Laboratorio #7: Configuración de Firewall en un Entorno de Red

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Objetivos del Laboratorio:

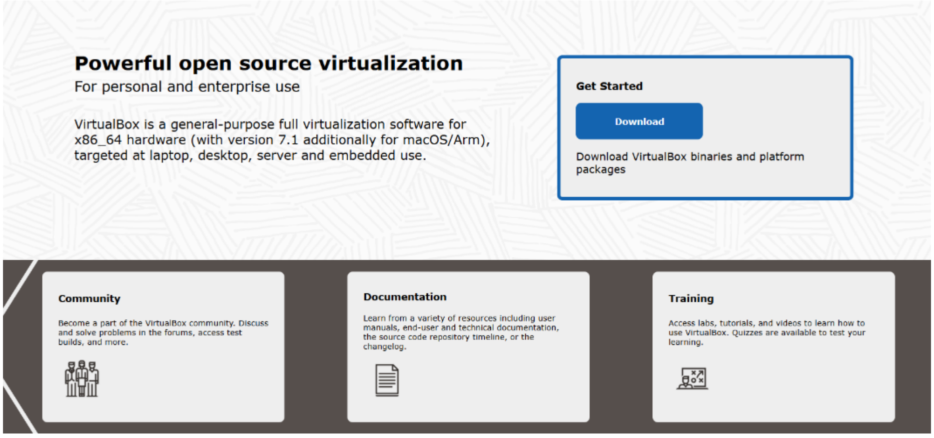
1. Implementar Políticas de Filtrado de Tráfico Entrante y Saliente

2. Configurar Reglas de Seguridad para Servicios Específicos

3. Monitorear y Ajustar la Configuración del Firewall

Parte 1.

1. Introducción al Firewall y Entorno de Configuración
   Paso 1: Revisión de la Configuración de Red Actual
   Paso 2: Instalación y Verificación del Firewall



Powerful open source virtualization

For personal and enterprise use

VirtualBox is a general-purpose full virtualization software for x86_64 hardware (with version 7.1 additionally for macOS/Arm), targeted at laptop, desktop, server and embedded use.

Get Started

Download VirtualBox binaries and platform packages

Community

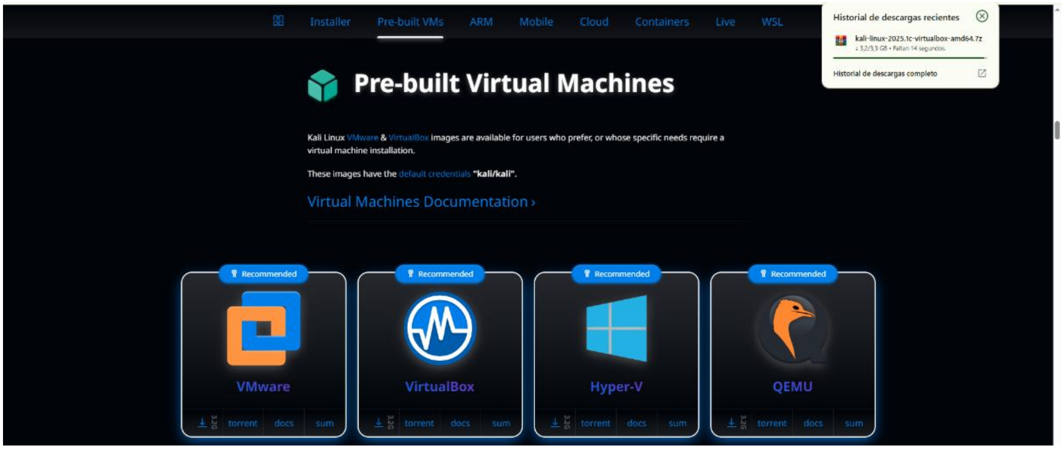
Become a part of the VirtualBox community. Discuss and solve problems in the forums, access test builds, and more.

Documentation

Learn from a variety of resources including user manuals, end-user and technical documentation, the source code repository timeline, or the changelog.

Training

Access labs, tutorials, and videos to learn how to use VirtualBox. Quizzes are available to test your learning.



Pre-built Virtual Machines

Kali Linux VMware & VirtualBox images are available for users who prefer, or whose specific needs require a virtual machine installation.

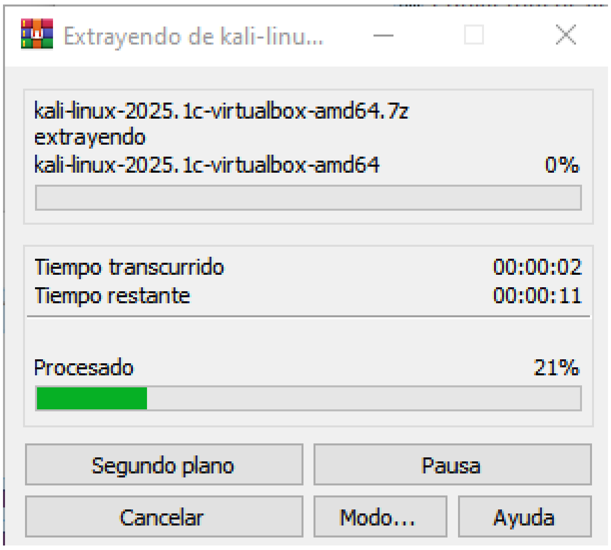
These images have the default credentials "kali/kali".

Virtual Machines Documentation ›

Historial de descargas recientes

kali-linux-2025.1c-virtualbox-amd64.7z
3,2/3,3 GB • Faltan 14 segundos.

