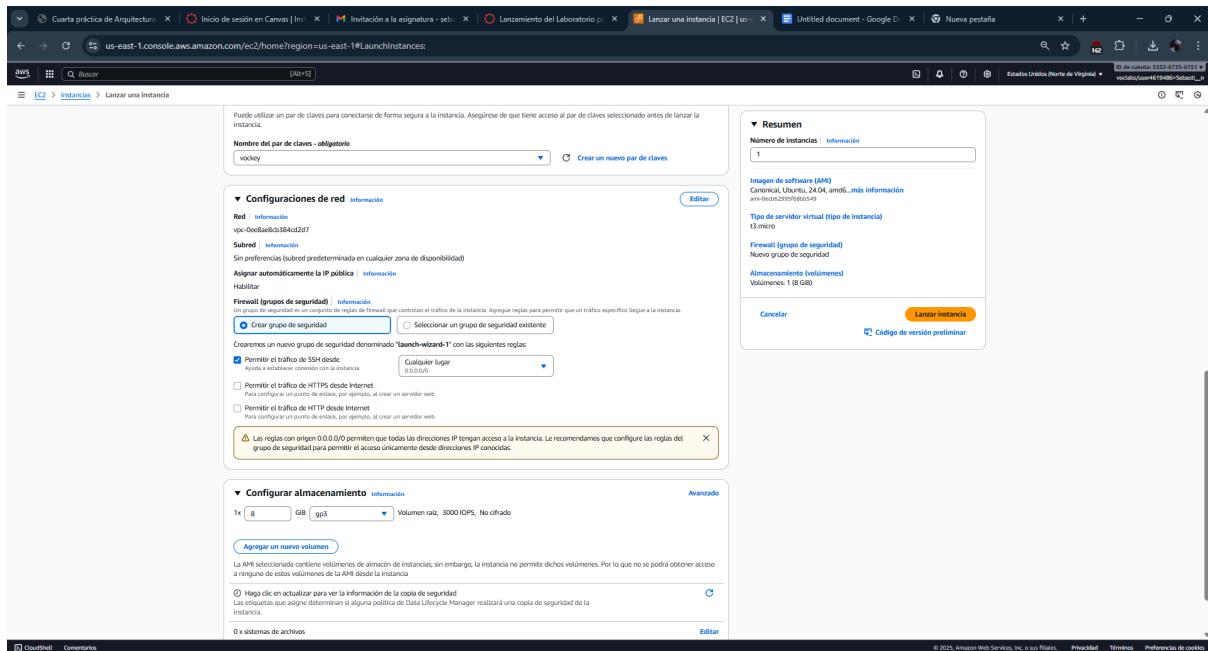
Se configura la red donde estará la instancia, asignación de IP pública y tamaño del volumen EBS.

The screenshot shows the 'Lanzar una instancia' (Launch instance) wizard. Step 1: 'Nombre y etiquetas' (Name and tags) where 'Nombre' is set to 'mi-servidor-web'. Step 2: 'Imagenes de aplicaciones y sistemas operativos (Imagen de máquina de Amazon)' (Amazon Machine Image) where 'Ubuntu Server 24.04 LTS (HVM,EBS General Purpose SSD Volume Type) Support available from Canonical' is selected. Step 3: 'Resumen' (Summary) showing the configuration: Nombre: mi-servidor-web, Número de instancias: 1, Imagen de sistema (AMI): Canonical, Ubuntu, 24.04, amd64 root image, Tipo de servidor virtual (tipo de instancia): t2.micro, Firewall (grupo de seguridad): Nuevo grupo de seguridad, Almacenamiento (volumenes): Volumenes: 1 (8 GiB). At the bottom, there are buttons for 'Cancelar', 'Lanzar instancia' (Launch instance), and 'Código de versión preliminar' (Preview code).

1.7 Configuración del Grupo de Seguridad (Security Group)

1.7.1 Reglas iniciales del Security Group

El asistente crea inicialmente un grupo de seguridad que permite acceso SSH para administración remota.



1.7.2 Añadir reglas para servidores web

Se añaden las reglas necesarias para la práctica:

- 8080 → Caddy primer servicio
- 8081 → Nginx
- 8082 → Caddy segundo servicio
- 8443 → Apache con SSL

Este paso es crítico para permitir acceso externo a los servidores web configurados posteriormente.

Cuenta práctica de Arquitecto | Inicio de sesión en Canvas | Invitación a la asignatura | Lanzamiento del Laboratorio | SecurityGroup | EC2 | us-east-1 | EC2 Instance Connect | Untitled document - Google Sheets | Nueva pestaña

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#SecurityGroupsecurityGroupID:sg-0ec041d643af46c71

Buscar [Alt+5]

EC2 > Grupos de seguridad > sg-0ec041d643af46c71 - launch-wizard-1

sg-0ec041d643af46c71 - launch-wizard-1

Acciones ▾

Detalles

Nombre del grupo de seguridad	sg-launch-wizard-1	ID del grupo de seguridad	sg-0ec041d643af46c71
Propietario	533267356151	Número de reglas de entrada	1 Entrada de permiso
		Número de reglas de salida	1 Entrada de permiso

Descripción: launch-wizard-1 created 2025-11-25T13:34:17.857Z | ID de la VPC: vpc-0ee8ae8cb384cd2d7

Reglas de entrada | Reglas de salida | Compartiendo : novedad | Asociaciones de VPC : novedad | Etiquetas

Reglas de entrada (1)

Name	ID de la regla del grupo	Versión de IP	Tipo	Protocolo	Intervalo de puertos	Origen	Descripción
-	sgr-0d5de4azbf2216450	IPv4	SSH	TCP	22	0.0.0.0/0	-

Administrar etiquetas | Editar reglas de entrada

CloudShell Comentarios

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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#SecurityGroupgroupID:sg-0ec041d643af46c71

Buscar [Alt+5]

