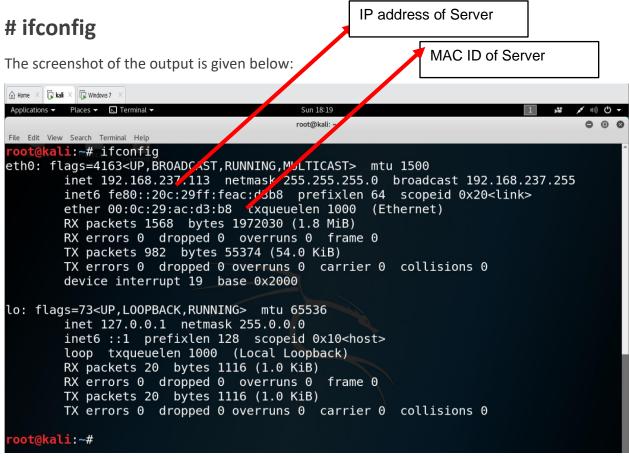
SABIH KHAN Cyber Security Project (Simplilearn)

University Cyber Attack

Task 1: Obtaining a scanning the report of entire network and identifying how many terminals are connected with the Windows operating system and the Linux-based systems

Solution: For successful attainment of IRT, you need to perform the following actions:

A. Scang the server terminal for IP address and MAC address using the following command:

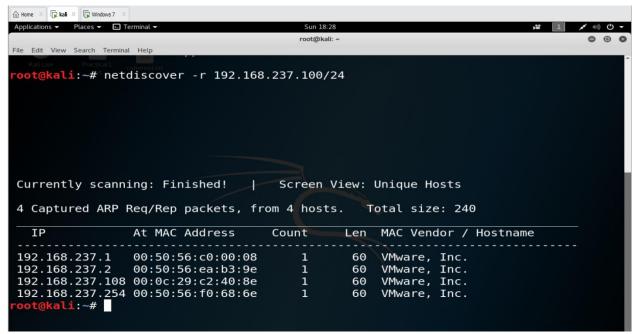


B. Run NET DISCOVER command for identifying all connected terminals with the server. .

netdiscover -r 192.168.237.100/24

As the server IP is 192.168.237.113, which is a class C IP address, CIDR can be 24

The screenshot of the output is given below:



Default gateway of network is 192.168.237.2

IP address of victim machine is 192.168.237.108

Default IP of router is **192.168.237.1**

C. Check communication between server and victim machine using the PING command.

#ping 192.168.237.108

This command offers the No. of bytes sent by the server to the client and its ICMP sequence for every packet with its TTL value and time.

By analyzing the TTL value, it can be easy to identify the type of operating system connected in networks.

TTL values corresponding to different operating systems are:

TTL 128 offers Windows Machines

TTL 63 offers Linux Machine

TTL 64 offers Mac Machine

TTL 40-55 offers Firewall

The screenshot of the output is given below:

```
← Home ×  kali ×  Windows 7
Applications ▼ Places ▼
                                                  root@kali: ~
                                                                                                     0 0
64 bytes from 192.168.237.1: icmp_seq=5 ttl=128 time=0.551 ms
64 bytes from 192.168.237.1: icmp_seq=6 ttl=128 time=0.567 ms
64 bytes from 192.168.237.1: icmp_seq=7 ttl=128 time=0.749 ms
64 bytes from 192.168.237.1: icmp_seq=8 ttl=128 time=1.05 ms
^X64 bytes from 192.168.237.1: icmp_seq=9 ttl=128 time=0.566 ms
64 bytes from 192.168.237.1: icmp_seq=10 ttl=128 time=0.444 ms
^Z
[1]+ Stopped
                                      ping 192.168.237.1
       cali:~# ping 192.168.237.2
PING 192.168.237.2 (192.168.237.2) 56(84) bytes of data.
64 bytes from 192.168.237.2: icmp_seq=1 ttl=128 time=0.288 ms
64 bytes from 192.168.237.2: icmp_seq=2 ttl=128 time=0.490 ms
64 bytes from 192.168.237.2: icmp_seq=3 ttl=128 time=0.512 ms
64 bytes from 192.168.237.2: icmp seq=4 ttl=128 time=0.429 ms
^X64 bytes from 192.168.237.2: icmp seq=5 ttl=128 time=0.451 ms
[2]+ Stopped
                                      ping 192.168.237.2
         li:~# ping 192.168.237.108
PING 192.168.237.108 (192.168.237.108) 56(84) bytes of data.
64 bytes from 192.168.237.108: icmp_seq=1 ttl=128 time=0.985 ms
64 bytes from 192.168.237.108: icmp_seq=2 ttl=128 time=1.14 ms
64 bytes from 192.168.237.108: icmp_seq=3 ttl=128 time=1.47 ms
64 bytes from 192.168.237.108: icmp_seq=4 ttl=128 time=0.640 ms
^X64 bytes from 192.168.237.108: icmp seq=5 ttl=128 time=1.14 ms
      Stopped
                                     ping 192.168.237.108
```

