SYN FLOOD ATTACK PREVENTION

Ramyasree Bakka

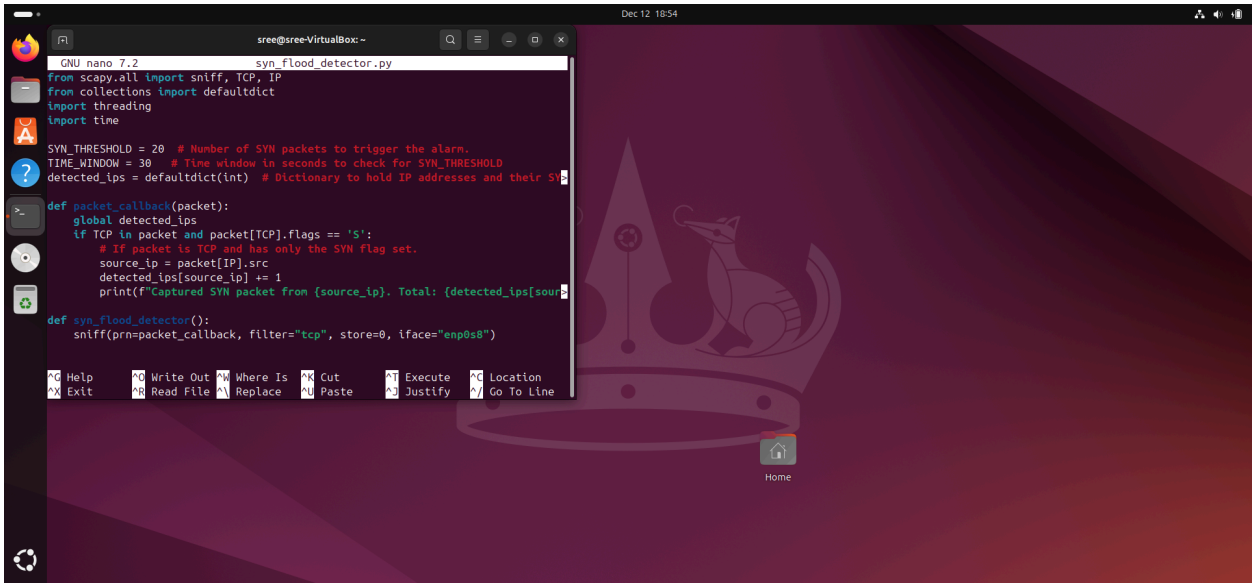
Script for detection

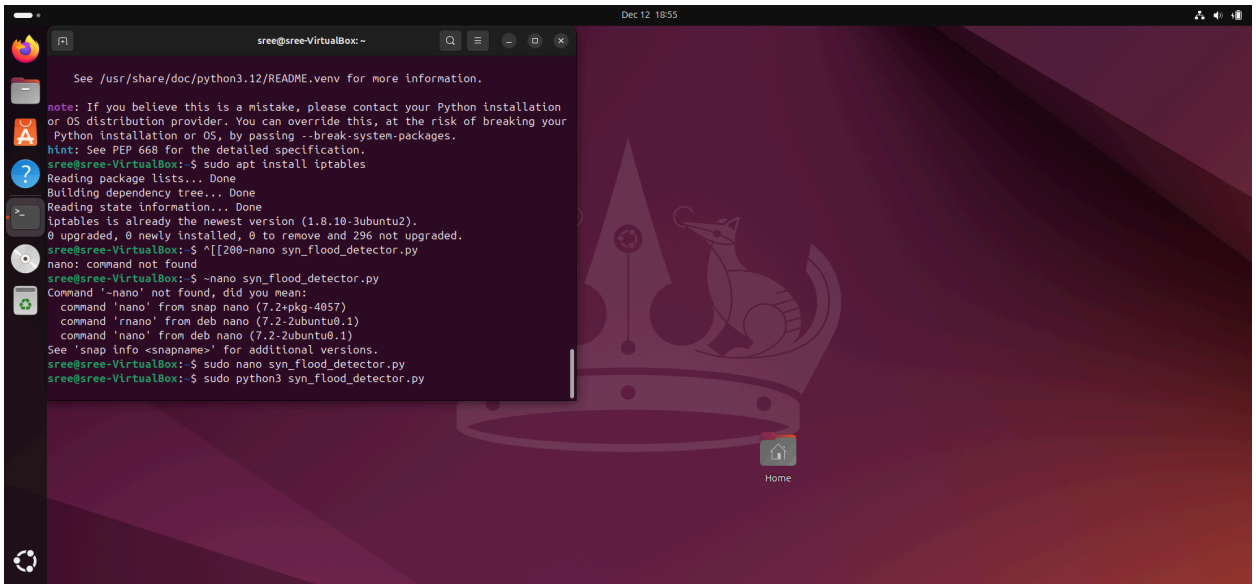
Step1: open ubuntu terminal and start writing the given script in a nano file and save the file

```
from scapy.all import sniff, TCP
from collections import defaultdict

SYN_THRESHOLD = 100  # Number of SYN packets to trigger the alarm.
TIME_WINDOW = 60  # Time window in seconds to check for SYN_THRESHOLD
detected_ips = defaultdict(int)  # Dictionary to hold IP addresses and
their SYN counts

def packet_callback(packet):
    global detected_ips

    if TCP in packet and packet[TCP].flags == 'S':
        # If packet is TCP and has only the SYN flag set.
        source_ip = packet[IP].src
        detected_ips[source_ip] += 1

def syn_flood_detector():
    sniff(prn=packet_callback, filter="tcp", store=0)

if __name__ == "__main__":
    import threading
    import time

    # Start the detector in a separate thread
    detector_thread = threading.Thread(target=syn_flood_detector)
    detector_thread.start()