EC2 > Grupos de seguridad > sg-0ec041d643af46c71 - launch-wizard-1

sg-0ec041d643af46c71 - launch-wizard-1

Detalles

Las reglas del grupo de seguridad de entrada se han modificado correctamente en el grupo de seguridad (sg-0ec041d643af46c71 | launch-wizard-1)

Detalles

Nombre del grupo de seguridad	sg-launch-wizard-1	ID del grupo de seguridad	sg-0ec041d643af46c71
Propietario	533267356151	Número de reglas de entrada	5 Entradas de permisos
		Número de reglas de salida	1 Entrada de permiso

ID de la VPC: vpc-0ee8ae8cb384cd2d7

Reglas de entrada | Reglas de salida | Compartiendo : novedad | Asociaciones de VPC : novedad | Etiquetas

Reglas de entrada (5)

Name	ID de la regla del grupo	Versión de IP	Tipo	Protocolo	Intervalo de puertos	Origen	Descripción
-	sgr-0d08116cc2fcf8d5	IPv4	TCP personalizado	TCP	8081	0.0.0.0/0	-
-	sgr-0d717cda2df6432a	IPv4	TCP personalizado	TCP	8082	0.0.0.0/0	-
-	sgr-0c843402ce34cb9af	IPv4	TCP personalizado	TCP	8080	0.0.0.0/0	-
-	sgr-0ef5962b4c4f63e19	IPv4	TCP personalizado	TCP	8443	0.0.0.0/0	-
-	sgr-0d9de4azbf2216450	IPv4	SSH	TCP	22	0.0.0.0/0	-

Administrar etiquetas | Editar reglas de entrada

CloudShell Comentarios

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```
juan@A6Alumno21:~ run a command as administrator (user "root"), use "sudo <command>". See "man sudo_root" for details.  
juan@A6Alumno21:~$ mkdir -p ~/.ssh  
mod 700 ~/.ssh  
juan@A6Alumno21:~$ cp /mnt/c/Users/Alumno.DESKTOP-DI5KTUG/Downloads/labsuser.pem ~/.ssh/  
juan@A6Alumno21:~$ chmod 400 ~/.ssh/labsuser.pem  
juan@A6Alumno21:~$ ls -la ~/.ssh/labsuser.pem  
---- 1 juan juan 1678 Nov 25 14:41 /home/juan/.ssh/labsuser.pem  
juan@A6Alumno21:~$ ssh -i ~/.ssh/labsuser.pem ubuntu@3.214.184.254  
Warning: authenticity of host '3.214.184.254 (3.214.184.254)' can't be established.  
25519 key fingerprint is SHA256:StsVNJqLs3UWM5+qby5XVp6M/SinR60qzhU5eEQFFkU.  
is key is not known by any other names.  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes|
```

```
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.14.0-1015-aws x86_64)  
  
 * Documentation:  https://help.ubuntu.com  
 * Management:    https://landscape.canonical.com  
 * Support:       https://ubuntu.com/pro  
  
System information as of Tue Nov 25 13:45:26 UTC 2025  
  
 System load: 0.0 Temperature: -273.1 C  
 Usage of /: 26.2% of 6.71GB Processes: 111  
 Memory usage: 23% Users logged in: 1  
 Swap usage: 0% IPv4 address for ens5: 172.31.77.26  
  
do Expanded Security Maintenance for Applications is not enabled.  
  
 0 updates can be applied immediately.  
/G/ Enable ESM Apps to receive additional future security updates.  
/L/ See https://ubuntu.com/esm or run: sudo pro status  
14  
c  
6M  
The list of available updates is more than a week old.  
ng To check for new updates run: sudo apt update  
  
Last login: Tue Nov 25 13:35:56 2025 from 18.206.107.27  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
ubuntu@ip-172-31-77-26:~$
```

SECCIÓN 2 — Instalación y configuración de los servidores web

2.1 Instalación y prueba de Apache2

conexión por SSH y actualización del sistema → corresponde a *preparación inicial antes de instalar Apache*.

Se instaló el servidor Apache2, se modificó el puerto por defecto a 8080, se configuró el VirtualHost y se verificó el servicio.

```
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-77-26:~$ sudo apt update && sudo apt upgrade -y
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [1334 kB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
Get:9 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/amd64 c-n-f Metadata [301 kB]
Get:10 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:12 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
```

instalación de Apache2

```
No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-77-26:~$ sudo apt install apache2 -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1t64 libaprutil1-dbd-sqlite3 libaprutil1-ldap libaprutil1t64
    liblua5.4-0 ssl-cert
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils libapr1t64 libaprutil1-dbd-sqlite3 libaprutil1-ldap libaprutil1t64
    liblua5.4-0 ssl-cert
0 upgraded, 10 newly installed, 0 to remove and 2 not upgraded.
Need to get 2086 kB of archives.
After this operation, 8090 kB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libapr1t64 amd64 1.7.2-3.1ubuntu0.1 [108 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libaprutil1t64 amd64 1.6.3-1.1ubuntu7 [91.9 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libaprutil1-dbd-sqlite3 amd64 1.6.3-1.1ubuntu7 [112 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libaprutil1-ldap amd64 1.6.3-1.1ubuntu7 [9116 B]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 liblua5.4-0 amd64 5.4.6-3build2 [166 kB]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 apache2-bin amd64 2.4.58-1ubuntu8.8 [1331 kB]
[6 apache2-bin 24.8 kB/1331 kB 2%]
```

modificación de ports.conf (Listen 8080)

```
# have to change the VirtualHost
# /etc/apache2/sites-enabled/000-
Listen 8080

<IfModule ssl_module>
    Listen 443
</IfModule>

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

modificación de 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
    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
    [ Read 29 lines ]

```

estado de Apache

```

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-77-26:~$ sudo systemctl restart apache2
ubuntu@ip-172-31-77-26:~$ 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 Tue 2025-11-25 13:51:42 UTC; 9s ago
     Docs: https://httpd.apache.org/docs/2.4/
 Process: 17944 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
 Main PID: 17947 (apache2)
   Tasks: 6 (limit: 1008)
  Memory: 10.7M (peak: 11.1M)
    CPU: 51ms
   CGroup: /system.slice/apache2.service
           ├─17947 /usr/sbin/apache2 -k start
           ├─17949 /usr/sbin/apache2 -k start
           ├─17950 /usr/sbin/apache2 -k start
           ├─17951 /usr/sbin/apache2 -k start
           ├─17952 /usr/sbin/apache2 -k start
           └─17953 /usr/sbin/apache2 -k start

