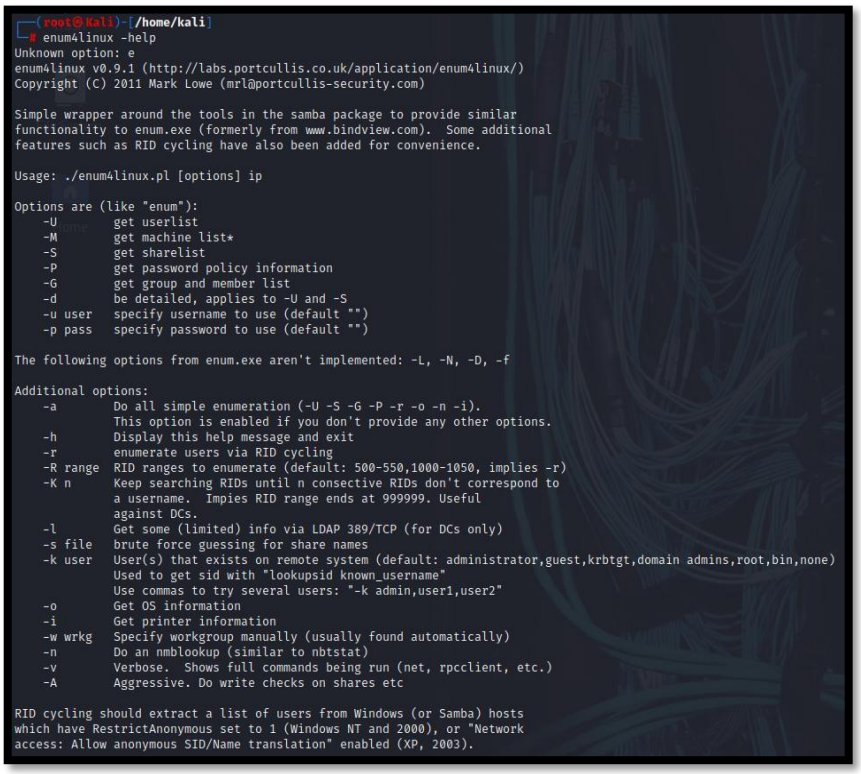
Experiment 6: Module 5 Cisco Certification

Part 1: Launch enum4linux and explore its capabilities.
Step 1: Verify that enum4linux is installed and view the help file.
Load Kali Linux using the username kali and the password kali. Open a terminal session from the menu bar at the top of the screen.
Most enum4linux commands must be run as root, so use the sudo su command to obtain persistent root access.

At the prompt, enter the command to view the enum4linux help file.

```
┌──(kali㉿kali)-[~]
└─$ sudo su
[sudo] password for kali:
```


```
┌──(root㉿kali)-[/home/kali]
└─# enum4linux –help
```



The help file contains the syntax and options available to enumerate host and server information on networks that use SMB. Enum4linux requires that Samba be installed on the host system, in this case the Kali Linux computer, because it is dependent on the built-in Samba utilities.

Part 2: Use Nmap to Find SMB Servers.
Step 1: Scan the virtual networks to find potential targets.
One way to identify potential targets for SMB enumeration is to examine the open ports. In an earlier lab, you used Nmap to find and enumerate open ports on target systems. Common open ports on SMB servers are:

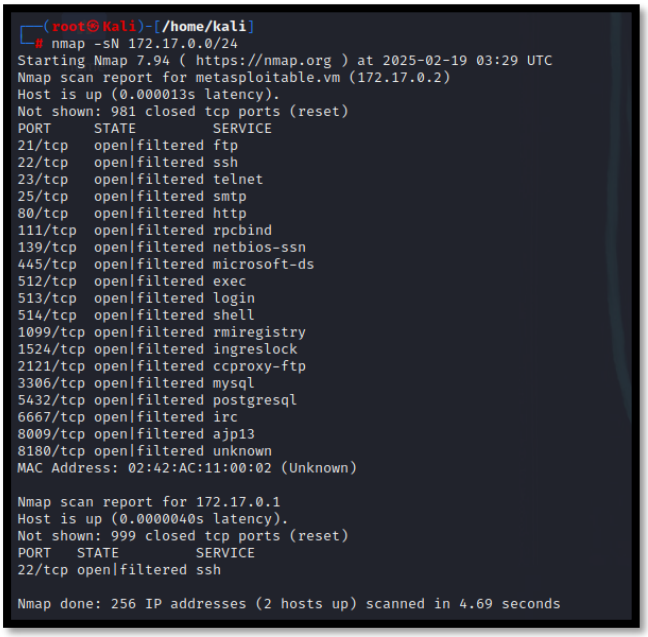
TCP 135 RPC
TCP 139 NetBIOS Session
TCP 389 LDAP Server
TCP 445 SMB File Service
TCP 9389 Active Directory Web Services

TCP/UDP 137 NetBIOS Name Service

UDP 138 NetBIOS Datagram

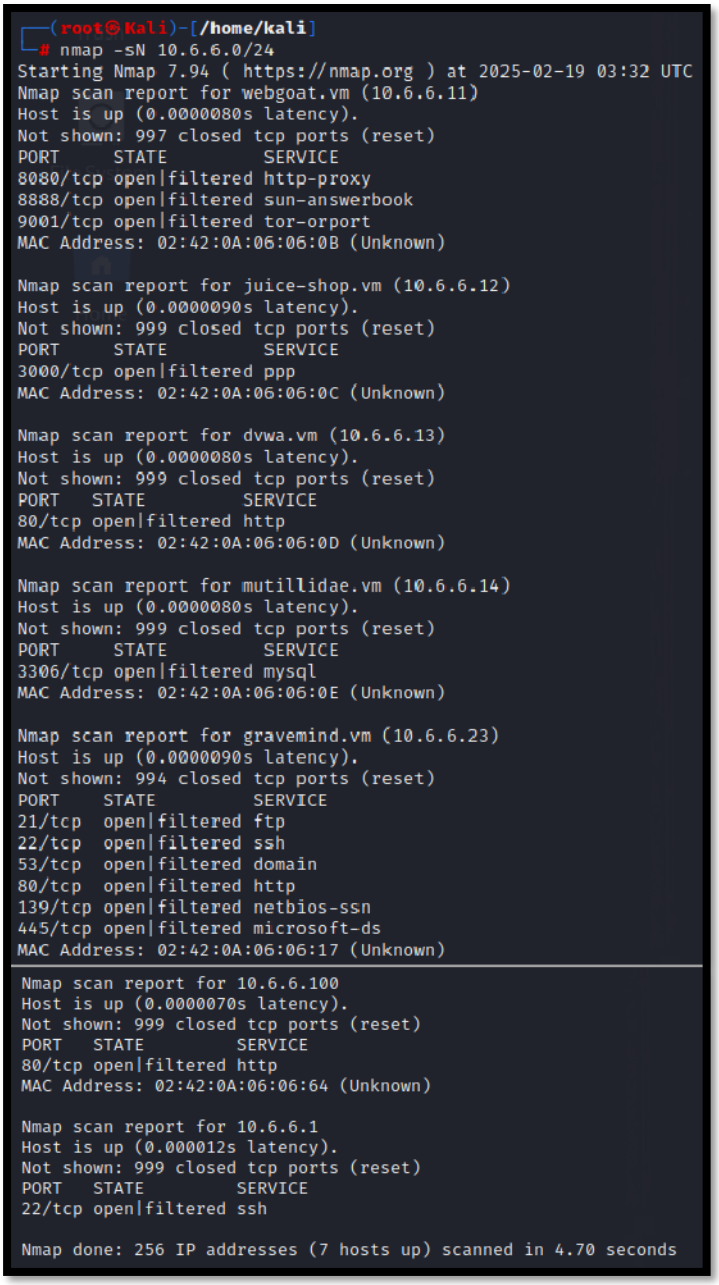
Two virtual networks are included in the Kali VM with Docker containers. Use the nmap -sN command to find the services available on hosts in the 172.17.0.0 virtual network.
Note: sudo is not required if you executed the sudo su command above.

```
┌──(root㉿kali)-[/home/kali]
└─# nmap -sN 172.17.0.0/24
```