    try:
        while True:
            time.sleep(TIME_WINDOW)
```

```
            # Check the counts and trigger alert for potential SYN
flood
            for ip, count in detected_ips.items():
                if count > SYN_THRESHOLD:
                    print(f"[ALERT] Possible SYN flood attack from
{ip}. Detected {count} SYN packets in the last {TIME_WINDOW}
seconds.")

            # Reset the counts after checking
            detected_ips.clear()

    except KeyboardInterrupt:
        print("Stopping the SYN flood detector.")
```

This script will continuously monitor for SYN flood attacks.





Step2: start running the python script which is saved

Step3: DEMO ATTACK

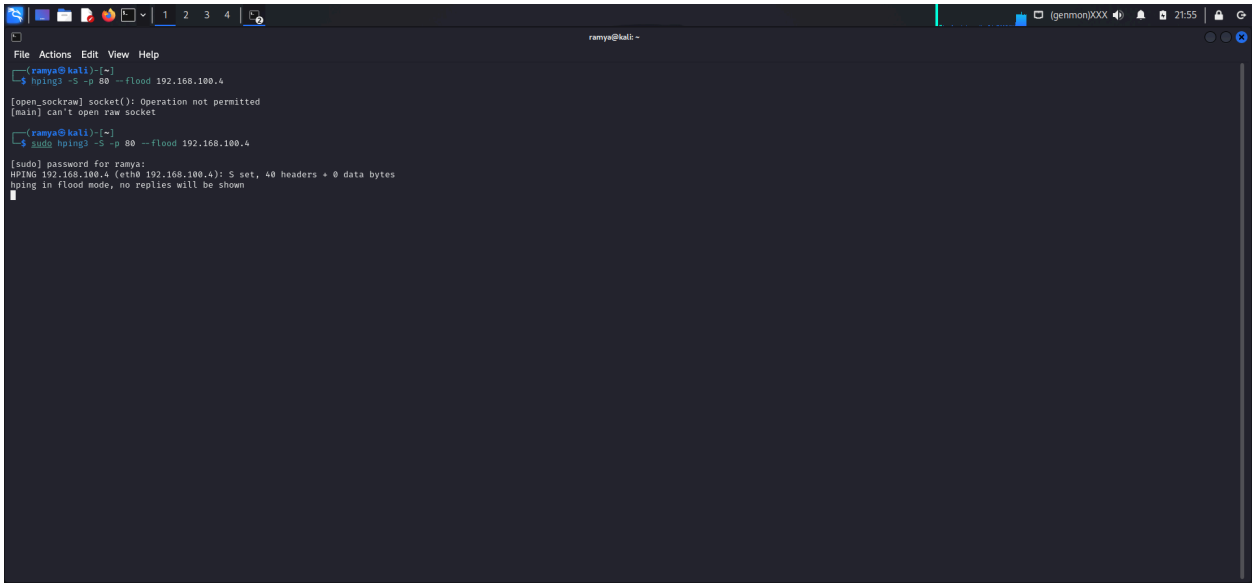
start the attack using hping3 from kali send syn packets

U can see the python script running terminal it is flooded with syn traffic and can see the alert

`hping3 -S -p 80 --flood 192.168.100.4`

- `192.168.100.4`: Replace this with the IP address of your Ubuntu machine.
- `-S`: Sends SYN packets.
- `-p 80`: Targets port 80.