Nov 25 13:51:42 ip-172-31-77-26 systemd[1]: Starting apache2.service - The Apache HTTP Server...
Nov 25 13:51:42 ip-172-31-77-26 systemd[1]: Started apache2.service - The Apache HTTP Server.
ubuntu@ip-172-31-77-26:~$
```

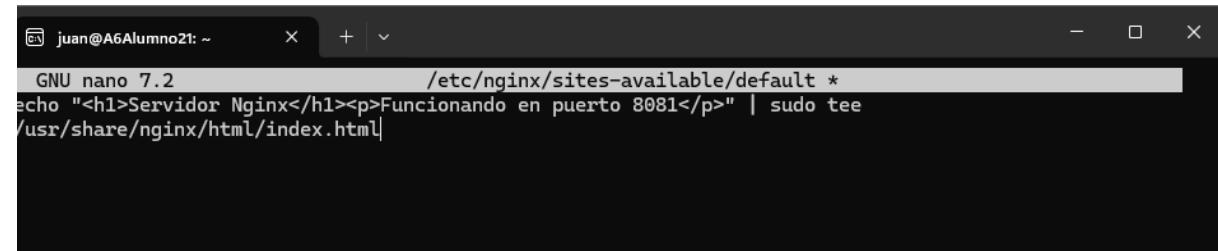
2.2 Instalación y prueba de Nginx

Nginx fue configurado para escuchar en el puerto 8081. Se creó una página HTML de prueba y se verificó el funcionamiento.

instalación de nginx

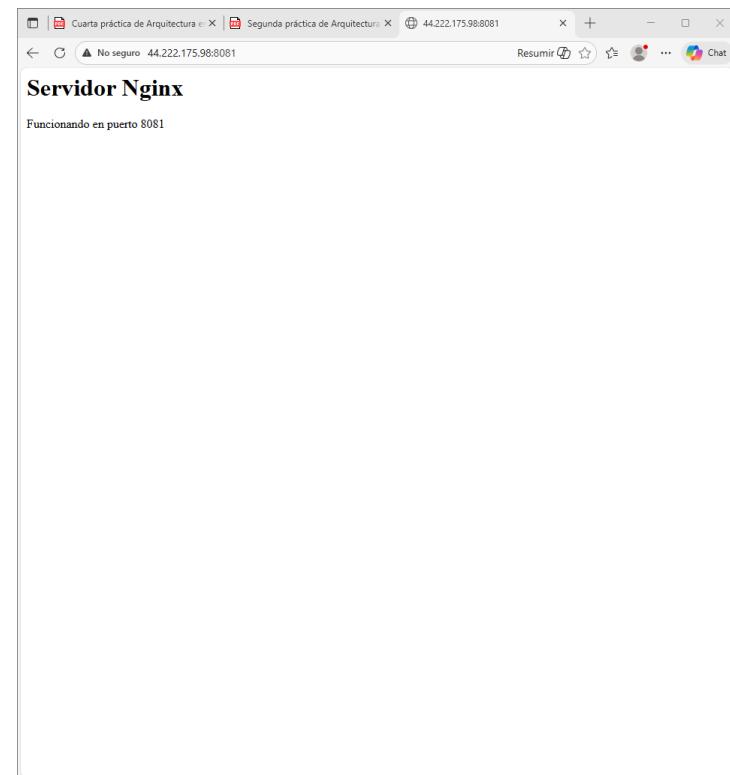
```
</div></body></html>ubuntu@ip-172-31-77-26:~$ sudo apt install nginx -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  nginx-common
Suggested packages:
  fcgiwrap nginx-doc
The following NEW packages will be installed:
  nginx nginx-common
0 upgraded, 2 newly installed, 0 to remove and 2 not upgraded.
Need to get 564 kB of archives.
```

creación de index.html de Nginx



```
juan@A6Alumno21: ~          + | ~
GNU nano 7.2                  /etc/nginx/sites-available/default *
echo "<h1>Servidor Nginx</h1><p>Funcionando en puerto 8081</p>" | sudo tee
/usr/share/nginx/html/index.html|
```

navegador mostrando “Servidor Nginx funcionando en puerto 8081



```
ubuntu@ip-172-31-77-26:/var/www/html$ sudo systemctl restart nginx
ubuntu@ip-172-31-77-26:/var/www/html$ curl http://localhost:8081/index.html
<h1>Servidor Nginx</h1><p>Funcionando en puerto 8081</p>
ubuntu@ip-172-31-77-26:/var/www/html$ sudo systemctl restart nginx
```

estado del servicio nginx

```
ubuntu@ip-172-31-77-26:/var/www/html$ 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:>)
  Active: active (running) since Thu 2025-12-04 13:43:29 UTC; 2min 51s ago
    Docs: man:nginx(8)
   Process: 2493 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_pr>
   Process: 2495 ExecStart=/usr/sbin/nginx -g daemon on; master_process on;>
 Main PID: 2496 (nginx)
    Tasks: 3 (limit: 1017)
   Memory: 2.4M (peak: 2.9M)
      CPU: 15ms
     CGroup: /system.slice/nginx.service
             ├─2496 "nginx: master process /usr/sbin/nginx -g daemon on; mas>
             ├─2497 "nginx: worker process"
             └─2498 "nginx: worker process"

Dec 04 13:43:29 ip-172-31-77-26 systemd[1]: Starting nginx.service - A high >
Dec 04 13:43:29 ip-172-31-77-26 systemd[1]: Started nginx.service - A high p>
lines 1-17/17 (END)
```

2.3 Instalación y prueba de Caddy

instalación de repositorio GPG de Caddy