Summary:

Server IP is **192.168.237.113** Victim IP is **192.168.237.108**

Total 1 terminal is connected with the server and the type of operating system is Windows.

Task2: Identify CVE score of victims vulnerability

Once you identify the relevant information about the environment, it's time to perform an autopsy of the victim's machine.

Vulnerability search offers types of open ports and is available for use by anonymous users. To verify this, use following steps:

- A. Use NMAP command and analyze available ports information
- **B.** Once you receive the port information, check the type of vulnerability with the CVE score portal of the NVD.

Commands:

#nmap target IP

#nmap 192.168.237.108

The screenshot of the output is given below:

```
root@kali: ~
     kali:~# nmap 192.168.237.108
Starting Nmap 7.60 ( https://nmap.org ) at 2021-06-27 18:53 IST
Nmap scan report for 192.168.237.108
Host is up (0.0012s latency).
Not shown: 993 filtered ports
          STATE SERVICE
PORT
135/tcp
139/tcp
           open msrpc
open netbios-ssn
           open microsoft-ds
445/tcp
         open rtsp
open icslap
554/tcp
2869/tcp
5357/tcp open wsdapi
10243/tcp open unknown
MAC Address: 00:0C:29:C2:40:8E (VMware)
Nmap done: 1 IP address (1 host up) scanned in 19.38 seconds
```

Use the following command to check the vulnerability:

Nmap -O -sV 192.168.237.108

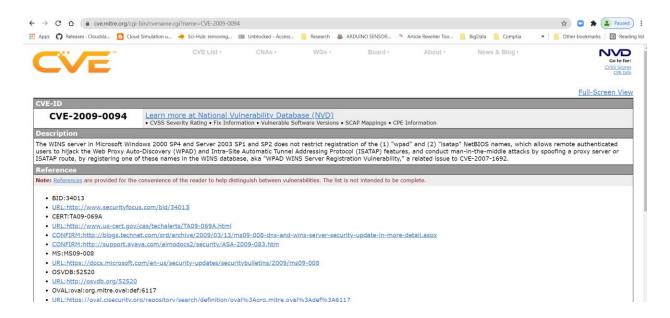
```
Applications Places Terminal Help
Applications Places Terminal Help
All 1000 scanned ports on 192.168.237.110 are filtered
MAC Address: 00:0C:29:AE:F9:7F (VMware)

Nmap done: 1 IP address (1 host up) scanned in 21.96 seconds
rootekali:-# nmap -0 -sV 192.168.237.108

Starting Nmap 7.60 ( https://nmap.org ) at 2021-06-27 19:06 IST
Nmap scan report for 192.168.237.108

Not shown: 93 filtered ports
PORT STATE SERVICE VERSION
135/tcp open msrpc Microsoft Windows RPC
139/tcp open microsoft-ds Microsoft Windows 7 - 10 microsoft-ds (workgroup: WORKGROUP)
554/tcp open microsoft-ds Microsoft Windows 7 - 10 microsoft-ds (workgroup: WORKGROUP)
554/tcp open http Microsoft HTTPAPI httpd 2.0 (SSDP/UPnP)
5357/tcp open http Microsoft HTTPAPI httpd 2.0 (SSDP/UPnP)
MAC Address: 00:0C:29:C2:40:8E (VMware)
Warning: OSScan results may be unreliable because we could not find at least 1 open and 1 closed port
Device type: general purpose
Running: Microsoft Windows 7::-:professional cpe:/o:microsoft:windows Server 2008:spl
OS details: Microsoft Windows 7 Professional cpe:/o:microsoft:windows Server 2008:spl
OS details: Microsoft Windows 7 Professional on Windows 8, Microsoft Windows Vista: SP0 or SP1, Windows Server 2008 SP1, or Windows 7, Microsoft Windows Vista SP2, Windows 7 SP1, or Windows Server 2008 SP1, or Windows CPE: cpe:/o:microsoft:windows
OS and Service detection performed. Please report any incorrect results at https://nmap.org/submi
```

