Week 1: Reconnaissance, Information Gathering, and Scanning

INT302: Kali Linux Tools and System Security – Lab 4: Basic Port Scanning

Lab Steps

Step 1: Gather the IP Address of Your OWASP VM

Record the IP Address:

• OWASP VM IP Address: _____

```
You can access the web apps at http://192.168.63.129/

You can administer / configure this machine through the console here, by SSHing
to 192.168.63.129, via Samba at \\192.168.63.129\, or via phpmyadmin at
http://192.168.63.129/phpmyadmin.

In all these cases, you can use username "root" and password "owaspbwa".

root@owaspbwa:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0c:29:59:62:f3
          inet addr:192.168.63.129  Bcast:192.168.63.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe59:62f3/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:33 errors:0 dropped:0 overruns:0 frame:0
          TX packets:84 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:3710 (3.7 KB)  TX bytes:11321 (11.3 KB)
          Interrupt:18 Base address:0x1400

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:132 errors:0 dropped:0 overruns:0 frame:0
          TX packets:132 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:28673 (28.6 KB)  TX bytes:28673 (28.6 KB)

root@owaspbwa:~# _
```

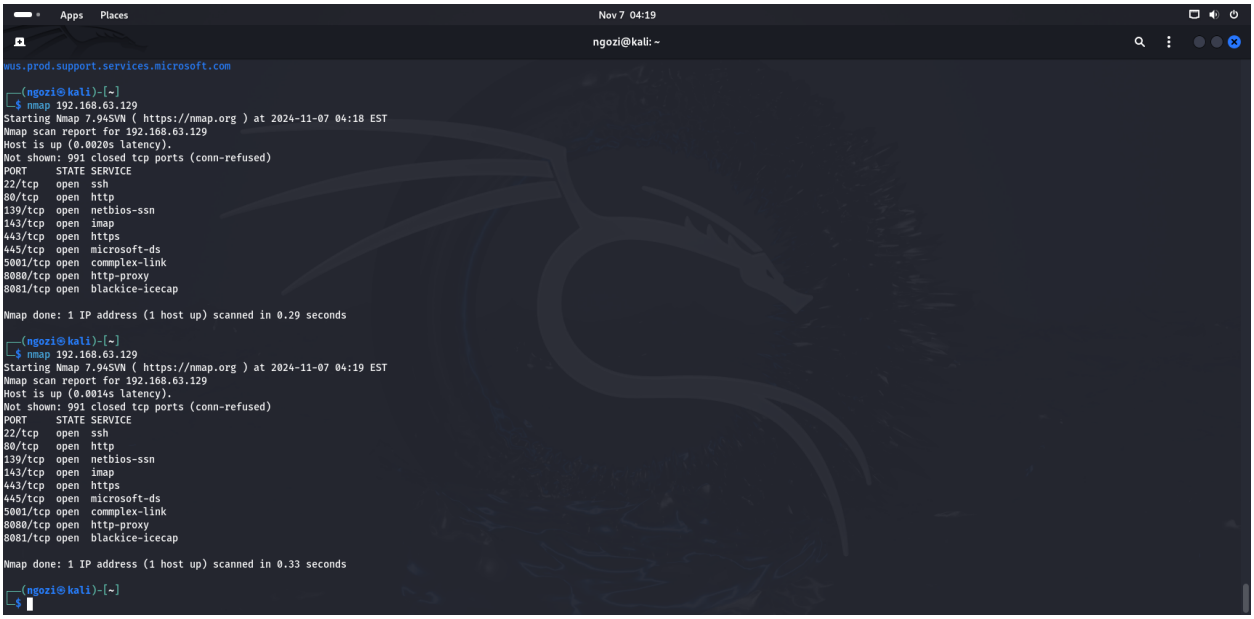
My OWASP VM IP Address is 192.168.63.129

Step 2: Basic Port Scanning with nmap

Exercise 1:

Perform a basic port scan on your OWASP VM IP address and record your findings:

• Open Ports:



Open ports includes

22/tcp

80/tcp

139/tcp

143/tcp

443/tcp

445/tcp

5001/tcp

8080/tcp

8081/tcp

Step 3: Aggressive Scanning with nmap Aggressive scanning with nmap can reveal service versions and the operating system running on open port.