Conduct a nmap -sN scan on the 10.6.6.0/24 subnet.

```
┌──(root㉿kali)-[/home/kali]
└─# nmap -sN 10.6.6.0/24
```



```
┌──(root㉿Kali)-[/home/kali]
└─# nmap -sN 10.6.6.0/24
Starting Nmap 7.94 ( https://nmap.org ) at 2025-02-19 03:32 UTC
Nmap scan report for webgoat.vm (10.6.6.11)
Host is up (0.0000080s latency).
Not shown: 997 closed tcp ports (reset)
PORT     STATE         SERVICE
8080/tcp open|filtered http-proxy
8888/tcp open|filtered sun-answerbook
9001/tcp open|filtered tor-orport
MAC Address: 02:42:0A:06:06:0B (Unknown)

Nmap scan report for juice-shop.vm (10.6.6.12)
Host is up (0.0000090s latency).
Not shown: 999 closed tcp ports (reset)
PORT     STATE         SERVICE
3000/tcp open|filtered ppp
MAC Address: 02:42:0A:06:06:0C (Unknown)

Nmap scan report for dvwa.vm (10.6.6.13)
Host is up (0.0000080s latency).
Not shown: 999 closed tcp ports (reset)
PORT   STATE         SERVICE
80/tcp open|filtered http
MAC Address: 02:42:0A:06:06:0D (Unknown)

Nmap scan report for mutillidae.vm (10.6.6.14)
Host is up (0.0000080s latency).
Not shown: 999 closed tcp ports (reset)
PORT     STATE         SERVICE
3306/tcp open|filtered mysql
MAC Address: 02:42:0A:06:06:0E (Unknown)

Nmap scan report for gravemind.vm (10.6.6.23)
Host is up (0.0000090s latency).
Not shown: 994 closed tcp ports (reset)
PORT    STATE         SERVICE
21/tcp  open|filtered ftp
22/tcp  open|filtered ssh
53/tcp  open|filtered domain
80/tcp  open|filtered http
139/tcp open|filtered netbios-ssn
445/tcp open|filtered microsoft-ds
MAC Address: 02:42:0A:06:06:17 (Unknown)

Nmap scan report for 10.6.6.100
Host is up (0.0000070s latency).
Not shown: 999 closed tcp ports (reset)
PORT   STATE         SERVICE
80/tcp open|filtered http
MAC Address: 02:42:0A:06:06:64 (Unknown)

Nmap scan report for 10.6.6.1
Host is up (0.000012s latency).
Not shown: 999 closed tcp ports (reset)
PORT   STATE         SERVICE
22/tcp open|filtered ssh

Nmap done: 256 IP addresses (7 hosts up) scanned in 4.70 seconds
```

Part 3: Use enum4linux to enumerate users and network file shares.

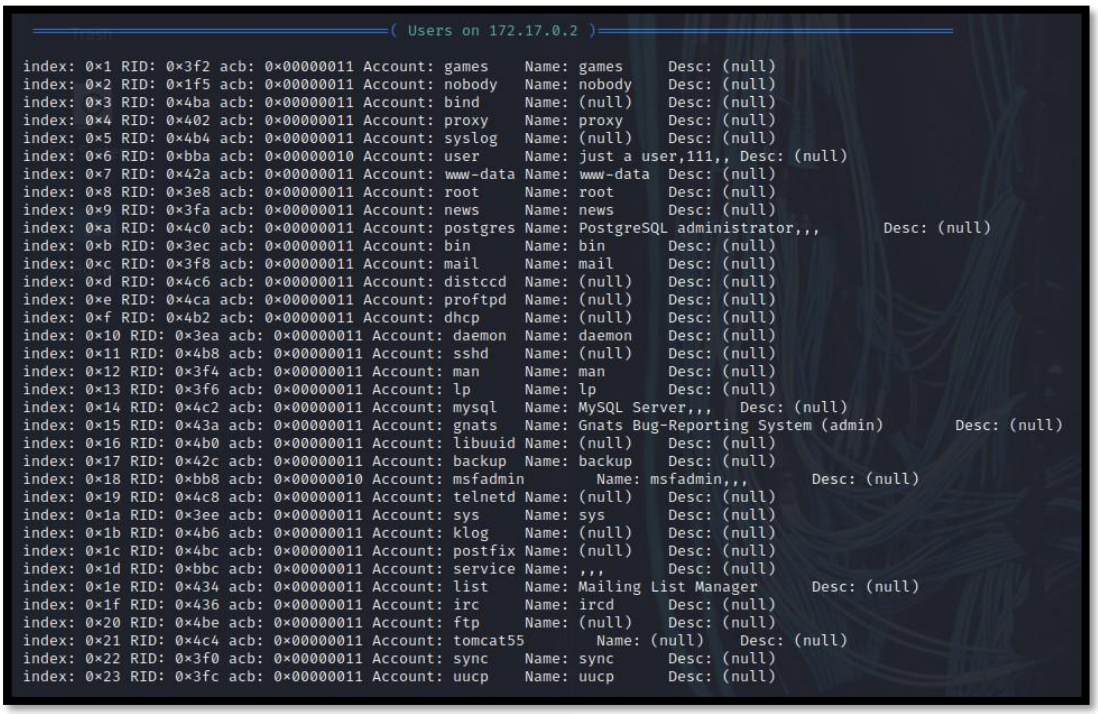
In this part, you will use enum4linux to discover more information about the two potential targets.

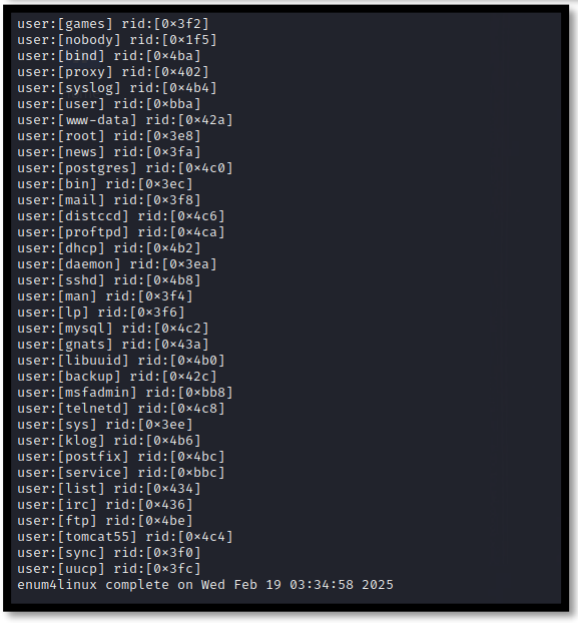
Step 1: Perform an enum4linux scan on target 172.17.0.2.

In Part 1, Step 1c, you used the enum4linux help page to learn about the options available to enumerate potential targets. The most common options are:

-U find configured users
-S get a list of file shares
-G get a list of the groups and their members
-P list the password policies
-i get a list of printers
Use the enum4linux -U option to list the users configured on the target 172.17.0.2.
Remember that enum4linux commands require root permissions to execute.

```
┌──(root㉿kali)-[/home/kali]
└─# enum4linux -U 172.17.0.2
```

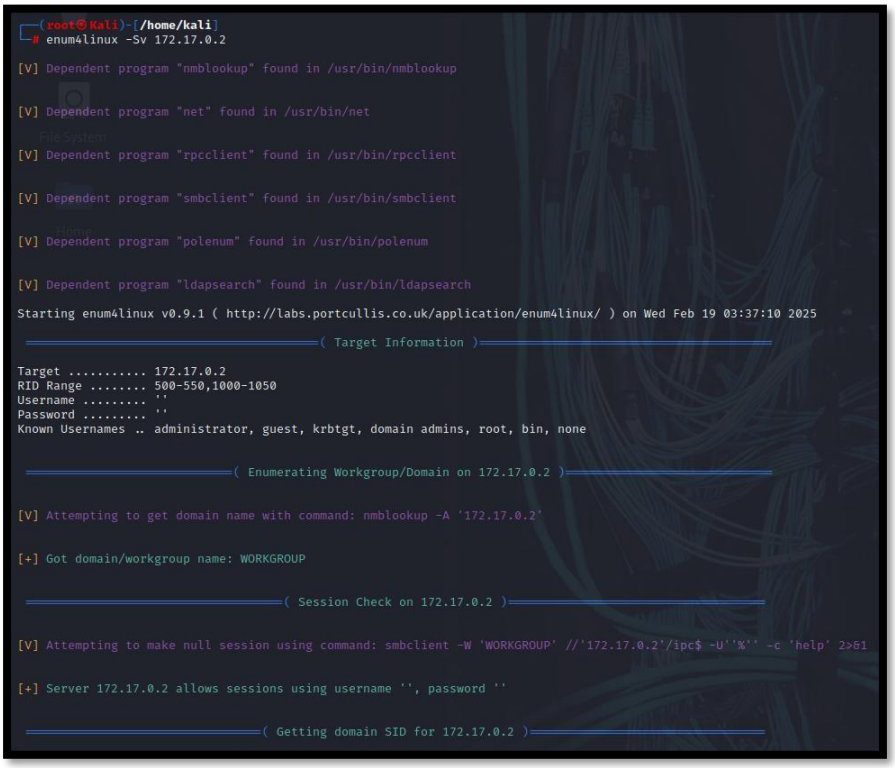


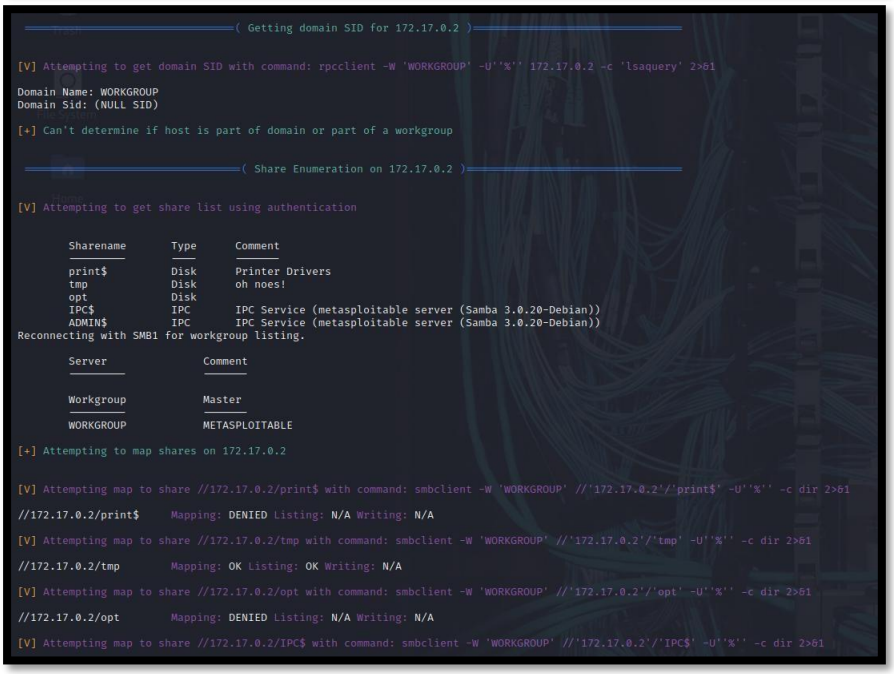


The output of this command can generate multiple screens of information if many users are discovered. Enum4linux aggregates output from multiple Samba tools to produce a concise result. If you want to see how each feature is used, use the verbose option (-v) with the command.