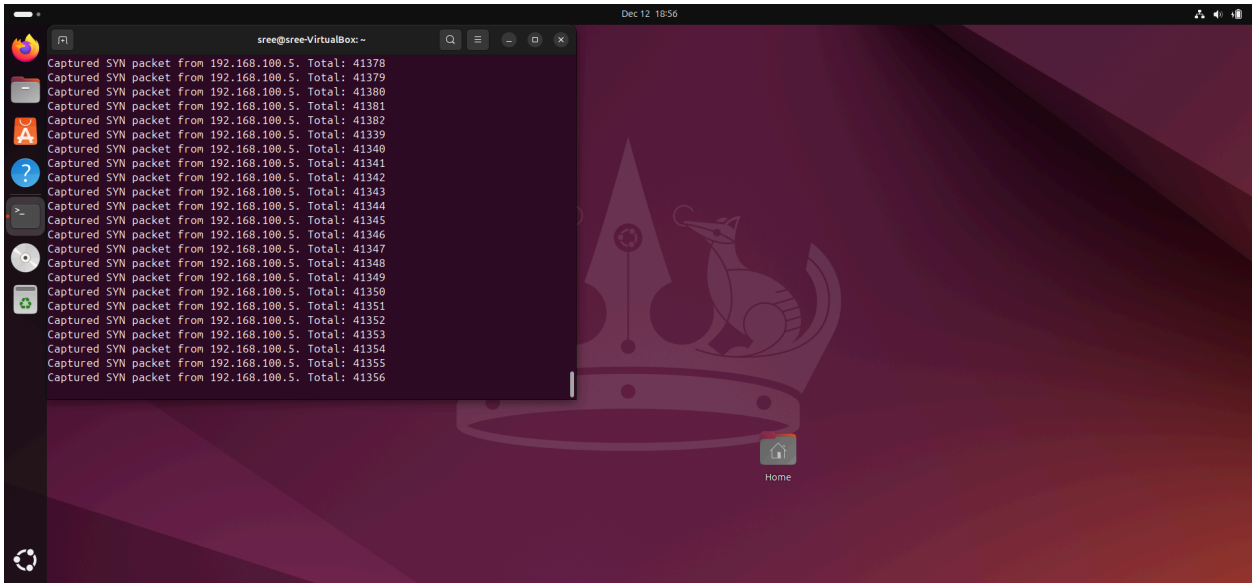
`--flood`: Sends packets as fast as possible.