Historial de descargas completo



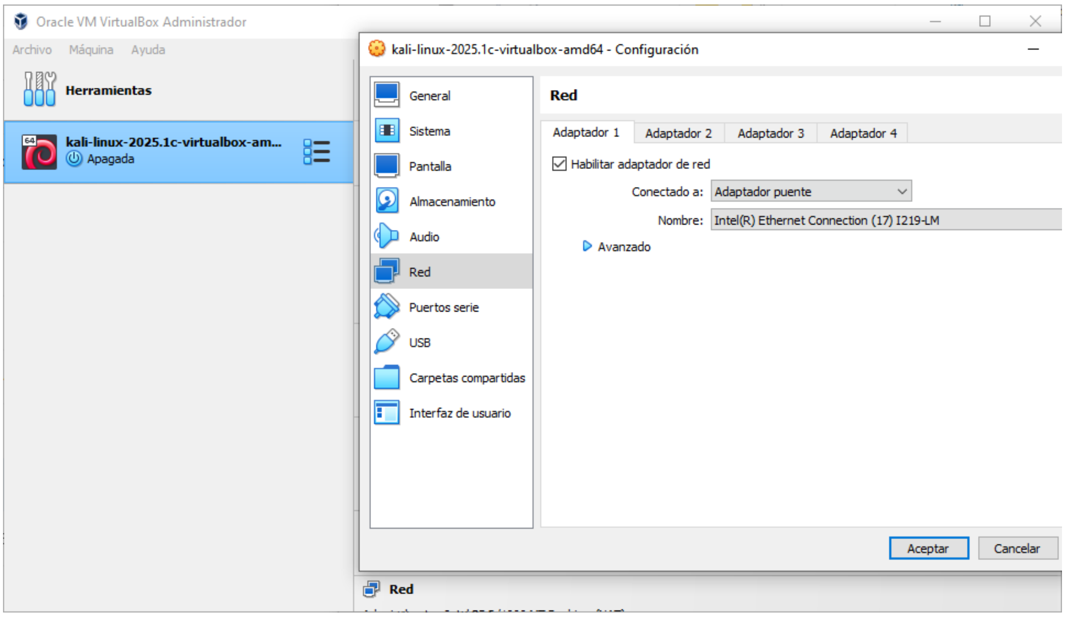
kali-linux-2025.1c-virtualbox-amd64.7z
extrayendo
kali-linux-2025.1c-virtualbox-amd64 0%

Tiempo transcurrido 00:00:02
Tiempo restante 00:00:11

Procesado 21%

Parte 2:

2. Configuración y Verificación del Firewall
   Paso 3: Configuración de Políticas por Defecto
   Paso 4: Permitir Tráfico para Servicios Específicos



Red

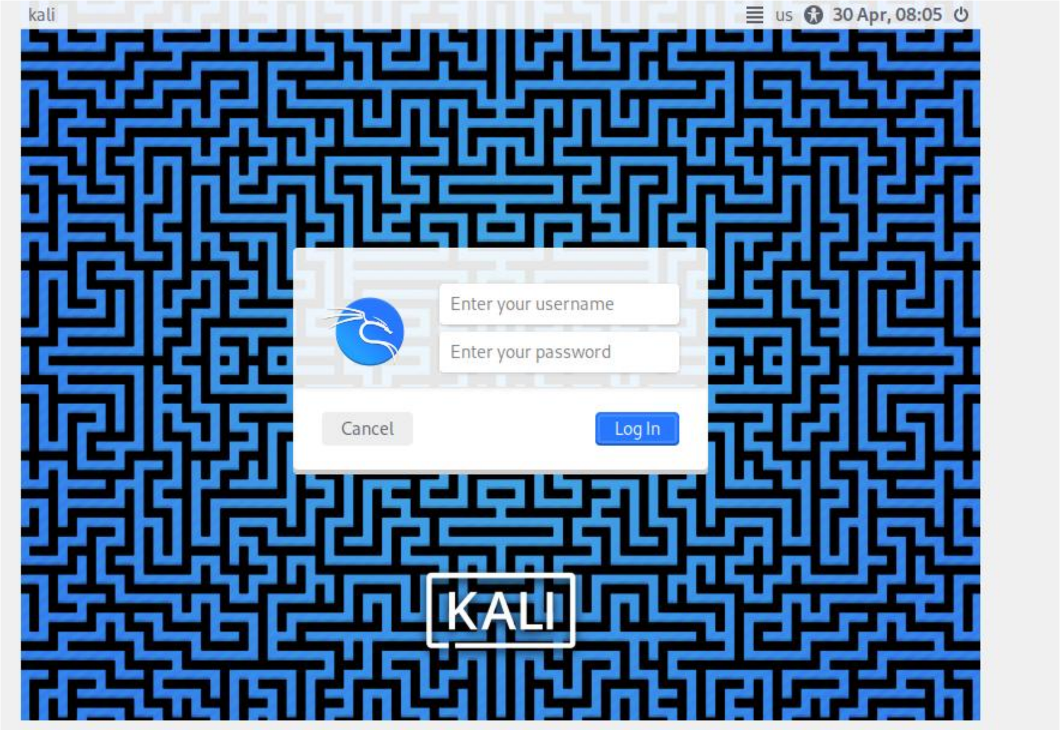
☑ Habilitar adaptador de red

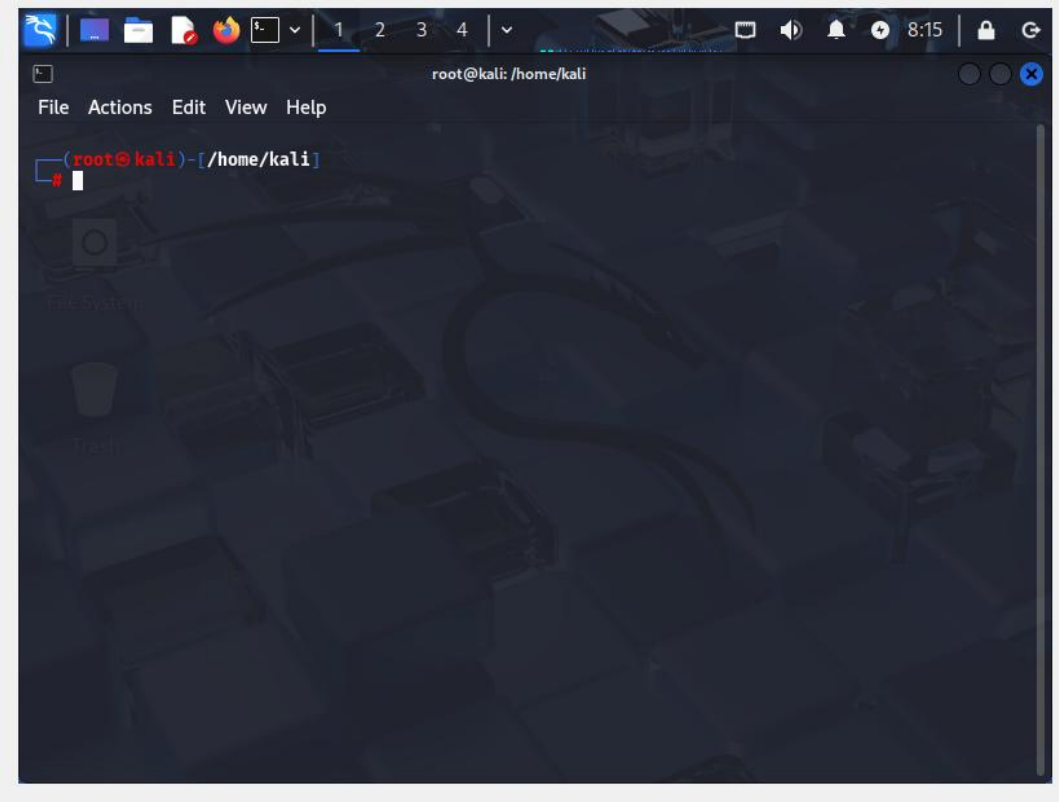
Conectado a: Adaptador puente

Nombre: Intel(R) Ethernet Connection (17) I219-LM

Parte 3:

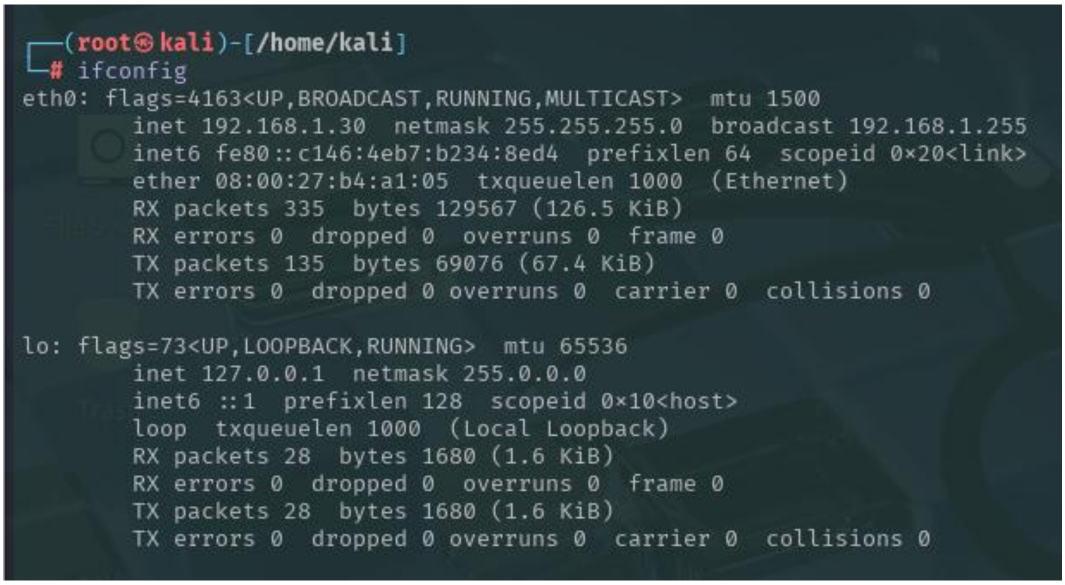
3. Configuración Avanzada del Firewall
   Paso 5: Crear Reglas de Filtrado por IP
   Paso 6: Configuración de Reglas para Redes Internas y Externas
   Nota: Entramos a la terminal e ingresamos a la cuenta root con sudo su





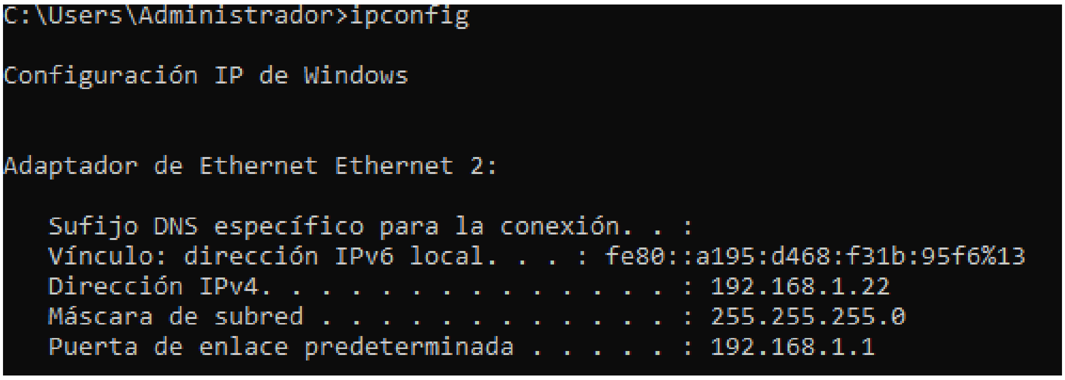
```
┌──(root㉿kali)-[/home/kali]
└─# 
```

Observamos la IP de kali y de Windows:

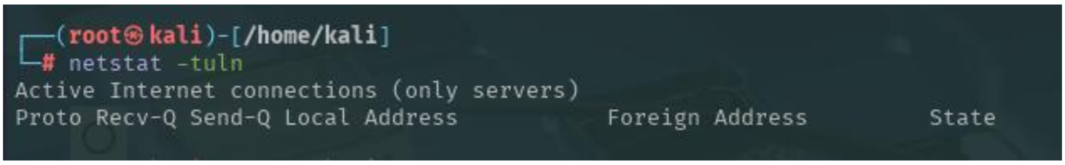


```
┌──(root㉿kali)-[/home/kali]
└─# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.30  netmask 255.255.255.0  broadcast 192.168.1.255
        inet6 fe80::c146:4eb7:b234:8ed4  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:b4:a1:05  txqueuelen 1000  (Ethernet)
        RX packets 335  bytes 129567 (126.5 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 135  bytes 69076 (67.4 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 28  bytes 1680 (1.6 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 28  bytes 1680 (1.6 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

Windows:

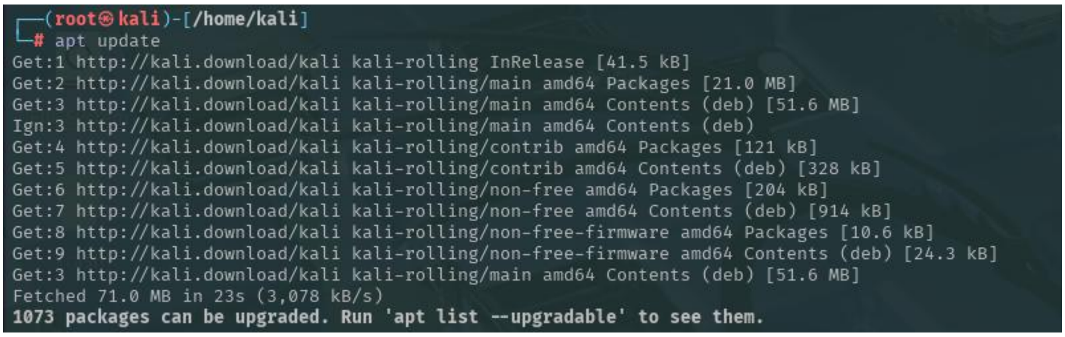


```
C:\Users\Administrador>ipconfig

Configuración IP de Windows


Adaptador de Ethernet Ethernet 2:

   Sufijo DNS específico para la conexión. . :
   Vínculo: dirección IPv6 local. . . : fe80::a195:d468:f31b:95f6%13
   Dirección IPv4. . . . . . . . . . . . . . : 192.168.1.22
   Máscara de subred . . . . . . . . . . . . : 255.255.255.0
   Puerta de enlace predeterminada . . . . . : 192.168.1.1
```

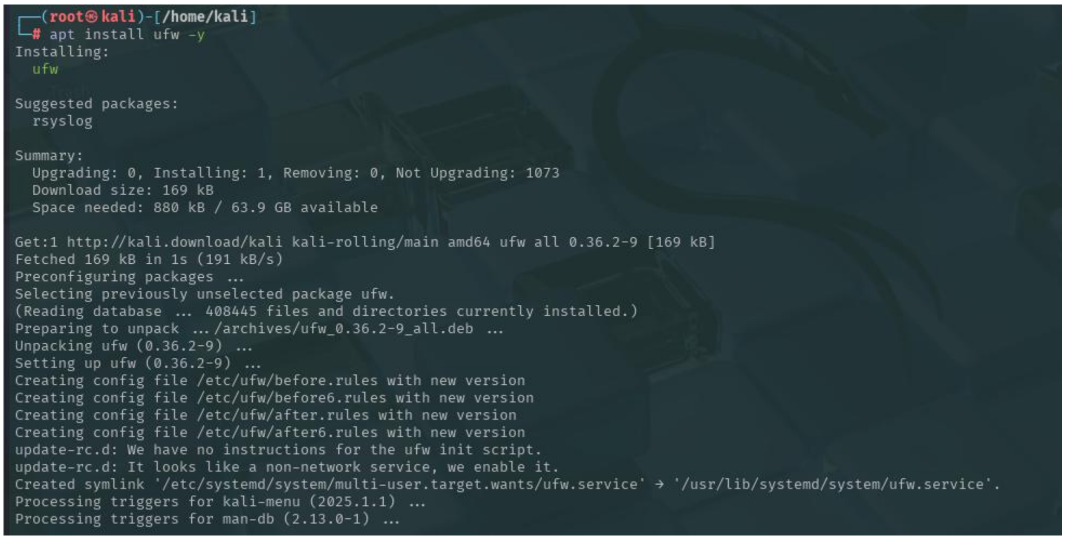


```
┌──(root㉿kali)-[/home/kali]
└─# netstat -tuln
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
```

Proceso de instalación de UFW (Uncomplicated Firewall)

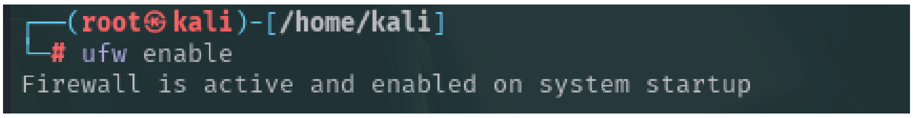


```
┌──(root㉿kali)-[/home/kali]
└─# apt update
Get:1 http://kali.download/kali kali-rolling InRelease [41.5 kB]
Get:2 http://kali.download/kali kali-rolling/main amd64 Packages [21.0 MB]
Get:3 http://kali.download/kali kali-rolling/main amd64 Contents (deb) [51.6 MB]
Ign:3 http://kali.download/kali kali-rolling/main amd64 Contents (deb)
Get:4 http://kali.download/kali kali-rolling/contrib amd64 Packages [121 kB]
Get:5 http://kali.download/kali kali-rolling/contrib amd64 Contents (deb) [328 kB]
Get:6 http://kali.download/kali kali-rolling/non-free amd64 Packages [204 kB]
Get:7 http://kali.download/kali kali-rolling/non-free amd64 Contents (deb) [914 kB]
Get:8 http://kali.download/kali kali-rolling/non-free-firmware amd64 Packages [10.6 kB]
Get:9 http://kali.download/kali kali-rolling/non-free-firmware amd64 Contents (deb) [24.3 kB]
Get:3 http://kali.download/kali kali-rolling/main amd64 Contents (deb) [51.6 MB]
Fetched 71.0 MB in 23s (3,078 kB/s)
1073 packages can be upgraded. Run 'apt list --upgradable' to see them.
```



```
┌──(root㉿kali)-[/home/kali]
└─# apt install ufw -y
Installing:
  ufw

Suggested packages:
  rsyslog

Summary:
  Upgrading: 0, Installing: 1, Removing: 0, Not Upgrading: 1073
  Download size: 169 kB
  Space needed: 880 kB / 63.9 GB available

Get:1 http://kali.download/kali kali-rolling/main amd64 ufw all 0.36.2-9 [169 kB]
Fetched 169 kB in 1s (191 kB/s)
Preconfiguring packages ...
Selecting previously unselected package ufw.
(Reading database ... 408445 files and directories currently installed.)
Preparing to unpack .../archives/ufw_0.36.2-9_all.deb ...
Unpacking ufw (0.36.2-9) ...
Setting up ufw (0.36.2-9) ...
Creating config file /etc/ufw/before.rules with new version
Creating config file /etc/ufw/before6.rules with new version
Creating config file /etc/ufw/after.rules with new version
Creating config file /etc/ufw/after6.rules with new version
update-rc.d: We have no instructions for the ufw init script.
update-rc.d: It looks like a non-network service, we enable it.
Created symlink '/etc/systemd/system/multi-user.target.wants/ufw.service' → '/usr/lib/systemd/system/ufw.service'.
Processing triggers for kali-menu (2025.1.1) ...
Processing triggers for man-db (2.13.0-1) ...
```

Habilitamos UFW:

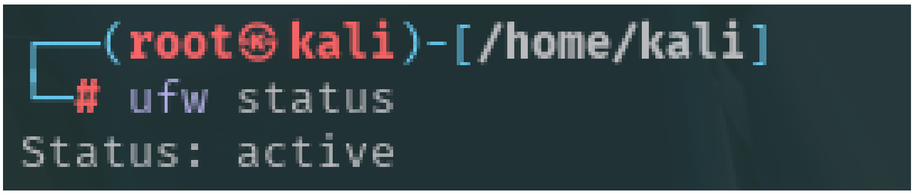


