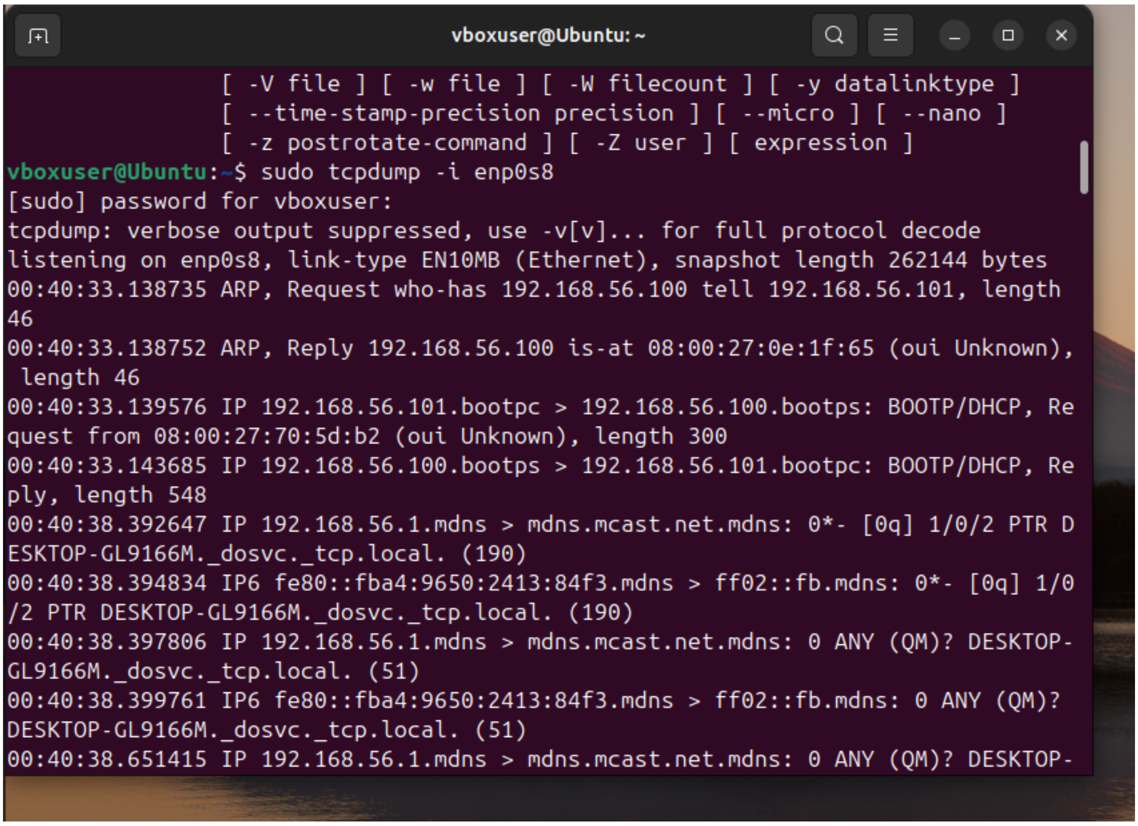
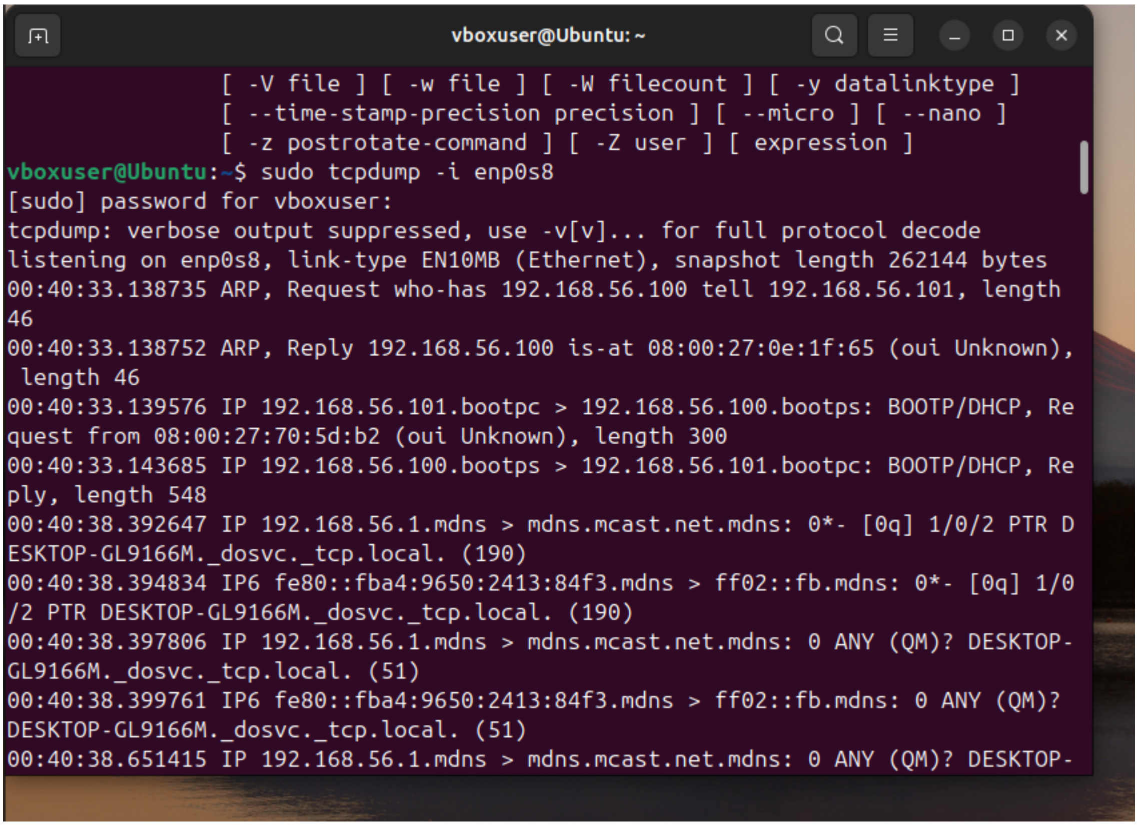
Setup the VMs to mirror traffic and sniffed on the SOC VM:



```
                [ -V file ] [ -w file ] [ -W filecount ] [ -y datalinktype ]
                [ --time-stamp-precision precision ] [ --micro ] [ --nano ]
                [ -z postrotate-command ] [ -Z user ] [ expression ]
vboxuser@Ubuntu:~$ sudo tcpdump -i enp0s8
[sudo] password for vboxuser:
tcpdump: verbose output suppressed, use -v[v]... for full protocol decode
listening on enp0s8, link-type EN10MB (Ethernet), snapshot length 262144 bytes
00:40:33.138735 ARP, Request who-has 192.168.56.100 tell 192.168.56.101, length
46
00:40:33.138752 ARP, Reply 192.168.56.100 is-at 08:00:27:0e:1f:65 (oui Unknown),
 length 46
00:40:33.139576 IP 192.168.56.101.bootpc > 192.168.56.100.bootps: BOOTP/DHCP, Re
quest from 08:00:27:70:5d:b2 (oui Unknown), length 300
00:40:33.143685 IP 192.168.56.100.bootps > 192.168.56.101.bootpc: BOOTP/DHCP, Re
ply, length 548
00:40:38.392647 IP 192.168.56.1.mdns > mdns.mcast.net.mdns: 0*- [0q] 1/0/2 PTR D
ESKTOP-GL9166M._dosvc._tcp.local. (190)
00:40:38.394834 IP6 fe80::fba4:9650:2413:84f3.mdns > ff02::fb.mdns: 0*- [0q] 1/0
/2 PTR DESKTOP-GL9166M._dosvc._tcp.local. (190)
00:40:38.397806 IP 192.168.56.1.mdns > mdns.mcast.net.mdns: 0 ANY (QM)? DESKTOP-
GL9166M._dosvc._tcp.local. (51)
00:40:38.399761 IP6 fe80::fba4:9650:2413:84f3.mdns > ff02::fb.mdns: 0 ANY (QM)?
DESKTOP-GL9166M._dosvc._tcp.local. (51)
00:40:38.651415 IP 192.168.56.1.mdns > mdns.mcast.net.mdns: 0 ANY (QM)? DESKTOP-
```