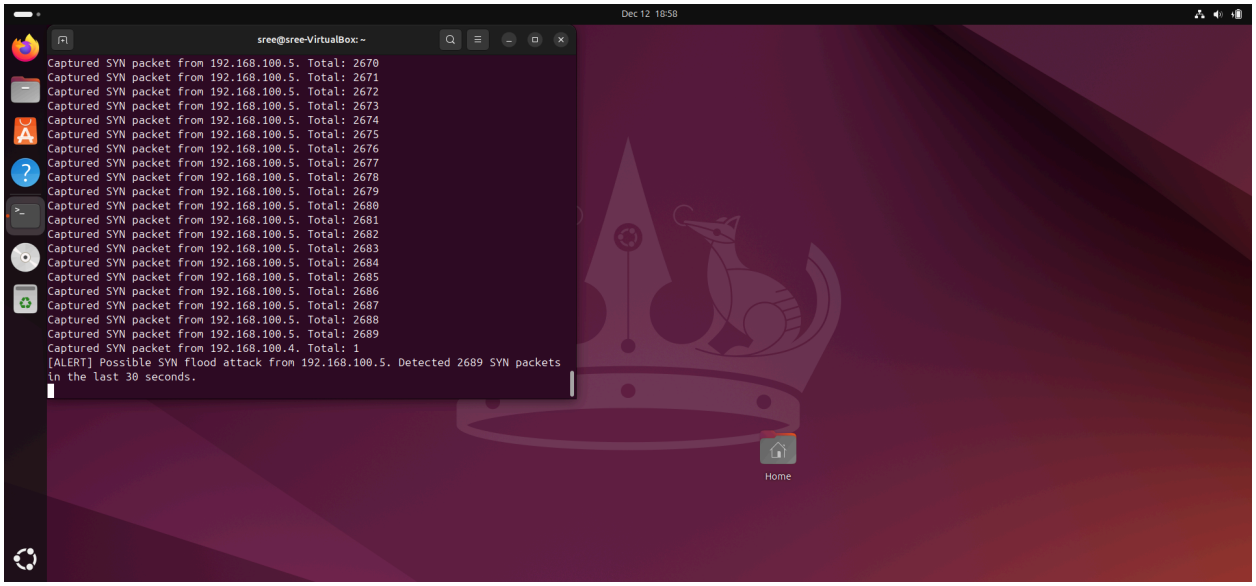


Step4: Mitigation Using Iptables

On Ubuntu Server (Target Machine)

Block the Attacker IP (Reactive Mitigation): After detecting the attacker's IP (e.g., `192.168.100.5`), block it:cmd `sudo iptables -A INPUT -s 192.168.100.5 -j DROP`



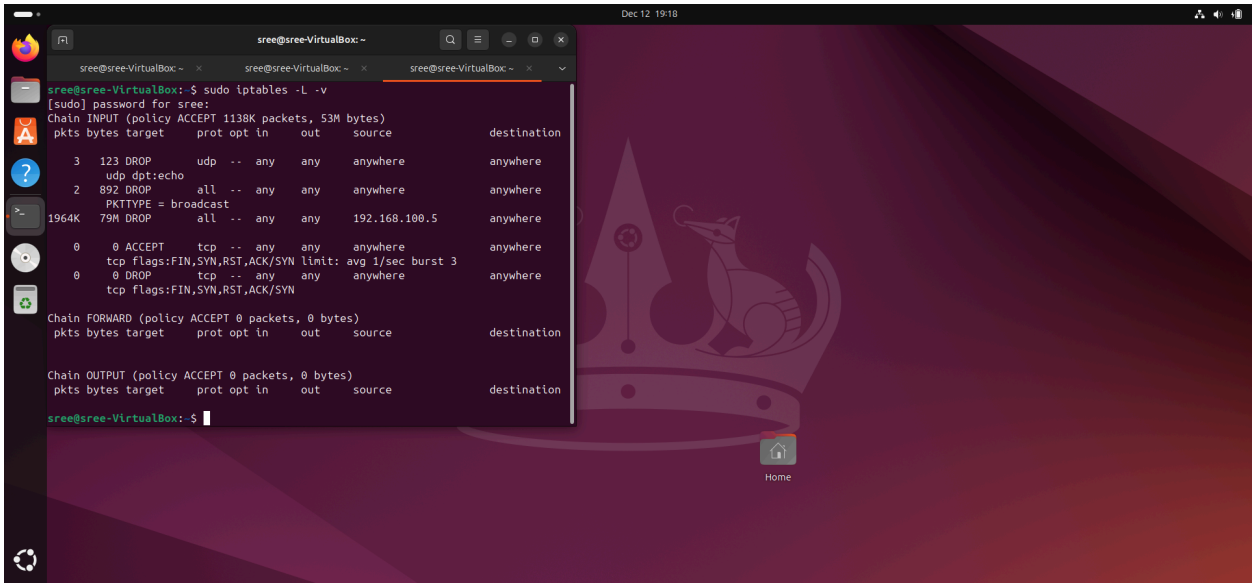


Step 5: Test the Mitigation

On Kali Linux (Attacker Machine):
Run the SYN flood attack again:

```
hping3 -S -p 80 --flood 192.168.100.4
```

On Ubuntu Server (Target Machine): Verify that the attacker's packets are blocked. No new alerts should appear in the detection script after applying the `iptables` rules.



Step 7: Verify and Monitor

On Ubuntu Server (Target Machine):

Check Active `iptables` Rules: `sudo iptables -L -v`