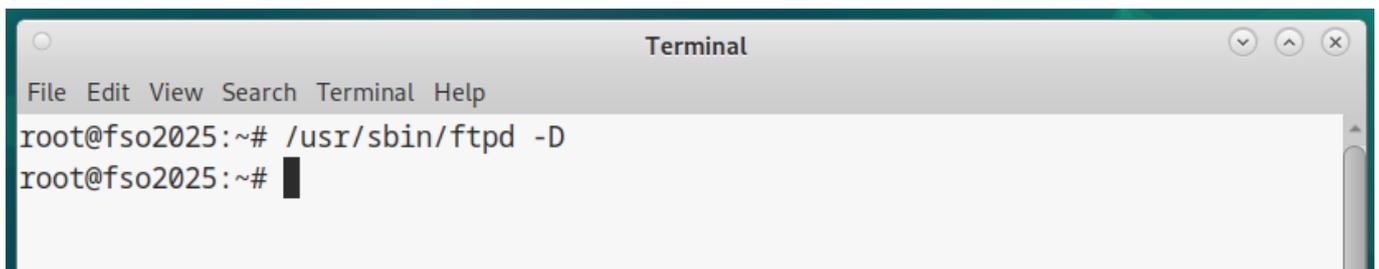


[FORT] Práctica 5: Control de Acceso a nivel de aplicación

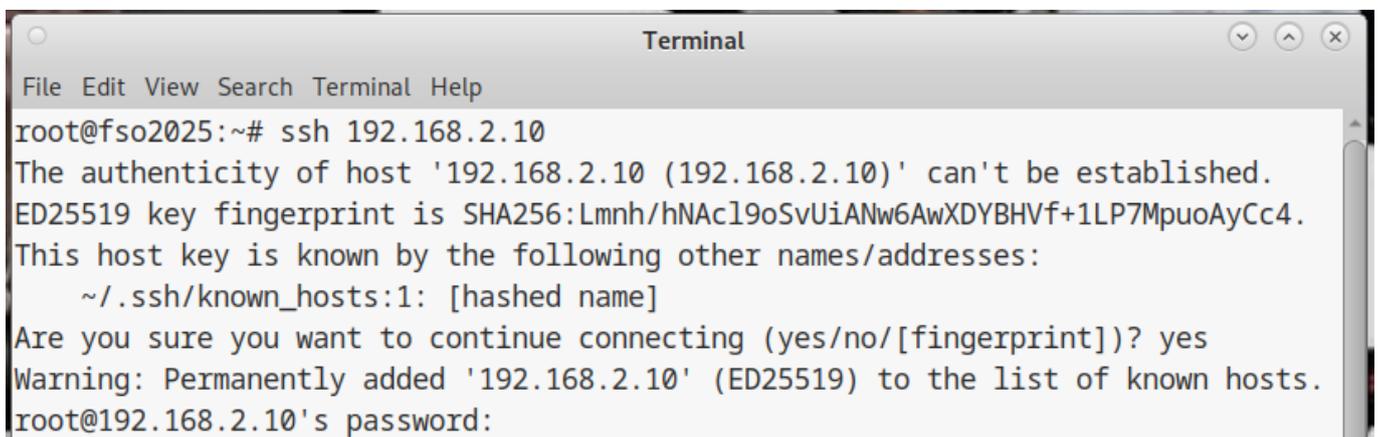
1. Habilita los servicios FTP en MAQUINA1 ejecutando `/usr/sbin/ftpd -D`



```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# /usr/sbin/ftpd -D
root@fso2025:~#
```

2. Revisa las conexiones ftp y ssh de MAQUINA2 a MAQUINA1 usando las direcciones de red locales

Comprobación de SSH:



```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# ssh 192.168.2.10
The authenticity of host '192.168.2.10 (192.168.2.10)' can't be established.
ED25519 key fingerprint is SHA256:Lmnh/hNAcl9oSvUiANw6AwXDYBHVf+1LP7MpuoAyCc4.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:1: [hashed name]
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.2.10' (ED25519) to the list of known hosts.
root@192.168.2.10's password:
```

```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# ssh 192.168.3.10
The authenticity of host '192.168.3.10 (192.168.3.10)' can't be established.
ED25519 key fingerprint is SHA256:Lmnh/hNAcl9oSvUiANw6AwXDYBHVf+1LP7MpUoAyCc4.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:1: [hashed name]
  ~/.ssh/known_hosts:4: [hashed name]
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.3.10' (ED25519) to the list of known hosts.
root@192.168.3.10's password:

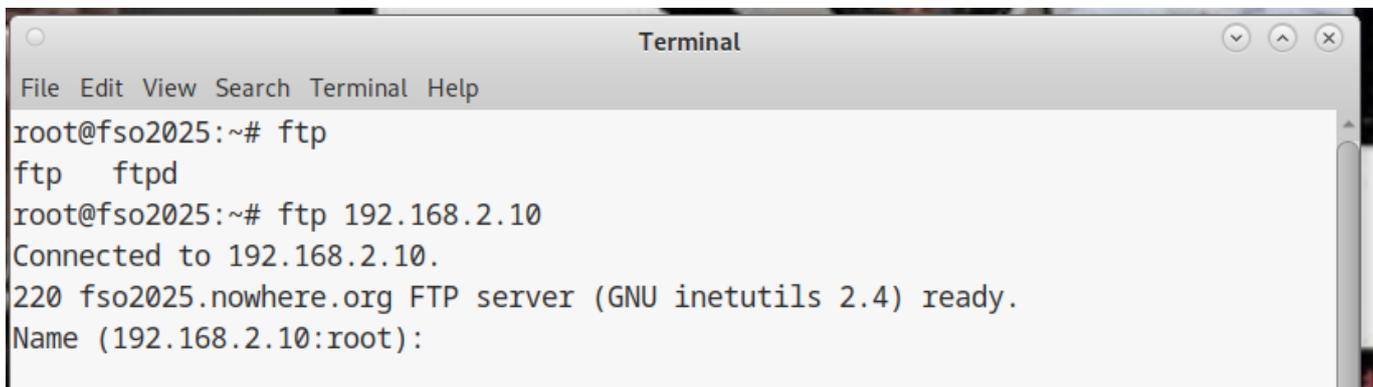
root@fso2025:~# ssh 192.168.4.10
The authenticity of host '192.168.4.10 (192.168.4.10)' can't be established.
ED25519 key fingerprint is SHA256:Lmnh/hNAcl9oSvUiANw6AwXDYBHVf+1LP7MpUoAyCc4.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:1: [hashed name]
  ~/.ssh/known_hosts:4: [hashed name]
  ~/.ssh/known_hosts:5: [hashed name]
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.4.10' (ED25519) to the list of known hosts.
root@192.168.4.10's password:

root@fso2025:~# ssh 192.168.12.10
The authenticity of host '192.168.12.10 (192.168.12.10)' can't be established.
ED25519 key fingerprint is SHA256:Lmnh/hNAcl9oSvUiANw6AwXDYBHVf+1LP7MpUoAyCc4.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:1: [hashed name]
  ~/.ssh/known_hosts:4: [hashed name]
  ~/.ssh/known_hosts:5: [hashed name]
  ~/.ssh/known_hosts:6: [hashed name]
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.12.10' (ED25519) to the list of known hosts.
root@192.168.12.10's password:

root@fso2025:~# ssh 192.168.13.10
The authenticity of host '192.168.13.10 (192.168.13.10)' can't be established.
ED25519 key fingerprint is SHA256:Lmnh/hNAcl9oSvUiANw6AwXDYBHVf+1LP7MpUoAyCc4.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:1: [hashed name]
  ~/.ssh/known_hosts:4: [hashed name]
  ~/.ssh/known_hosts:5: [hashed name]
  ~/.ssh/known_hosts:6: [hashed name]
  ~/.ssh/known_hosts:7: [hashed name]
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.13.10' (ED25519) to the list of known hosts.
root@192.168.13.10's password: █
```