Exercise 2:

Perform an aggressive scan on your OWASP VM IP address and record your findings:

```
+ /phpmyadmin/: phpMyAdmin directory found.
+ /phpmyadmin/Documentation.html: phpMyAdmin is for managing MySQL databases, and should be protected or limited to authorized hosts.
+ /#wp-config.php#: #wp-config.php# file found. This file contains the credentials.
+ /wordpress/#wp-config.php#: #wp-config.php# file found. This file contains the credentials.
+ 9061 requests: 1 error(s) and 41 item(s) reported on remote host
+ End Time:         2024-11-07 04:53:15 (GMT-5) (59 seconds)
---------------------------------------------------------------------------
+ 1 host(s) tested

┌──(ngozi㉿kali)-[~]
└─$ sudo nmap -sV -O 192.168.63.129
[sudo] password for ngozi:
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-11-07 05:00 EST
Nmap scan report for 192.168.63.129
Host is up (0.00059s latency).
Not shown: 991 closed tcp ports (reset)
PORT     STATE SERVICE     VERSION
22/tcp   open  ssh         OpenSSH 5.3p1 Debian 3ubuntu4 (Ubuntu Linux; protocol 2.0)
80/tcp   open  http        Apache httpd 2.2.14 ((Ubuntu) mod_mono/2.4.3 PHP/5.3.2-1ubuntu4.30 with Suhosin-Patch proxy_html/3.0.1 mod_python/3.3.1 Python/2.6.5 mod_ssl/2.2.14 OpenSSL...)
139/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
143/tcp  open  imap        Courier Imapd (released 2008)
443/tcp  open  ssl/http    Apache httpd 2.2.14 ((Ubuntu) mod_mono/2.4.3 PHP/5.3.2-1ubuntu4.30 with Suhosin-Patch proxy_html/3.0.1 mod_python/3.3.1 Python/2.6.5 mod_ssl/2.2.14 OpenSSL...)
445/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
5001/tcp open  java-object Java Object Serialization
8080/tcp open  http        Apache Tomcat/Coyote JSP engine 1.1
8081/tcp open  http        Jetty 6.1.25
1 service unrecognized despite returning data. If you know the service/version, please submit the following fingerprint at https://nmap.org/cgi-bin/submit.cgi?new-service :
SF-Port5001-TCP:V=7.94SVN%I=7%D=11/7%Time=672C8FB1%P=x86_64-pc-linux-gnu%r
SF:(NULL,4,"\xac\xed\0\x05");
MAC Address: 00:0C:29:59:62:F3 (VMware)
Device type: general purpose
Running: Linux 2.6.X
OS CPE: cpe:/o:linux:linux_kernel:2.6
OS details: Linux 2.6.17 - 2.6.36
Network Distance: 1 hop
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

OS and Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 14.72 seconds

┌──(ngozi㉿kali)-[~]
└─$
```

• Service Versions:

PORT STATE SERVICE VERSION

22/tcp open ssh OpenSSH 5.3p1 Debian 3ubuntu4 (Ubuntu Linux; protocol 2.0)

80/tcp open http Apache httpd 2.2.14 ((Ubuntu) mod_mono/2.4.3 PHP/5.3.2-1ubuntu4.30 with Suhosin-Patch proxy_html/3.0.1 mod_python/3.3.1 Python/2.6.5 mod_ssl/2.2.14 OpenSSL...)

139/tcp open netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)

143/tcp open imap Courier Imapd (released 2008)

443/tcp open ssl/http Apache httpd 2.2.14 ((Ubuntu) mod_mono/2.4.3 PHP/5.3.2-1ubuntu4.30 with Suhosin-Patch proxy_html/3.0.1 mod_python/3.3.1 Python/2.6.5 mod_ssl/2.2.14 OpenSSL...)

