Week 8 Homework: Networking Fundamentals-Rocking your Network!

Phase 1: "I'd like to Teach the World to Ping"

1. *Steps and commands used to complete the tasks*

```
sysadmin@UbuntuDesktop: ~
File  Edit  View  Search  Terminal  Help
sysadmin@UbuntuDesktop:~$ sudo apt install fping
[sudo] password for sysadmin:
Reading package lists... Done
Building dependency tree
Reading state information... Done
fping is already the newest version (4.0-6).
The following packages were automatically installed and are no longer required:
  efibootmgr fonts-liberation2 fonts-opensymbol gir1.2-dbusmenu-glib-0.4
  gir1.2-dee-1.0 gir1.2-geocodeglib-1.0 gir1.2-gst-plugins-base-1.0
  gir1.2-gstreamer-1.0 gir1.2-gudev-1.0 gir1.2-udisks-2.0 gir1.2-unity-5.0
  grilo-plugins-0.3-base gstreamer1.0-gtk3 libboost-date-time1.65.1
  libboost-locale1.65.1 libcdr-0.1-1 libclucene-contribs1v5 libclucene-core1v5
  libcmis-0.5-5v5 libcolamd2 libdazzle-1.0-0 libe-book-0.1-1
  libedataserverui-1.2-2 libegl1-mesa libeot0 libepubgen-0.1-1
  libetonyek-0.1-1 libevent-2.1-6 libexiv2-14 libfreerdp-client2-2
  libfreerdp2-2 libfwup1 libgee-0.8-2 libgexiv2-2 libgom-1.0-0 libgpgmepp6
  libgpod-common libgpod4 liblangtag-common liblangtag1 liblirc-client0
  libllvm8 libmediaart-2.0-0 libmspub-0.1-1 libodfgen-0.1-1 libqqwing2v5
  libraw16 librevenge-0.0-0 libsgutils2-2 libssh-4 libsuitesparseconfig5
  libvncclient1 libwayland-egl1-mesa libwinpr2-2 libxmlsec1 libxmlsec1-nss
  lp-solve media-player-info python3-debconf python3-debian python3-mako
  python3-markupsafe syslinux syslinux-common syslinux-legacy
  update-notifier-common usb-creator-common
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
```

```
sysadmin@UbuntuDesktop:~$ fping -g 15.199.95.91/28
sysadmin@UbuntuDesktop:~$ fping -g 15.199.94.91/28
sysadmin@UbuntuDesktop:~$ fping -g 11.199.158.91/28
sysadmin@UbuntuDesktop:~$ fping -g 167.172.144.11/32
```

```
sysadmin@UbuntuDesktop:~$ fping -g 11.199.141.91/28
```

2. *Summary of your findings for each testing phase*

The only live IP address was 167.172.144.11/32

```
sysadmin@UbuntuDesktop:~$ fping -g 15.199.95.91/28
15.199.95.81 is unreachable
15.199.95.82 is unreachable
15.199.95.83 is unreachable
15.199.95.84 is unreachable
15.199.95.85 is unreachable
15.199.95.86 is unreachable
15.199.95.87 is unreachable
15.199.95.88 is unreachable
15.199.95.89 is unreachable
15.199.95.90 is unreachable
15.199.95.91 is unreachable
15.199.95.92 is unreachable
15.199.95.93 is unreachable
15.199.95.94 is unreachable
sysadmin@UbuntuDesktop:~$ fping -g 15.199.94.91/28
15.199.94.81 is unreachable
15.199.94.82 is unreachable
15.199.94.83 is unreachable
15.199.94.84 is unreachable
15.199.94.85 is unreachable
15.199.94.86 is unreachable
15.199.94.87 is unreachable
15.199.94.88 is unreachable
15.199.94.89 is unreachable
15.199.94.90 is unreachable
15.199.94.91 is unreachable
15.199.94.92 is unreachable
15.199.94.93 is unreachable
15.199.94.94 is unreachable
sysadmin@UbuntuDesktop:~$ fping -g 11.199.158.91/28
11.199.158.81 is unreachable
11.199.158.82 is unreachable
11.199.158.83 is unreachable
11.199.158.84 is unreachable
11.199.158.85 is unreachable
11.199.158.86 is unreachable
11.199.158.87 is unreachable
11.199.158.88 is unreachable
11.199.158.89 is unreachable
11.199.158.90 is unreachable
11.199.158.91 is unreachable
11.199.158.92 is unreachable
11.199.158.93 is unreachable
11.199.158.94 is unreachable
sysadmin@UbuntuDesktop:~$ fping -g 167.172.144.11/32
167.172.144.11 is alive
sysadmin@UbuntuDesktop:~$ fping -g 11.199.141.91/28
11.199.141.81 is unreachable
```

```
11.199.141.82 is unreachable
11.199.141.83 is unreachable
11.199.141.84 is unreachable
11.199.141.85 is unreachable
11.199.141.86 is unreachable
11.199.141.87 is unreachable
11.199.141.88 is unreachable
11.199.141.89 is unreachable
11.199.141.90 is unreachable
11.199.141.91 is unreachable167
11.199.141.92 is unreachable
11.199.141.93 is unreachable
11.199.141.94 is unreachable
```