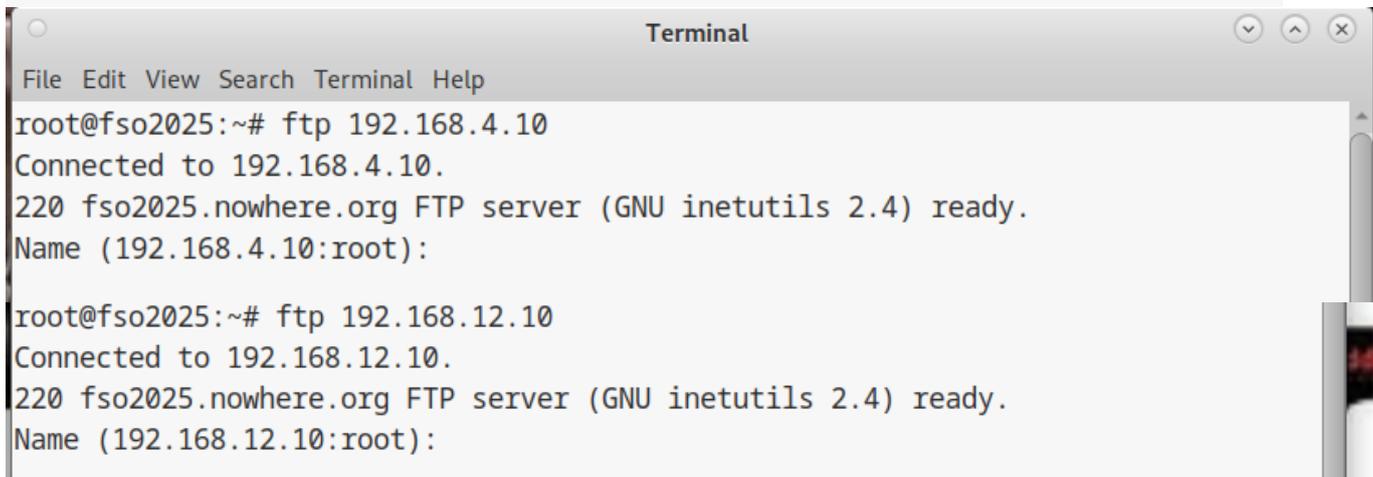
```
root@fso2025:~# ssh 192.168.14.10
The authenticity of host '192.168.14.10 (192.168.14.10)' can't be established.
ED25519 key fingerprint is SHA256:Lmnh/hNAcl9oSvUiANw6AwXDYBHVf+1LP7MpAoAyCc4.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:1: [hashed name]
  ~/.ssh/known_hosts:4: [hashed name]
  ~/.ssh/known_hosts:5: [hashed name]
  ~/.ssh/known_hosts:6: [hashed name]
  ~/.ssh/known_hosts:7: [hashed name]
  ~/.ssh/known_hosts:8: [hashed name]
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.14.10' (ED25519) to the list of known hosts.
root@192.168.14.10's password: █
```

Comprobación ftp



```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# ftp
ftp ftpd
root@fso2025:~# ftp 192.168.2.10
Connected to 192.168.2.10.
220 fso2025.nowhere.org FTP server (GNU inetutils 2.4) ready.
Name (192.168.2.10:root):
```

```
root@fso2025:~# ftp 192.168.3.10
Connected to 192.168.3.10.
220 fso2025.nowhere.org FTP server (GNU inetutils 2.4) ready.
Name (192.168.3.10:root):
```



```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# ftp 192.168.4.10
Connected to 192.168.4.10.
220 fso2025.nowhere.org FTP server (GNU inetutils 2.4) ready.
Name (192.168.4.10:root):

root@fso2025:~# ftp 192.168.12.10
Connected to 192.168.12.10.
220 fso2025.nowhere.org FTP server (GNU inetutils 2.4) ready.
Name (192.168.12.10:root):
```

```
root@fso2025:~# ftp 192.168.13.10
Connected to 192.168.13.10.
220 fso2025.nowhere.org FTP server (GNU inetutils 2.4) ready.
Name (192.168.13.10:root):

root@fso2025:~# ftp 192.168.14.10
Connected to 192.168.14.10.
220 fso2025.nowhere.org FTP server (GNU inetutils 2.4) ready.
Name (192.168.14.10:root):
```

3. Configura rcptwrappers (/etc/hosts.allow y /etc/hosts.deny) en MAQUINA1 para:

Aceptar todas las conexiones ftp excepto las que vienen de

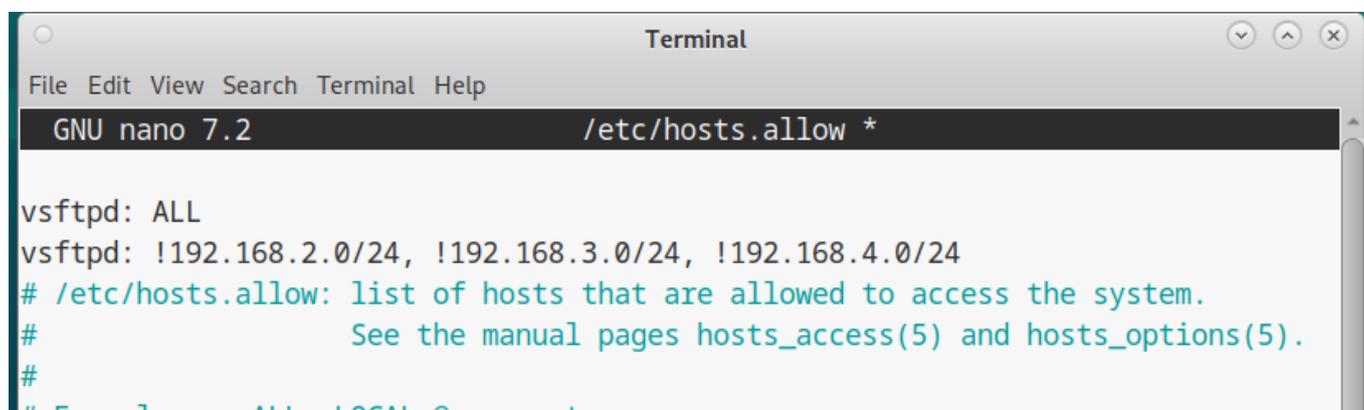
- 192.168.2.X
- 192.168.3.X
- 192.168.4.X

Rechazar todas las conexiones ssh que vienen de:

- 192.168.12.x
- 192,168.13.x
- 192.168.14.X

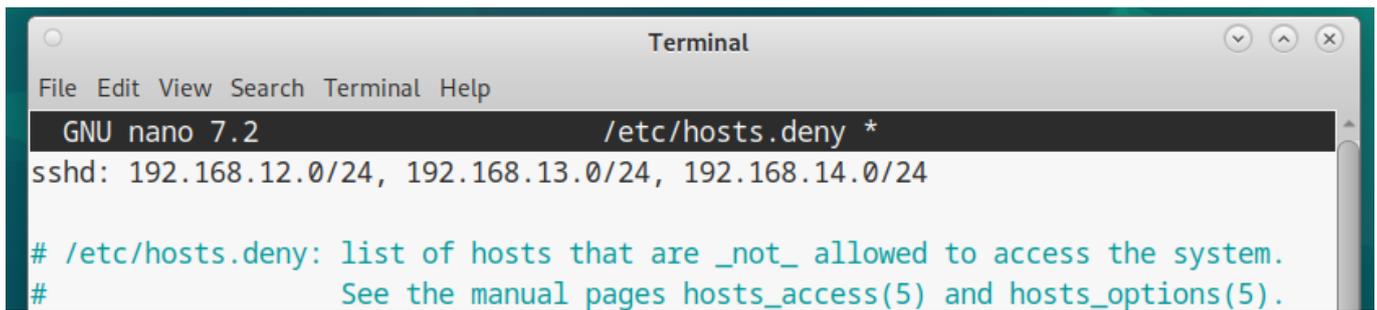
Comenzamos editando el archivo /etc/hosts.allow para aceptar todas las conexiones menos las indicadas con las siguientes líneas:

```
vsftpd: ALL #Se permite todo el tráfico FTP
vsftpd: !192.168.2.0/24, !192.168.3.0/24, !192.168.4.0/24 #Se bloquean los rangos indicados para conexiones FTP
```



Tras eso procedemos a editar el archivo /etc/hosts.deny para bloquear las conexiones indicadas con las siguientes líneas:

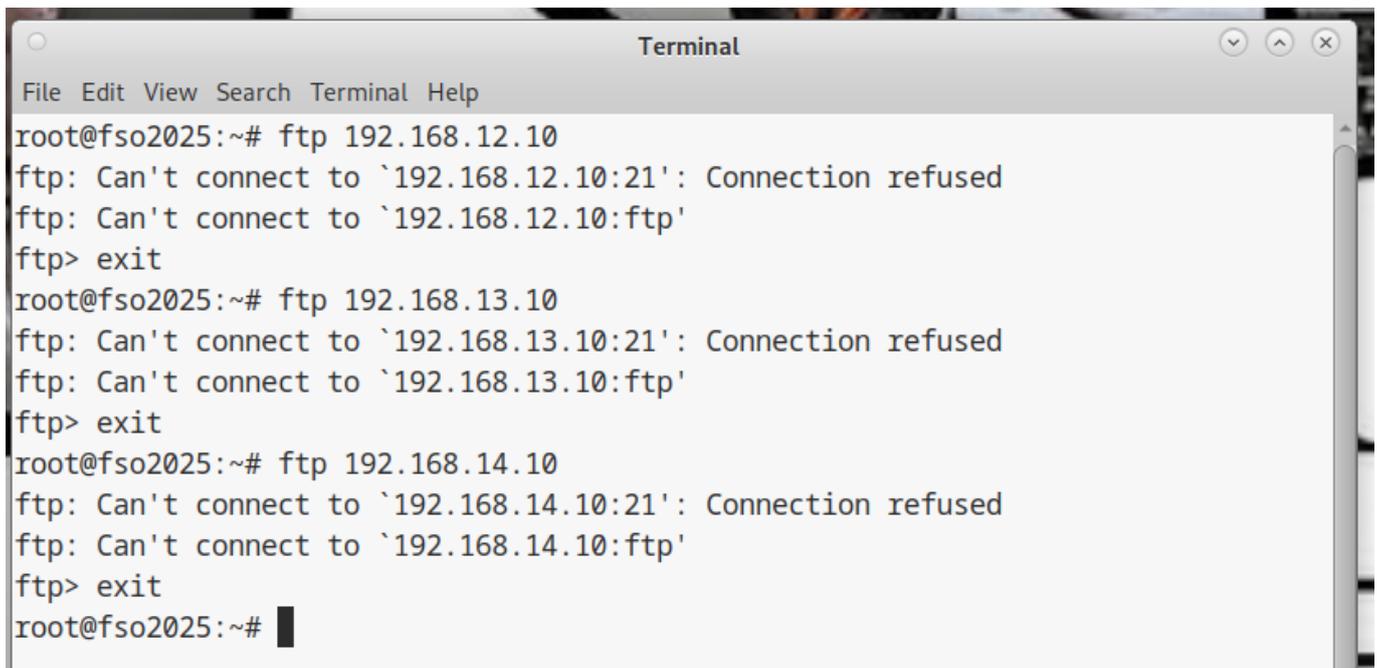
```
sshd: 192.168.12.0/24, 192.168.13.0/24, 192.168.14.0/24 #Se bloquea el SSH para las direcciones indicadas
```



```
Terminal
File Edit View Search Terminal Help
GNU nano 7.2 /etc/hosts.deny *
sshd: 192.168.12.0/24, 192.168.13.0/24, 192.168.14.0/24
# /etc/hosts.deny: list of hosts that are _not_ allowed to access the system.
# See the manual pages hosts_access(5) and hosts_options(5).
```

4. Revisa las conexiones ftp y ssh desde MAQUINA2 a MAQUINA1

Comenzamos revisando las conexiones FTP:



```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# ftp 192.168.12.10
ftp: Can't connect to `192.168.12.10:21': Connection refused
ftp: Can't connect to `192.168.12.10:ftp'
ftp> exit
root@fso2025:~# ftp 192.168.13.10
ftp: Can't connect to `192.168.13.10:21': Connection refused
ftp: Can't connect to `192.168.13.10:ftp'
ftp> exit
root@fso2025:~# ftp 192.168.14.10
ftp: Can't connect to `192.168.14.10:21': Connection refused
ftp: Can't connect to `192.168.14.10:ftp'
ftp> exit
root@fso2025:~# █
```

```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# ftp 192.168.2.10
ftp: Can't connect to `192.168.2.10:21': Connection refused
ftp: Can't connect to `192.168.2.10:ftp'
ftp> exit
root@fso2025:~# ftp 192.168.3.10
ftp: Can't connect to `192.168.3.10:21': Connection refused
ftp: Can't connect to `192.168.3.10:ftp'
ftp>
ftp> exit
root@fso2025:~# ftp 192.168.4.10
ftp: Can't connect to `192.168.4.10:21': Connection refused
ftp: Can't connect to `192.168.4.10:ftp'
ftp> exit
```

Tras eso revisamos las conexiones ssh:

```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# ssh 192.168.2.10
root@192.168.2.10's password:

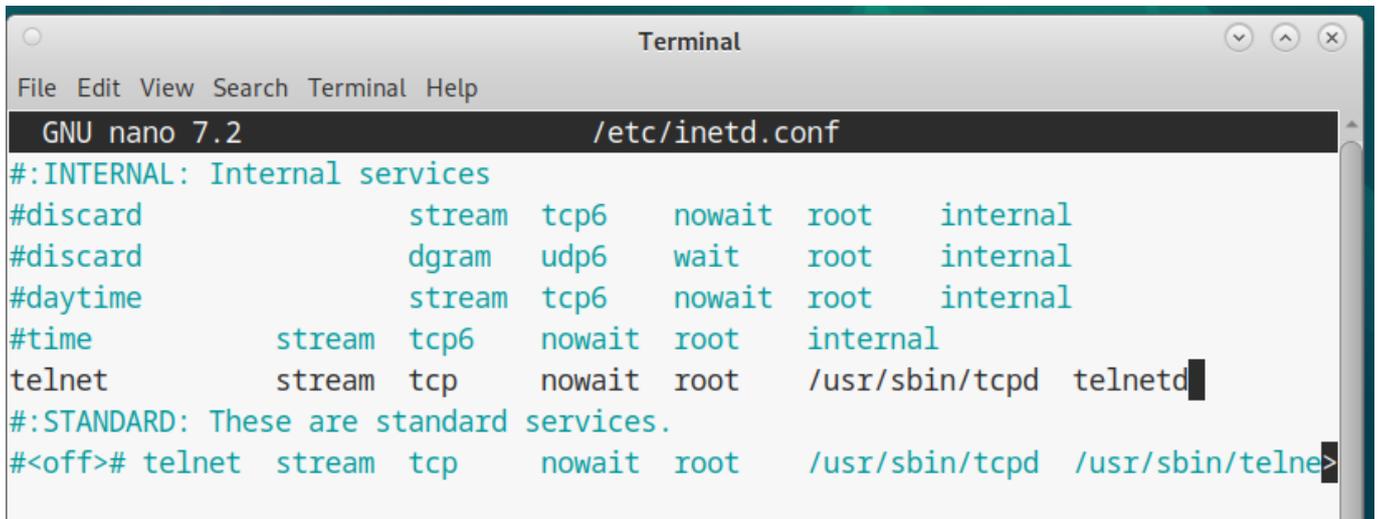
root@fso2025:~# ssh 192.168.3.10
root@192.168.3.10's password:

root@fso2025:~# ssh 192.168.4.10
root@192.168.4.10's password:

root@fso2025:~# ssh 192.168.12.10
kex_exchange_identification: read: Connection reset by peer
Connection reset by 192.168.12.10 port 22
root@fso2025:~# ssh 192.168.13.10
kex_exchange_identification: read: Connection reset by peer
Connection reset by 192.168.13.10 port 22
root@fso2025:~# ssh 192.168.14.10
kex_exchange_identification: read: Connection reset by peer
Connection reset by 192.168.14.10 port 22
root@fso2025:~# █
```