445/tcp open netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)

5001/tcp open java-object Java Object Serialization

8080/tcp open http Apache Tomcat/Coyote JSP engine 1.1

8081/tcp open http Jetty 6.1.25

• Operating System:

OS CPE: cpe:/o:linux:linux_kernel:2.6

OS details: Linux 2.6.17 - 2.6.36

Step 4: Vulnerability Scanning with nmap

Exercise 3: Conduct a vulnerability scan on your OWASP VM IP address and record your findings:

• Vulnerabilities:

1. Cross-domain and Client Access policies.

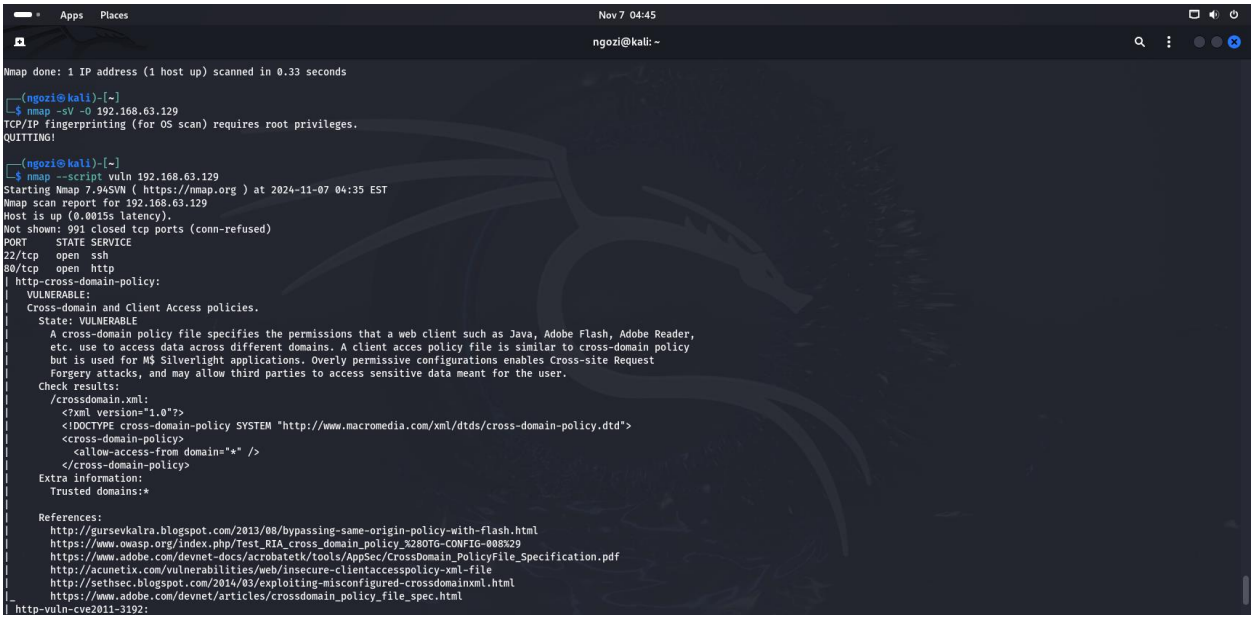
2. SSL/TLS MITM vulnerability (CCS Injection)

3. Service regsvc in Microsoft Windows systems vulnerable to denial of service

4. Diffie-Hellman Key Exchange Insufficient Group Strength

5. SL POODLE information leak

6. Apache byterange filter DoS



Step 5: Web Vulnerability Scanning with nikto

Exercise 4:

Perform a vulnerability scan on your OWASP VM and record your findings:

- Vulnerabilities Found:

```
Apps  Places                                   Nov 7  04:52
                                               ngozi@kali: ~
┌──(ngozi㉿kali)-[~]
└─$ nikto -h 192.168.63.129
- Nikto v2.5.0
---------------------------------------------------------------------------
+ Target IP:          192.168.63.129
+ Target Hostname:    192.168.63.129
+ Target Port:        80
+ Start Time:         2024-11-07 04:52:16 (GMT-5)
---------------------------------------------------------------------------
+ Server: Apache/2.2.14 (Ubuntu) mod_mono/2.4.3 PHP/5.3.2-1ubuntu4.30 with Suhosin-Patch proxy_html/3.0.1 mod_python/3.3.1 Python/2.6.5 mod_ssl/2.2.14 OpenSSL/0.9.8k Phusion_Passenger/4.0.38 mod_perl/2.0.4 Perl/v
5.10.1
+ /: Server may leak inodes via ETags, header found with file /, inode: 286483, size: 28067, mtime: Thu Jul 30 22:55:52 2015. See: http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2003-1418
+ /: The anti-clickjacking X-Frame-Options header is not present. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/X-Frame-Options
+ /: The X-Content-Type-Options header is not set. This could allow the user agent to render the content of the site in a different fashion to the MIME type. See: https://www.netsparker.com/web-vulnerability-scan
ner/vulnerabilities/missing-content-type-header/
+ /cgi-bin/: Directory indexing found.
+ /crossdomain.xml contains a full wildcard entry. See: http://jeremiahgrossman.blogspot.com/2008/05/crossdomainxml-invites-cross-site.html
+ /favicon.ico: identifies this app/server as: owasp.org. See: https://en.wikipedia.org/wiki/Favicon
+ /images: IP address found in the 'location' header. The IP is "127.0.1.1". See: https://portswigger.net/kb/issues/00600300_private-ip-addresses-disclosed
+ /images: The web server may reveal its internal or real IP in the Location header via a request to with HTTP/1.0. The value is "127.0.1.1". See: http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2000-0649
+ /index: Uncommon header 'tcn' found, with contents: list.
+ /index: Apache mod_negotiation is enabled with MultiViews, which allows attackers to easily brute force file names. The following alternatives for 'index' were found: index.css, index.html. See: http://www.wise
c.it/sectou.php?id=4698ebdc59d15,https://exchange.xforce.ibmcloud.com/vulnerabilities/8275
+ Python/2.6.5 appears to be outdated (current is at least 3.9.6).
+ Perl/v5.10.1 appears to be outdated (current is at least v5.32.1).
+ proxy_html/3.0.1 appears to be outdated (current is at least 3.1.2).
+ mod_perl/2.0.4 appears to be outdated (current is at least 2.0.11).
+ mod_ssl/2.2.14 appears to be outdated (current is at least 2.9.6) (may depend on server version).
+ mod_mono/2.4.3 appears to be outdated (current is at least 3.12).
+ Apache/2.2.14 appears to be outdated (current is at least Apache/2.4.54). Apache 2.2.34 is the EOL for the 2.x branch.
+ Phusion_Passenger/4.0.38 appears to be outdated (current is at least 6.0.7).
+ PHP/5.3.2-1ubuntu4.30 appears to be outdated (current is at least 8.1.5), PHP 7.4.28 for the 7.4 branch.
+ mod_python/3.3.1 appears to be outdated (current is at least 3.5.0).
+ OpenSSL/0.9.8k appears to be outdated (current is at least 3.0.7). OpenSSL 1.1.1s is current for the 1.x branch and will be supported until Nov 11 2023.
+ OPTIONS: Allowed HTTP Methods: GET, HEAD, POST, OPTIONS, TRACE .
+ /: HTTP TRACE method is active which suggests the host is vulnerable to XST. See: https://owasp.org/www-community/attacks/Cross_Site_Tracing
+ mod_ssl/2.2.14 OpenSSL/0.9.8k Phusion_Passenger/4.0.38 mod_perl/2.0.4 Perl/v5.10.1 - mod_ssl 2.8.7 and lower are vulnerable to a remote buffer overflow which may allow a remote shell.
+ PHP/5.3 - PHP 3/4/5 and 7.0 are End of Life products without support.
+ /phpBB2/search.php?search_id=1\\: Cookie phpbb2owaspbwa_data created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /phpBB2/search.php?search_id=1\\: Cookie phpbb2owaspbwa_sid created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /phpBB2/search.php?search_id=1\\: Retrieved x-powered-by header: PHP/5.3.2-1ubuntu4.30.
```

```
Apps  Places                                   Nov 7  04:55
                                               ngozi@kali: ~
+ /images: The web server may reveal its internal or real IP in the Location header via a request to with HTTP/1.0. The value is "127.0.1.1". See: http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2000-0649
+ /index: Uncommon header 'tcn' found, with contents: list.
+ /index: Apache mod_negotiation is enabled with MultiViews, which allows attackers to easily brute force file names. The following alternatives for 'index' were found: index.css, index.html. See: http://www.wise
c.it/sectou.php?id=4698ebdc59d15,https://exchange.xforce.ibmcloud.com/vulnerabilities/8275
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+ mod_ssl/2.2.14 appears to be outdated (current is at least 2.9.6) (may depend on server version).
+ mod_mono/2.4.3 appears to be outdated (current is at least 3.12).
+ Apache/2.2.14 appears to be outdated (current is at least Apache/2.4.54). Apache 2.2.34 is the EOL for the 2.x branch.
+ Phusion_Passenger/4.0.38 appears to be outdated (current is at least 6.0.7).
+ PHP/5.3.2-1ubuntu4.30 appears to be outdated (current is at least 8.1.5), PHP 7.4.28 for the 7.4 branch.
+ mod_python/3.3.1 appears to be outdated (current is at least 3.5.0).
+ OpenSSL/0.9.8k appears to be outdated (current is at least 3.0.7). OpenSSL 1.1.1s is current for the 1.x branch and will be supported until Nov 11 2023.
+ OPTIONS: Allowed HTTP Methods: GET, HEAD, POST, OPTIONS, TRACE .
+ /: HTTP TRACE method is active which suggests the host is vulnerable to XST. See: https://owasp.org/www-community/attacks/Cross_Site_Tracing
+ mod_ssl/2.2.14 OpenSSL/0.9.8k Phusion_Passenger/4.0.38 mod_perl/2.0.4 Perl/v5.10.1 - mod_ssl 2.8.7 and lower are vulnerable to a remote buffer overflow which may allow a remote shell.
+ PHP/5.3 - PHP 3/4/5 and 7.0 are End of Life products without support.
+ /phpBB2/search.php?search_id=1\\: Cookie phpbb2owaspbwa_data created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /phpBB2/search.php?search_id=1\\: Cookie phpbb2owaspbwa_sid created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /phpBB2/search.php?search_id=1\\: Retrieved x-powered-by header: PHP/5.3.2-1ubuntu4.30.
+ /phpmyadmin/changelog.php: phpMyAdmin is for managing MySQL databases, and should be protected or limited to authorized hosts.
+ /test/: Directory indexing found.
+ /test/: This might be interesting.
+ /icons/: Directory indexing found.
+ /images/: Directory indexing found.
+ /icons/README: Apache default file found. See: https://www.vntweb.co.uk/apache-restricting-access-to-iconsreadme/
+ /wordpress/readme.html: This WordPress file reveals the installed version.
+ /wordpress/wp-login/: Admin login page/section found.
+ /wordpress/: A Wordpress installation was found.
+ /phpmyadmin/: phpMyAdmin directory found.
+ /phpmyadmin/Documentation.html: phpMyAdmin is for managing MySQL databases, and should be protected or limited to authorized hosts.
+ /#wp-config.php#: #wp-config.php# file found. This file contains the credentials.
+ /wordpress/#wp-config.php#: #wp-config.php# file found. This file contains the credentials.
+ 9061 requests: 1 error(s) and 41 item(s) reported on remote host
+ End Time:           2024-11-07 04:53:15 (GMT-5) (59 seconds)
---------------------------------------------------------------------------
+ 1 host(s) tested

┌──(ngozi㉿kali)-[~]
└─$
```