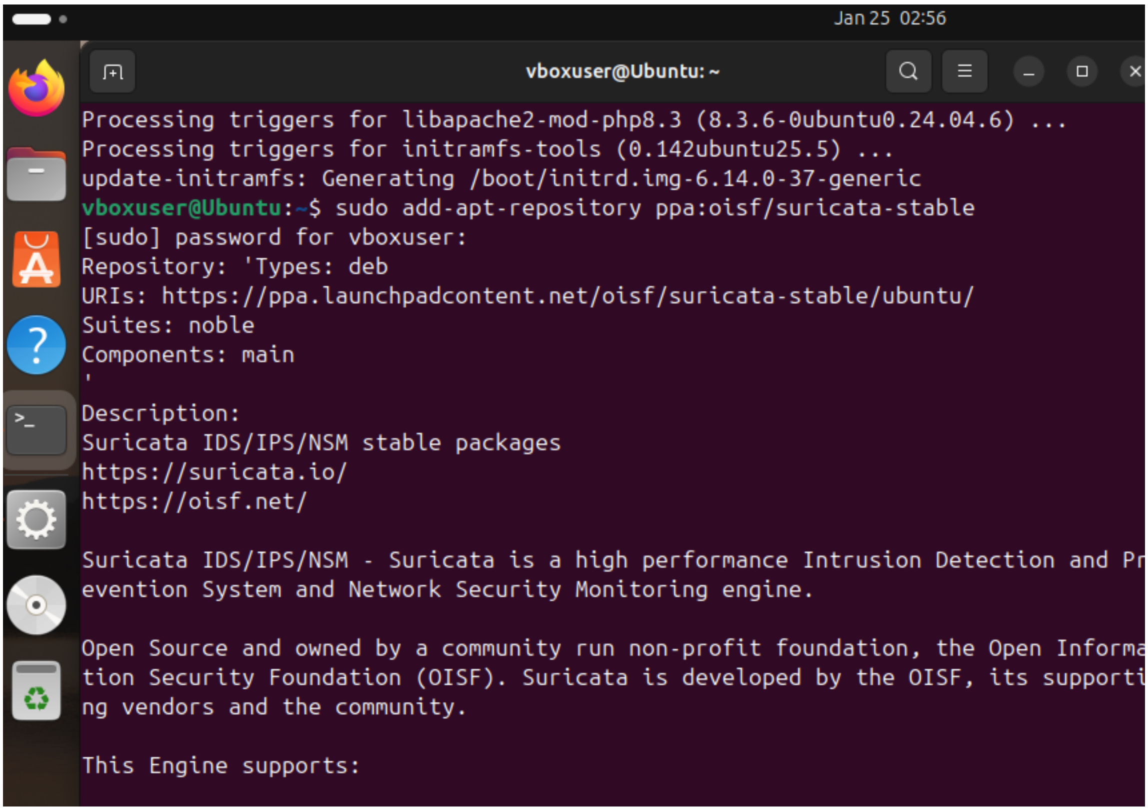
The tcp dump shows communication between the attacker and the target as shown below:


vboxuser@Ubuntu: ~

```
                [ -V file ] [ -w file ] [ -W filecount ] [ -y datalinktype ]
                [ --time-stamp-precision precision ] [ --micro ] [ --nano ]
                [ -z postrotate-command ] [ -Z user ] [ expression ]
vboxuser@Ubuntu:~$ sudo tcpdump -i enp0s8
[sudo] password for vboxuser:
tcpdump: verbose output suppressed, use -v[v]... for full protocol decode
listening on enp0s8, link-type EN10MB (Ethernet), snapshot length 262144 bytes
00:40:33.138735 ARP, Request who-has 192.168.56.100 tell 192.168.56.101, length
46
00:40:33.138752 ARP, Reply 192.168.56.100 is-at 08:00:27:0e:1f:65 (oui Unknown),
 length 46
00:40:33.139576 IP 192.168.56.101.bootpc > 192.168.56.100.bootps: BOOTP/DHCP, Re
quest from 08:00:27:70:5d:b2 (oui Unknown), length 300
00:40:33.143685 IP 192.168.56.100.bootps > 192.168.56.101.bootpc: BOOTP/DHCP, Re
ply, length 548
00:40:38.392647 IP 192.168.56.1.mdns > mdns.mcast.net.mdns: 0*- [0q] 1/0/2 PTR D
ESKTOP-GL9166M._dosvc._tcp.local. (190)
00:40:38.394834 IP6 fe80::fba4:9650:2413:84f3.mdns > ff02::fb.mdns: 0*- [0q] 1/0
/2 PTR DESKTOP-GL9166M._dosvc._tcp.local. (190)
00:40:38.397806 IP 192.168.56.1.mdns > mdns.mcast.net.mdns: 0 ANY (QM)? DESKTOP-
GL9166M._dosvc._tcp.local. (51)
00:40:38.399761 IP6 fe80::fba4:9650:2413:84f3.mdns > ff02::fb.mdns: 0 ANY (QM)?
DESKTOP-GL9166M._dosvc._tcp.local. (51)
00:40:38.651415 IP 192.168.56.1.mdns > mdns.mcast.net.mdns: 0 ANY (QM)? DESKTOP-
```