Check the CVE score for all open ports



CVE -2009-0094 windows XP/2007 netBIOS

Source link: https://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2009-0094 Score is 5.5 According to CVSS 2.0

Task 3: Identify whether the victims terminal is affected with MiMT attack or not and submit the incident report for the same.

As Samantha works in the university, and sometimes she would access the public network without the university VPN, it may be possible that her system could be affected by MiMT. To check this, the Incident Response Team was required to collect and check the footprinting of the victim's machine. To do the same, they had to follow the given steps:

Possible conditions for an MiMT attack are:

- A. Unexpected or repeated disconnections of terminal with servers
- B. Unknown or invalid addresses reported on URL bar
- C. Connected with unsecure or open Wi-Fi
- D. Network connections with unknown locations

Possible checks to counter the above situations are:

- A. Regular inspections of Wi-Fi Connections
- B. Routine Check of Malware
- C. Use Network Sniffer tools
- D. Apply Monitoring Scripts

Note: Using Wireshark allows you to easily identify any unwanted sniffing into the network.

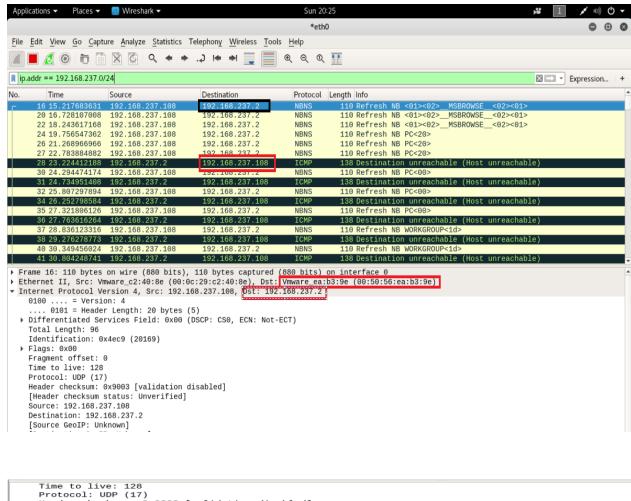
For Example: Using the pcap file of the terminal, it was detected that if the condition is as following, then MiMT attack can be possible:

Default gateway IP is **192.168.237.2**

Victim machine IP is **192.168.237.108** (Marked as RED for MiMT attack as the message is 138 destination unreachable (Host Unreachable)

MAC address of source is (00:0c:29:c2:40:8e)

MAC address of destination is (00:50:56:ea:b3:9e)



Entry port is 137. Therefore NetBIOS is used for entry.

Summary:

Samantha was a victim of an MiMT attack type in which the following artifacts were used for compromising her personal email id

Server IP is 192.168.237.113

Victim IP is 192.168.237.108

Total 1 terminal is connected with Server and Type of Operating system is Windows

CVE -2009-0094 windows XP/2007 netBIOS

Score is 7

Default gateway IP is 192.168.237.2

Victim Machine IP is 192.168.237.108 (Marked as RED for MiMT attack as message is 138

Destination unreachable (Host Unreachable)

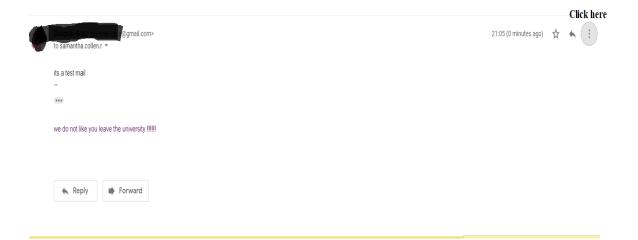
MAC address of source is (00:0c:29:c2:40:8e)