```
ubuntu@ip-172-31-77-26:/var/www/html$ sudo apt install -y debian-keyring debi
an-archive-keyring apt-transport-https curl
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 NEW packages will be installed:
  apt-transport-https debian-archive-keyring debian-keyring
0 upgraded, 3 newly installed, 0 to remove and 5 not upgraded.
```

```
ubuntu@ip-172-31-77-26:/var/www/html$ curl -1sLF 'https://dl.cloudsmith.io/pu
blic/caddy/stable/debian.deb.txt'
# 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] http
s://dl.cloudsmith.io/public/caddy/stable/deb/debian any-version main
ubuntu@ip-172-31-77-26:/var/www/html$ sudo tee /etc/apt/sources.list.d/caddy-stable.list
Activa Windows
Vea la Configuración para activar Windows.
```

instalación completa de Caddy

```
LmOP+R+Ny1gKVOW9tVf2HpuVY2cNwJSA096C3K4W4z/ykHco/6HzcAb/MydMKPy
cI8jUDKa++Dk88xvq/AsRH++ri5WIY3n/HIkDyxGX5KCyxAfU1xuGkosnu7iBxoz
2YVIV5GUwjf7ys0mgkb7FAcb73hUnCdGxcbWiQofABEBAAGJBHIEGAEKACYWIQRl
dgcR7eogF86iyhUVW215ylbqNAUCX+uckAIbAgUJCWYBgAJACRAVW215ylbqNMF0
IAQZAQoAHRYhBC9c0+mIas0pEyme+6uh+biHWmZhBQJF65yQAAoJEkuh+biHWmZh
ZIIP/2FxCz40ev/sR60ozPRg/eMqAx8M8tmwAcjPk84tCzryTRQ9dQ2nKzIWIQvt
rLjl00U3CCLgHRHl5lEjTgeDSfvrlGss48fKAenBlHLGTzaMqdI6bs1fg7Ieh5
dZQd9CrF6xLC7tBSjEzaqaPseux9tEdLEbHn8oJlQAgymW4wBko+ymriZpj543Hx
ir8iHn/H+oSJe4tOwaGmLzbMY5LMffvUWVKnoacjIx92XiVlUVypkh22iSa0upsz
vseu+hiytwBMyxU99dsRw0Qy2BZd3P/tCwpnDI8hSZCzBTyuo6XNgwLHZzvUuNKc
qXZK4kxPRTVGyur9S1rYbZqnmPf4Wy7wFtwRuvbVve6BvdC7v9zWsTkEtTEJ4Buh
GHSwBTdGKy8CJJgRN8K2umGCPxnUNvoC0sqW6xIJTp2baM1nRWZf1UvNjgVhwyJt
AlrMk1xdmDDqVU080Y5p7Jn2G1XPlQOVHcjyjFtM4sIWpqrRzTzB4xTAZ1push3
E0ys2+4IGLgS7P6z0q+4Cxwtnm32ZueQDWyQA5g00ZAodb8HCku6sIIiF+zGtrNO
F45xsKAoJVPt5VvH4zOKK+TbYyHAN/Ujpf09zXrTtmrnHwjB8PD+Uq20ber/Zf5Q
4MGnzQAY/Qkw8suciIxgLC9kCNwJIFRULHMTusAFaAq+L9+iBmwP/R2Yt/Gop4Nl
IfJDSMIBXGVn/2I2rTW0NDU3UC1njVRSVwQ4fjyRcuxi7dM/f8YBPnNGX02Ur709
f7LF7GkY/VgjQ9RWaZ6CB3GPhUjj1Q5nmW+lQkyehPYgx1/MuD3wq3w/BfYyrYHb
xRn5r4N5QmUasFrPH8Ey/zI2cEFwckek0Z1G2SwnkEsY0e9vy12RvCGGicHJ+Xxs
7E/L6rEjRpCQg1xzzCh1Sdx4ZKIxss9N5vJ5xCTd9kFl68ZCQJEz9zJUztEiEYcG
l6WQ+BK3W4UepkbzgZ1HVb2LWF84cHC4a983k0avI1KtKSnd6Nn4qUJUa1Hj+mw7
tlCwt97V+vBEnhFsoVj0bJqsVXQOs9Cd0iV2vsRqVD5tQPEq3AfowGhtNgxXbf0/
wPiLmPSzZoAaLfaRXx60ff9B6RYuh5pVd/njewpsPAJfefiYeBOS0nThrQMbwef
S7FG/ibAE8NspI2Dn3nT+D6cUeYzCVkhNKKgBzYotODML0N3H6pf0QwWp0a08teo
0v07lrePvMGNQcu2GuTM1v9Y0t5kMrfbNgdAfrN8BLPUV/ZseCdKlfJLNlh6/pxr
STw95n1JvFHpSZCMR5NWbiEdtXzmlJTfLMNMww8v03DwTkA9hdqnkl04yPHQQpMD
A5zVwuXbvH6GHaZJvHUrII6w8rjimo5r
=e4lF
-----END PGP PUBLIC KEY BLOCK-----
ubuntu@ip-172-31-77-26:/var/www/html$ sudo gpg --dearmor -o
/usr/share/keyrings/caddy-stable-archive-keyring.gpg
gpg: missing argument for option "-o"
-bash: /usr/share/keyrings/caddy-stable-archive-keyring.gpg: No such file or
directory
ubuntu@ip-172-31-77-26:/var/www/html$ exit
logout
There are stopped jobs.
ubuntu@ip-172-31-77-26:/var/www/html$ /usr/share/keyrings/caddy-stable-archiv
e-keyring.gpg
-bash: /usr/share/keyrings/caddy-stable-archive-keyring.gpg: No such file or
directory
Vé a Configuración para activar Windows.
ubuntu@ip-172-31-77-26:/var/www/html$
```

creación del sitio web en /var/www/caddy