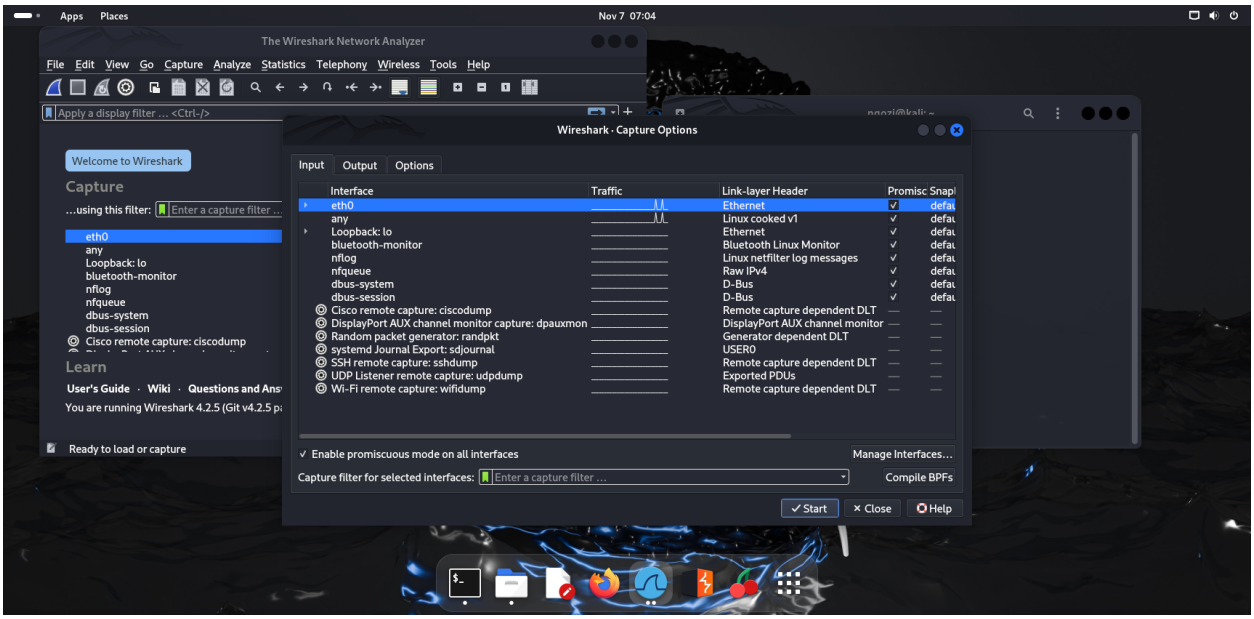
INT302: Kali Linux Tools and System Security – Lab 5: Wireshark