MAC address of Destination is (00:50:56:ea:b3:9e)

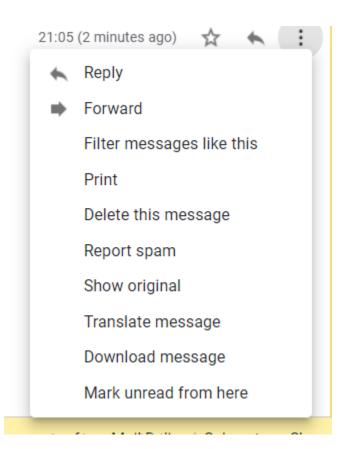
Entry port is 137 (NetBIOS) is use for entry

Task 4: Use email forensics analysis to identify the address location of sender's IP

• Go to the mailbox and click on the three dots option.



• Click on Show original option.



It will offer following details:

MIME-Version: 1.0

Date: Sun, 27 Jun 2021 21:05:56 +0530

References:

<CAA7z9VfC4od73fdsFxwSu0=WzRuxxMFErbgwkXEwkyS_x3sNtQ@mail.gmail.co m>

In-Reply-To:

<CAA7z9VfC4od73fdsFxwSu0=WzRuxxMFErbgwkXEwkyS_x3sNtQ@mail.gmail.co m>

Message-ID: <CAA7z9Vdv0OvSCQE6edHj0j9DB2cQ95iA-

CVDhCYGn5AFa9OMmw@mail.gmail.com>

Subject: Fwd:

From: xxxxxxx <xxxx.xoxr@gmail.com>
To: samantha.collen.r@gmail.com
Content-Type: multipart/alternative;

boundary="0000000000005a45905c5c12101"

--00000000000005a45905c5c12101

Content-Type: text/plain; charset="UTF-8"

its a test mail

--

we do not like you leave the university !!!!!!

--00000000000005a45905c5c12101

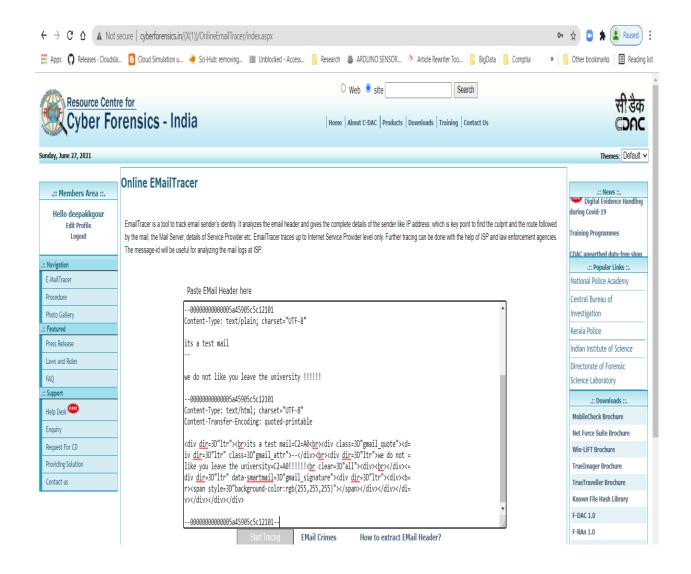
Content-Type: text/html; charset="UTF-8"

Content-Transfer-Encoding: quoted-printable

<div dir=3D"ltr">
its a test mail=C2=A0
<div class=3D"gmail_quote"><d=
iv dir=3D"ltr" class=3D"gmail_attr">--</div>
<div dir=3D"ltr">we do not =
like you leave the university=C2=A0!!!!!!<br clear=3D"all"><div>
</div><= div dir=3D"ltr" data-smartmail=3D"gmail_signature"><div dir=3D"ltr"><div><b=
r></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div>

--00000000000005a45905c5c12101--

Go to any online tracer website and paste above original message
 It will offer the IP address of the sender. Users can use any IP tracer website for the address and identification of threat attacker.