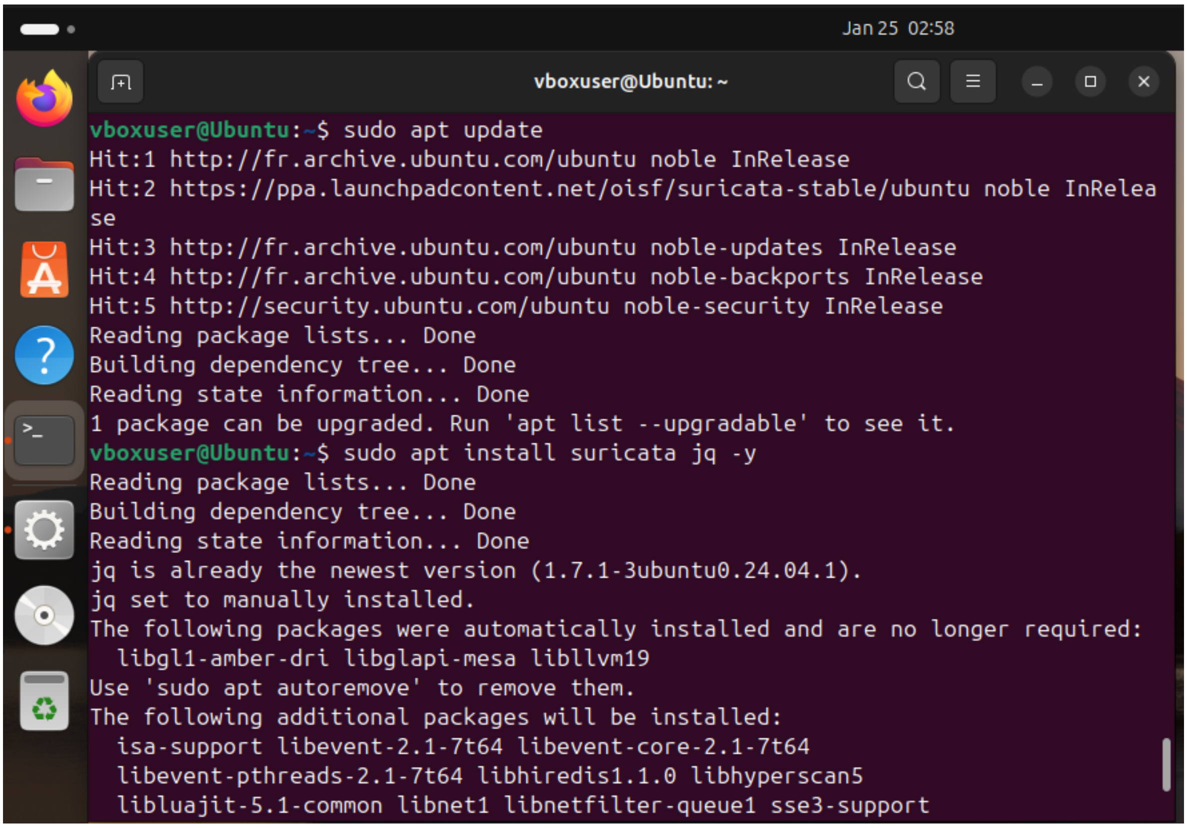
Now install Suricata.

Add suricata to the apt repo



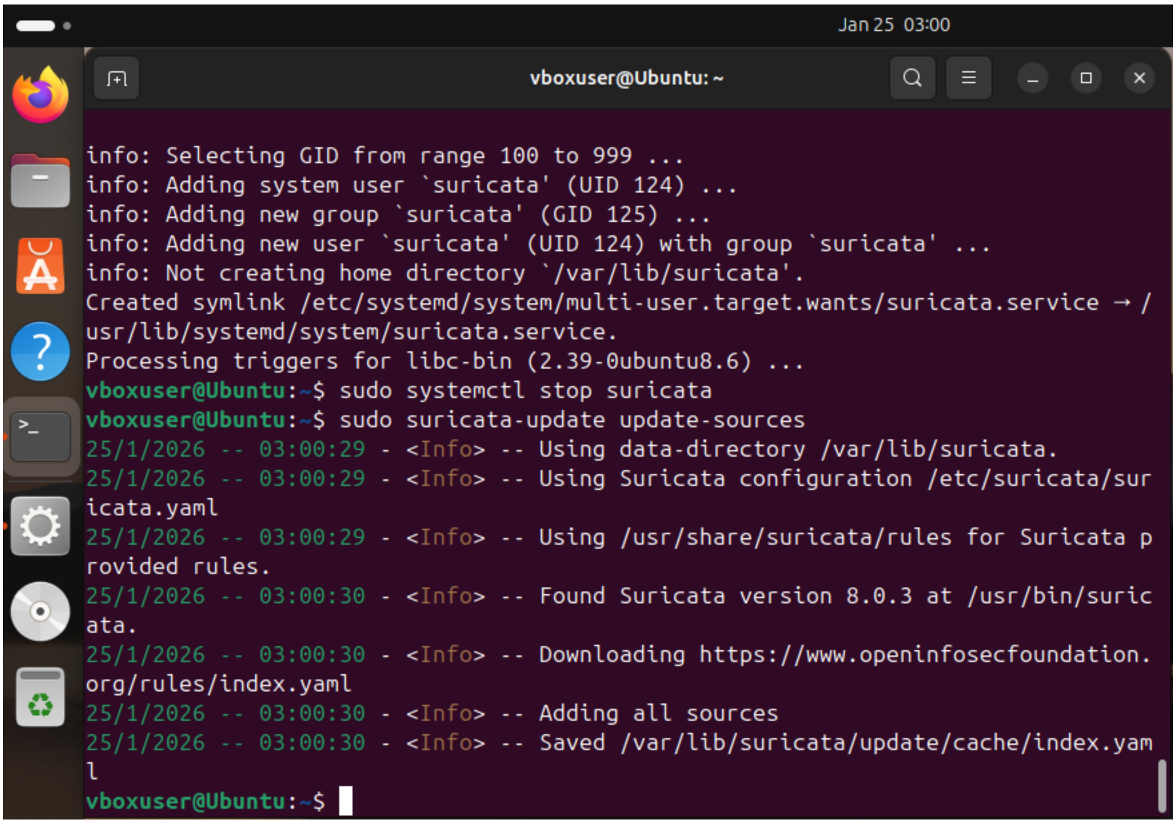
```
Processing triggers for libapache2-mod-php8.3 (8.3.6-0ubuntu0.24.04.6) ...
Processing triggers for initramfs-tools (0.142ubuntu25.5) ...
update-initramfs: Generating /boot/initrd.img-6.14.0-37-generic
vboxuser@Ubuntu:~$ sudo add-apt-repository ppa:oisf/suricata-stable
[sudo] password for vboxuser:
Repository: 'Types: deb
URIs: https://ppa.launchpadcontent.net/oisf/suricata-stable/ubuntu/
Suites: noble
Components: main
'
Description:
Suricata IDS/IPS/NSM stable packages
https://suricata.io/
https://oisf.net/

Suricata IDS/IPS/NSM - Suricata is a high performance Intrusion Detection and Pr
evention System and Network Security Monitoring engine.

Open Source and owned by a community run non-profit foundation, the Open Informa
tion Security Foundation (OISF). Suricata is developed by the OISF, its supporti
ng vendors and the community.

This Engine supports:
```