3. *Network vulnerabilities discovered*

   Can see what target hosts are responding and those that are not.

4. *Findings associated with a hacker*

   Provides the hacker with an opportunity to find an open port that would ultimately allow them to get into your network and data.

5. *Recommended mitigation strategy*

   Block ping messages

6. *OSI layer where findings were found*

   OSI Layer 2-Data

Phase 2: "Some Syn for Nothin"

1. *Steps and commands used to complete the tasks*

```
sysadmin@UbuntuDesktop:~$ sudo nmap -sS 167.172.144.11/32
[sudo] password for sysadmin:

Starting Nmap 7.60 ( https://nmap.org ) at 2021-01-28 14:18 EST
```

2. *Summary of your findings for each testing phase*

```
sysadmin@UbuntuDesktop:~$ sudo nmap -sS 167.172.144.11
[sudo] password for sysadmin:

Starting Nmap 7.60 ( https://nmap.org ) at 2021-01-28 16:19 EST
Nmap scan report for 167.172.144.11
Host is up (0.059s latency).
Not shown: 998 closed ports
PORT   STATE    SERVICE
22/tcp open     ssh
25/tcp filtered smtp
```

3. *Network vulnerabilities discovered*

   SSH port 22 is open

4. *Findings associated with a hacker*

   Allows the hacker to see what the service is running to create a plan of attack.

5. *Recommended mitigation strategy*

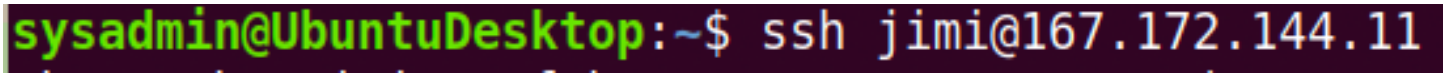
   Set up structure for continuous security monitoring in which tools can be utilized to assist with this process. Open port vulnerabilities seem to be easily mitigated with a good cybersecurity culture/hygiene.

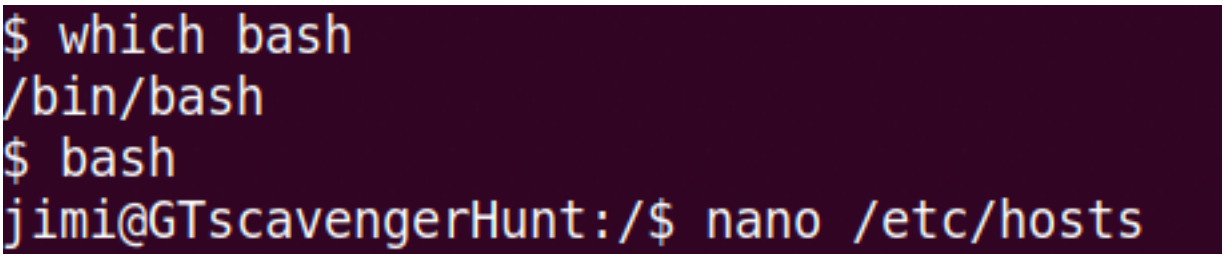
6. *OSI layer where findings were found*