```
┌──(root㉿kali)-[/home/kali]
└─# ufw enable
Firewall is active and enabled on system startup
```

Parte 4:

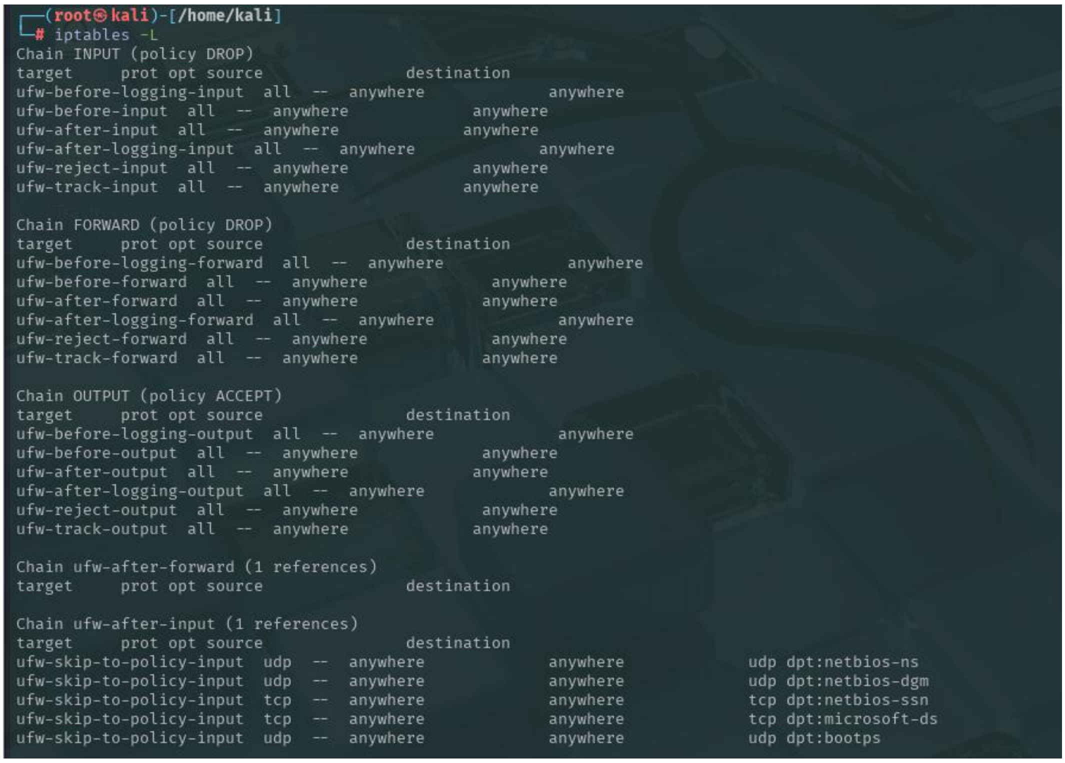
4. Monitoreo y Ajustes del Firewall
   Paso7: Monitoreo de Logs del Firewall
   Paso 8: Ajuste de Reglas Basado en Monitoreo

Revisamos el estatus del Firewall:



```
┌──(root㉿kali)-[/home/kali]
└─# ufw status
Status: active
```

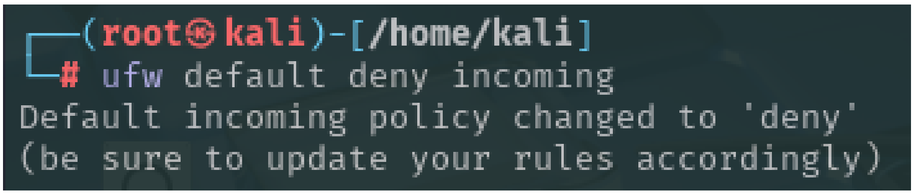
Ejecutamos el siguiente comando **iptables –L**:



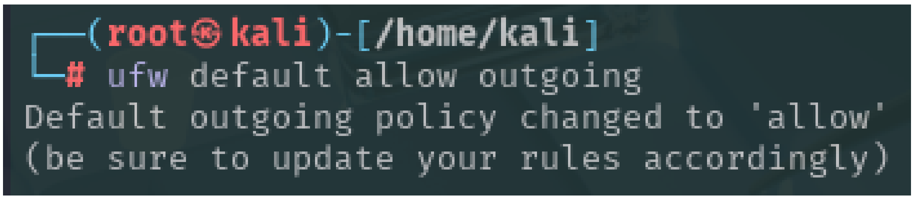
```
┌──(root㉿kali)-[/home/kali]
└─# iptables -L
Chain INPUT (policy DROP)
target     prot opt source               destination
ufw-before-logging-input  all  --  anywhere             anywhere
ufw-before-input  all  --  anywhere             anywhere
ufw-after-input  all  --  anywhere             anywhere
ufw-after-logging-input  all  --  anywhere             anywhere
ufw-reject-input  all  --  anywhere             anywhere
ufw-track-input  all  --  anywhere             anywhere

Chain FORWARD (policy DROP)
target     prot opt source               destination
ufw-before-logging-forward  all  --  anywhere             anywhere
ufw-before-forward  all  --  anywhere             anywhere
ufw-after-forward  all  --  anywhere             anywhere
ufw-after-logging-forward  all  --  anywhere             anywhere
ufw-reject-forward  all  --  anywhere             anywhere
ufw-track-forward  all  --  anywhere             anywhere

Chain OUTPUT (policy ACCEPT)
target     prot opt source               destination
ufw-before-logging-output  all  --  anywhere             anywhere
ufw-before-output  all  --  anywhere             anywhere
ufw-after-output  all  --  anywhere             anywhere
ufw-after-logging-output  all  --  anywhere             anywhere
ufw-reject-output  all  --  anywhere             anywhere
ufw-track-output  all  --  anywhere             anywhere

Chain ufw-after-forward (1 references)
target     prot opt source               destination

Chain ufw-after-input (1 references)
target     prot opt source               destination
ufw-skip-to-policy-input  udp  --  anywhere             anywhere             udp dpt:netbios-ns
ufw-skip-to-policy-input  udp  --  anywhere             anywhere             udp dpt:netbios-dgm
ufw-skip-to-policy-input  tcp  --  anywhere             anywhere             tcp dpt:netbios-ssn
ufw-skip-to-policy-input  tcp  --  anywhere             anywhere             tcp dpt:microsoft-ds
ufw-skip-to-policy-input  udp  --  anywhere             anywhere             udp dpt:bootps
```

Configuramos políticas para entradas y salidas en UFW y Iptables:

UFW:

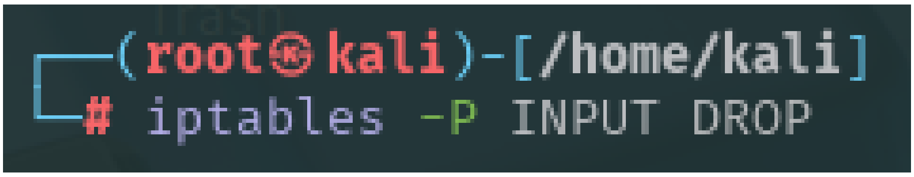