It offers the following response:



IP Address	167.89.49.252	
Country	United States of America 1	
Region & City	Colorado, Denver	
Coordinates	39.749838, -104.995597 (39°44'59"N 104°59'44"W)	
ISP	SendGrid Inc.	
Local Time	27 Jun, 2021 09:47 AM (UTC -06:00)	
Domain	sendgrid.com	
Net Speed	(COMP) Company/T1	
IDD & Area Code	(1) 303/720	
ZIP Code	80202	
Weather Station	Denver (USCO0105)	
Mobile Carrier		
Mobile Country Code (MCC)	-	
Mobile Network Code (MNC)	-	
Elevation	1606m	
Usage Type	(DCH) Data Center/Web Hosting/Transit	

Task5: Submit complete incident report

Incident Description:

Threat Description	Credential hijacking using Man-in-the-Middle attack		
Threat Target	University faculty Samantha		
Attack Techniques	Social Engineering and Footprinting with Man-in-the-Middle Attack (MiMT)		
Controls/ Countermeasures	Banner grabbing and identifying vulnerable ports, Compromising victim's machine with MiMT attack and hijacking of credentials		
Artifact Hijacked	Personal email ID of victim (samantha.collen.r@gmail.com)		
Threat Statement	to samantha.collen.r ▼		
	its a test mail		

	we do not like you leave the university !!!!!!		
Collected Artifacts From Incident Response Team Other Collected Artifacts	Server IP is 192.168.237.113 Victim IP is 192.168.237.108 Total 1 terminal is connected with Server and Type of Operating system is		
	Windows		
	CVE -2009-0094 windows XP/2007 netBIOS		
	Score is 7 Default gateway IP is 192.168.237.2		
	Victim Machine IP is 192.168.237.108 (Marked as RED for MiMT attack as		
	message is 138 Destination unreachable (Host Unreachable)		
	MAC address of source is (00:0c:29:c2:40:8e) MAC address of Destination is (00:50:56:ea:b3:9e)		

Entry port is 137. Therefore, NetBIOS is used for entry **Attacker Email** Email forensic analysis with original source: Summary MIME-Version: 1.0 Date: Sun, 27 Jun 2021 21:05:56 +0530 References: <CAA7z9VfC4od73fdsFxwSu0=WzRuxxMFErbgwkXEwkyS_x3sNtQ@mail.gmail.com> In-Reply-To: <CAA7z9VfC4od73fdsFxwSu0=WzRuxxMFErbgwkXEwkyS_x3sNtQ@mail.gmail.com> Message-ID: <CAA7z9Vdv0OvSCQE6edHj0j9DB2cQ95iA-CVDhCYGn5AFa9OMmw@mail.gmail.com> Subject: Fwd: < demonstrate | general | com> From: To: samantha.collen.r@gmail.com Content-Type: multipart/alternative; boundary="0000000000005a45905c5c12101" --000000000000005a45905c5c12101 Content-Type: text/plain; charset="UTF-8" its a test mail we do not like you leave the university !!!!!! --000000000000005a45905c5c12101 Content-Type: text/html; charset="UTF-8" Content-Transfer-Encoding: quoted-printable <div dir=3D"ltr">
its a test mail=C2=A0
<div class=3D"gmail_quote"><d=</pre> iv dir=3D"ltr" class=3D"gmail attr">--</div>
<div dir=3D"ltr">we do not = like you leave the university=C2=A0!!!!!!<br clear=3D"all"><div>
</div><= div dir=3D"ltr" data-smartmail=3D"gmail_signature"><div dir=3D"ltr"><div><b= r></div></div></di v></div></div></div> --000000000000005a45905c5c12101--

E-Mail Forensic Summary	IP Address	167.89.49.252
	Country	United States of America 6
	Region & City	Colorado, Denver
	Coordinates	39.749838, -104.995597 (39°44'59"N 104°59'44"W)
	ISP	SendGrid Inc.
	Local Time	27 Jun, 2021 10:03 AM (UTC -06:00)
	Domain	sendgrid.com
	Net Speed	(COMP) Company/T1
	IDD & Area Code	(1) 303/720
	ZIP Code	80202
	Weather Station	Denver (USCO0105)
	Mobile Carrier	-
	Mobile Country Code (MCC)	-
	Mobile Network Code (MNC)	-
	Elevation	1606m
	Usage Type	(DCH) Data Center/Web Hosting/Transit