List the file shares available on 172.17.0.2 using the enum4linux -S command. Use the verbose option to see the Samba tools that are used to obtain the information.

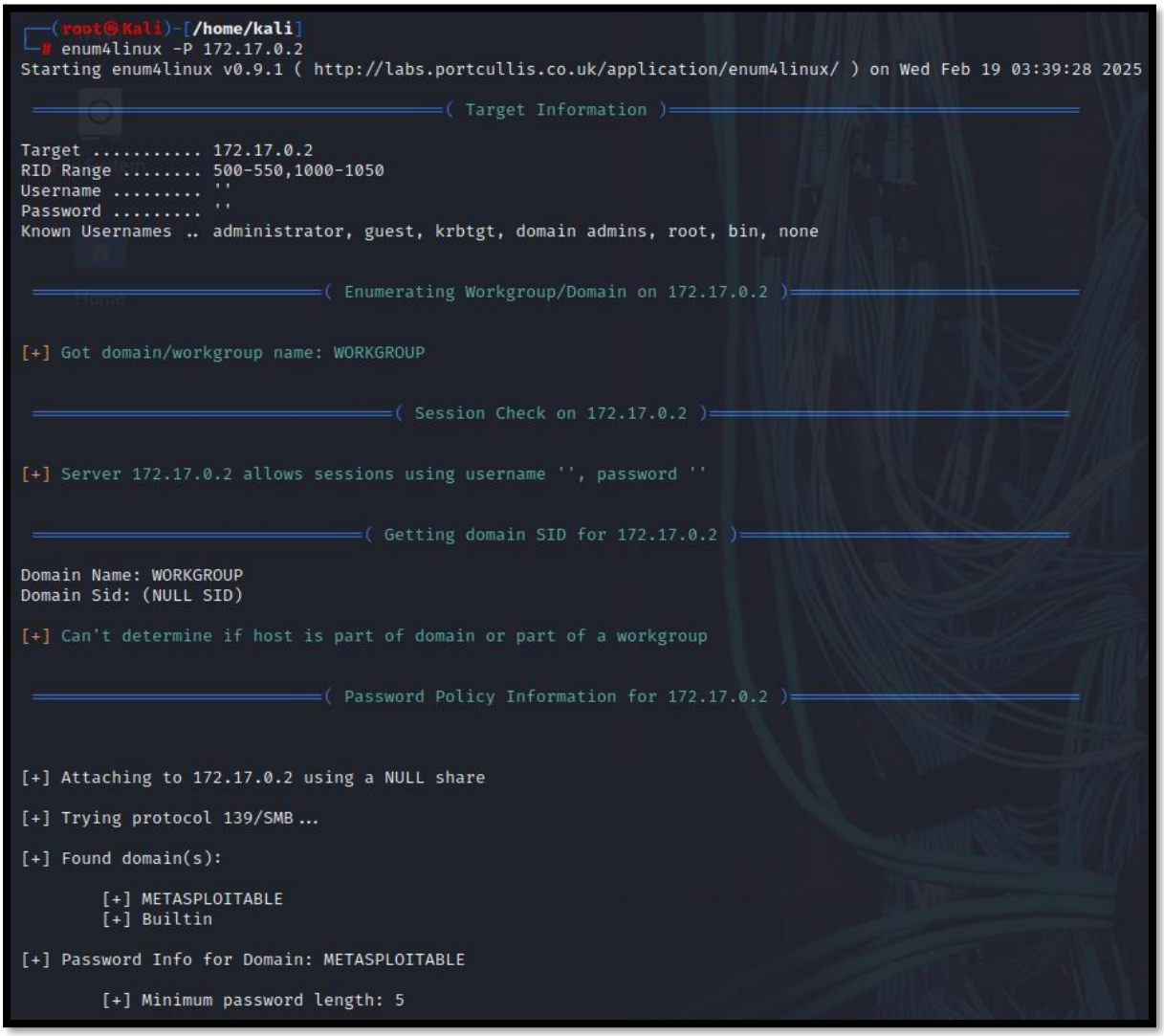
```
┌──(root㉿kali)-[/home/kali]
└─# enum4linux -Sv 172.17.0.2
```

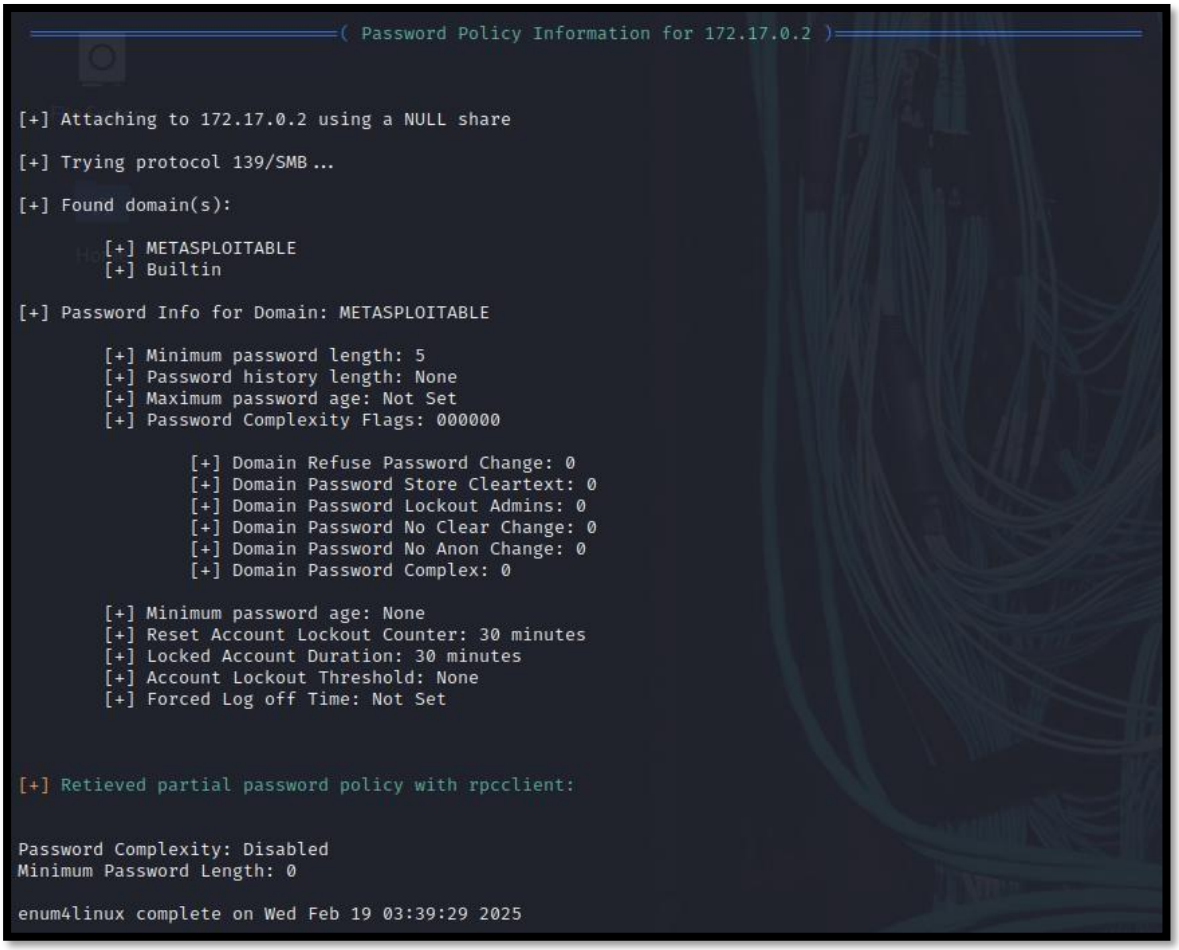




Note the [V] at the beginning of some of the lines of output. The verbose mode provides a narrative of how the results were obtained. For example, in the Enumerating Workgroup/Domain section of the output, enum4linux attempted to get the domain name using the command: nmblookup -A '172.17.0.2'.
Penetration testers may not have uncovered a known username/password combination to further their exploit. In this case, they need to do a brute-force password attack to obtain the necessary credentials. It is a benefit to know the password policies in place on the target system to structure the brute-force effort. Use the enum4linux -P command to list the password policies.