Update apt and install suricata using apt



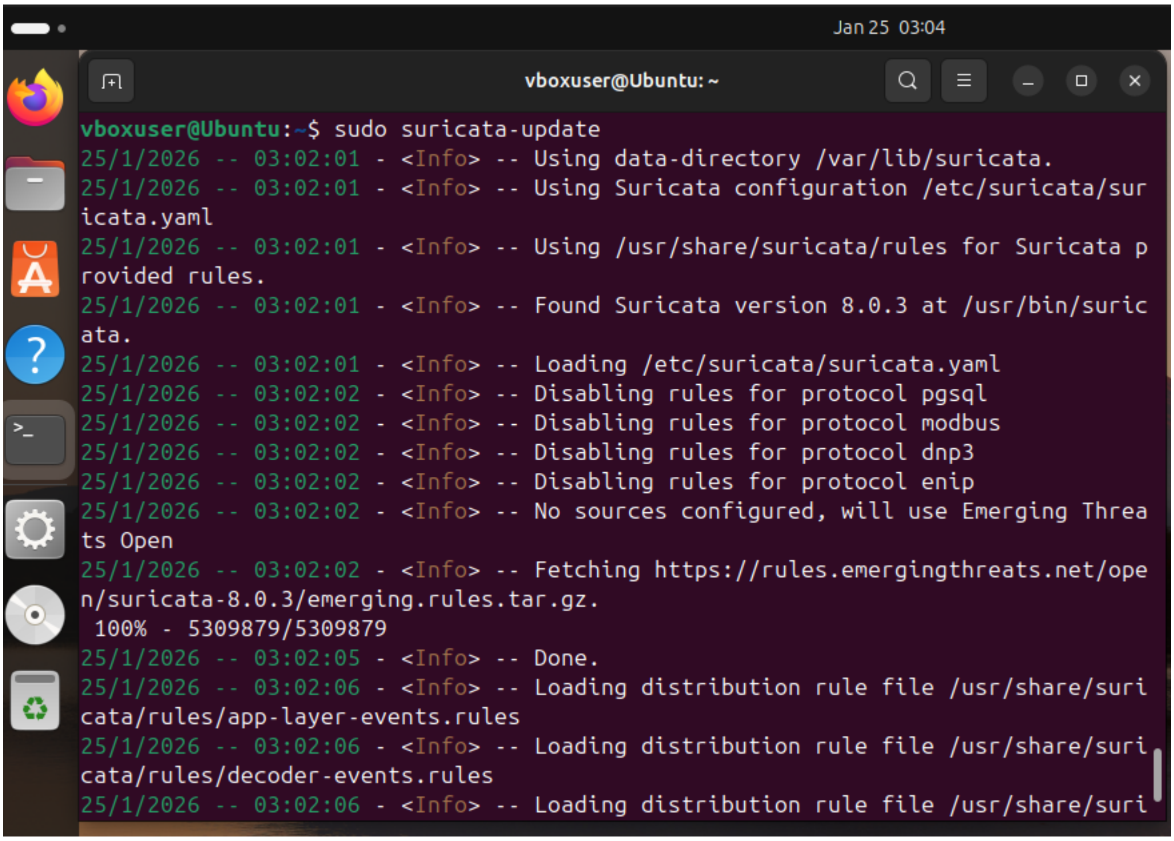
```
vboxuser@Ubuntu:~$ sudo apt update
Hit:1 http://fr.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 https://ppa.launchpadcontent.net/oisf/suricata-stable/ubuntu noble InRelea
se
Hit:3 http://fr.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:4 http://fr.archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:5 http://security.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
1 package can be upgraded. Run 'apt list --upgradable' to see it.
vboxuser@Ubuntu:~$ sudo apt install suricata jq -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
jq is already the newest version (1.7.1-3ubuntu0.24.04.1).
jq set to manually installed.
The following packages were automatically installed and are no longer required:
  libgl1-amber-dri libglapi-mesa libllvm19
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  isa-support libevent-2.1-7t64 libevent-core-2.1-7t64
  libevent-pthreads-2.1-7t64 libhiredis1.1.0 libhyperscan5
  libluajit-5.1-common libnet1 libnetfilter-queue1 sse3-support
```

Stop suricata in order to setup configurations. Then update the rule sources:



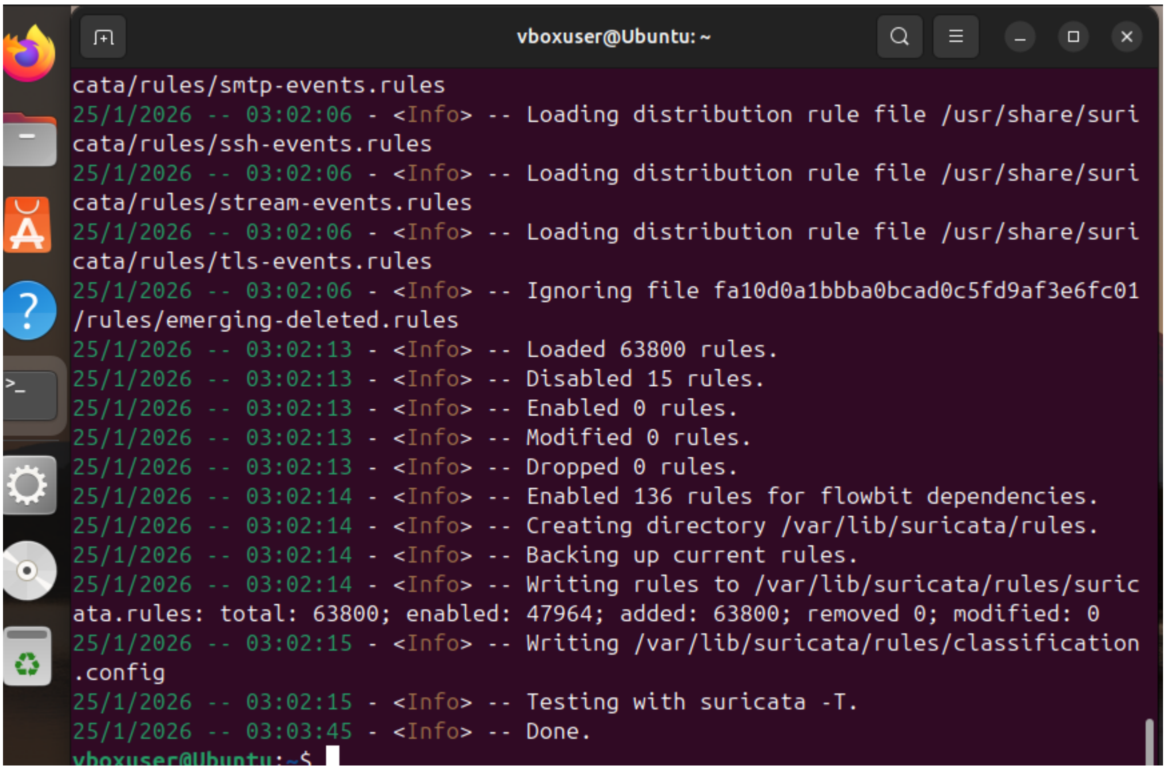
```
info: Selecting GID from range 100 to 999 ...
info: Adding system user `suricata' (UID 124) ...
info: Adding new group `suricata' (GID 125) ...
info: Adding new user `suricata' (UID 124) with group `suricata' ...
info: Not creating home directory `/var/lib/suricata'.
Created symlink /etc/systemd/system/multi-user.target.wants/suricata.service → /
usr/lib/systemd/system/suricata.service.
Processing triggers for libc-bin (2.39-0ubuntu8.6) ...
vboxuser@Ubuntu:~$ sudo systemctl stop suricata
vboxuser@Ubuntu:~$ sudo suricata-update update-sources
25/1/2026 -- 03:00:29 - <Info> -- Using data-directory /var/lib/suricata.
25/1/2026 -- 03:00:29 - <Info> -- Using Suricata configuration /etc/suricata/sur
icata.yaml
25/1/2026 -- 03:00:29 - <Info> -- Using /usr/share/suricata/rules for Suricata p
rovided rules.
25/1/2026 -- 03:00:30 - <Info> -- Found Suricata version 8.0.3 at /usr/bin/suric
ata.
25/1/2026 -- 03:00:30 - <Info> -- Downloading https://www.openinfosecfoundation.
org/rules/index.yaml
25/1/2026 -- 03:00:30 - <Info> -- Adding all sources
25/1/2026 -- 03:00:30 - <Info> -- Saved /var/lib/suricata/update/cache/index.yam
l
vboxuser@Ubuntu:~$ 
```