```
┌──(root㉿kali)-[/home/kali]
└─# ufw default deny incoming
Default incoming policy changed to 'deny'
(be sure to update your rules accordingly)
```

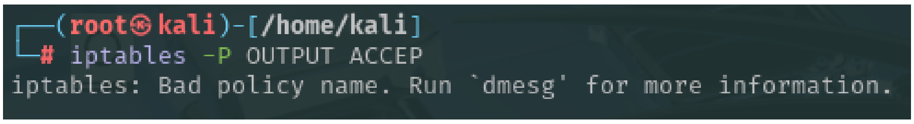


```
┌──(root㉿kali)-[/home/kali]
└─# ufw default allow outgoing
Default outgoing policy changed to 'allow'
(be sure to update your rules accordingly)
```

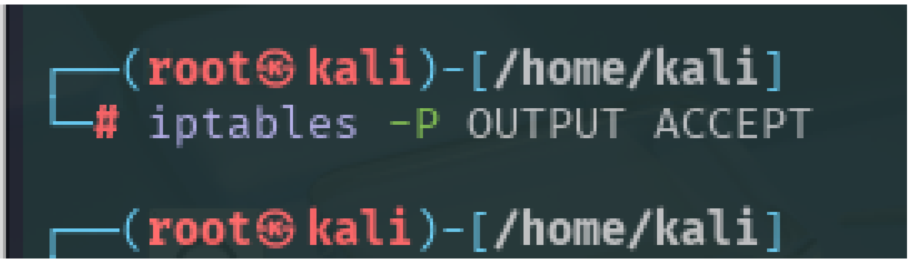
Iptables:



```
┌──(root㉿kali)-[/home/kali]
└─# iptables -P INPUT DROP
```

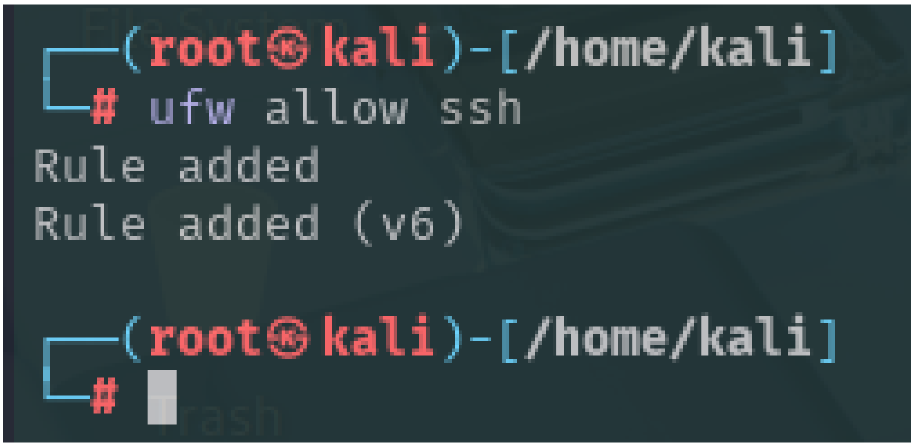


```
┌──(root㉿kali)-[/home/kali]
└─# iptables -P OUTPUT ACCEP
iptables: Bad policy name. Run `dmesg' for more information.
```

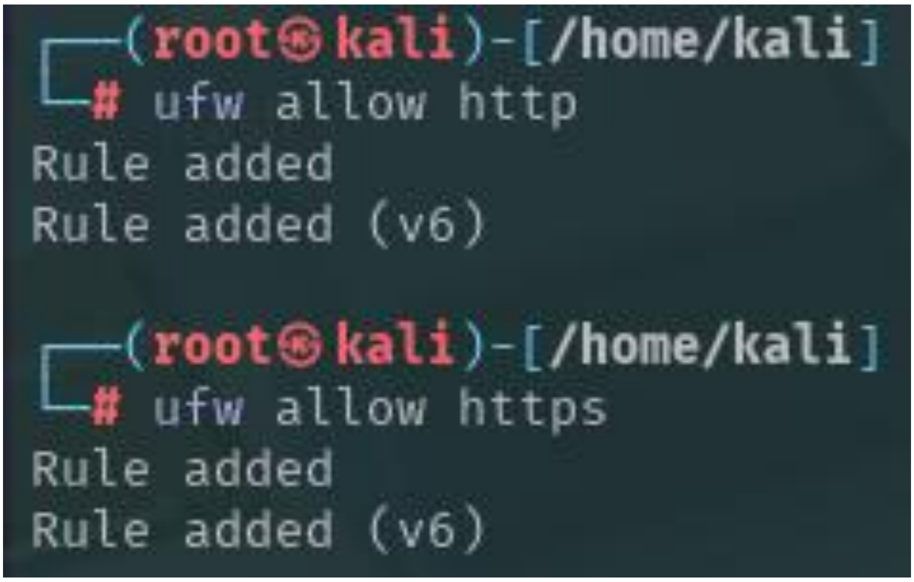


```
┌──(root㉿kali)-[/home/kali]
└─# iptables -P OUTPUT ACCEPT

┌──(root㉿kali)-[/home/kali]
```

UFW:

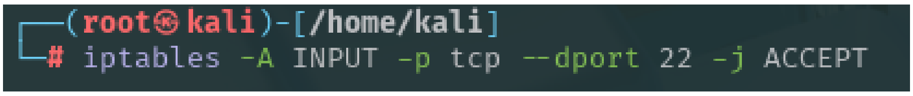


```
┌──(root㉿kali)-[/home/kali]
└─# ufw allow ssh
Rule added
Rule added (v6)

┌──(root㉿kali)-[/home/kali]
└─# 
```

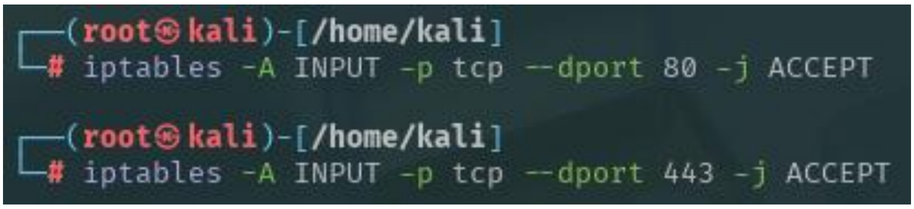


```
┌──(root㉿kali)-[/home/kali]
└─# ufw allow http
Rule added
Rule added (v6)