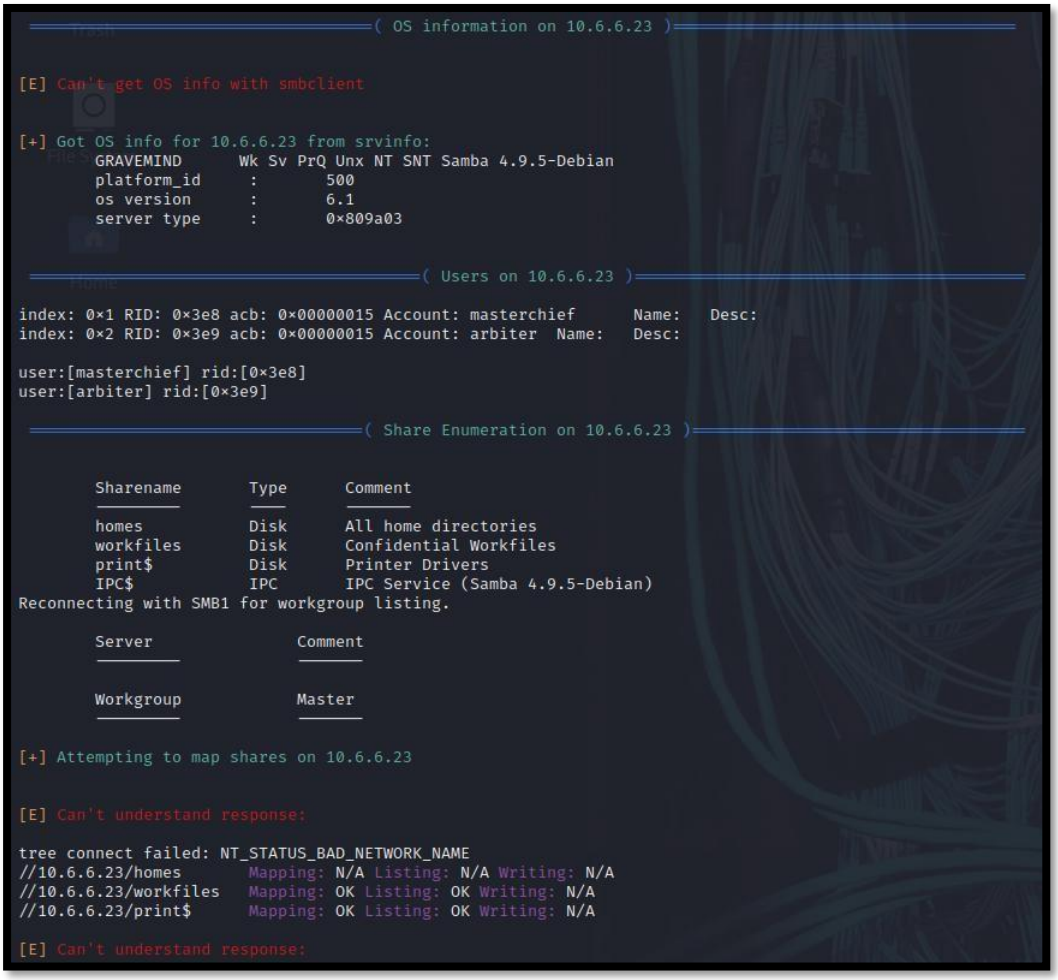
```
┌──(root㉿kali)-[/home/kali]
└─# enum4linux -P 172.17.0.2
```



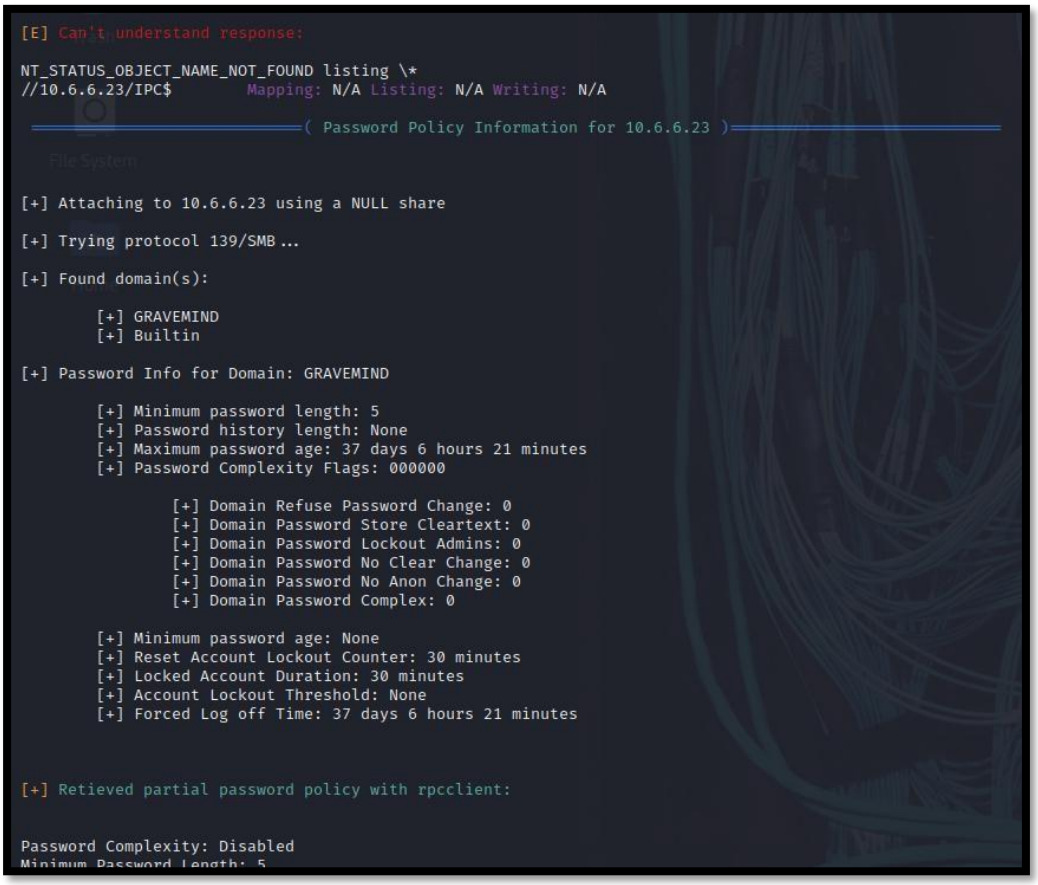


Step 2: Perform a simple enumeration scan on target 10.6.6.23.
Enum4linux has an option that combines the -U, -S, -G, -P, -r, -o, -n, -i options into one command. This requires using the -a argument. This option quickly performs multiple SMB enumeration operations in one scan.
Use the enum4linux -a command to perform a scan on the potential Samba server target that you identified in Part 2.

```
┌──(root㉿kali)-[/home/kali]
└─# enum4linux -a 10.6.6.23
```



```
 ========================( OS information on 10.6.6.23 )=========================


[E] Can't get OS info with smbclient


[+] Got OS info for 10.6.6.23 from srvinfo:
        GRAVEMIND      Wk Sv PrQ Unx NT SNT Samba 4.9.5-Debian
        platform_id     :       500
        os version      :       6.1
        server type     :       0x809a03


 ============================( Users on 10.6.6.23 )==============================

index: 0x1 RID: 0x3e8 acb: 0x00000015 Account: masterchief      Name:   Desc:
index: 0x2 RID: 0x3e9 acb: 0x00000015 Account: arbiter  Name:   Desc:

user:[masterchief] rid:[0x3e8]
user:[arbiter] rid:[0x3e9]

 ======================( Share Enumeration on 10.6.6.23 )========================


        Sharename       Type      Comment
        ---------       ----      -------
        homes           Disk      All home directories
        workfiles       Disk      Confidential Workfiles
        print$          Disk      Printer Drivers
        IPC$            IPC       IPC Service (Samba 4.9.5-Debian)
Reconnecting with SMB1 for workgroup listing.

        Server               Comment
        ---------            -------

        Workgroup            Master
        ---------            -------

[+] Attempting to map shares on 10.6.6.23


[E] Can't understand response:

tree connect failed: NT_STATUS_BAD_NETWORK_NAME
//10.6.6.23/homes       Mapping: N/A Listing: N/A Writing: N/A
//10.6.6.23/workfiles   Mapping: OK Listing: OK Writing: N/A
//10.6.6.23/print$      Mapping: OK Listing: OK Writing: N/A

[E] Can't understand response:
```



```
[E] Can't understand response:

NT_STATUS_OBJECT_NAME_NOT_FOUND listing \*
//10.6.6.23/IPC$        Mapping: N/A Listing: N/A Writing: N/A

 ==================( Password Policy Information for 10.6.6.23 )==================


[+] Attaching to 10.6.6.23 using a NULL share

[+] Trying protocol 139/SMB ...

[+] Found domain(s):

        [+] GRAVEMIND
        [+] Builtin

[+] Password Info for Domain: GRAVEMIND

        [+] Minimum password length: 5
        [+] Password history length: None
        [+] Maximum password age: 37 days 6 hours 21 minutes
        [+] Password Complexity Flags: 000000

                [+] Domain Refuse Password Change: 0
                [+] Domain Password Store Cleartext: 0
                [+] Domain Password Lockout Admins: 0
                [+] Domain Password No Clear Change: 0
                [+] Domain Password No Anon Change: 0
                [+] Domain Password Complex: 0

        [+] Minimum password age: None
        [+] Reset Account Lockout Counter: 30 minutes
        [+] Locked Account Duration: 30 minutes
        [+] Account Lockout Threshold: None
        [+] Forced Log off Time: 37 days 6 hours 21 minutes


[+] Retieved partial password policy with rpcclient:


Password Complexity: Disabled
Minimum Password Length: 5
```

```
[+] Enumerating users using SID S-1-22-1 and logon username '', password ''

S-1-22-1-1000 Unix User\masterchief (Local User)
S-1-22-1-1001 Unix User\arbiter (Local User)
S-1-22-1-1002 Unix User\labuser (Local User)

[+] Enumerating users using SID S-1-5-21-3080196717-3701805971-2094628062 and logon username '', password ''

S-1-5-21-3080196717-3701805971-2094628062-501 GRAVEMIND\nobody (Local User)
S-1-5-21-3080196717-3701805971-2094628062-513 GRAVEMIND\None (Domain Group)
S-1-5-21-3080196717-3701805971-2094628062-1000 GRAVEMIND\masterchief (Local User)
S-1-5-21-3080196717-3701805971-2094628062-1001 GRAVEMIND\arbiter (Local User)

[+] Enumerating users using SID S-1-5-32 and logon username '', password ''

S-1-5-32-544 BUILTIN\Administrators (Local Group)
S-1-5-32-545 BUILTIN\Users (Local Group)
S-1-5-32-546 BUILTIN\Guests (Local Group)
S-1-5-32-547 BUILTIN\Power Users (Local Group)
S-1-5-32-548 BUILTIN\Account Operators (Local Group)
S-1-5-32-549 BUILTIN\Server Operators (Local Group)
S-1-5-32-550 BUILTIN\Print Operators (Local Group)

 ==========( Getting printer info for 10.6.6.23 )==========

No printers returned.


enum4linux complete on Wed Feb 19 03:42:14 2025
```