```
ubuntu@ip-172-31-77-26:/var/www/html$ sudo apt update && sudo apt install caddy -y
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InReleas
e
Hit:4 http://security.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... 54%
ubuntu@ip-172-31-77-26:/var/www/html$ echo "Este servidor está funcionando co
rrectamente." | sudo tee -a
/var/www/caddy/README.md
Este servidor está funcionando correctamente.
```

```
/var/www/caddy/README.md
# Bienvenido a Caddy
ubuntu@ip-172-31-77-26:/var/www/html$ echo "" | sudo tee -a /var/www/caddy/RE
ADME.md

ubuntu@ip-172-31-77-26:/var/www/html$ echo "Este servidor está funcionando co
rrectamente." | sudo tee -a
Este servidor está funcionando correctamente.
ubuntu@ip-172-31-77-26:/var/www/html$ echo "Este servidor está funcionando co
rrectamente." | sudo tee -a
/var/www/caddy/README.md
Este servidor está funcionando correctamente.
-bash: /var/www/caddy/README.md: Permission denied
ubuntu@ip-172-31-77-26:/var/www/html$ sudo tee -a
/var/www/caddy/README.md
^Z
[3]+ Stopped                  sudo tee -a
-bash: /var/www/caddy/README.md: Permission denied
ubuntu@ip-172-31-77-26:/var/www/html$ echo "" | sudo tee -a /var/www/caddy/RE
ADME.md

ubuntu@ip-172-31-77-26:/var/www/html$ echo "## Características" | sudo tee -a
/var/www/caddy/README.md
## Características
ubuntu@ip-172-31-77-26:/var/www/html$ echo "- Servidor moderno" | sudo tee -a
/var/www/caddy/README.md
- Servidor moderno
ubuntu@ip-172-31-77-26:/var/www/html$ echo "- HTTPS automático" | sudo tee -a
/var/www/caddy/README.md
- HTTPS automático
ubuntu@ip-172-31-77-26:/var/www/html$ echo "- Fácil configuración" | sudo tee
-a /var/www/caddy/README.md
                                         Activar Windows
                                         Ve a Configuración para activar Windows.
- Fácil configuración
ubuntu@ip-172-31-77-26:/var/www/html$
```

```
juan@A6Alumno21:~$ 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
 0       0      0      0      0       0       0 --:--:-- --:--:-- --:--:--
100  7382  100  7382      0       0   140k      0 --:--:-- Activar Windows --:--:--  144
k
                                         Ve a Configuración para activar Windows.
juan@A6Alumno21:~$
```

```
# The Caddyfile is an easy way to configure your Caddy web server.  
#  
# Unless the file starts with a global options block, the first  
# uncommented line is always the address of your site.  
#  
# To use your own domain name (with automatic HTTPS), first make  
# sure your domain's A/AAAA DNS records are properly pointed to  
# this machine's public IP, then replace ":80" below with your  
# domain name.  
  
:8082 {  
    root * /var/www/caddy  
    file_server browse  
  
    @markdown path *.md  
    header @markdown Content-Type text/plain  
}
```

systemctl restart caddy y estado del servicio

```
juan@A6Alumno21:~$ ls -l /etc/caddy
total 4
-rw-r--r-- 1 root root 769 Aug 23 03:47 Caddyfile
juan@A6Alumno21:~$ sudo nano /etc/caddy/Caddyfile
juan@A6Alumno21:~$ sudo nano /etc/caddy/Caddyfile Activar
juan@A6Alumno21:~$ sudo systemctl restart caddy Ve a Configurar
juan@A6Alumno21:~$
```

Caddy se configuró como servidor web en el puerto 8082, con un sitio básico de prueba y acceso mediante dashboard



SECCIÓN 3 — Implementación de HTTPS con Apache (Certbot + SSL)

Se habilitó el módulo SSL de Apache, se configuró un certificado autofirmado y se verificó el acceso por HTTPS.

instalación de certbot + módulo apache

```
juan@A6Alumno21:~$ sudo systemctl restart caddy
juan@A6Alumno21:~$ sudo apt install certbot python3-certbot-apache -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils augeas-lenses libapr1t64
  libaprutil1-dbd-sqlite3 libaprutil1-dbd libaprutil1+curl libaugeas0
juan@A6Alumno21:~$ sudo apt update
Get:1 https://dl.cloudsmith.io/public/caddy/stable/deb/debian any-version InRelease [14.8 kB]
Hit:2 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:3 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:4 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:5 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Fetched 14.8 kB in 0s (44.5 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
50 packages can be upgraded. Run 'apt list --upgradable' to see them.
juan@A6Alumno21:~$ certbot --version
Activar Windows
Ve a Configuración para activar Windows.
certbot 2.9.0
juan@A6Alumno21:~$
```

```
juan@A6Alumno21:~$ certbot --version
certbot 2.9.0
juan@A6Alumno21:~$ sudo ls /usr/lib/python3/dist-packages/certbot_apache
__init__.py  __pycache__  _internal  py.typed
juan@A6Alumno21:~$
```

Habilitar SSL (a2enmod ssl)

```
juan@A6Alumno21:~$ 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
juan@A6Alumno21:~$
```

Editar ports.conf para Listen 8443

```
juan@A6Alumno21:~$ sudo nano /etc/apache2/ports.conf
juan@A6Alumno21:~$ sudo ss -tulpn | grep apache2
tcp  LISTEN  0      511          *:8443           *:*      users:(("apache2",pid=6643,fd=4),("apache2",pid=6642,fd=4),("apache2",pid=6640,fd=4))
juan@A6Alumno21:~$ sudo a2ensite default-ssl.conf
Site default-ssl already enabled
juan@A6Alumno21:~$ sudo systemctl restart apache2
juan@A6Alumno21:~$ sudo ss -tulpn | grep apache2
tcp  LISTEN  0      511          *:8443           *.*      users:(("apache2",pid=6739,fd=4),("apache2",pid=6738,fd=4),("apache2",pid=6736,fd=4))
juan@A6Alumno21:~$
```

Acceso por navegador a https://IP:8443



SECCIÓN 4 — Verificación de servicios

Estado de Apache

