Responding to Threats and Incidents

Cybersecurity Boot Camp

Incident Response Day 3

Last Class:

We covered the following topics last class:

01 Virtual Machines

02 SIEMs and SOARs

03 Customizing Wireshark

04 Walkthrough of attack analysis

Today’s class is a little different:

We will simulate a “Day in the Life” of an SOC analyst

The exercises will be divided into four extended activities in which we will respond, investigate, and analyze various incidents.

The goal is to practice the skills and software we’ve learned throughout the unit in order to better understand an analyst’s position.

Today's exercises involve live malware.
Use your Ubuntu VM to work in a contained environment.

Part 1: !Alert1!

In this activity, you will investigate a malware attack using a Snort alert and a network pcap.

Activities/Alert_1

Today’s exercises involve live malware.
Use your Ubuntu VM to work in a contained environment.

Suggested Time:
30 minutes

Part 1: !Alert 1!

In this exercise, you will work from an alert file and determine if the alert is a False Positive or a True Positive

Snort file

1. What activity is Snort reporting on? (Provide a few alert headlines.)

2. What is the date and time of this alert?

3. What is the external IP address that Snort is flagging for malicious activity?

4. What is the internal IP address that Snort is flagging for malicious activity?

5. What is the source port of the activity?

6. What is the destination port of the activity?

pcap file

1. What is the MAC Address of the internal computer involved?

2. What is the host name of the internal machine?

3. Can you confirm the date and time this issue occurred?

4. How can you confirm if the Snort alert is accurate?

5. Can you safely verify whether or not malware was downloaded?

6. Would you categorize this alert as a `False Positive` or a `True Positive`?

7. If this issue needs to be mitigated, what steps should be taken with the infected machine?

8. What steps should be taken in regards to network security?

9. Would you categorize this issue as a Web, Email or Network attack?

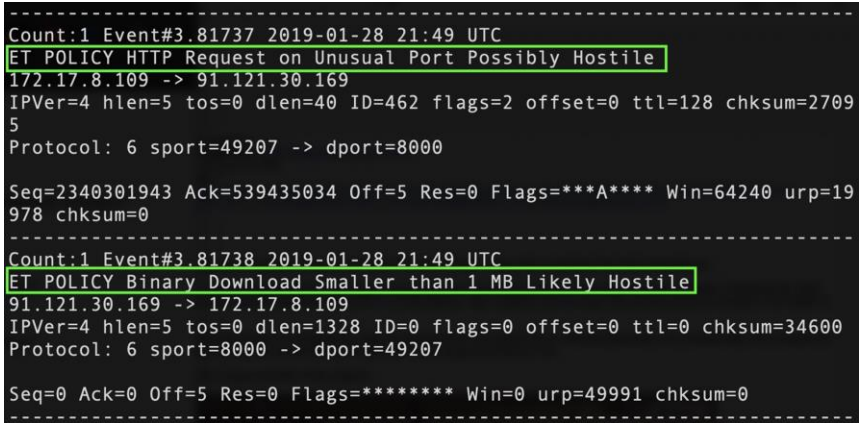
Alert 1 Review: Snort File

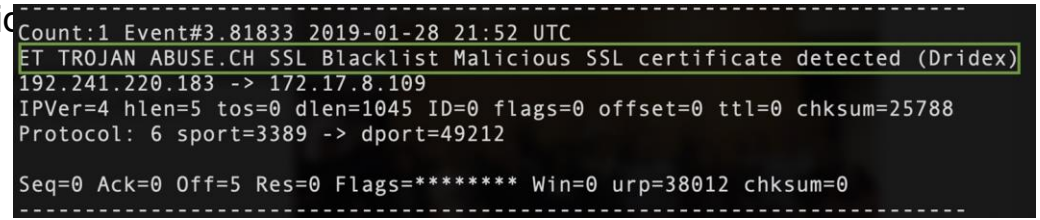
What is Snort reporting on? (Provide a few alert headlines.)

Alert 1 Review: Snort File

What is Snort reporting on? (Provide a few alert headlines.)

- “ET POLICY HTTP Request on Unusual Port Possibly Hostile.”
- “ET POLICY Binary Download Smaller than 1MB Likely Hostile.”
    - This is likely where malware was downloaded.
- “ET TROJAN ABUSE.CH SSL Blacklist Malicious SSL Certificate detected (Dric
    - This is the malware running





Alert 1 Review: Snort File

What is the date and time of this alert?

What is the external IP address that Snort is flagging for the ET Policy HTTP?

What is the internal IP address that snort is flagging for the ET Policy HTTP?