This command can produce multiple screens of output.

Part 4: Use smbclient to transfer files between systems.
Smbclient is a component of Samba that can store and retrieve files, similar to an FTP client. You will use smbclient to transfer a file to the target system at 172.17.0.2. This simulates exploiting a network host with malware through an SMB vulnerability.
Create a text file using the cat command. Name the file badfile.txt. Enter the desired text. In this example, This is a bad file. was used. Be sure that you know the path to the file. Press CTRL-C to when finished.

```
┌──(root㉿kali)-[/home/kali]
└─# cat >> badfile.txt
```

This is a bad file.

Press CRTL-C to write the file.

```
┌──(root㉿Kali)-[/home/kali]
└─# cat>>badfile.txt
^C
```

Take a look at the options available with smbclient using the command smbclient –help command.

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

Use the smbclient -L command to list the shares on the target host. This command produces a similar output to what the enum4linx command did in Part 3. When asked for a password, press enter. The double / character before the IP address and the / following it are necessary if the target is a Windows computer.

┌──(root㉿kali)-[/home/kali]
└─# smbclient -L //172.17.0.2/
Password for [WORKGROUPkali]: <Press enter>

```
┌──(root㉿Kali)-[/home/kali]
└─# smbclient -L //172.17.0.2/
Password for [WORKGROUP\root]:
Anonymous login successful

        Sharename       Type      Comment
        ---------       ----      -------
        print$          Disk      Printer Drivers
        tmp             Disk      oh noes!
        opt             Disk
        IPC$            IPC       IPC Service (metasploitable server (Samba 3.0.20-Debian))
        ADMIN$          IPC       IPC Service (metasploitable server (Samba 3.0.20-Debian))
Reconnecting with SMB1 for workgroup listing.
Anonymous login successful

        Server               Comment
        ---------            -------

        Workgroup            Master
        ---------            -------
        WORKGROUP            METASPLOITABLE
```

Connect to the tmp share using the smbclient command by specifying the share name and IP address.

```
┌──(root㉿kali)-[/home/kali]
└─# smbclient //172.17.0.2/tmp
Password for [WORKGROUPkali]: <Press enter>

smb: >
```

```
┌──(root㉿Kali)-[/home/kali]
└─# smbclient //172.17.0.2/tmp
Password for [WORKGROUP\root]:
Anonymous login successful
Try "help" to get a list of possible commands.
smb: \>
```

Note that the prompt changed to the smb:> prompt. Type help to see what commands are available.
Enter dir to view the contents of the share.

```
smb: \> dir
  .                                   D        0  Wed Feb 19 03:49:45 2025
  ..                                 DR        0  Mon Aug 14 10:39:59 2023
  .X11-unix                          DH        0  Mon Aug 14 10:35:14 2023
  .ICE-unix                          DH        0  Sun Jan 28 03:08:08 2018
  .X0-lock                           HR       11  Mon Aug 14 10:35:14 2023
  717.jsvc_up                         R        0  Wed Feb 12 11:36:51 2025
  706.jsvc_up                         R        0  Tue Feb 11 18:27:54 2025
  685.jsvc_up                         R        0  Sat Feb  8 07:06:22 2025
  684.jsvc_up                         R        0  Wed Feb 12 17:04:54 2025
  693.jsvc_up                         R        0  Wed Jan 22 16:32:22 2025
  682.jsvc_up                         R        0  Mon Aug 14 10:35:26 2023
  fileG4CY0k                          R        0  Thu Jan 23 17:26:25 2025
  694.jsvc_up                         R        0  Tue Feb 11 17:26:08 2025
  705.jsvc_up                         R        0  Mon Jan 27 03:11:35 2025
  826.jsvc_up                         R        0  Sun Jan 28 07:08:40 2018
  810.jsvc_up                         R        0  Sun Jan 28 03:54:31 2018
  1582.jsvc_up                        R        0  Sun Jan 28 04:01:49 2018
  1823.jsvc_up                        R        0  Sun Jan 28 02:57:44 2018

                38497656 blocks of size 1024. 9017992 blocks available
```

Upload the badfile.txt to the target server using the put command. The syntax for the command is:
put local-file-name remote-file-name

smb: > put badfile.txt badfile.txt

Putting file badfile.txt as badfile.txt (19.5 kb/s) (average 19.5 kb/s)

```
smb: \> put badfile.txt badfile.txt
putting file badfile.txt as \badfile.txt (0.0 kb/s) (average 0.0 kb/s)
```

Verify that the file successfully uploaded using the dir command.

smb: > dir

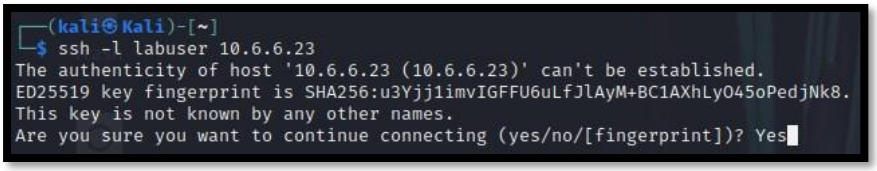
```
smb: \> dir
  .                                   D        0  Wed Feb 19 03:51:14 2025
  ..                                 DR        0  Mon Aug 14 10:39:59 2023
  .X11-unix                          DH        0  Mon Aug 14 10:35:14 2023
  .ICE-unix                          DH        0  Sun Jan 28 03:08:08 2018
  .X0-lock                           HR       11  Mon Aug 14 10:35:14 2023
  717.jsvc_up                         R        0  Wed Feb 12 11:36:51 2025
  706.jsvc_up                         R        0  Tue Feb 11 18:27:54 2025
  685.jsvc_up                         R        0  Sat Feb  8 07:06:22 2025
  684.jsvc_up                         R        0  Wed Feb 12 17:04:54 2025
  693.jsvc_up                         R        0  Wed Jan 22 16:32:22 2025
  682.jsvc_up                         R        0  Mon Aug 14 10:35:26 2023
  fileG4CY0k                          R        0  Thu Jan 23 17:26:25 2025
  badfile.txt                         A        0  Wed Feb 19 03:51:14 2025
  694.jsvc_up                         R        0  Tue Feb 11 17:26:08 2025
  705.jsvc_up                         R        0  Mon Jan 27 03:11:35 2025
  826.jsvc_up                         R        0  Sun Jan 28 07:08:40 2018
  810.jsvc_up                         R        0  Sun Jan 28 03:54:31 2018
  1582.jsvc_up                        R        0  Sun Jan 28 04:01:49 2018
  1823.jsvc_up                        R        0  Sun Jan 28 02:57:44 2018

                38497656 blocks of size 1024. 9017956 blocks available
```

Type quit to exit the smbclient and return to the CLI prompt.

Part 1: Launch Ettercap and Explore its Capabilities.
Ettercap is used to perform on-path (MITM) attacks. The goal of an on-path attack is to intercept traffic between devices to obtain information that can be used to impersonate the target or to alter data being transmitted. The attacker is situated" between" two communicating hosts. In on-path attacks, the hacker doesn't need to compromise the target device, but can just sniff traffic passing back and forth between the target and destination. Ettercap is used as an on-path tool, and the attack machine is on the same IP network as the victim.
Step 1: Set up an ARP spoofing attack.
In this attack, you will use ARP spoofing to redirect traffic on the local virtual network to your Kali Linux system at 10.6.6.1. ARP spoofing is often used to impersonate the default gateway router to capture all traffic entering or leaving the local IP network. Because your lab environment uses an internal virtual network, instead of spoofing the default gateway, you will use ARP spoofing to redirect traffic that is destined for a local server with the address 10.6.6.13.
Load Kali Linux using the username kali and the password kali. Open a terminal session from the menu bar at the top of the screen.
The target host in this lab is the Linux device at 10.6.6.23. To view the network from the target perspective, and initiate traffic between the target and the server, use SSH to log in to this host. The username is labuser and the password is Cisco123.
The user of the 10.6.6.23 host is communicating with the server at 10.6.6.13. The on-path attacker at 10.6.6.1 (your Kali VM) will intercept and relay traffic between these hosts.
Note: The password will not display on the screen.