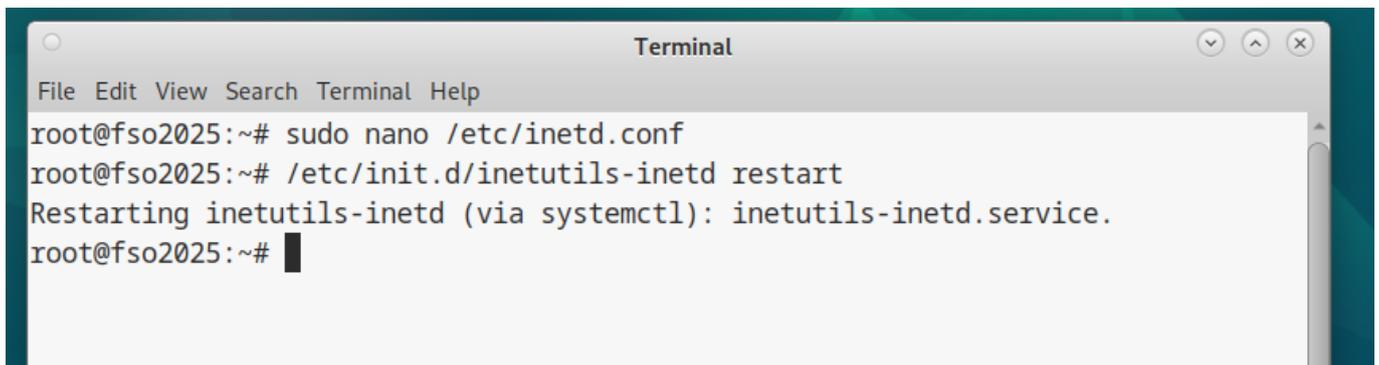
5. En MAQUINA1 habilita los servicios telnet añadiendo la siguiente línea a /etc/inetd.conf

```
telnet      stream    tcp nowait root  /usr/sbin/tcpd  telnetd
```



```
Terminal
File Edit View Search Terminal Help
GNU nano 7.2 /etc/inetd.conf
#:INTERNAL: Internal services
#discard          stream  tcp6    nowait  root    internal
#discard          dgram  udp6    wait    root    internal
#daytime          stream  tcp6    nowait  root    internal
#time             stream  tcp6    nowait  root    internal
telnet            stream  tcp     nowait  root    /usr/sbin/tcpd  telnetd
#:STANDARD: These are standard services.
#<off># telnet    stream  tcp     nowait  root    /usr/sbin/tcpd  /usr/sbin/telne>
```

6. Reinicia inetd (/etc/init.d/inetutils-inetd restart, systemctl restart inetutils-inetd.service kill -HUP pid_de_inetd)



```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# sudo nano /etc/inetd.conf
root@fso2025:~# /etc/init.d/inetutils-inetd restart
Restarting inetutils-inetd (via systemctl): inetutils-inetd.service.
root@fso2025:~#
```

7. Revisa la conexión telnet de MAQUINA2 a MAQUINA1

```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# telnet 192.168.2.10
Trying 192.168.2.10...
Connected to 192.168.2.10.
Escape character is '^]'.

Linux 6.1.0-30-amd64 (fso2025.nowhere.org) (pts/1)

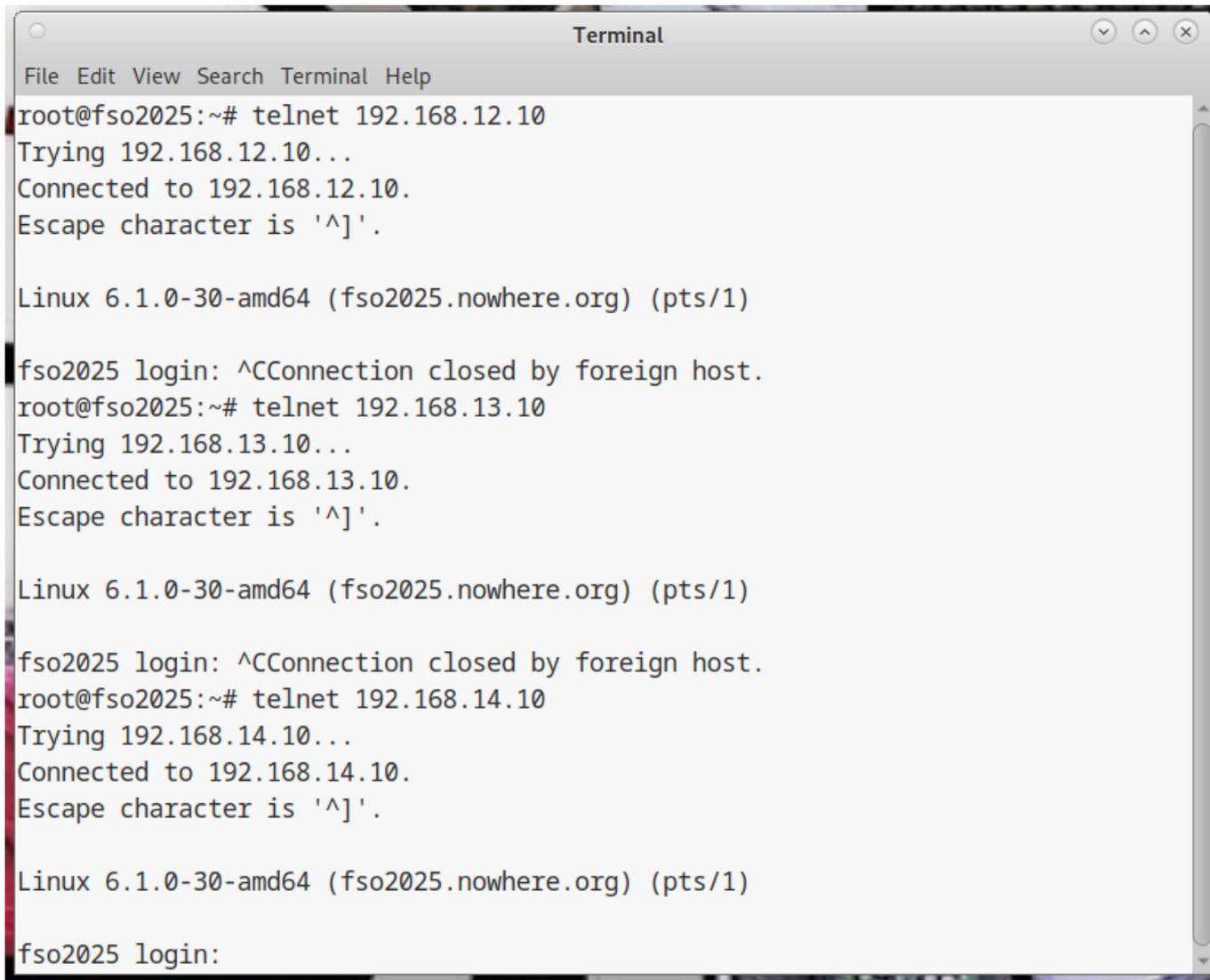
fso2025 login: ^CConnection closed by foreign host.
root@fso2025:~# telnet 192.168.3.10
Trying 192.168.3.10...
Connected to 192.168.3.10.
Escape character is '^]'.

Linux 6.1.0-30-amd64 (fso2025.nowhere.org) (pts/1)

fso2025 login: ^CConnection closed by foreign host.
root@fso2025:~# telnet 192.168.4.10
Trying 192.168.4.10...
Connected to 192.168.4.10.
Escape character is '^]'.

Linux 6.1.0-30-amd64 (fso2025.nowhere.org) (pts/1)

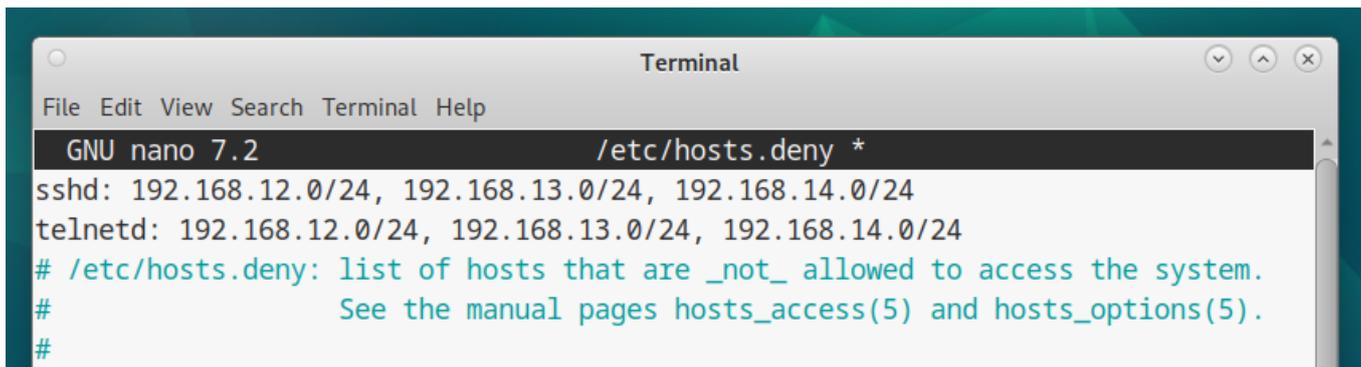
fso2025 login:
```