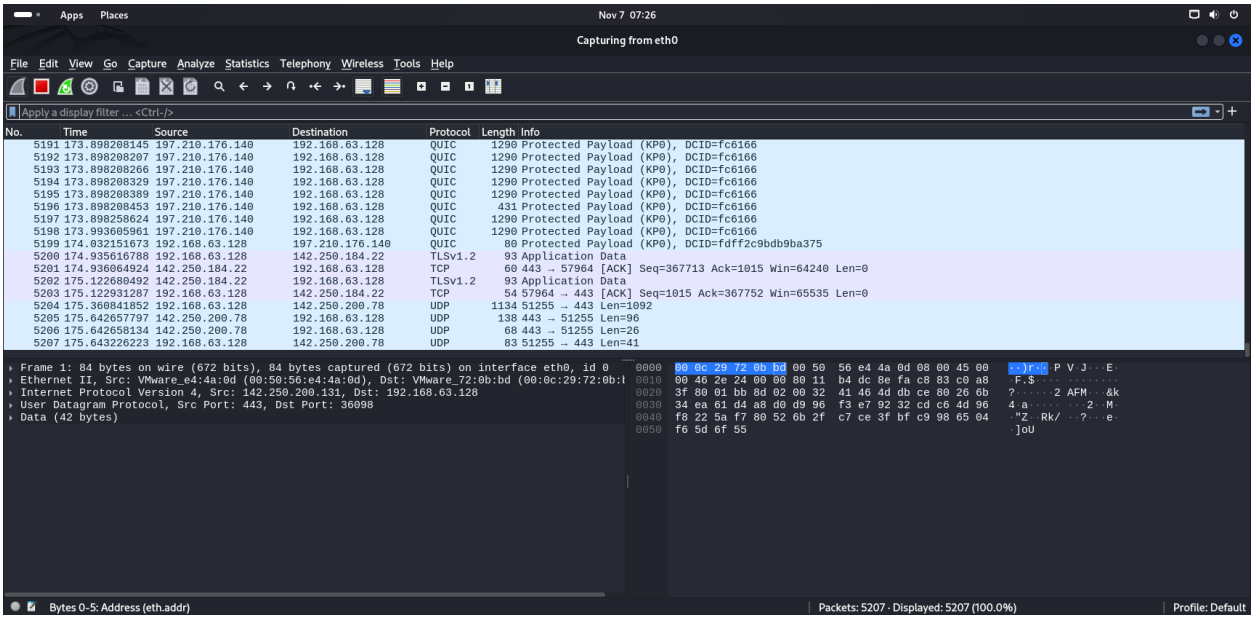
Lab Steps

Step 1: Launching Wireshark

Exercise 1:

• Explore the Wireshark GUI. Identify and list the main components you see, including where to find the Statistics menu