What is the source port and destination port of the activity?

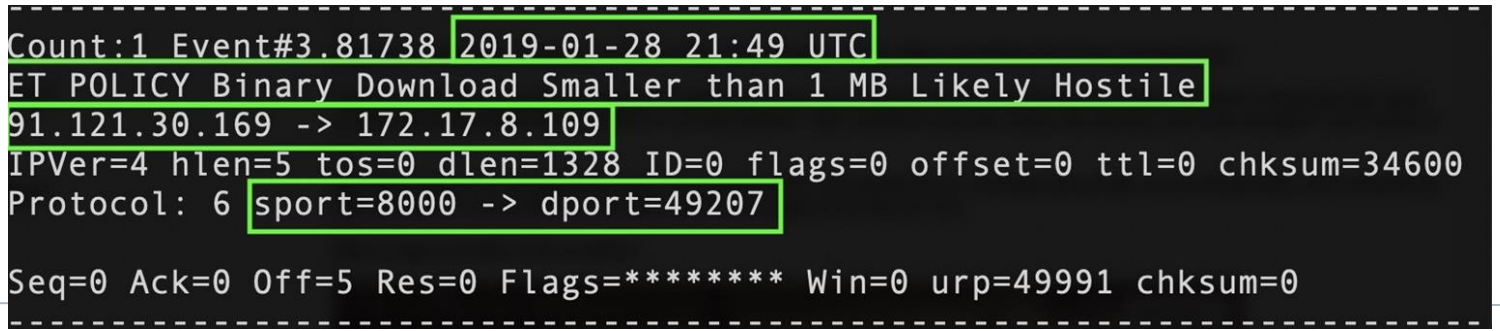
Alert 1 Review: Snort File

2019-01-28 21:49 UTCtime of this alert?

What is the external IP address that Snort is flagging for the ET Policy HTTP?

What is the internal IP address that snort is flagging for the ET Policy HTTP?

What is the source port and destination port of the activity?



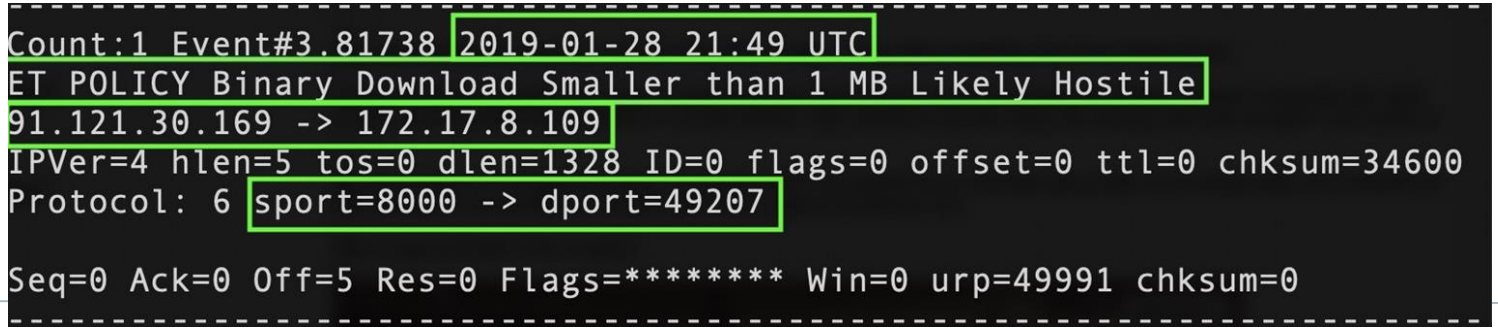
Alert 1 Review: Snort File

2019-01-28 21:49 UTC**time of this alert?**

Using the second alert where the malware was likely downloaded, we see 91.121.30.169 **?**

What is the internal IP address that snort is flagging for the ET Policy HTTP?

What is the source port and destination port of the activity?