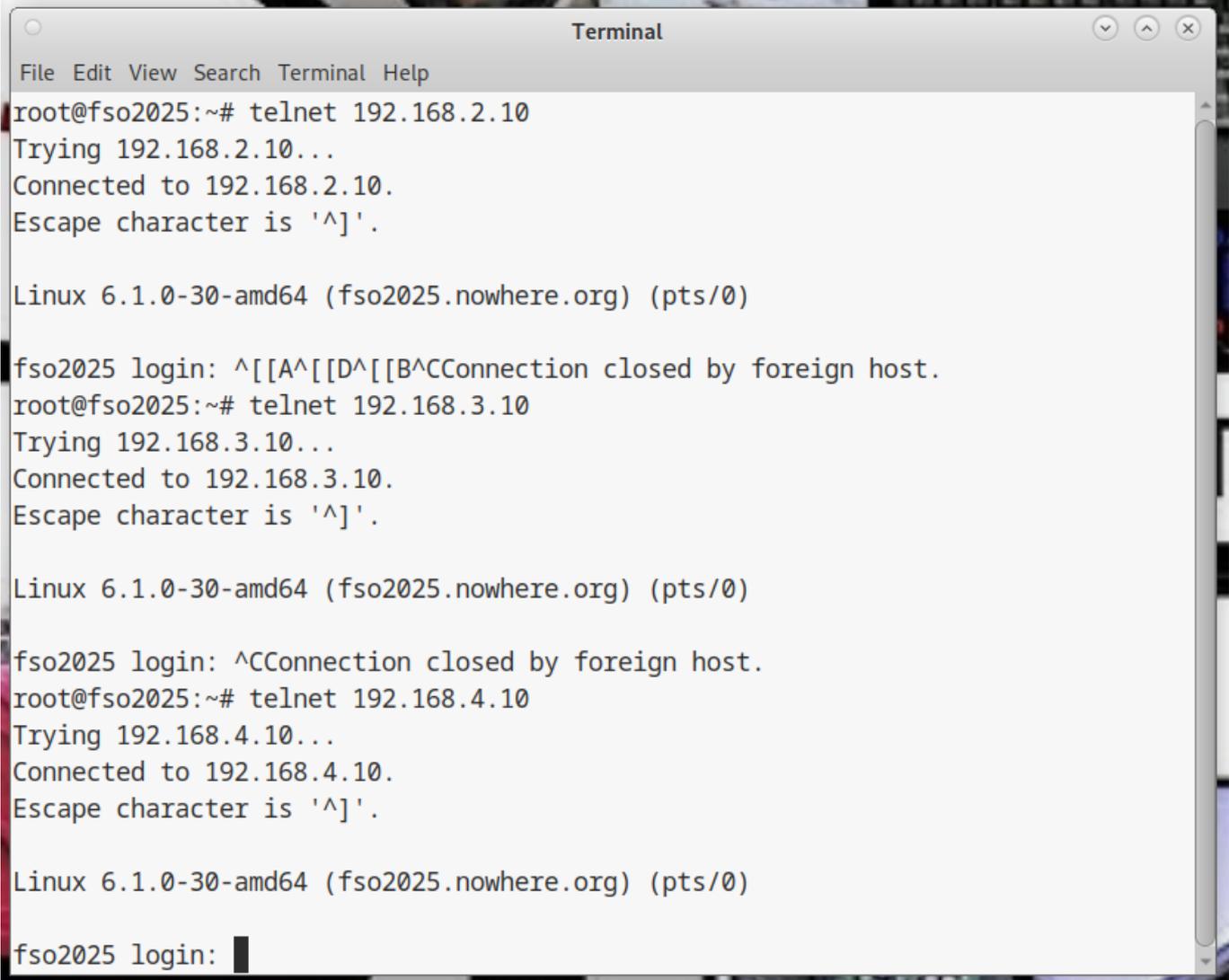
8. Configura tcpwrappers para rechazar todas las conexiones telnet desde 192.168.12.X, 192.168.13.X y 192.168.14.X

Configuramos /etc/hosts.deny con las siguientes líneas:

```
telnetd: 192.168.12.0/24, 192.168.12.0/24, 192.168.13.0/24
```