```
juan@A6Alumno21:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
  Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; pres>
  Active: active (running) since Fri 2025-12-05 09:12:43 CET; 1min 13s ago
    Docs: https://httpd.apache.org/docs/2.4/
   Process: 6733 ExecStart=/usr/sbin/apachectl start (code=exited, status=0>
 Main PID: 6736 (apache2)
   Tasks: 55 (limit: 9350)
  Memory: 6.8M (peak: 8.8M)
    CPU: 29ms
   CGroup: /system.slice/apache2.service
           ├─6736 /usr/sbin/apache2 -k start
           ├─6738 /usr/sbin/apache2 -k start
           └─6739 /usr/sbin/apache2 -k start

Dec 05 09:12:43 A6Alumno21 systemd[1]: Starting apache2.service - The Apache >
Dec 05 09:12:43 A6Alumno21 systemd[1]: Started apache2.service - The Apache >
[lines 1-16/16 (END)]
```



```
[2]+  Stopped                  sudo systemctl status apache2
juan@A6Alumno21:~$ sudo ss -tulpn | grep apache2
tcp  LISTEN  0      511          *:8443          *:*      users:(("apa
che2",pid=6739,fd=4),("apache2",pid=6738,fd=4),("apache2",pid=6736,fd=4))
juan@A6Alumno21:~$
```

Estado de Nginx (systemctl status nginx)

```
juan@A6Alumno21:~$ sudo systemctl status nginx
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) ...
juan@A6Alumno21:~$ 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:|)
   Active: active (running) since Fri 2025-12-05 09:15:38 CET; 4s ago
     Docs: man:nginx(8)
  Process: 6986 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_pr>
  Process: 6988 ExecStart=/usr/sbin/nginx -g daemon on; master_process on;>
 Main PID: 7029 (nginx)
    Tasks: 17 (limit: 9350)
   Memory: 11.6M (peak: 27.0M)
      CPU: 107ms
     CGroup: /system.slice/nginx.service
             ├─7029 "nginx: master process /usr/sbin/nginx -g daemon on; mas>
             ├─7031 "nginx: worker process"
             ├─7032 "nginx: worker process"
             ├─7033 "nginx: worker process"
             ├─7034 "nginx: worker process"
             ├─7035 "nginx: worker process"
             ├─7036 "nginx: worker process"
             ├─7037 "nginx: worker process"
             ├─7038 "nginx: worker process"
             ├─7039 "nginx: worker process"
             ├─7040 "nginx: worker process"
             ├─7041 "nginx: worker process"
             ├─7042 "nginx: worker process"
             ├─7043 "nginx: worker process"
             ├─7045 "nginx: worker process"
             ├─7046 "nginx: worker process"
             └─7047 "nginx: worker process"

Dec 05 09:15:38 A6Alumno21 systemd[1]: Starting nginx.service - A high performance web server and a reverse proxy server...
Dec 05 09:15:38 A6Alumno21 systemd[1]: Started nginx.service - A high performance web server and a reverse proxy server.
| Lines 1-31/31 (END)
```

```
juan@A6Alumno21:~$ sudo systemctl restart nginx
juan@A6Alumno21:~$ sudo ss -tulpn | grep nginx
tcp    LISTEN  0      511          0.0.0.0:8081      0.0.0.0:*      users:(("nginx",pid=7122,fd=5),("nginx",pid=7121,fd=5),("nginx",pid=7120,fd=5),("nginx",pid=7119,fd=5),("nginx",pid=7118,fd=5),("nginx",pid=7117,fd=5),("nginx",pid=7116,fd=5),("nginx",pid=7115,fd=5),("nginx",pid=7114,fd=5),("nginx",pid=7113,fd=5),("nginx",pid=7112,fd=5),("nginx",pid=7110,fd=5),("nginx",pid=7109,fd=5),("nginx",pid=7108,fd=5),("nginx",pid=7107,fd=5),("nginx",pid=7106,fd=5),("nginx",pid=7105,fd=5))
tcp    LISTEN  0      511          [::]:8081        [::]:*      users:(("nginx",pid=7122,fd=6),("nginx",pid=7121,fd=6),("nginx",pid=7120,fd=6),("nginx",pid=7119,fd=6),("nginx",pid=7118,fd=6),("nginx",pid=7117,fd=6),("nginx",pid=7116,fd=6),("nginx",pid=7115,fd=6),("nginx",pid=7114,fd=6),("nginx",pid=7113,fd=6),("nginx",pid=7112,fd=6),("nginx",pid=7110,fd=6),("nginx",pid=7109,fd=6),("nginx",pid=7108,fd=6),("nginx",pid=7107,fd=6),("nginx",pid=7106,fd=6),("nginx",pid=7105,fd=6))
juan@A6Alumno21:~$
```

Estado de Caddy (systemctl status caddy)

```
juan@A6Alumno21:~$ sudo systemctl status caddy
● caddy.service - Caddy
  Loaded: loaded (/usr/lib/systemd/system/caddy.service; enabled; preset: en
  Active: active (running) since Fri 2025-12-05 08:37:47 CET; 41min ago
    Docs: https://caddyserver.com/docs/
   Main PID: 4789 (caddy)
     Tasks: 13 (limit: 9350)
    Memory: 10.7M (peak: 13.4M)
      CPU: 259ms
     CGroup: /system.slice/caddy.service
             └─4789 /usr/bin/caddy run --environ --config /etc/caddy/Caddyfile

Dec 05 08:37:47 A6Alumno21 caddy[4789]: {"level":"info","ts":1764920267.2773}
Dec 05 08:37:47 A6Alumno21 caddy[4789]: {"level":"warn","ts":1764920267.2775}
Dec 05 08:37:47 A6Alumno21 caddy[4789]: {"level":"warn","ts":1764920267.2775}
Dec 05 08:37:47 A6Alumno21 caddy[4789]: {"level":"info","ts":1764920267.2775}
Dec 05 08:37:47 A6Alumno21 caddy[4789]: {"level":"info","ts":1764920267.2775}
Dec 05 08:37:47 A6Alumno21 caddy[4789]: {"level":"info","ts":1764920267.2777}
Dec 05 08:37:47 A6Alumno21 caddy[4789]: {"level":"info","ts":1764920267.3140}
Dec 05 08:37:47 A6Alumno21 caddy[4789]: {"level":"info","ts":1764920267.3143}
[lines 1-21/21 (END)]
```

```
juan@A6Alumno21:~$ sudo ss -tulpn | grep caddy
tcp LISTEN 0 4096 127.0.0.1:2019 0.0.0.0:* users:(("caddy",pid=4789,fd=3))
```

```
tcp LISTEN 0 4096 *:8082 *:* users:(("caddy",pid=4789,fd=6))
```

Activar Windows
Ve a Configuración para activar Windows.