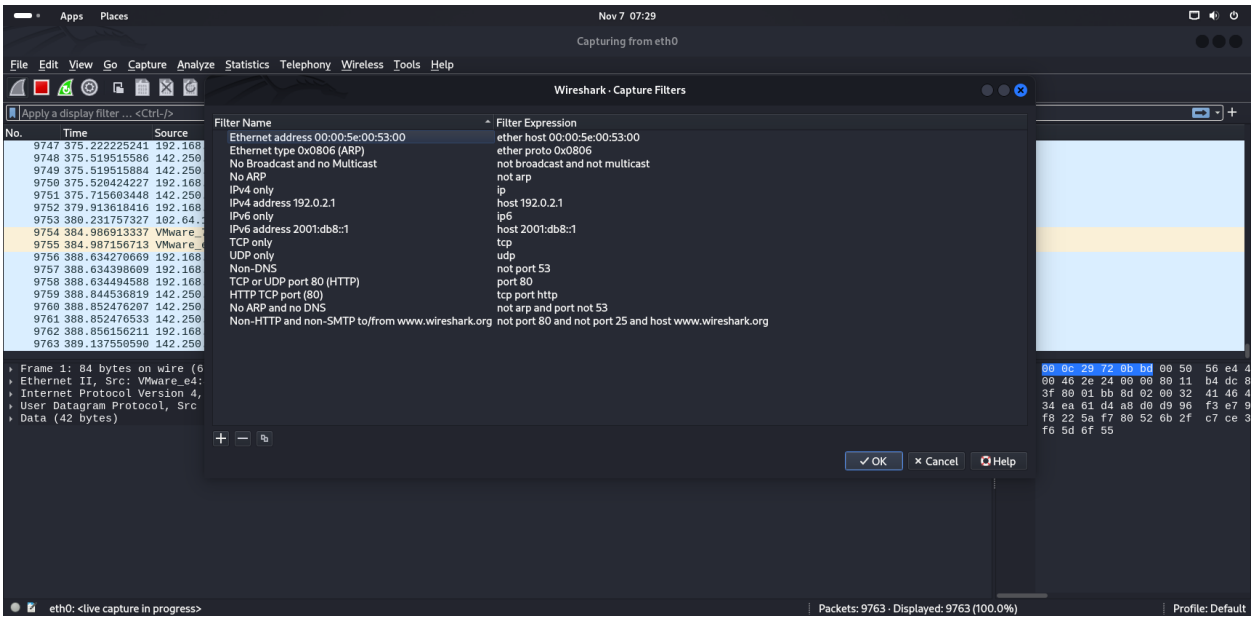


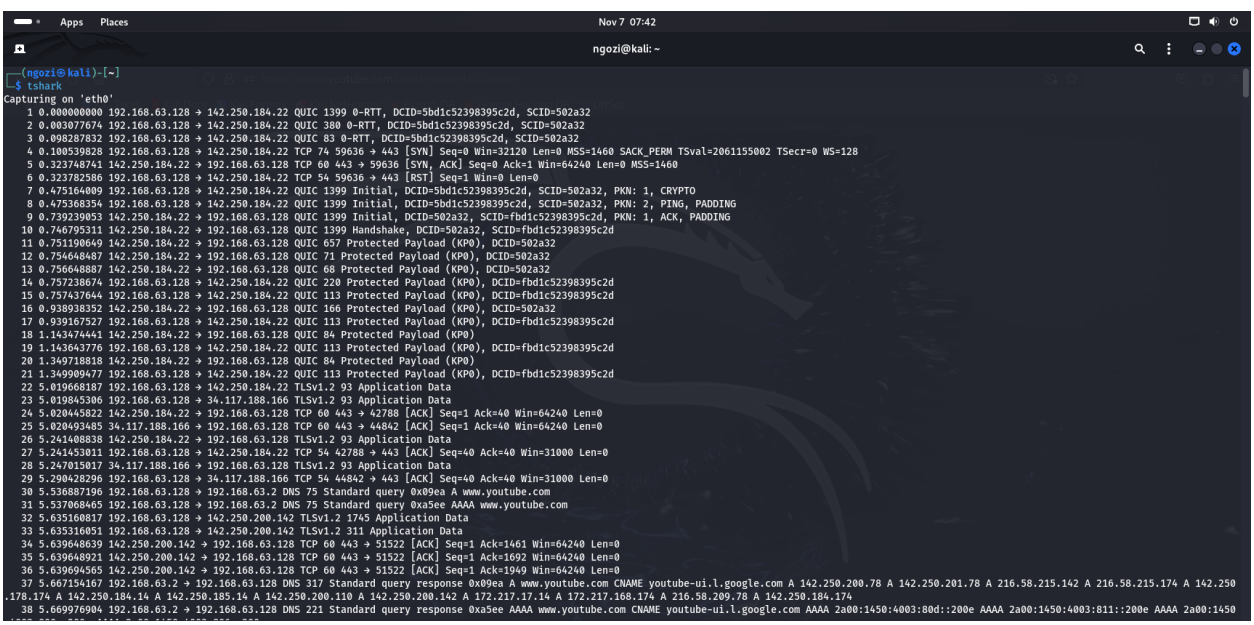

Apps Places
Nov 7 07:26
Capturing from eth0
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter ... <Ctrl-/>
No. Time Source Destination Protocol Length Info
5191 173.898208145 197.210.176.140 192.168.63.128 QUIC 1290 Protected Payload (KP0), DCID=fc6166
5192 173.898208207 197.210.176.140 192.168.63.128 QUIC 1290 Protected Payload (KP0), DCID=fc6166
5193 173.898208266 197.210.176.140 192.168.63.128 QUIC 1290 Protected Payload (KP0), DCID=fc6166
5194 173.898208329 197.210.176.140 192.168.63.128 QUIC 1290 Protected Payload (KP0), DCID=fc6166
5195 173.898208389 197.210.176.140 192.168.63.128 QUIC 1290 Protected Payload (KP0), DCID=fc6166
5196 173.898208453 197.210.176.140 192.168.63.128 QUIC 431 Protected Payload (KP0), DCID=fc6166
5197 173.898258624 197.210.176.140 192.168.63.128 QUIC 1290 Protected Payload (KP0), DCID=fc6166
5198 173.993605961 197.210.176.140 192.168.63.128 QUIC 1290 Protected Payload (KP0), DCID=fc6166
5199 174.032151673 192.168.63.128 197.210.176.140 QUIC 80 Protected Payload (KP0), DCID=fdff2c9bdb9ba375
5200 174.935616788 192.168.63.128 142.250.184.22 TLSv1.2 93 Application Data
5201 174.936064924 142.250.184.22 192.168.63.128 TCP 60 443 → 57964 [ACK] Seq=367713 Ack=1015 Win=64240 Len=0
5202 175.122680492 142.250.184.22 192.168.63.128 TLSv1.2 93 Application Data
5203 175.122931287 192.168.63.128 142.250.184.22 TCP 54 57964 → 443 [ACK] Seq=1015 Ack=367752 Win=65535 Len=0
5204 175.360841852 192.168.63.128 142.250.200.78 UDP 1134 51255 → 443 Len=1092