9. Revisa la comunicación telnet desde MAQUINA2 hasta MAQUINA1



```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# telnet 192.168.2.10
Trying 192.168.2.10...
Connected to 192.168.2.10.
Escape character is '^]'.

Linux 6.1.0-30-amd64 (fso2025.nowhere.org) (pts/0)

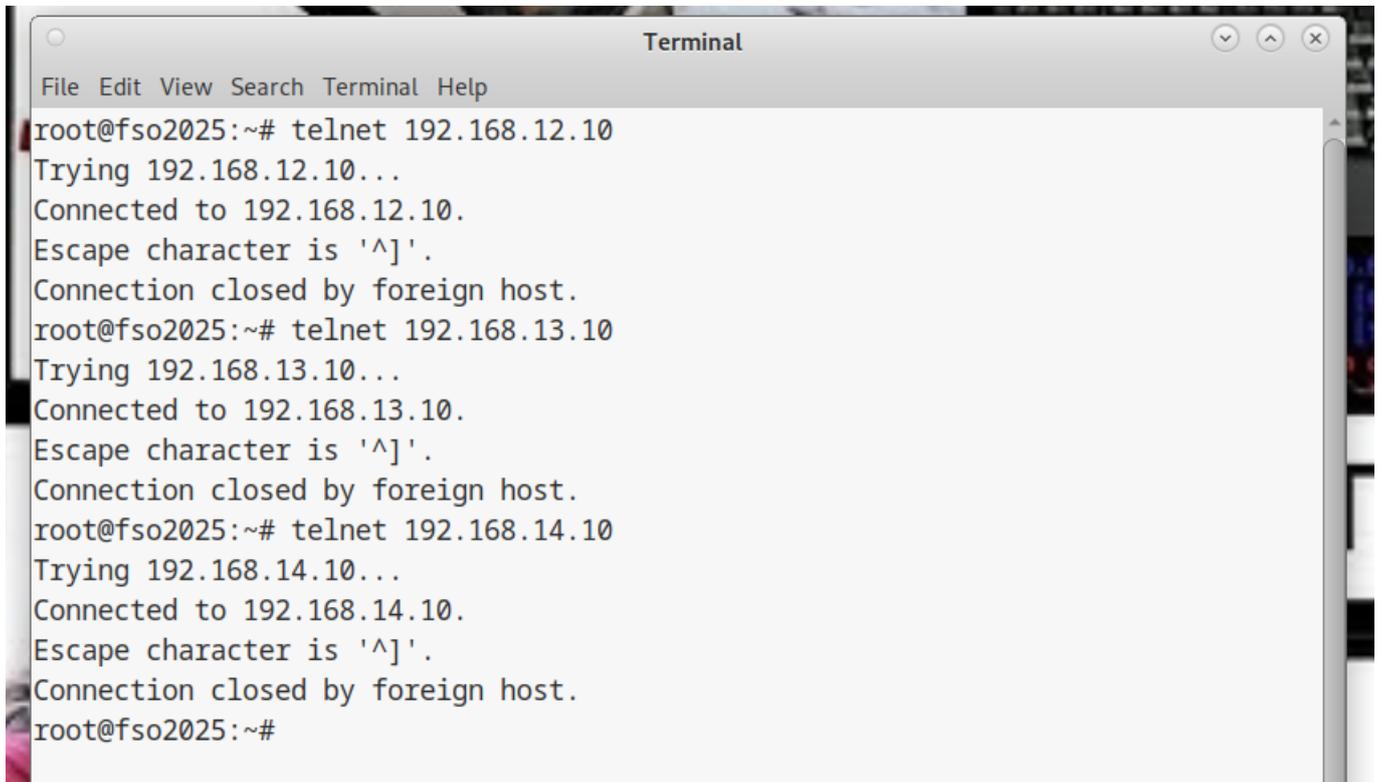
fso2025 login: ^[[A^[[D^[[B^CConnection closed by foreign host.
root@fso2025:~# telnet 192.168.3.10
Trying 192.168.3.10...
Connected to 192.168.3.10.
Escape character is '^]'.

Linux 6.1.0-30-amd64 (fso2025.nowhere.org) (pts/0)

fso2025 login: ^CConnection closed by foreign host.
root@fso2025:~# telnet 192.168.4.10
Trying 192.168.4.10...
Connected to 192.168.4.10.
Escape character is '^]'.

Linux 6.1.0-30-amd64 (fso2025.nowhere.org) (pts/0)

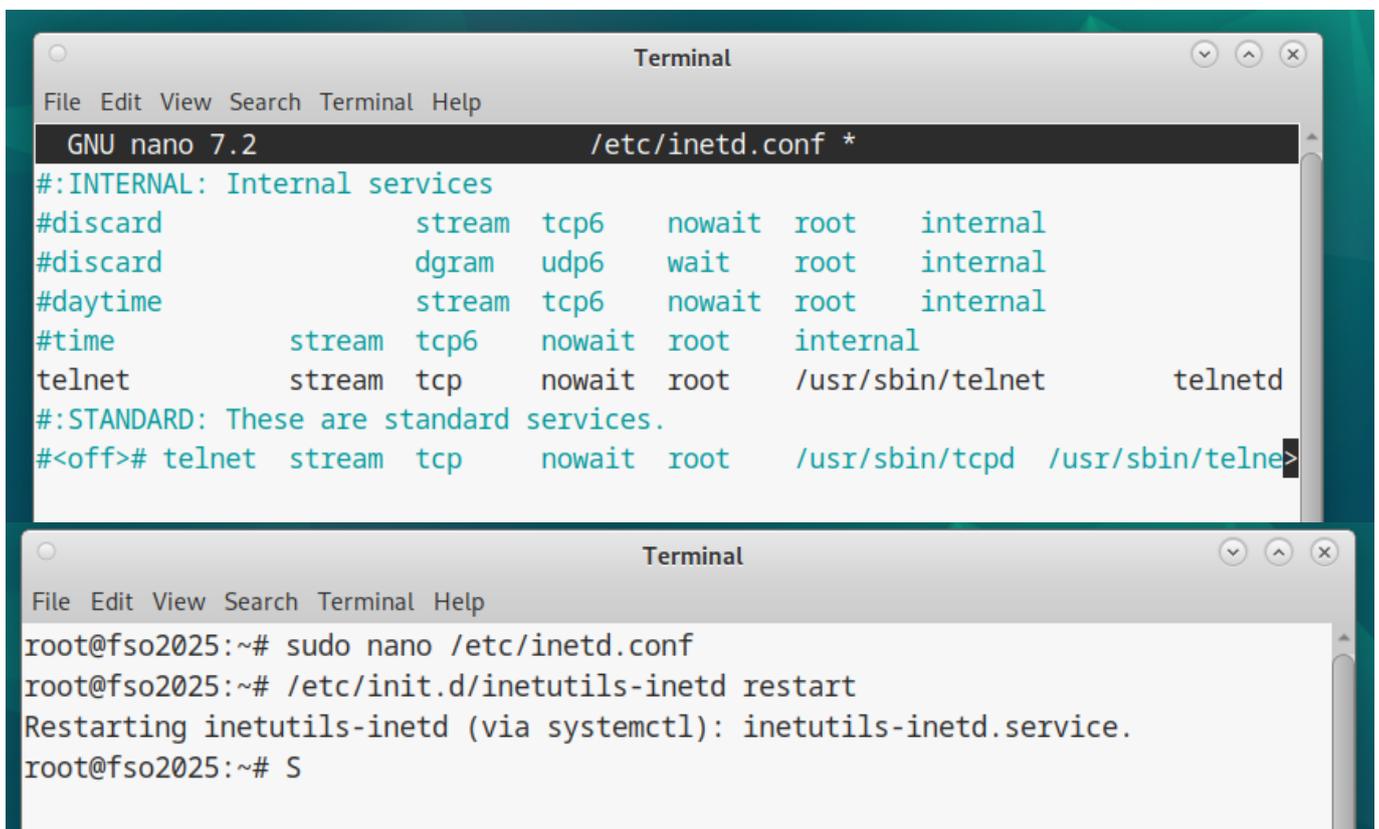
fso2025 login: █
```



```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# telnet 192.168.12.10
Trying 192.168.12.10...
Connected to 192.168.12.10.
Escape character is '^]'.
Connection closed by foreign host.
root@fso2025:~# telnet 192.168.13.10
Trying 192.168.13.10...
Connected to 192.168.13.10.
Escape character is '^]'.
Connection closed by foreign host.
root@fso2025:~# telnet 192.168.14.10
Trying 192.168.14.10...
Connected to 192.168.14.10.
Escape character is '^]'.
Connection closed by foreign host.
root@fso2025:~#
```

10. Sustituye la línea previa en `/etc/inetd.conf` con la siguiente y reinicia `inetd`

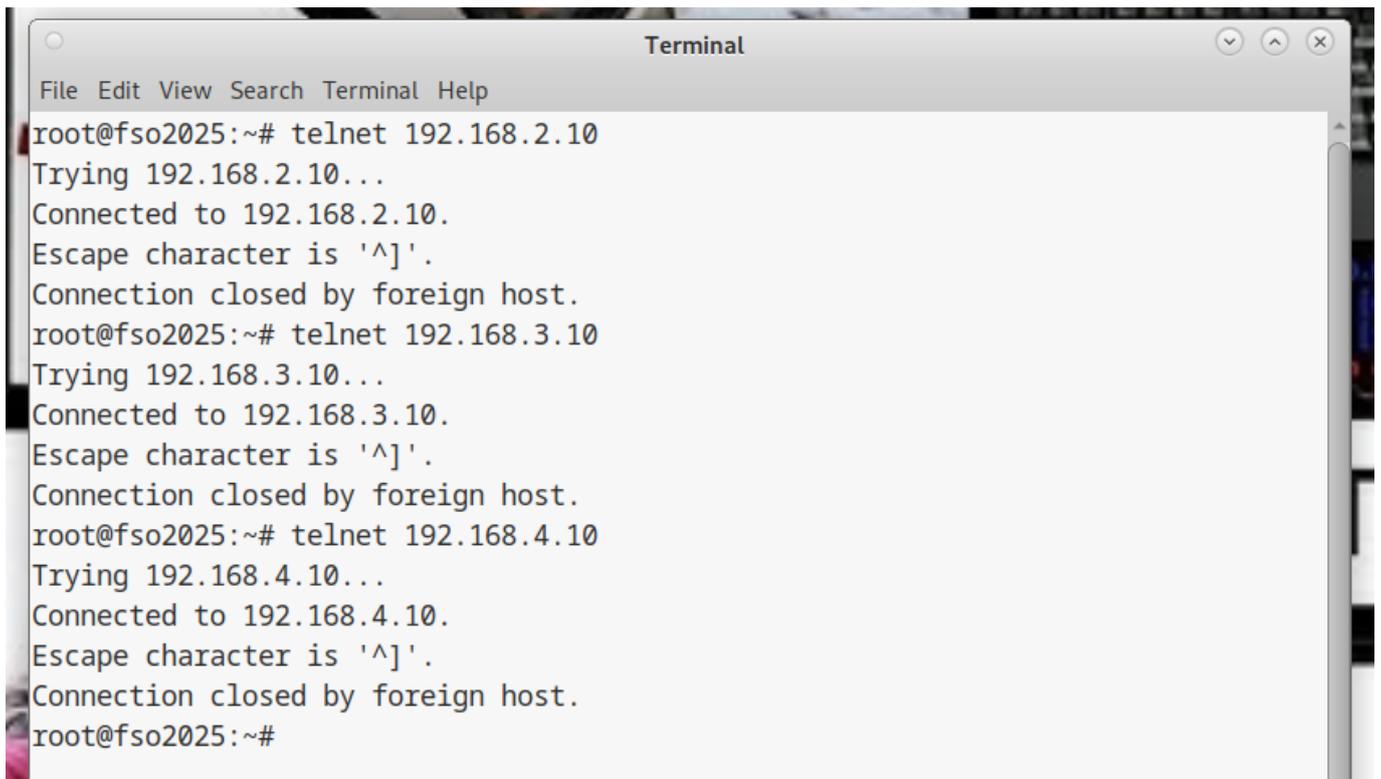
```
telnet    stream    tcp       nowait   root     /usr/sbin/telnetd  telnetd
```