```
juan@A6Alumno21:~$
```

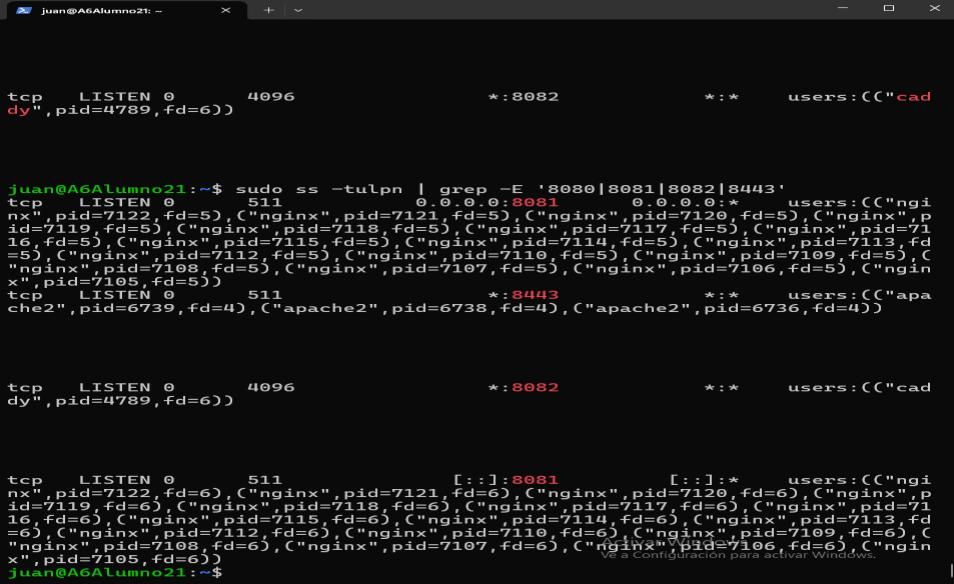
SECCIÓN 5 — Comprobación de puertos

Los servicios escuchan en los puertos configurados simultáneamente, permitiendo coexistencia en la misma EC2

Se observan:

- Apache en 8080 y 8443
- Nginx en 8081
- Caddy en 8082

Comando ss -tulnp | grep -E "8080|8081|8082|8443"



```
juan@A6Alumno21:~$ ss -tulnp | grep -E '8080|8081|8082|8443'
tcp   LISTEN  0      4096          *:8082                      *:*      users:(("caddy",pid=4789,fd=6))
tcp   LISTEN  0      511           0.0.0.0:8081              0.0.0.0:*
                                         users:(("nginx",pid=7122,fd=5),("nginx",pid=7121,fd=5),("nginx",pid=7118,fd=5),("nginx",pid=7117,fd=5),("nginx",pid=7116,fd=5),("nginx",pid=7115,fd=5),("nginx",pid=7114,fd=5),("nginx",pid=7113,fd=5),("nginx",pid=7112,fd=5),("nginx",pid=7110,fd=5),("nginx",pid=7109,fd=5),("nginx",pid=7108,fd=5),("nginx",pid=7107,fd=5),("nginx",pid=7106,fd=5),("nginx",pid=7105,fd=5))
tcp   LISTEN  0      511           *:8443                      *:*      users:(("apache2",pid=6739,fd=4),("apache2",pid=6738,fd=4),("apache2",pid=6736,fd=4))
tcp   LISTEN  0      4096          *:8082                      *:*      users:(("caddy",pid=4789,fd=6))

tcp   LISTEN  0      511           [::]:8081                  [::]:*      users:(("nginx",pid=7122,fd=6),("nginx",pid=7121,fd=6),("nginx",pid=7120,fd=6),("nginx",pid=7119,fd=6),("nginx",pid=7118,fd=6),("nginx",pid=7117,fd=6),("nginx",pid=7116,fd=6),("nginx",pid=7115,fd=6),("nginx",pid=7114,fd=6),("nginx",pid=7113,fd=6),("nginx",pid=7112,fd=6),("nginx",pid=7110,fd=6),("nginx",pid=7109,fd=6),("nginx",pid=7108,fd=6),("nginx",pid=7107,fd=6),("nginx",pid=7106,fd=6),("nginx",pid=7105,fd=6))
juan@A6Alumno21:~$
```

SECCIÓN 6 — Verificación final de funcionamiento de los tres servidores

6.2 Pruebas de respuesta con cURL (Apache, Nginx y Caddy)

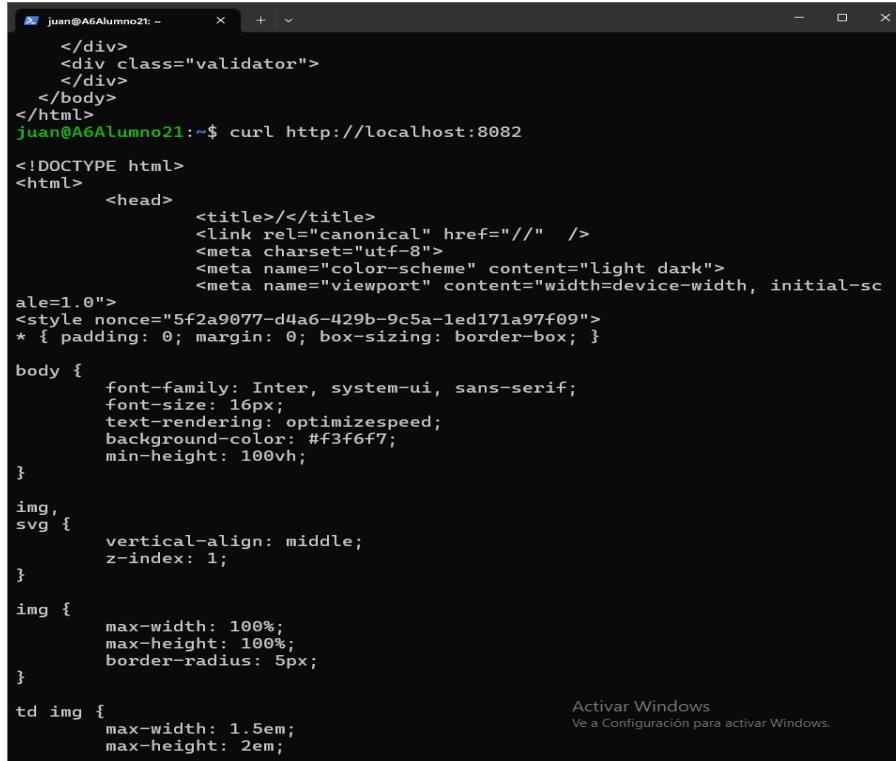
Muestra la respuesta HTML de Nginx funcionando correctamente.

`curl http://localhost:8081 (Nginx)`