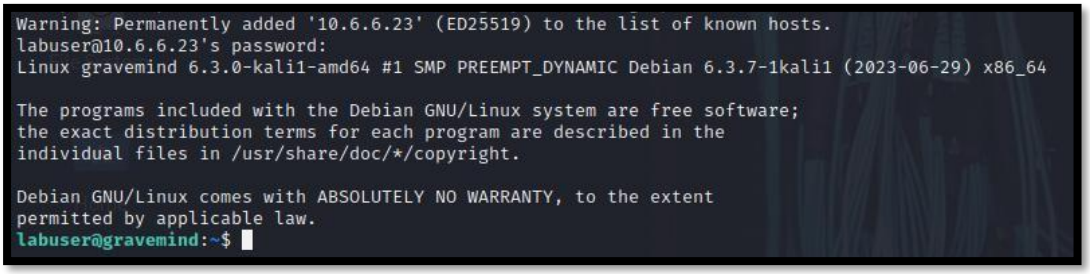
```
┌──(kali㉿Kali)-[~]
└─# ssh -l labuser 10.6.6.23
```

If you get the following message, answer yes to continue.
The authenticity of host '10.6.6.23 (10.6.6.23)' can't be established.
ED25519 key fingerprint is
SHA256:u3Yjj1imvIGFFU6uLfJlAyM+BC1AXhLyO45oPedjNk8.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? Yes



Warning: Permanently added '10.6.6.23' (ED25519) to the list of known hosts.

labuser@10.6.6.23's password: Cisco123



Because you are creating an on-path attack that uses ARP spoofing, you will be monitoring the ARP mappings on the victim host. The attack will cause changes to those mappings.
Use the command ip neighbor to view the current ARP cache on the target computer. Note: The hostname 3fb0515ea2f7 maybe different for your Kali VM environment.
labuser@3fb0515ea2f7:/$ ip neighbor
10.6.6.1 dev eth0 llanddr 02:42:17:81:d2:45 REACHABLE (output may vary)

Note: If you are using the ARM CPUs (Apple M1/M2) version of the VM, you will need to switch to use the root user with the password Cisco123 and use the command arp -a in place of ip neighbor to view the current ARP cache throughout this activity.
labuser@gravemind:/$ su -

Password: Cisco123

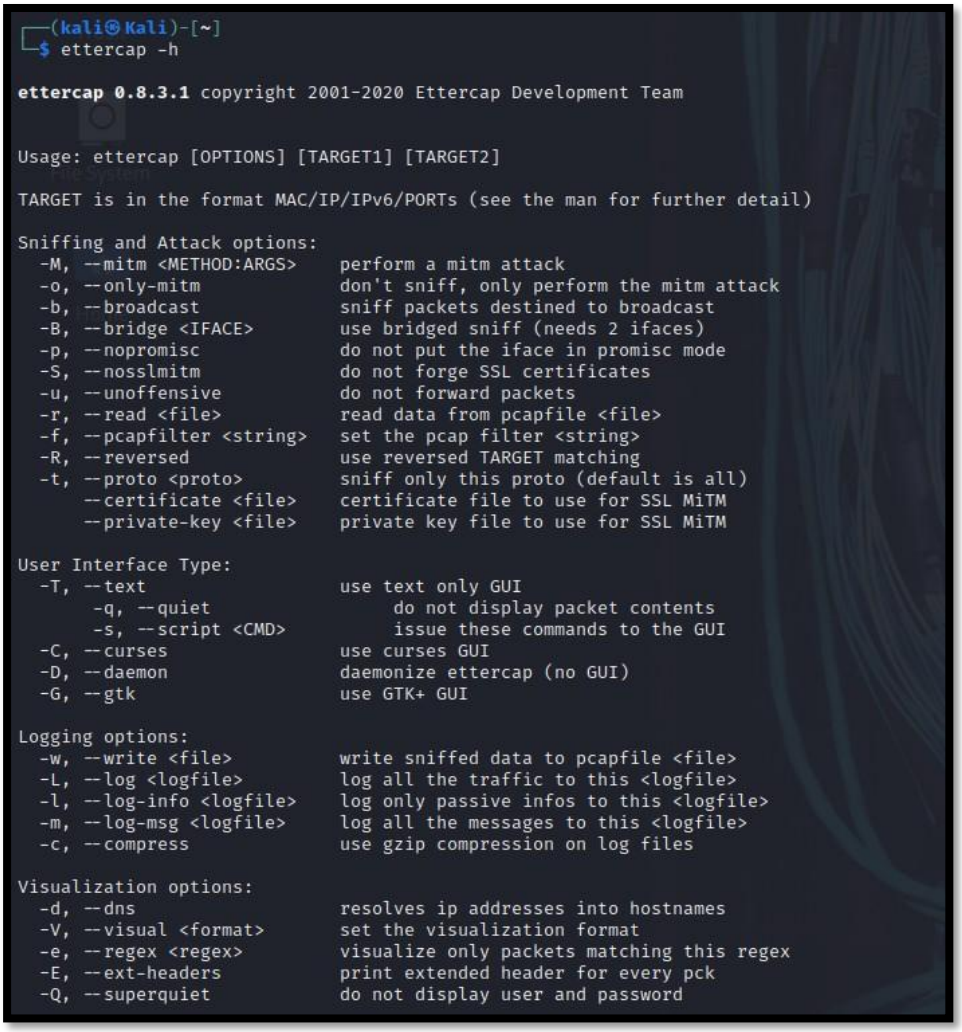
root@gravemind:/$ arp -a

? (10.6.6.1) at 02:42:17:d5:bb:2b:ab [ether] on eth0

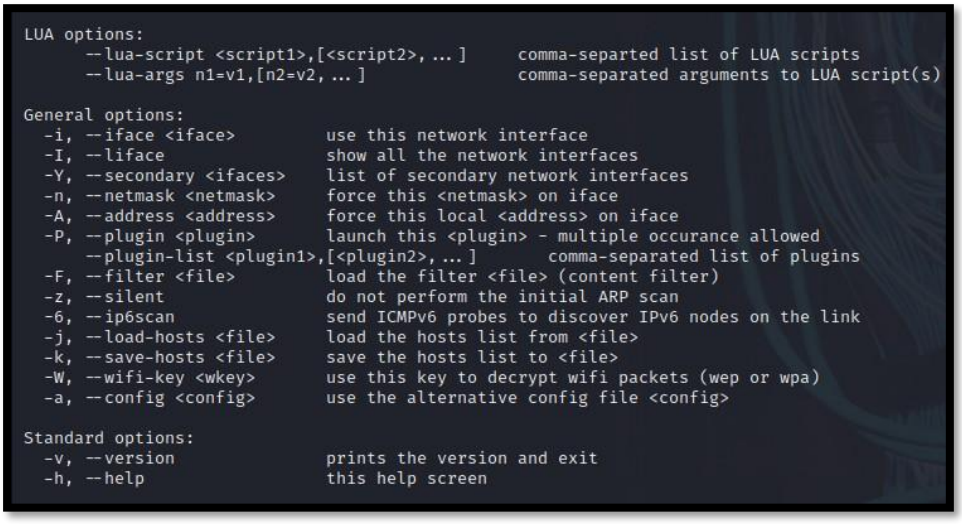
Step 2: Load Ettercap GUI interface to begin scanning.
Open a new terminal session from the menu bar in Kali Linux. Do not close the SSH-terminal that is running the session with 10.6.6.23.
Use the ettercap -h command to view the help file for the Ettercap application.

┌──(kali㉿kali)-[~]
└─# ettercap -h

Examine the help file content.



```
┌──(kali㉿Kali)-[~]
└─$ ettercap -h

ettercap 0.8.3.1 copyright 2001-2020 Ettercap Development Team


Usage: ettercap [OPTIONS] [TARGET1] [TARGET2]

TARGET is in the format MAC/IP/IPv6/PORTs (see the man for further detail)

Sniffing and Attack options:
  -M, --mitm <METHOD:ARGS>    perform a mitm attack
  -o, --only-mitm             don't sniff, only perform the mitm attack
  -b, --broadcast             sniff packets destined to broadcast
  -B, --bridge <IFACE>        use bridged sniff (needs 2 ifaces)
  -p, --nopromisc             do not put the iface in promisc mode
  -S, --nosslmitm             do not forge SSL certificates
  -u, --unoffensive           do not forward packets
  -r, --read <file>           read data from pcapfile <file>
  -f, --pcapfilter <string>   set the pcap filter <string>
  -R, --reversed              use reversed TARGET matching
  -t, --proto <proto>         sniff only this proto (default is all)
      --certificate <file>    certificate file to use for SSL MiTM
      --private-key <file>    private key file to use for SSL MiTM

User Interface Type:
  -T, --text                  use text only GUI
       -q, --quiet                 do not display packet contents
       -s, --script <CMD>          issue these commands to the GUI
  -C, --curses                use curses GUI
  -D, --daemon                daemonize ettercap (no GUI)
  -G, --gtk                   use GTK+ GUI

Logging options:
  -w, --write <file>          write sniffed data to pcapfile <file>
  -L, --log <logfile>         log all the traffic to this <logfile>
  -l, --log-info <logfile>    log only passive infos to this <logfile>
  -m, --log-msg <logfile>     log all the messages to this <logfile>
  -c, --compress              use gzip compression on log files

Visualization options:
  -d, --dns                   resolves ip addresses into hostnames
  -V, --visual <format>       set the visualization format
  -e, --regex <regex>         visualize only packets matching this regex
  -E, --ext-headers           print extended header for every pck
  -Q, --superquiet            do not display user and password
```