Download the rules:



```
vboxuser@Ubuntu:~$ sudo suricata-update
25/1/2026 -- 03:02:01 - <Info> -- Using data-directory /var/lib/suricata.
25/1/2026 -- 03:02:01 - <Info> -- Using Suricata configuration /etc/suricata/sur
icata.yaml
25/1/2026 -- 03:02:01 - <Info> -- Using /usr/share/suricata/rules for Suricata p
rovided rules.
25/1/2026 -- 03:02:01 - <Info> -- Found Suricata version 8.0.3 at /usr/bin/suric
ata.
25/1/2026 -- 03:02:01 - <Info> -- Loading /etc/suricata/suricata.yaml
25/1/2026 -- 03:02:02 - <Info> -- Disabling rules for protocol pgsql
25/1/2026 -- 03:02:02 - <Info> -- Disabling rules for protocol modbus
25/1/2026 -- 03:02:02 - <Info> -- Disabling rules for protocol dnp3
25/1/2026 -- 03:02:02 - <Info> -- Disabling rules for protocol enip
25/1/2026 -- 03:02:02 - <Info> -- No sources configured, will use Emerging Threa
ts Open
25/1/2026 -- 03:02:02 - <Info> -- Fetching https://rules.emergingthreats.net/ope
n/suricata-8.0.3/emerging.rules.tar.gz.
 100% - 5309879/5309879
25/1/2026 -- 03:02:05 - <Info> -- Done.
25/1/2026 -- 03:02:06 - <Info> -- Loading distribution rule file /usr/share/suri
cata/rules/app-layer-events.rules
25/1/2026 -- 03:02:06 - <Info> -- Loading distribution rule file /usr/share/suri
cata/rules/decoder-events.rules
25/1/2026 -- 03:02:06 - <Info> -- Loading distribution rule file /usr/share/suri
```

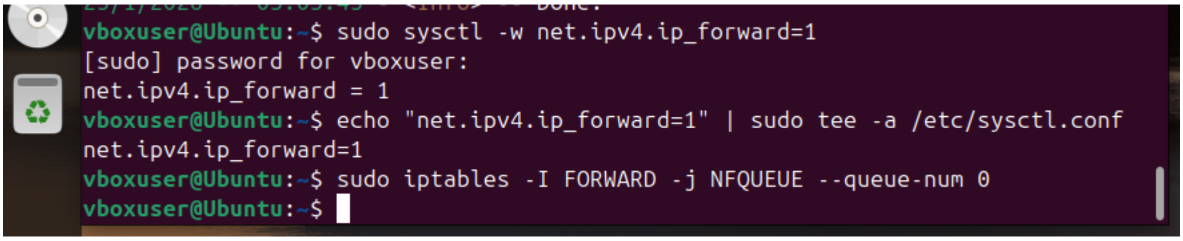
This includes the emerging rules set as shown here.



```
cata/rules/smtp-events.rules
25/1/2026 -- 03:02:06 - <Info> -- Loading distribution rule file /usr/share/suri
cata/rules/ssh-events.rules
25/1/2026 -- 03:02:06 - <Info> -- Loading distribution rule file /usr/share/suri
cata/rules/stream-events.rules
25/1/2026 -- 03:02:06 - <Info> -- Loading distribution rule file /usr/share/suri
cata/rules/tls-events.rules
25/1/2026 -- 03:02:06 - <Info> -- Ignoring file fa10d0a1bbba0bcad0c5fd9af3e6fc01
/rules/emerging-deleted.rules
25/1/2026 -- 03:02:13 - <Info> -- Loaded 63800 rules.
25/1/2026 -- 03:02:13 - <Info> -- Disabled 15 rules.
25/1/2026 -- 03:02:13 - <Info> -- Enabled 0 rules.
25/1/2026 -- 03:02:13 - <Info> -- Modified 0 rules.
25/1/2026 -- 03:02:13 - <Info> -- Dropped 0 rules.
25/1/2026 -- 03:02:14 - <Info> -- Enabled 136 rules for flowbit dependencies.
25/1/2026 -- 03:02:14 - <Info> -- Creating directory /var/lib/suricata/rules.
25/1/2026 -- 03:02:14 - <Info> -- Backing up current rules.
25/1/2026 -- 03:02:14 - <Info> -- Writing rules to /var/lib/suricata/rules/suric
ata.rules: total: 63800; enabled: 47964; added: 63800; removed 0; modified: 0
25/1/2026 -- 03:02:15 - <Info> -- Writing /var/lib/suricata/rules/classification
.config
25/1/2026 -- 03:02:15 - <Info> -- Testing with suricata -T.
25/1/2026 -- 03:03:45 - <Info> -- Done.
vboxuser@Ubuntu:~$
```

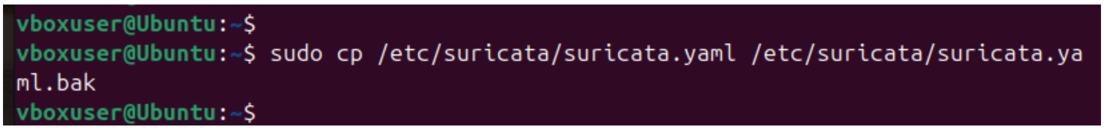
Network and routing configuration:

Enable ip forwarding and routing through suricata using nfqueue



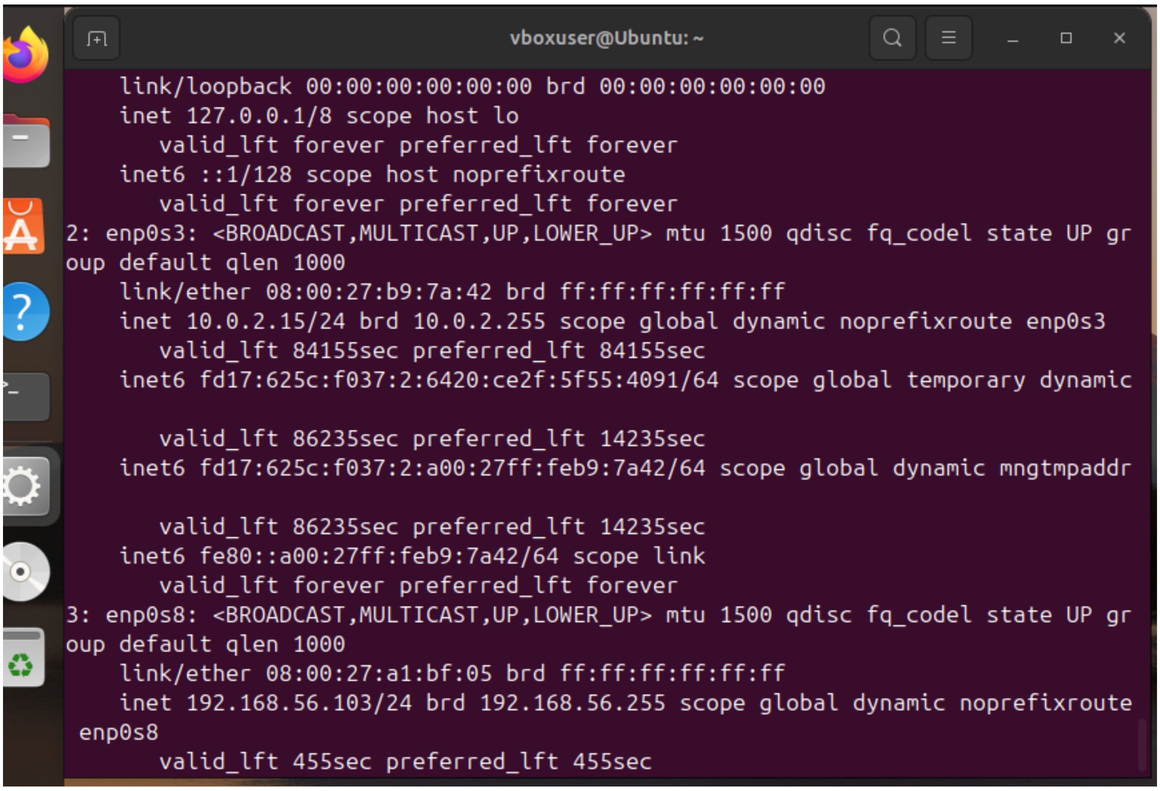
```
25/1/2026 -- 03:03:45 - <Info> -- Done.
vboxuser@Ubuntu:~$ sudo sysctl -w net.ipv4.ip_forward=1
[sudo] password for vboxuser:
net.ipv4.ip_forward = 1
vboxuser@Ubuntu:~$ echo "net.ipv4.ip_forward=1" | sudo tee -a /etc/sysctl.conf
net.ipv4.ip_forward=1
vboxuser@Ubuntu:~$ sudo iptables -I FORWARD -j NFQUEUE --queue-num 0
vboxuser@Ubuntu:~$
```

Backup current suricata config before editing



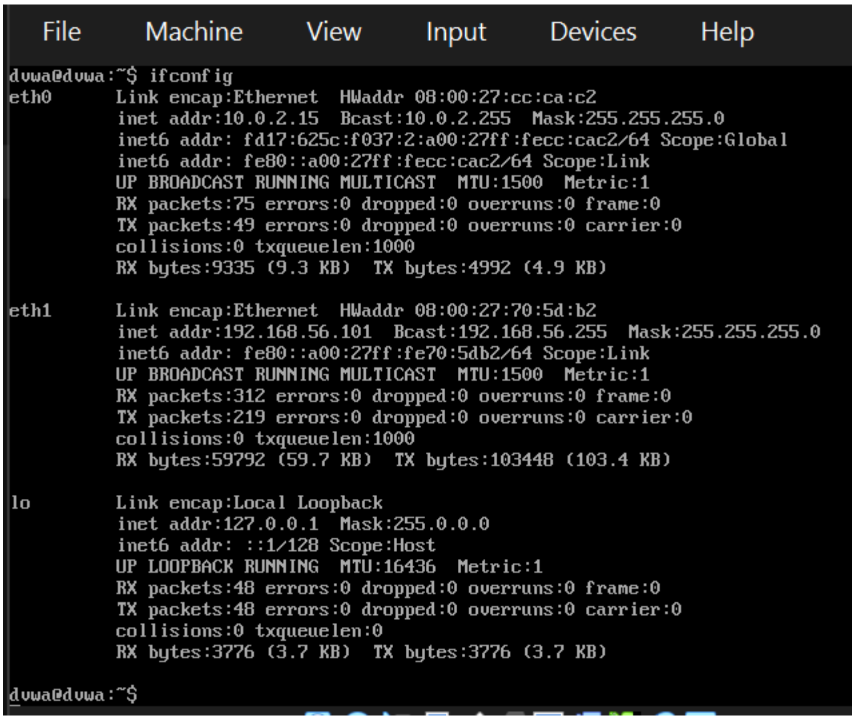
```
vboxuser@Ubuntu:~$
vboxuser@Ubuntu:~$ sudo cp /etc/suricata/suricata.yaml /etc/suricata/suricata.ya
ml.bak
vboxuser@Ubuntu:~$
```

Soc vm:



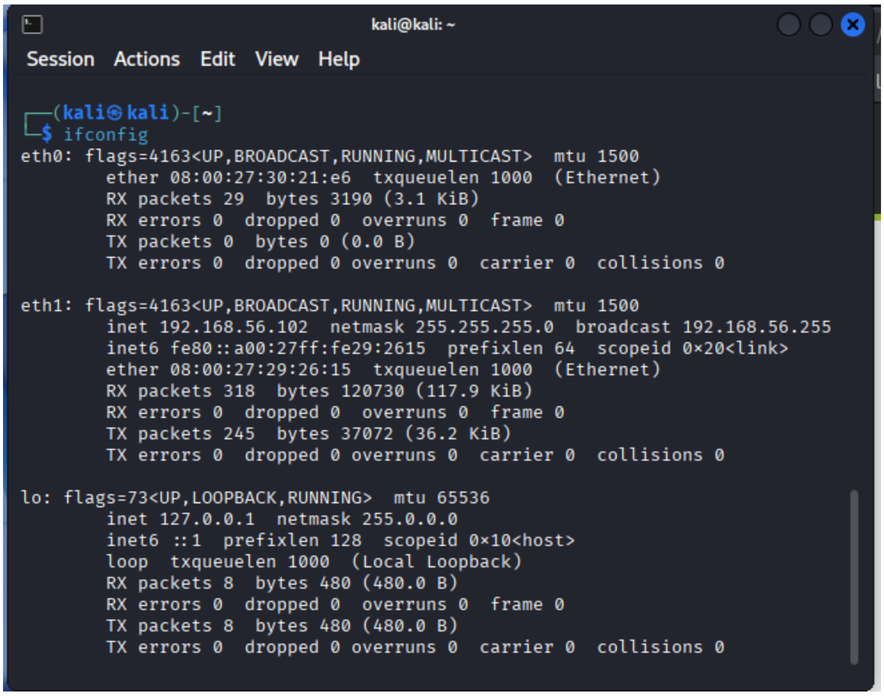
```
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP gr
oup default qlen 1000
    link/ether 08:00:27:b9:7a:42 brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
       valid_lft 84155sec preferred_lft 84155sec
    inet6 fd17:625c:f037:2:6420:ce2f:5f55:4091/64 scope global temporary dynamic

       valid_lft 86235sec preferred_lft 14235sec
    inet6 fd17:625c:f037:2:a00:27ff:feb9:7a42/64 scope global dynamic mngtmpaddr

       valid_lft 86235sec preferred_lft 14235sec
    inet6 fe80::a00:27ff:feb9:7a42/64 scope link
       valid_lft forever preferred_lft forever
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP gr
oup default qlen 1000
    link/ether 08:00:27:a1:bf:05 brd ff:ff:ff:ff:ff:ff
    inet 192.168.56.103/24 brd 192.168.56.255 scope global dynamic noprefixroute
 enp0s8
       valid_lft 455sec preferred_lft 455sec
```