```
tcp    LISTEN 0      511          [::]:8081          [::]:*      users:(("nginx",pid=7122,fd=6),("nginx",pid=7121,fd=6),("nginx",pid=7120,fd=6),("nginx",pid=7119,fd=6),("nginx",pid=7118,fd=6),("nginx",pid=7117,fd=6),("nginx",pid=7116,fd=6),("nginx",pid=7115,fd=6),("nginx",pid=7114,fd=6),("nginx",pid=7113,fd=6),("nginx",pid=7112,fd=6),("nginx",pid=7110,fd=6),("nginx",pid=7109,fd=6),("nginx",pid=7108,fd=6),("nginx",pid=7107,fd=6),("nginx",pid=7106,fd=6),("nginx",pid=7105,fd=6))  
juan@A6Alumno21:~$ curl http://localhost:8081  
<!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">  
  <!--  
  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;  
      font-family: Ubuntu, Verdana, sans-serif;  
      font-size: 11pt;  
      text-align: center;  
    }  
  
    div.main_page {  
      position: relative;  
      display: table;  
      width: 800px;  
    }  
  </style>  
</head>  
<body>  
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</body>  
</html>
```

curl <http://localhost:8082> (Caddy)



```
juan@A6Alumno21:~$ 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="5f2a9077-d4a6-429b-9c5a-1ed171a97f09">
      * { 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;
      }

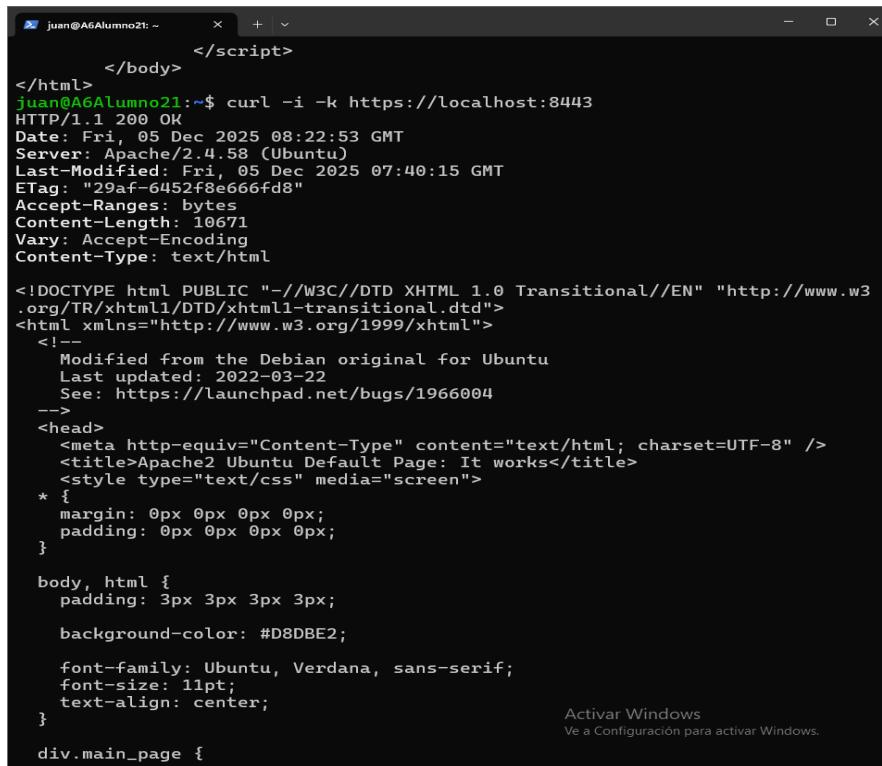
      img,
      svg {
        vertical-align: middle;
        z-index: 1;
      }

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

      td img {
        max-width: 1.5em;
        max-height: 2em;
      }
    
  </head>
  <body>
    <div class="validator">
      </div>
    </body>
  </html>
```

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curl -i -k <https://localhost:8443> (Apache SSL)



```
juan@A6Alumno21:~$ curl -i -k https://localhost:8443
HTTP/1.1 200 OK
Date: Fri, 05 Dec 2025 08:22:53 GMT
Server: Apache/2.4.58 (Ubuntu)
Last-Modified: Fri, 05 Dec 2025 07:40:15 GMT
ETag: "29af-6452f8e666fd8"
Accept-Ranges: bytes
Content-Length: 10671
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">
  <!--
    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;
        font-family: Ubuntu, Verdana, sans-serif;
        font-size: 11pt;
        text-align: center;
      }
    </style>
  </head>
  <body>
```

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