┌──(root㉿kali)-[/home/kali]
└─# ufw allow https
Rule added
Rule added (v6)
```

Iptables:



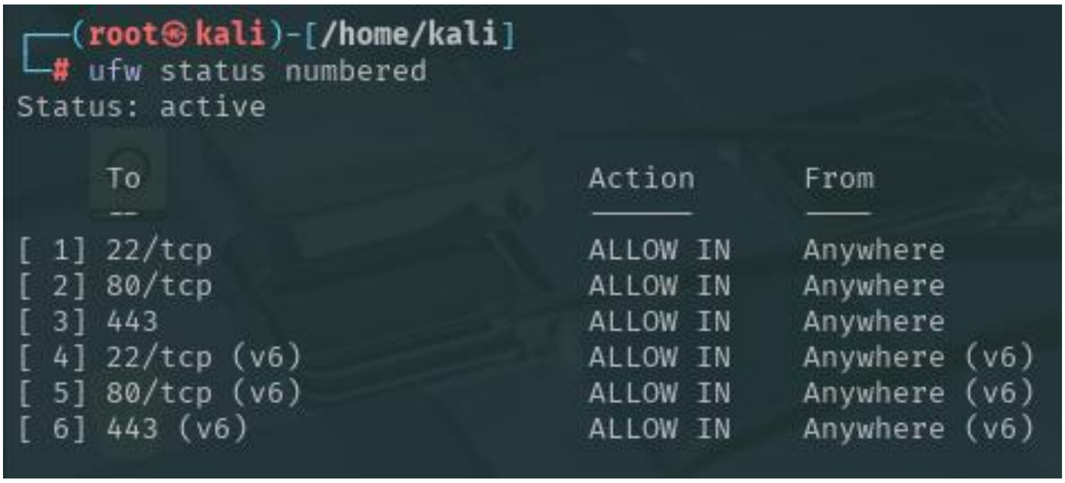
```
┌──(root㉿kali)-[/home/kali]
└─# iptables -A INPUT -p tcp --dport 22 -j ACCEPT
```



```
┌──(root㉿kali)-[/home/kali]
└─# iptables -A INPUT -p tcp --dport 80 -j ACCEPT

┌──(root㉿kali)-[/home/kali]
└─# iptables -A INPUT -p tcp --dport 443 -j ACCEPT
```

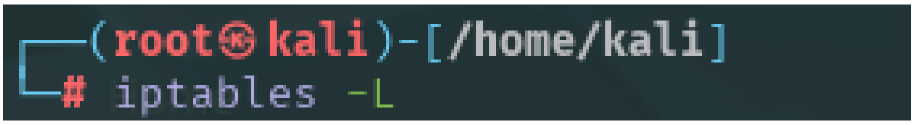
Cuando configuramos los permisos revisamos en los firewalls, cuales son los resultados de los comandos ejecutados:

- **UFW:**

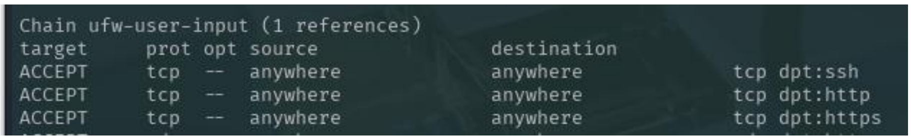


```
┌──(root㉿kali)-[/home/kali]
└─# ufw status numbered
Status: active

     To                         Action      From
     --                         ------      ----
[ 1] 22/tcp                     ALLOW IN    Anywhere
[ 2] 80/tcp                     ALLOW IN    Anywhere
[ 3] 443                        ALLOW IN    Anywhere
[ 4] 22/tcp (v6)                ALLOW IN    Anywhere (v6)
[ 5] 80/tcp (v6)                ALLOW IN    Anywhere (v6)
[ 6] 443 (v6)                   ALLOW IN    Anywhere (v6)
```

- **Iptables:**

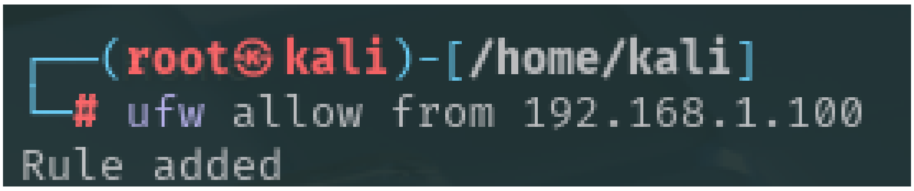


```
┌──(root㉿kali)-[/home/kali]
└─# iptables -L
```

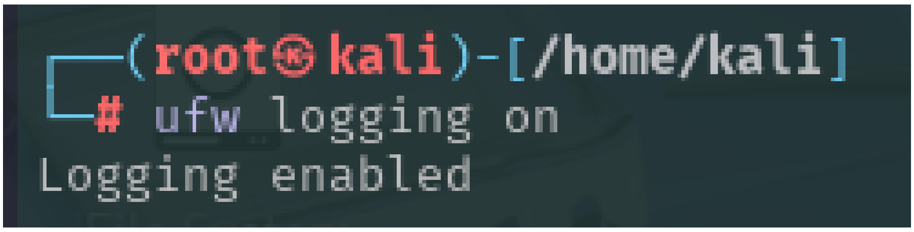


```
Chain ufw-user-input (1 references)
target     prot opt source               destination
ACCEPT     tcp  --  anywhere             anywhere             tcp dpt:ssh
ACCEPT     tcp  --  anywhere             anywhere             tcp dpt:http
ACCEPT     tcp  --  anywhere             anywhere             tcp dpt:https
```

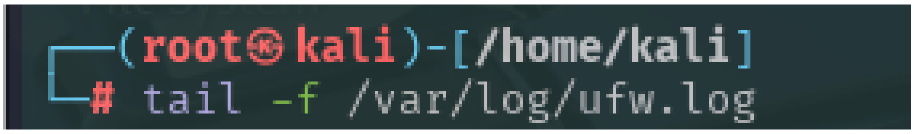
- **Permisos en UFW**:



```
┌──(root㉿kali)-[/home/kali]
└─# ufw allow from 192.168.1.100
Rule added
```



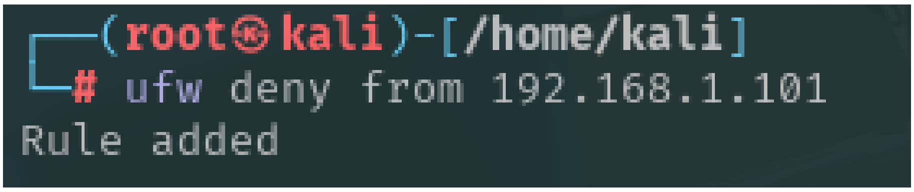
```
┌──(root㉿kali)-[/home/kali]
└─# ufw logging on
Logging enabled
```



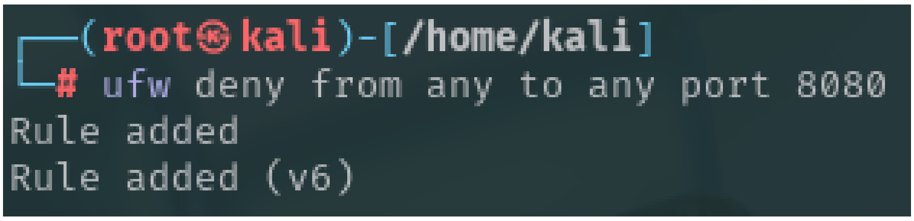
```
┌──(root㉿kali)-[/home/kali]
└─# tail -f /var/log/ufw.log
```

Miramos la parte de los bloqueos

- **Bloqueo en UFW**:

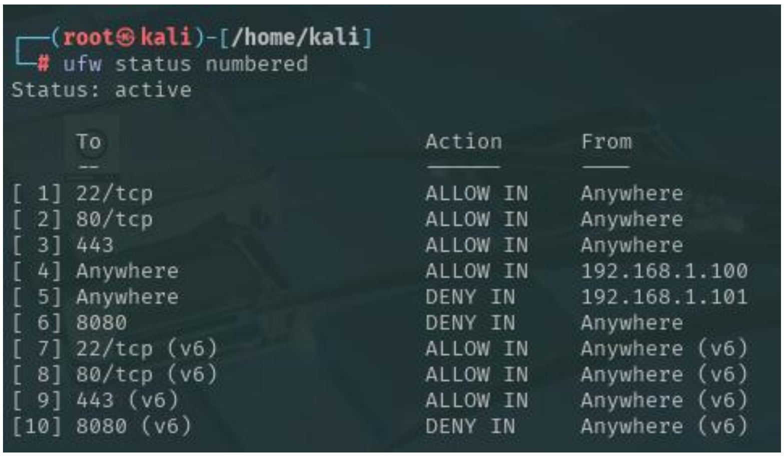


```
┌──(root㉿kali)-[/home/kali]
└─# ufw deny from 192.168.1.101
Rule added
```



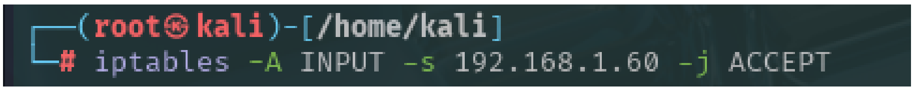
```
┌──(root㉿kali)-[/home/kali]
└─# ufw deny from any to any port 8080
Rule added
Rule added (v6)
```

- **Estatus UFW**:



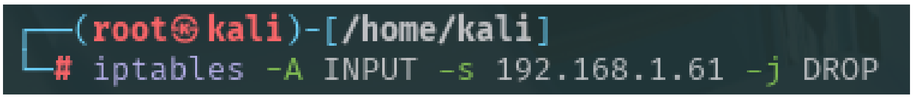
```
┌──(root㉿kali)-[/home/kali]
└─# ufw status numbered
Status: active

     To                         Action      From
     --                         ------      ----
[ 1] 22/tcp                     ALLOW IN    Anywhere
[ 2] 80/tcp                     ALLOW IN    Anywhere
[ 3] 443                        ALLOW IN    Anywhere
[ 4] Anywhere                   ALLOW IN    192.168.1.100
[ 5] Anywhere                   DENY IN     192.168.1.101
[ 6] 8080                       DENY IN     Anywhere
[ 7] 22/tcp (v6)                ALLOW IN    Anywhere (v6)
[ 8] 80/tcp (v6)                ALLOW IN    Anywhere (v6)
[ 9] 443 (v6)                   ALLOW IN    Anywhere (v6)
[10] 8080 (v6)                  DENY IN     Anywhere (v6)
```

- **Permisos en Iptables**:

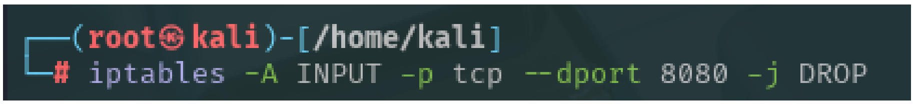


```
┌──(root㉿kali)-[/home/kali]
└─# iptables -A INPUT -s 192.168.1.60 -j ACCEPT
```

- **Bloqueo en Iptables:**

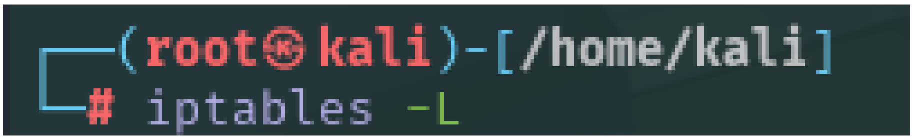


```
┌──(root㉿kali)-[/home/kali]
└─# iptables -A INPUT -s 192.168.1.61 -j DROP
```



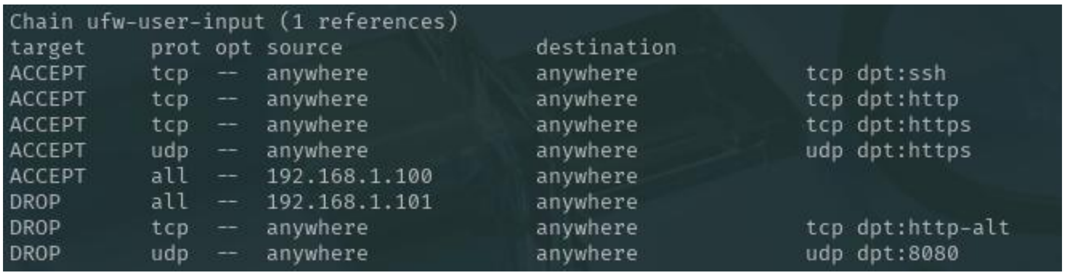
```
┌──(root㉿kali)-[/home/kali]
└─# iptables -A INPUT -p tcp --dport 8080 -j DROP
```

- **Estatus Iptables**:



```
┌──(root㉿kali)-[/home/kali]
└─# iptables -L
```

Nos muestra esto enseguida



```
Chain ufw-user-input (1 references)
target     prot opt source               destination
ACCEPT     tcp  --  anywhere             anywhere             tcp dpt:ssh
ACCEPT     tcp  --  anywhere             anywhere             tcp dpt:http
ACCEPT     tcp  --  anywhere             anywhere             tcp dpt:https
ACCEPT     udp  --  anywhere             anywhere             udp dpt:https
ACCEPT     all  --  192.168.1.100        anywhere
DROP       all  --  192.168.1.101        anywhere
DROP       tcp  --  anywhere             anywhere             tcp dpt:http-alt
DROP       udp  --  anywhere             anywhere             udp dpt:8080
```