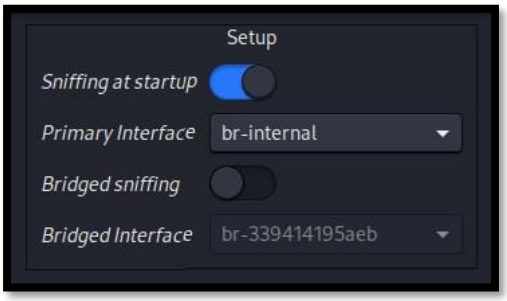


```
LUA options:
      --lua-script <script1>,[<script2>, ... ]     comma-separated list of LUA scripts
      --lua-args n1=v1,[n2=v2, ... ]               comma-separated arguments to LUA script(s)

General options:
  -i, --iface <iface>         use this network interface
  -I, --liface                show all the network interfaces
  -Y, --secondary <ifaces>    list of secondary network interfaces
  -n, --netmask <netmask>     force this <netmask> on iface
  -A, --address <address>     force this local <address> on iface
  -P, --plugin <plugin>       launch this <plugin> - multiple occurance allowed
      --plugin-list <plugin1>,[<plugin2>, ... ]       comma-separated list of plugins
  -F, --filter <file>         load the filter <file> (content filter)
  -z, --silent                do not perform the initial ARP scan
  -6, --ip6scan               send ICMPv6 probes to discover IPv6 nodes on the link
  -j, --load-hosts <file>     load the hosts list from <file>
  -k, --save-hosts <file>     save the hosts list to <file>
  -W, --wifi-key <wkey>       use this key to decrypt wifi packets (wep or wpa)
  -a, --config <config>       use the alternative config file <config>

Standard options:
  -v, --version               prints the version and exit
  -h, --help                  this help screen
```

In this part, you will use a GUI interface to access Ettercap. Start Ettercap GTK+ graphical user interface using the ettercap -G command. Most Ettercap functions require root permissions, so use the sudo command to obtain the required permissions.

```
┌──(kali㉿kali)-[~]
└─# sudo ettercap –G
```

The Ettercap GUI opens in a new window. You are sniffing traffic on an internal, virtual network. The default setup is to scan using interface eth0. Change the sniffing interface to br-internal, which is the interface that is configured on the 10.6.6.0/24 virtual network, by changing the value in the Setup > Primary Interface dropdown.

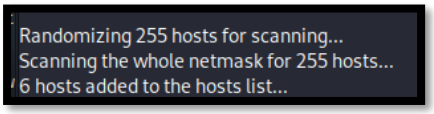


Click the checkbox icon at the top right of the Ettercap screen to continue. A message appears at the bottom of the screen indicating that Unified sniffing has started.

Part 2: Perform the On-Path (MITM) Attack

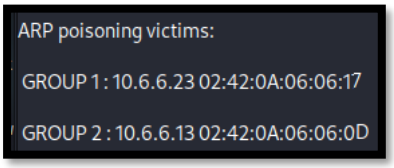
Step 1: Select the Target Devices.

In the Ettercap GUI window, open the Hosts List window by clicking the Ettercap menu (three dots icon). Select the Hosts entry and then Hosts List. Click the Scan for Hosts icon (magnifying glass) at top left in the menu bar. A list of the hosts that were discovered on the 10.6.6.0/24 network appears in the Host List window.

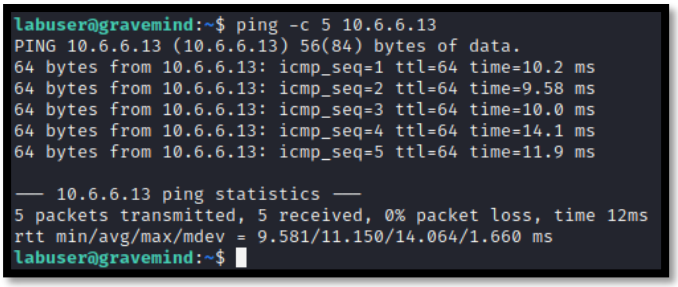


At least one of the MAC addresses should be familiar.
Define the source and destination devices for the attack. To do so, click the IP address 10.6.6.23 in the window to highlight the target user host. Click the Add to Target 1 button at the bottom of the Host List window. This defines the user's host as Target 1.
Click the IP address of the destination web server at 10.6.6.13 to highlight the line. Click the Add to Target 2 button at the bottom of the host window.

Any IP/MAC address specified as a Target 1 will have all its traffic diverted through the attacking computer that is running Ettercap. In this lab, the attacking computer is the Kali Linux machine at 10.6.6.1. All other computers on the subnet, other than the targets, will communicate normally.
Click the MITM icon on the menu bar (the first circular icon on top right). Select ARP Poisoning… from the dropdown menu. Verify that Sniff remote connections is selected. Click OK.



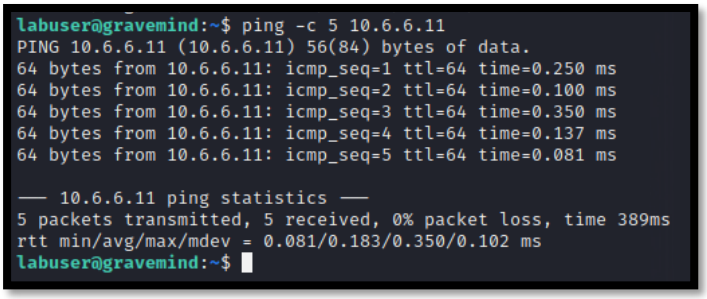
The MITM exploit is started. If sniffing does not start immediately, click the Start option (play button) at left in the top menu.
Step 2: Perform the ARP spoofing attack.
Return to the terminal window that is running the SSH session with the target user host at 10.6.6.23. Repeat the ping to 10.6.6.13
labuser@3fb0515ea2f7:/$ ping -c 5 10.6.6.13



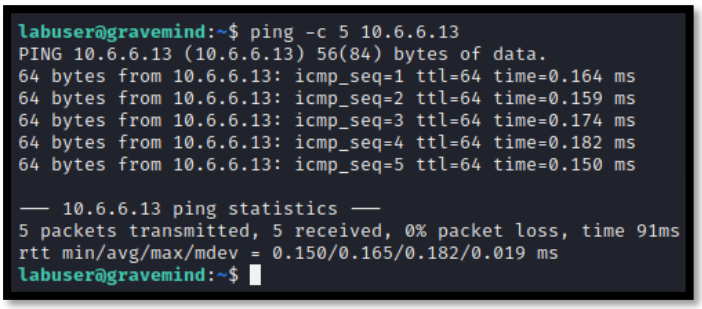
Use the ip neighbor command to view the ARP table on 10.6.6.23 again. Note the MAC address listed for 10.6.6.13.
Close the Ettercap graphical user interface. Leave the SSH connection to 10.6.6.23 active.

Part 3: Use Wireshark to Observe the ARP Spoofing Attack
Step 1: Select the Target Devices and Perform the MITM attack using the CLI
In this step, you will use the command line interface in Ettercap to perform ARP spoofing and write a .pcap file that can be opened in Wireshark. Refer to the help information for Ettercap to interpret the options used in the commands.

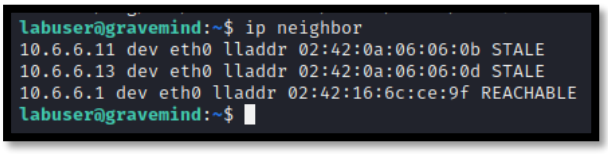
Return to the terminal session that is connected via SSH to 10.6.6.23. Ping the IP addresses 10.6.6.11 and 10.6.6.13. 10.6.6.11 is another host on the LAN that we will verify is unaffected by the attack. Then, use the ip neighbor command to find the MAC addresses associated with the IP addresses of the two systems.
labuser@3fb0515ea2f7:/$ ping -c 5 10.6.6.11



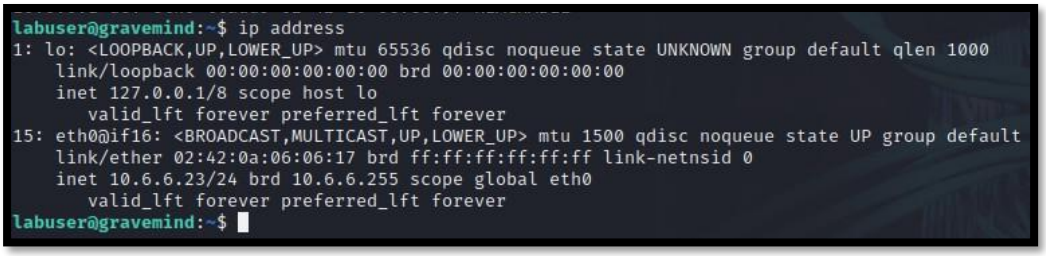
labuser@3fb0515ea2f7:/$ ping -c 5 10.6.6.13



labuser@3fb0515ea2f7:/$ ip neighbor



Note: To find the MAC of 10.6.6.23, go to the SSH session terminal and enter the ip address command. Determine the MAC address of the interface that is addressed on the 10.6.6.0/24 network.