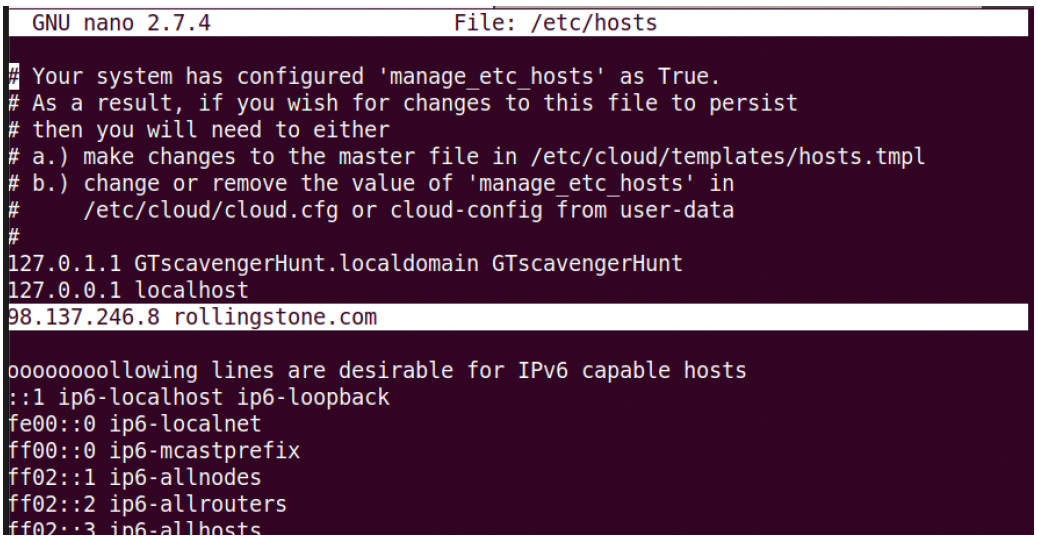
   OSI Layer 4-Transport

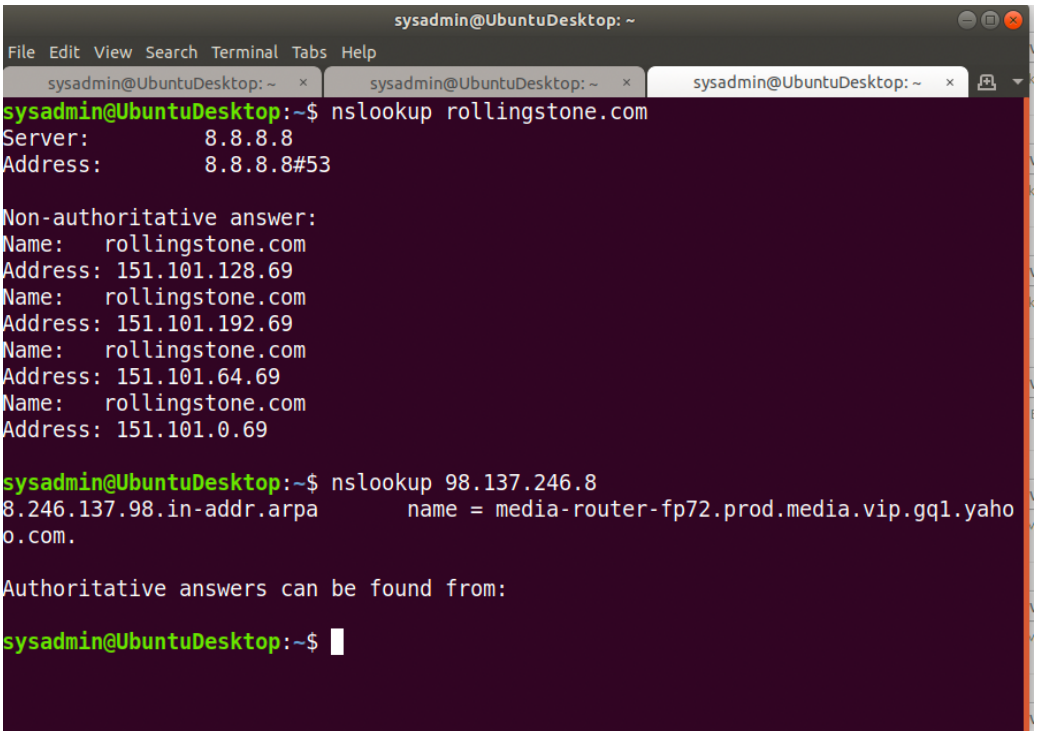
Phase 3: "I feel a DNS Change Comin' On"

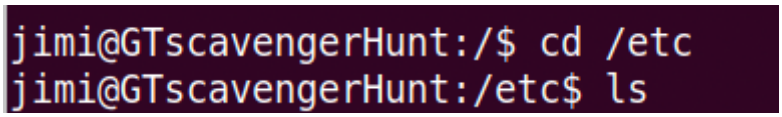
1. *Steps and commands used to complete the tasks*

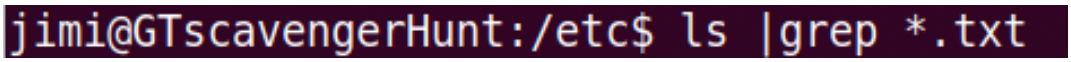












2. *Summary of your findings for each testing phase*

   Through the research it was discovered that they were actually being directed to the wrong site

3. *Network vulnerabilities discovered*

   Possible lax guidelines on password development for employees.