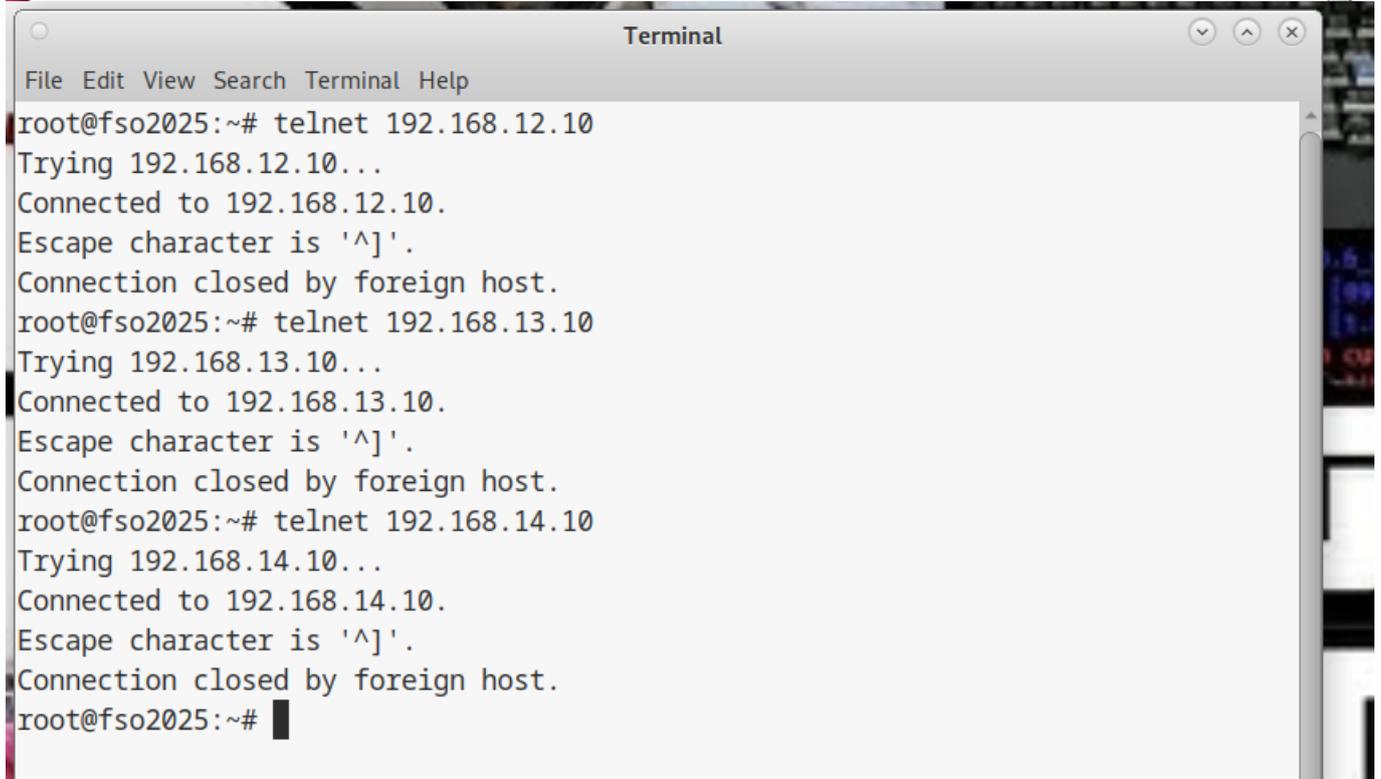
```
Terminal
File Edit View Search Terminal Help
GNU nano 7.2 /etc/inetd.conf *
#:INTERNAL: Internal services
#discard      stream  tcp6    nowait  root    internal
#discard      dgram  udp6    wait    root    internal
#daytime      stream  tcp6    nowait  root    internal
#time         stream  tcp6    nowait  root    internal
telnet        stream  tcp     nowait  root    /usr/sbin/telnetd  telnetd
#:STANDARD: These are standard services.
#<off># telnet stream tcp  nowait  root    /usr/sbin/tcpd  /usr/sbin/telne>

Terminal
File Edit View Search Terminal Help
root@fso2025:~# sudo nano /etc/inetd.conf
root@fso2025:~# /etc/init.d/inetutils-inetd restart
Restarting inetutils-inetd (via systemctl): inetutils-inetd.service.
root@fso2025:~# S
```

11. Revisa la conexión telnet de MAQUINA2 a MAQUINA1



```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# telnet 192.168.2.10
Trying 192.168.2.10...
Connected to 192.168.2.10.
Escape character is '^]'.
Connection closed by foreign host.
root@fso2025:~# telnet 192.168.3.10
Trying 192.168.3.10...
Connected to 192.168.3.10.
Escape character is '^]'.
Connection closed by foreign host.
root@fso2025:~# telnet 192.168.4.10
Trying 192.168.4.10...
Connected to 192.168.4.10.
Escape character is '^]'.
Connection closed by foreign host.
root@fso2025:~#
```



```
Terminal
File Edit View Search Terminal Help
root@fso2025:~# telnet 192.168.12.10
Trying 192.168.12.10...
Connected to 192.168.12.10.
Escape character is '^]'.
Connection closed by foreign host.
root@fso2025:~# telnet 192.168.13.10
Trying 192.168.13.10...
Connected to 192.168.13.10.
Escape character is '^]'.
Connection closed by foreign host.
root@fso2025:~# telnet 192.168.14.10
Trying 192.168.14.10...
Connected to 192.168.14.10.
Escape character is '^]'.
Connection closed by foreign host.
root@fso2025:~#
```