The ettercap -T command runs Ettercap in text mode, instead of using the GUI interface. The syntax to start Ettercap and specify the targets is: sudo ettercap -T [options] -q -i [interface] --write [file name] -- mitm arp /[target 1]// /[target 2]//.
Open a new terminal window as necessary.
In a terminal window, enter the command as follows to save the pcap file in the current working directory:

```
┌──(kali@kali)-[~]
└─$sudo ettercap -T -q -i br-internal --write mitm-saved.pcap --mitm arp /10.6.6.23// /10.6.6.13//
```

When Ettercap starts, you will receive output similar to that shown:

ettercap 0.8.3.1 copyright 2001-2020 Ettercap Development Team

Listening on:

br-internal -> 02:42:14:BB:18:BD

10.6.6.1/255.255.255.0

fe80::42:14ff:febb:18bd/64

SSL dissection needs a valid 'redir_command_on' script in the etter.conf file

Privileges dropped to EUID 65534 EGID 65534...

34 plugins
42 protocol dissectors
57 ports monitored
28230 mac vendor fingerprint

1766 tcp OS fingerprint

2182 known services
Lua: no scripts were specified, not starting up!

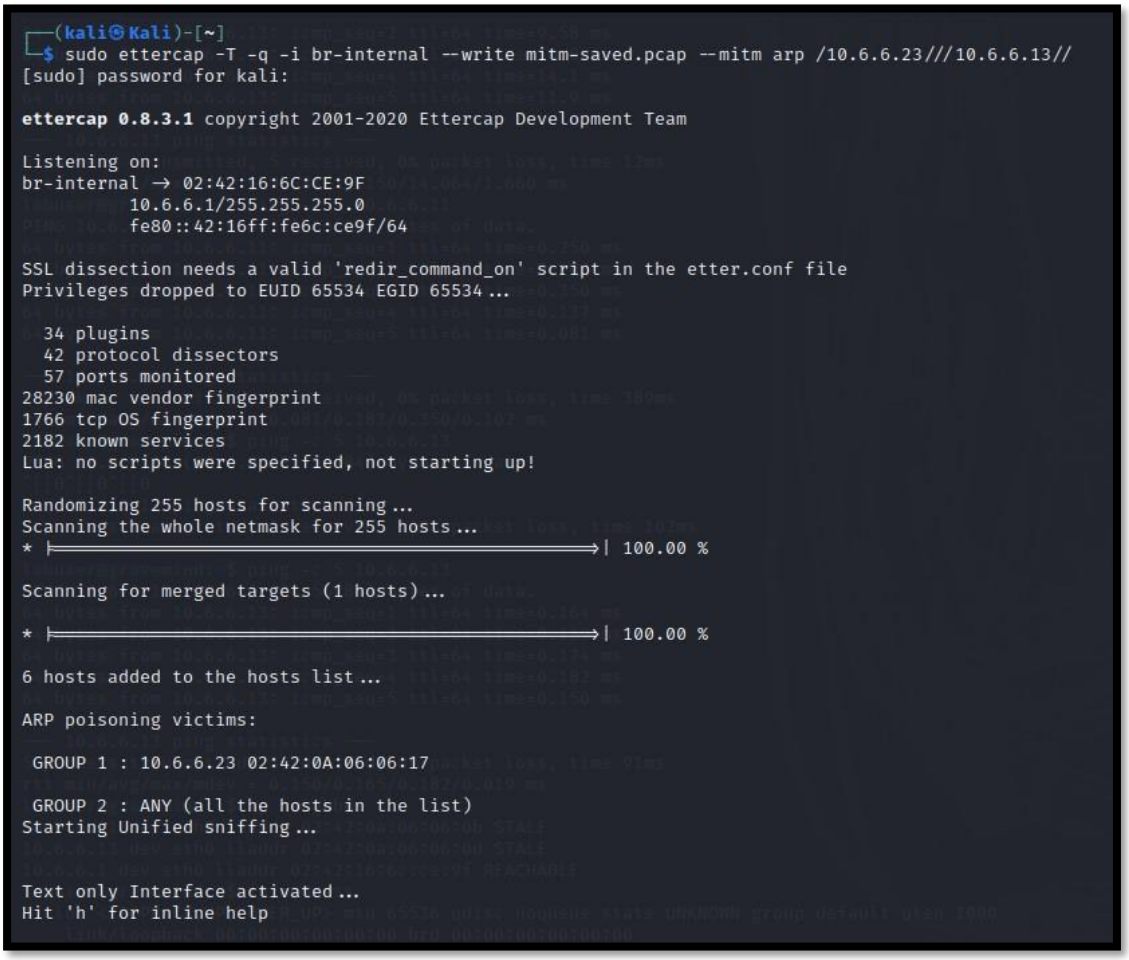
Scanning for merged targets (2 hosts)...

* |==>| 100.00 %
2 hosts added to the hosts list...

ARP poisoning victims:
GROUP 1 : 10.6.6.23 02:42:0A:06:06:17
GROUP 2 : 10.6.6.11 02:42:0A:06:06:0B
Starting Unified sniffing...

Text only Interface activated...

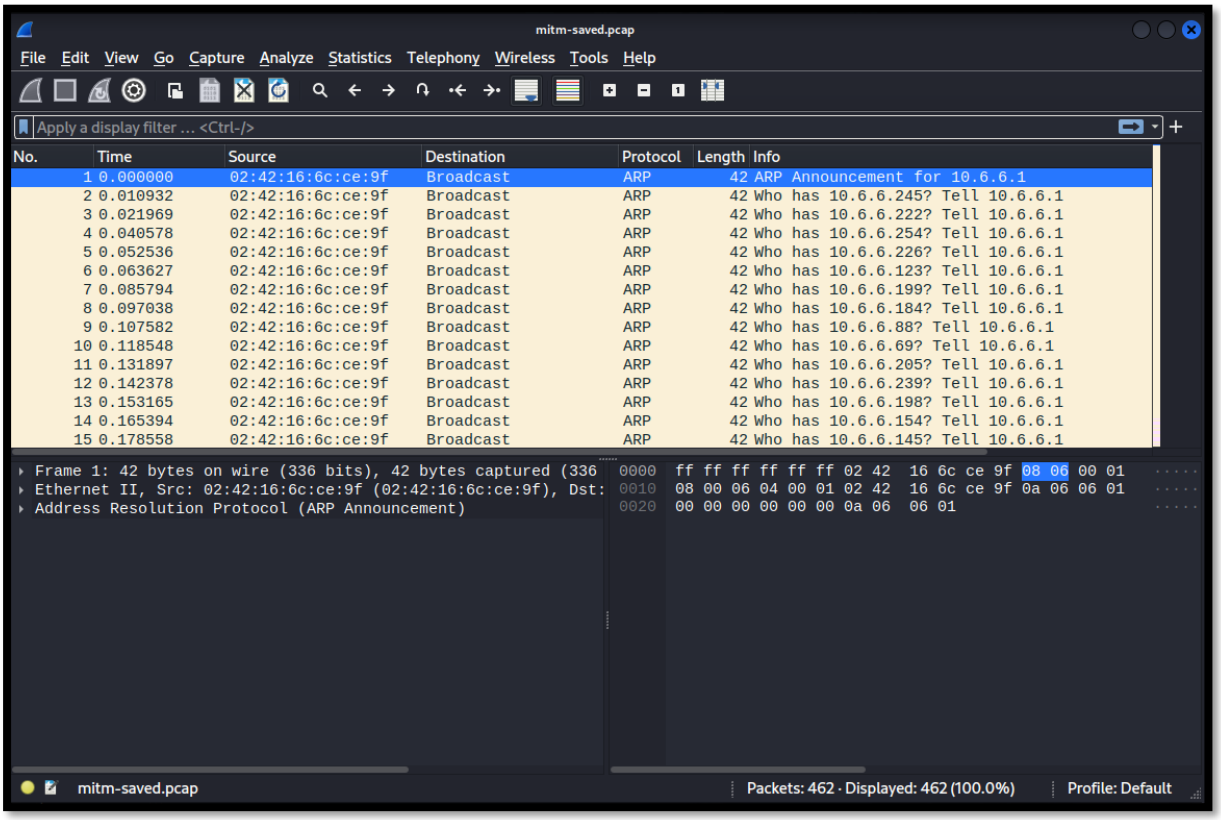
Hit 'h' for inline help



Return to the SSH terminal session to 10.6.6.23. Ping the two IP addresses, 10.6.6.11 and 10.6.6.13, again. Use the ip neighbor command to view the associated MAC addresses. Close the SSH terminal session that is connected to 10.6.6.23 and return to the terminal session running Ettercap in text mode. Enter q to quit Ettercap.
Step 2: Open Wireshark to view the Saved PCAP file.
In this step, you will examine the .pcap file that Ettercap created.

Review the MAC addresses that you recorded in Step 1c. The MAC address for 10.6.6.23 can be found in the output of the Ettercap text interface in Target Group 1.
In the Kali terminal window, start Wireshark with the mitm-saved.pcap file that you created with Ettercap.

```
┌──(kali@kali)-[~]
└─$ wireshark mitm-saved.pcap
```



The Ettercap attack computer first broadcasts ARP requests to obtain the actual MAC addresses for the two target hosts, 10.6.6.23 and 10.6.6.11. The attacking machine then begins to send ARP responses to both target hosts using its own MAC for both IP addresses. This causes the two target hosts to address the Ethernet frames to the attacker's computer, which enables it to collect data as an on-path attacker.