4. *Findings associated with a hacker*

   They were able to gain unauthorized access through SSH

5. *Recommended mitigation strategy*

   - Security team will monitor changes in important files (i.e. etc/hosts)
   - Set a custom SSH port
   - Integrate a server-side software firewall
   - Disable root login
   - Protocols need to be developed for strong password creation then limit max authentication attempts
   - Set idle timeout intervals

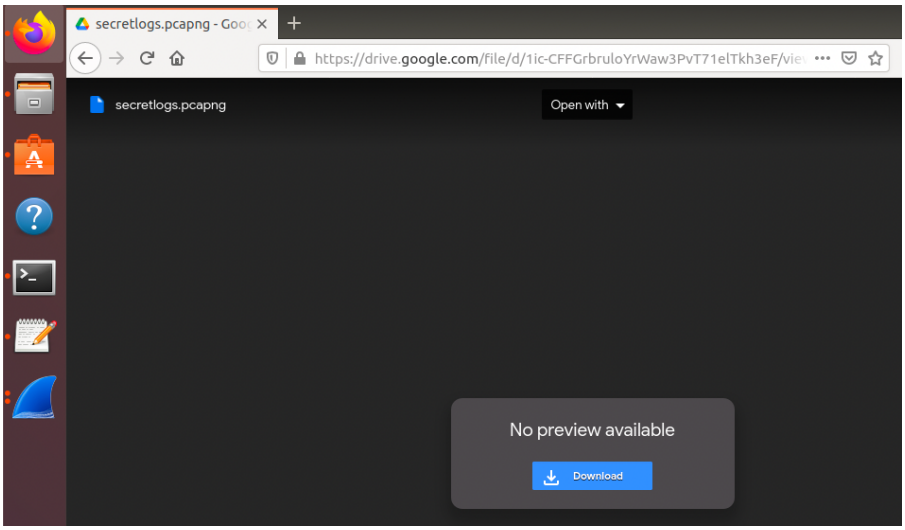
OSI layer where findings were found

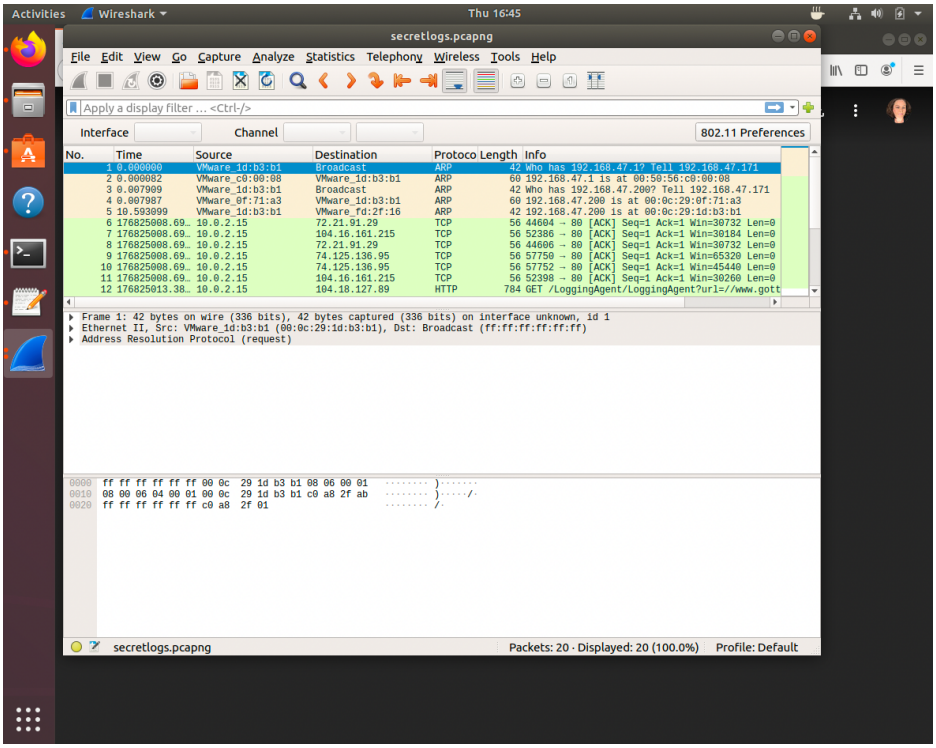
OSI Layer 7-Application

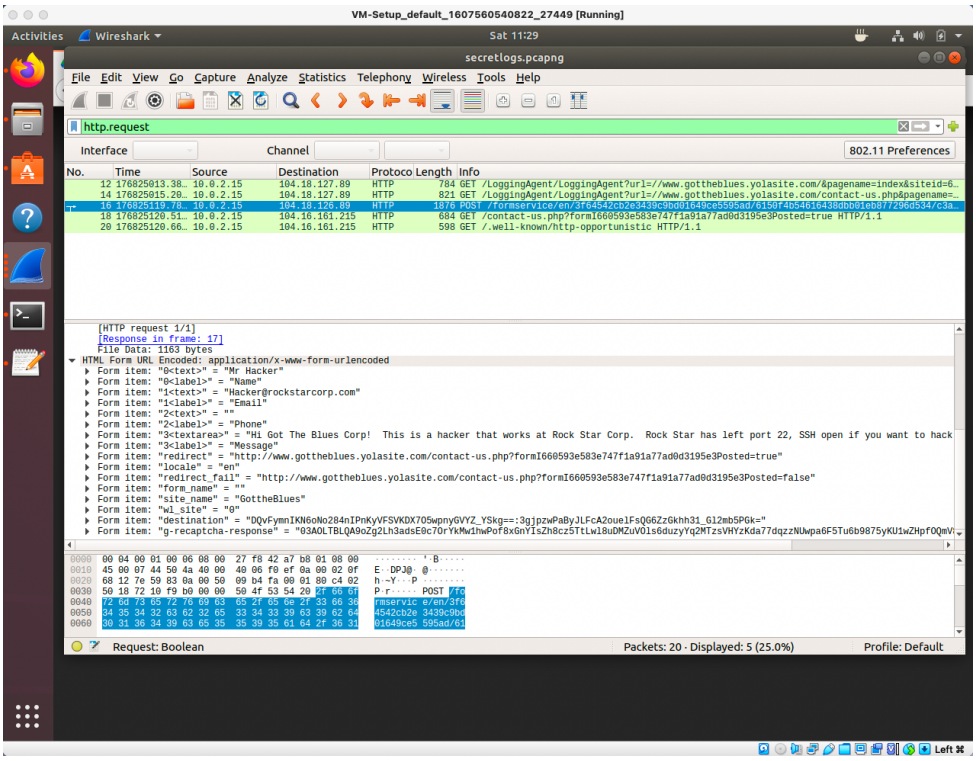
Phase 4: “ShARP Dressed Man”

1. *Steps and commands used to complete the tasks*

```
jimi@GTscavengerHunt:/etc$ cat packetcaptureinfo.txt
 Captured Packets are here:
 https://drive.google.com/file/d/1ic-CFFGrbruloYrWaw3PvT71elTkh3eF/view?usp=shar
ing
```







2. *Summary of your findings for each testing phase*

We have been attacked allowing someone to send falsified ARP messages over a LAN which has allowed the linking of an individual's MAC address with the IP address with our computers(S) and/or server(s). This can allow them to intercept, modify or even stop data from flowing.

3. *Network vulnerabilities discovered*

There are vulnerabilities with our data and networks as this hacker has altered routing on the network.

4. *Findings associated with a hacker*

The hacker is doing a Man in the Middle attack known as ARP Spoofing/Poising attack.

5. *Recommended mitigation strategy*

This will not be a quick fix but once we recognize that this occurring we could:

- Rely on VPN's to get into system
- Rely on trust relationships
- Use a static ARP
- Set-up packet filtering
- Integrate malware monitoring systems
- Run spoofing attacks and keep track of what works and what failed so as to stay ahead of the hackers
- Use cryptographic network protocols including TLS, SSH, HTTPS.

6. *OSI layer where findings were found*

OSI Layer 7-Application