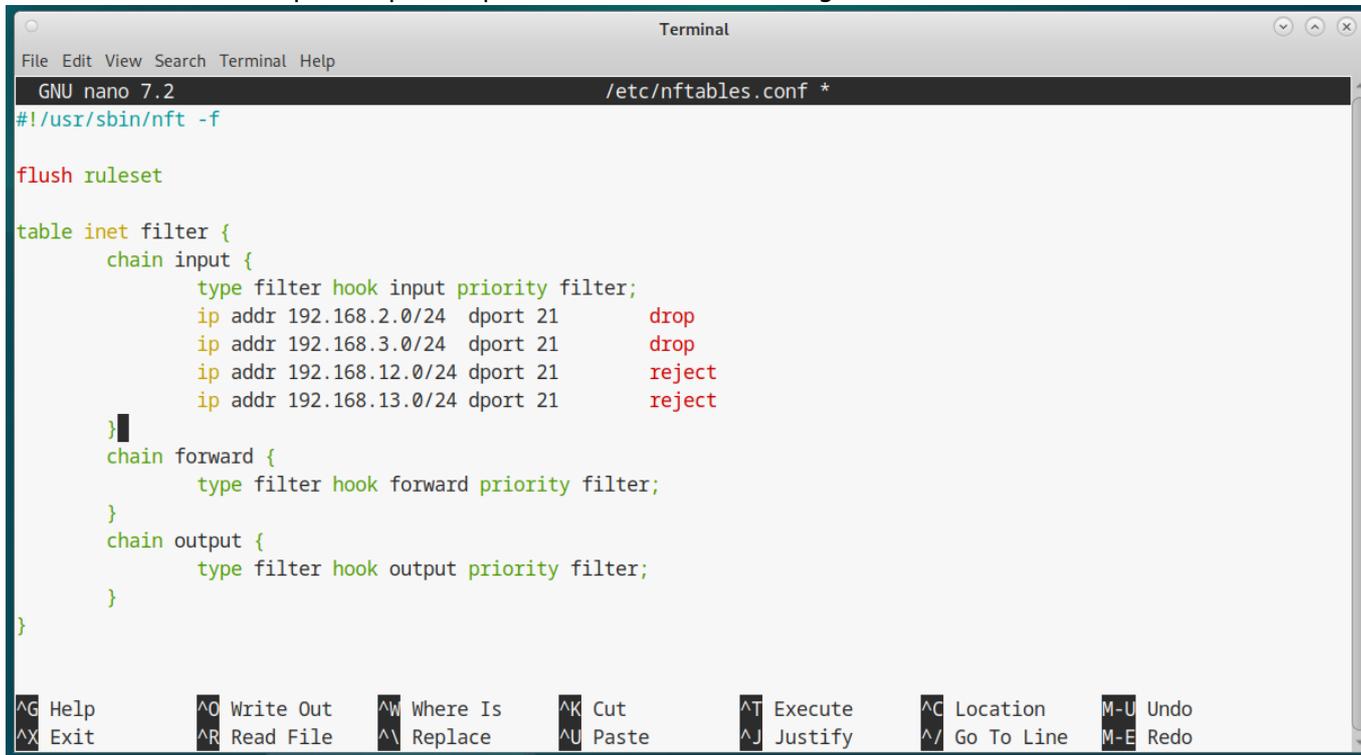
12. Mira que librerías usan sshd, ftpd, inetd, tcpd y telnetd

```
root@fso2025:~# ldd /bin/ssh
linux-vdso.so.1 (0x00007ffe007ee000)
libselinux.so.1 => /lib/x86_64-linux-gnu/libselinux.so.1 (0x00007f308e949000)
libgssapi_krb5.so.2 => /lib/x86_64-linux-gnu/libgssapi_krb5.so.2 (0x00007f308e8f6000)
libcrypto.so.3 => /lib/x86_64-linux-gnu/libcrypto.so.3 (0x00007f308e400000)
libz.so.1 => /lib/x86_64-linux-gnu/libz.so.1 (0x00007f308e8d7000)
libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007f308e21f000)
libpcre2-8.so.0 => /lib/x86_64-linux-gnu/libpcre2-8.so.0 (0x00007f308e185000)
/lib64/ld-linux-x86-64.so.2 (0x00007f308eaa0000)
libkrb5.so.3 => /lib/x86_64-linux-gnu/libkrb5.so.3 (0x00007f308e0ab000)
libk5crypto.so.3 => /lib/x86_64-linux-gnu/libk5crypto.so.3 (0x00007f308e8a8000)
libcom_err.so.2 => /lib/x86_64-linux-gnu/libcom_err.so.2 (0x00007f308e8a2000)
libkrb5support.so.0 => /lib/x86_64-linux-gnu/libkrb5support.so.0 (0x00007f308e894000)
libkeyutils.so.1 => /lib/x86_64-linux-gnu/libkeyutils.so.1 (0x00007f308e88b000)
libresolv.so.2 => /lib/x86_64-linux-gnu/libresolv.so.2 (0x00007f308e09a000)
root@fso2025:~# █
root@fso2025:~# ldd /bin/ftp
linux-vdso.so.1 (0x00007ffffedd1000)
libedit.so.2 => /lib/x86_64-linux-gnu/libedit.so.2 (0x00007f8787879000)
libssl.so.3 => /lib/x86_64-linux-gnu/libssl.so.3 (0x00007f87877d0000)
libcrypto.so.3 => /lib/x86_64-linux-gnu/libcrypto.so.3 (0x00007f8787200000)
libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007f878701f000)
libtinfo.so.6 => /lib/x86_64-linux-gnu/libtinfo.so.6 (0x00007f878779d000)
libbsd.so.0 => /lib/x86_64-linux-gnu/libbsd.so.0 (0x00007f8787785000)
/lib64/ld-linux-x86-64.so.2 (0x00007f8787912000)
libmd.so.0 => /lib/x86_64-linux-gnu/libmd.so.0 (0x00007f8787778000)
root@fso2025:~# ldd /bin/inetutils-telnet
linux-vdso.so.1 (0x00007ffca6dea000)
libtinfo.so.6 => /lib/x86_64-linux-gnu/libtinfo.so.6 (0x00007f5e9bdb6000)
libkrb5.so.3 => /lib/x86_64-linux-gnu/libkrb5.so.3 (0x00007f5e9bcd000)
libk5crypto.so.3 => /lib/x86_64-linux-gnu/libk5crypto.so.3 (0x00007f5e9bcaf000)
libcom_err.so.2 => /lib/x86_64-linux-gnu/libcom_err.so.2 (0x00007f5e9bca9000)
libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007f5e9bac8000)
libkrb5support.so.0 => /lib/x86_64-linux-gnu/libkrb5support.so.0 (0x00007f5e9bab8000)
libkeyutils.so.1 => /lib/x86_64-linux-gnu/libkeyutils.so.1 (0x00007f5e9bab1000)
libresolv.so.2 => /lib/x86_64-linux-gnu/libresolv.so.2 (0x00007f5e9baa0000)
/lib64/ld-linux-x86-64.so.2 (0x00007f5e9be37000)
root@fso2025:~# ldd /bin/telnet
linux-vdso.so.1 (0x00007ffffe26fc000)
libtinfo.so.6 => /lib/x86_64-linux-gnu/libtinfo.so.6 (0x00007ff77a0ef000)
libkrb5.so.3 => /lib/x86_64-linux-gnu/libkrb5.so.3 (0x00007ff77a015000)
libk5crypto.so.3 => /lib/x86_64-linux-gnu/libk5crypto.so.3 (0x00007ff779fe8000)
libcom_err.so.2 => /lib/x86_64-linux-gnu/libcom_err.so.2 (0x00007ff779fe2000)
libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007ff779e01000)
libkrb5support.so.0 => /lib/x86_64-linux-gnu/libkrb5support.so.0 (0x00007ff779df1000)
libkeyutils.so.1 => /lib/x86_64-linux-gnu/libkeyutils.so.1 (0x00007ff779dea000)
libresolv.so.2 => /lib/x86_64-linux-gnu/libresolv.so.2 (0x00007ff779dd9000)
/lib64/ld-linux-x86-64.so.2 (0x00007ff77a170000)
```

13. (MAQUINA1) Para el protocolo ftp (puerto 21) usa nftables para establecer la acción DROP para las conexiones en las redes 192.168.2.X, 192.168.3.X y REJECT para

192.168.12.X y 192.168.13.X

Normalmente esto se configuraría en /etc/nftables.conf, pero en este caso revisando /etc/inid.d se puede observar que las nftables están siendo gestionadas por lxc-net debido a que estamos usando containers en las máquinas. por lo que en este caso las configuraciones no van a funcionar`.



```
Terminal
File Edit View Search Terminal Help
GNU nano 7.2 /etc/nftables.conf *
#!/usr/sbin/nft -f

flush ruleset

table inet filter {
    chain input {
        type filter hook input priority filter;
        ip addr 192.168.2.0/24 dport 21 drop
        ip addr 192.168.3.0/24 dport 21 drop
        ip addr 192.168.12.0/24 dport 21 reject
        ip addr 192.168.13.0/24 dport 21 reject
    }
    chain forward {
        type filter hook forward priority filter;
    }
    chain output {
        type filter hook output priority filter;
    }
}
```

Terminal window showing nano editor editing /etc/nftables.conf. The configuration includes a table named 'inet filter' with three chains: 'input', 'forward', and 'output'. The 'input' chain has four rules: two 'drop' rules for 192.168.2.0/24 and 192.168.3.0/24 on port 21, and two 'reject' rules for 192.168.12.0/24 and 192.168.13.0/24 on port 21. The 'forward' and 'output' chains are currently empty.

14. (MAQUINA1) Para el protocolo ssh (puerto 22) usa nftables para hacer un DROP para las conexiones en 192.168.12.x y 192.168.13.x y para hacer reject para las redes 192.168.2.x y 192.168.3.x

```
Terminal
File Edit View Search Terminal Help
GNU nano 7.2 /etc/nftables.conf *
#!/usr/sbin/nft -f

flush ruleset

table inet filter {
    chain input {
        type filter hook input priority filter;
        ip addr 192.168.2.0/24 dport 21 drop
        ip addr 192.168.3.0/24 dport 21 drop
        ip addr 192.168.12.0/24 dport 21 reject
        ip addr 192.168.13.0/24 dport 21 reject
        ip addr 192.168.12.0/24 dport 22 drop
        ip addr 192.168.13.0/24 dport 22 drop
        ip addr 192.168.2.0/24 dport 22 reject
        ip addr 192.168.2.0/24 dport 22 reject
    }
    chain forward {
        type filter hook forward priority filter;
    }
    chain output {

```

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