5205 175.642657797 142.250.200.78 192.168.63.128 UDP 138 443 → 51255 Len=96
5206 175.642658134 142.250.200.78 192.168.63.128 UDP 68 443 → 51255 Len=26
5207 175.643226223 192.168.63.128 142.250.200.78 UDP 83 51255 → 443 Len=41
Frame 1: 84 bytes on wire (672 bits), 84 bytes captured (672 bits) on interface eth0, id 0
Ethernet II, Src: VMware_e4:4a:0d (00:50:56:e4:4a:0d), Dst: VMware_72:0b:bd (00:0c:29:72:0b:b
Internet Protocol Version 4, Src: 142.250.200.131, Dst: 192.168.63.128
User Datagram Protocol, Src Port: 443, Dst Port: 36098
Data (42 bytes)
0000 00 0c 29 72 0b bd 00 50 56 e4 4a 0d 08 00 45 00
0010 00 46 2e 24 00 00 80 11 b4 dc 8e fa c8 83 c0 a8
0020 3f 80 01 bb 8d 02 00 32 41 46 4d db ce 80 26 6b
0030 34 ea 61 d4 a8 d0 d9 96 f3 e7 92 32 cd c6 4d 96
0040 f8 22 5a f7 80 52 6b 2f c7 ce 3f bf c9 98 65 04
0050 f6 5d 6f 55
Bytes 0-5: Address (eth.addr)
Packets: 5207 · Displayed: 5207 (100.0%)
Profile: Default

Step 2: Capturing Network Traffic

Exercise 2:

• Capture network traffic using both Wireshark and tshark. Compare the two methods and note any differences in the user experience





The first image is for wireshark and the second image is for tshark, the interface are different.

You work directly on the Kail terminal with the tshark but not the wireshark.

Step 3: Analyzing Captured Packet

Exercise 3:

• Use filters to analyze different types of traffic.

Record the following:

o Number of HTTP packets captured: _____

o Number of DNS packets captured: _____

o Specific IP addresses you identified in the traffic: _____