Dvwa vm



```
dvwa@dvwa:~$ ifconfig
eth0      Link encap:Ethernet  HWaddr 08:00:27:cc:ca:c2
          inet addr:10.0.2.15  Bcast:10.0.2.255  Mask:255.255.255.0
          inet6 addr: fd17:625c:f037:2:a00:27ff:fecc:cac2/64 Scope:Global
          inet6 addr: fe80::a00:27ff:fecc:cac2/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:75 errors:0 dropped:0 overruns:0 frame:0
          TX packets:49 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:9335 (9.3 KB)  TX bytes:4992 (4.9 KB)

eth1      Link encap:Ethernet  HWaddr 08:00:27:70:5d:b2
          inet addr:192.168.56.101  Bcast:192.168.56.255  Mask:255.255.255.0
          inet6 addr: fe80::a00:27ff:fe70:5db2/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:312 errors:0 dropped:0 overruns:0 frame:0
          TX packets:219 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:59792 (59.7 KB)  TX bytes:103448 (103.4 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:48 errors:0 dropped:0 overruns:0 frame:0
          TX packets:48 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:3776 (3.7 KB)  TX bytes:3776 (3.7 KB)

dvwa@dvwa:~$
```

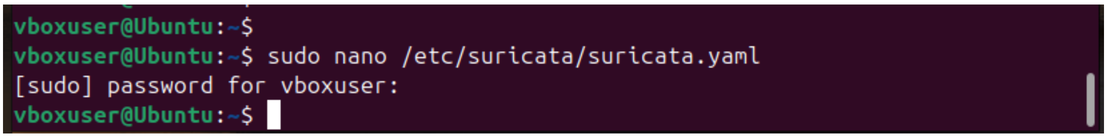
Kali vm



```
┌──(kali㉿kali)-[~]
└─$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        ether 08:00:27:30:21:e6  txqueuelen 1000  (Ethernet)
        RX packets 29  bytes 3190 (3.1 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

eth1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.56.102  netmask 255.255.255.0  broadcast 192.168.56.255
        inet6 fe80::a00:27ff:fe29:2615  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:29:26:15  txqueuelen 1000  (Ethernet)
        RX packets 318  bytes 120730 (117.9 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 245  bytes 37072 (36.2 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 8  bytes 480 (480.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 8  bytes 480 (480.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

Configure suricata:

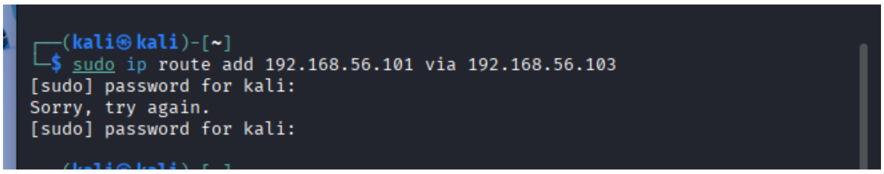
Edit the suricata.yaml file to set the network subnet and the nfqueue details



```
vboxuser@Ubuntu:~$
vboxuser@Ubuntu:~$ sudo nano /etc/suricata/suricata.yaml
[sudo] password for vboxuser:
vboxuser@Ubuntu:~$
```

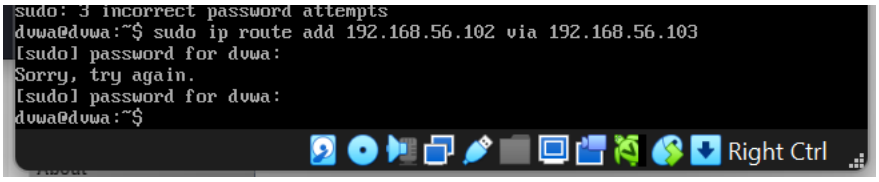
Endpoint traffic routing

Route attacker traffic to target through the soc



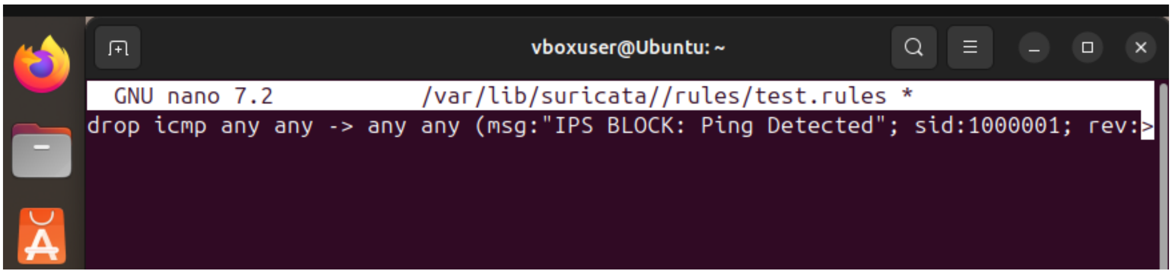
```
┌──(kali㉿kali)-[~]
└─$ sudo ip route add 192.168.56.101 via 192.168.56.103
[sudo] password for kali:
Sorry, try again.
[sudo] password for kali:
```

Route target traffic to attacker through soc



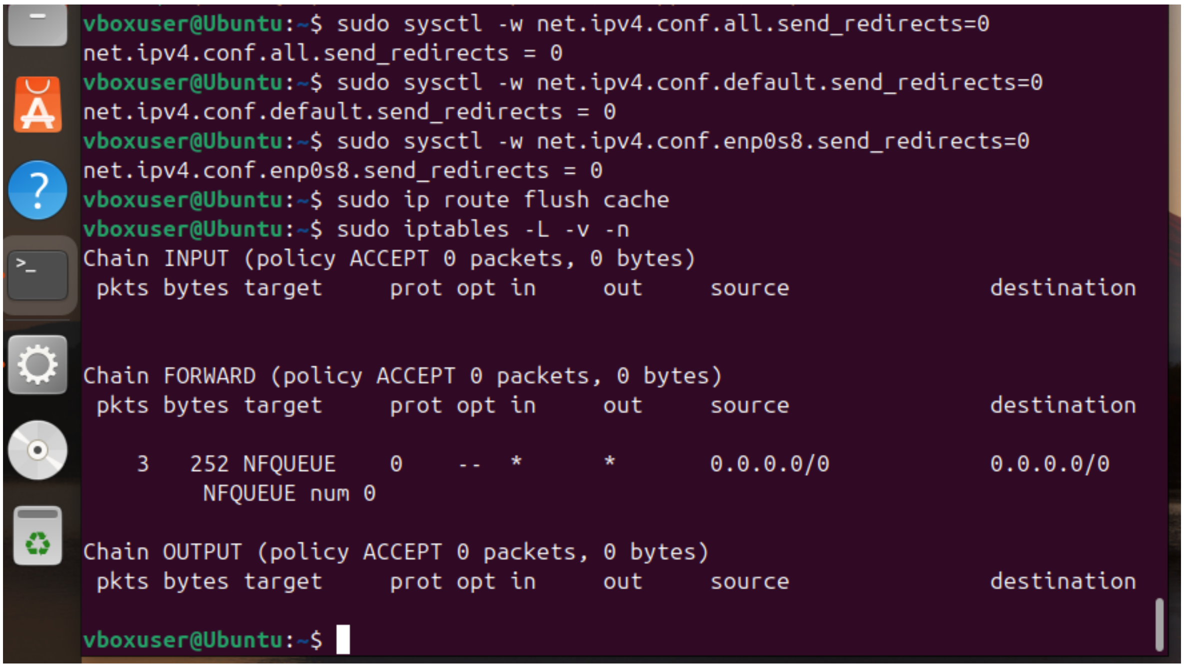
```
sudo: 3 incorrect password attempts
dvwa@dvwa:~$ sudo ip route add 192.168.56.102 via 192.168.56.103
[sudo] password for dvwa:
Sorry, try again.
[sudo] password for dvwa:
dvwa@dvwa:~$
```

Drop test



```
  GNU nano 7.2            /var/lib/suricata//rules/test.rules *
drop icmp any any -> any any (msg:"IPS BLOCK: Ping Detected"; sid:1000001; rev:>
```

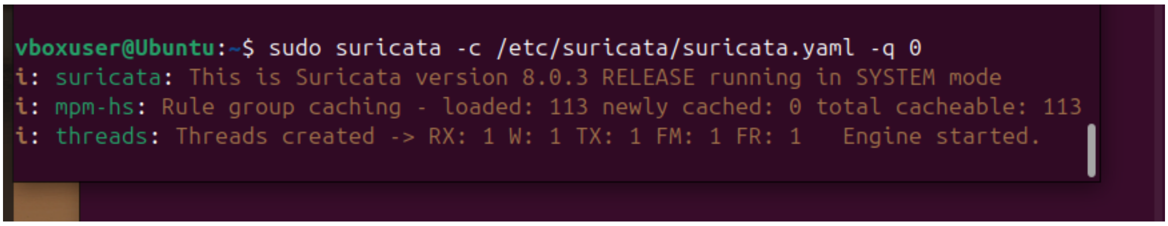
Force routing through soc vm



```
vboxuser@Ubuntu:~$ sudo sysctl -w net.ipv4.conf.all.send_redirects=0
net.ipv4.conf.all.send_redirects = 0
vboxuser@Ubuntu:~$ sudo sysctl -w net.ipv4.conf.default.send_redirects=0
net.ipv4.conf.default.send_redirects = 0
vboxuser@Ubuntu:~$ sudo sysctl -w net.ipv4.conf.enp0s8.send_redirects=0
net.ipv4.conf.enp0s8.send_redirects = 0
vboxuser@Ubuntu:~$ sudo ip route flush cache
vboxuser@Ubuntu:~$ sudo iptables -L -v -n
Chain INPUT (policy ACCEPT 0 packets, 0 bytes)
 pkts bytes target     prot opt in     out     source               destination


Chain FORWARD (policy ACCEPT 0 packets, 0 bytes)
 pkts bytes target     prot opt in     out     source               destination

    3   252 NFQUEUE    0    --  *      *       0.0.0.0/0            0.0.0.0/0
         NFQUEUE num 0


Chain OUTPUT (policy ACCEPT 0 packets, 0 bytes)
 pkts bytes target     prot opt in     out     source               destination

vboxuser@Ubuntu:~$
```

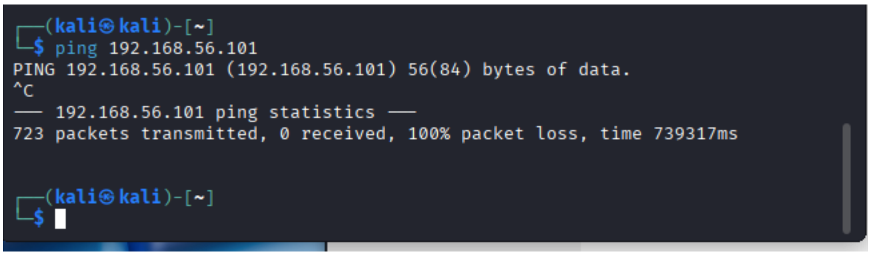
Test

Suricata listening



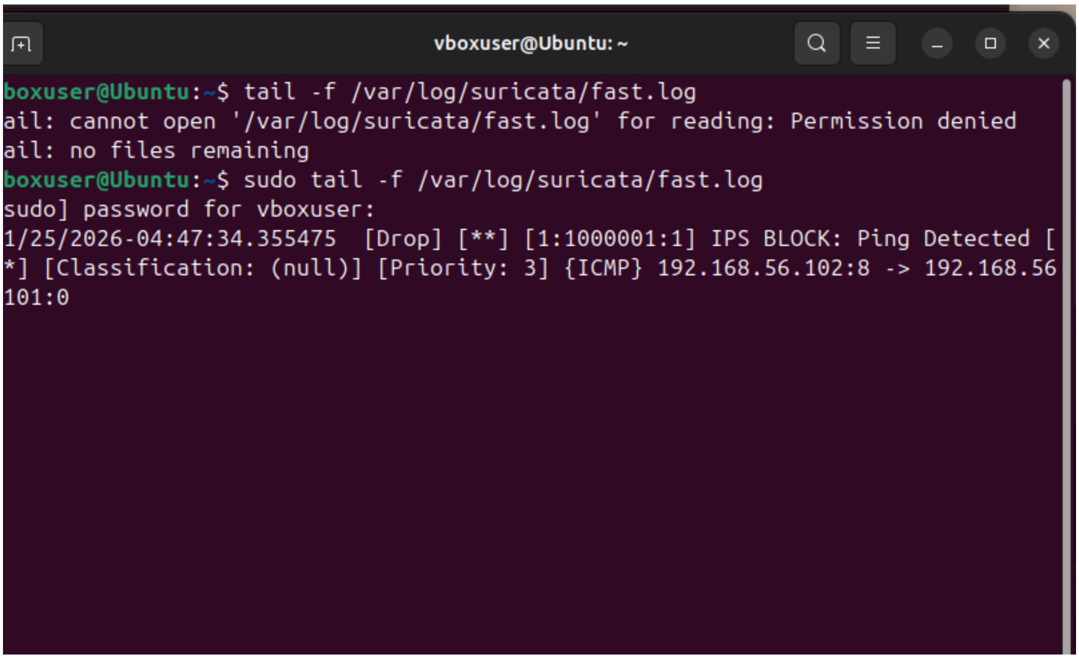
```
vboxuser@Ubuntu:~$ sudo suricata -c /etc/suricata/suricata.yaml -q 0
i: suricata: This is Suricata version 8.0.3 RELEASE running in SYSTEM mode
i: mpm-hs: Rule group caching - loaded: 113 newly cached: 0 total cacheable: 113
i: threads: Threads created -> RX: 1 W: 1 TX: 1 FM: 1 FR: 1   Engine started.
```

Ping from attacker to victim



```
┌──(kali㉿kali)-[~]
└─$ ping 192.168.56.101
PING 192.168.56.101 (192.168.56.101) 56(84) bytes of data.
^C
── 192.168.56.101 ping statistics ──
723 packets transmitted, 0 received, 100% packet loss, time 739317ms


┌──(kali㉿kali)-[~]
└─$ 
```

Suricata fast log



```
boxuser@Ubuntu:~$ tail -f /var/log/suricata/fast.log
ail: cannot open '/var/log/suricata/fast.log' for reading: Permission denied
ail: no files remaining
boxuser@Ubuntu:~$ sudo tail -f /var/log/suricata/fast.log
sudo] password for vboxuser:
1/25/2026-04:47:34.355475  [Drop] [**] [1:1000001:1] IPS BLOCK: Ping Detected [
*] [Classification: (null)] [Priority: 3] {ICMP} 192.168.56.102:8 -> 192.168.56
101:0
```