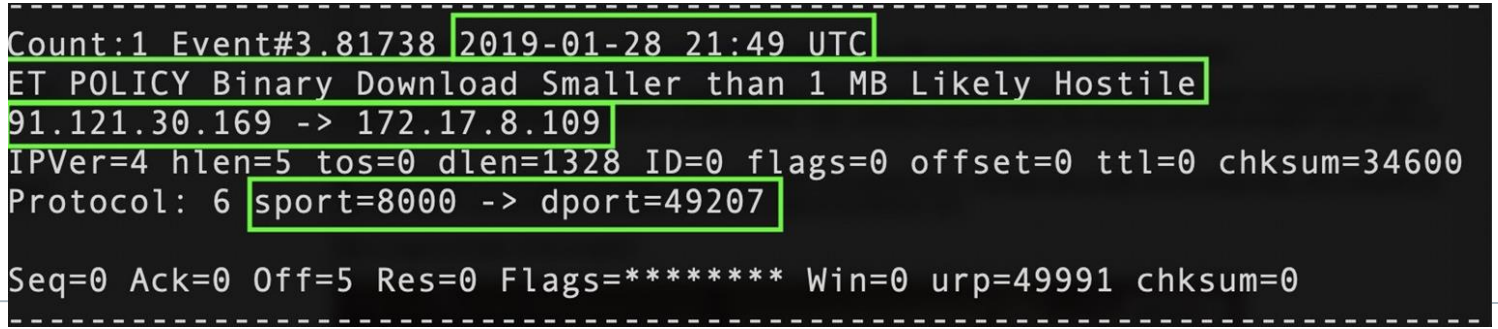
Alert 1 Review: Snort File

2019-01-28 21:49 UTC**time of this alert?**

Using the second alert where the malware was likely downloaded, we see 91.121.30.169
?

Using the same alert, we see 172.17.8.109**t is flagging for the ET Policy HTTP?**
?

What is the source port and destination port of the activity?



Alert 1 Review: Snort File

2019-01-28 21:49 UTC**time of this alert?**

Using the second alert where the malware was likely downloaded, we see 91.121.30.169
?

Using the same alert, we see 172.17.8.109**t is flagging for the ET Policy HTTP?**
?

Source port = 8000, destination port = 49207**ort of the activity?**

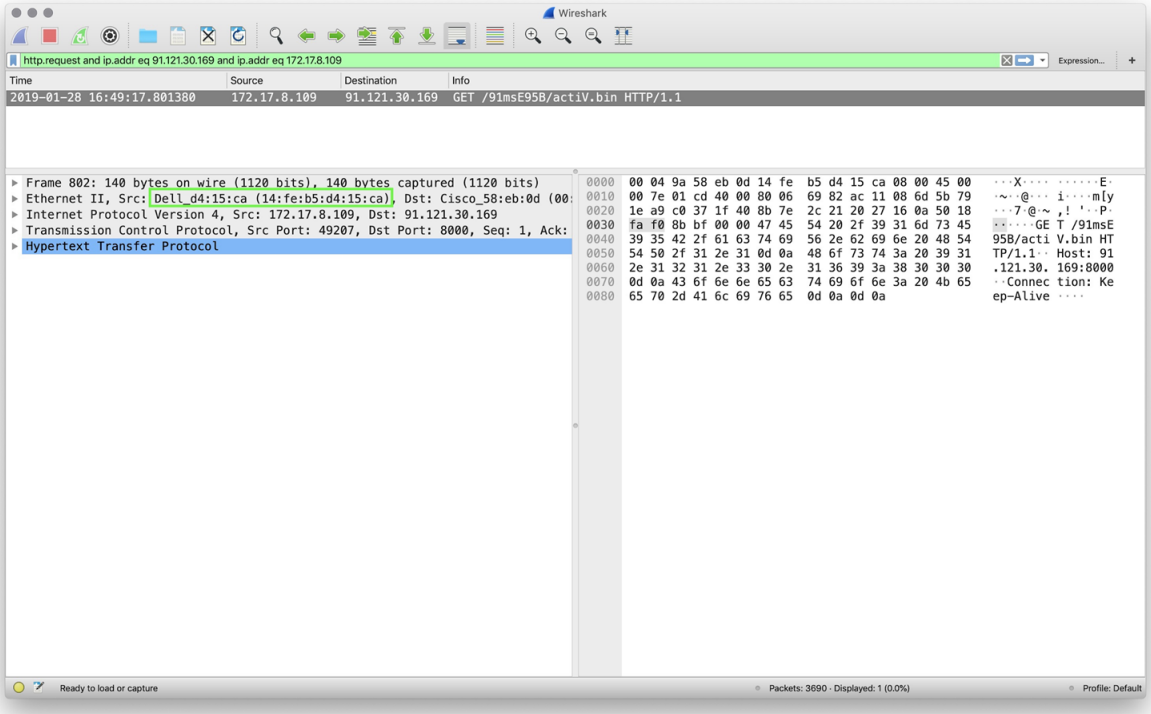
```
Count:1 Event#3.81738 2019-01-28 21:49 UTC
ET POLICY Binary Download Smaller than 1 MB Likely Hostile
91.121.30.169 -> 172.17.8.109
IPVer=4 hlen=5 tos=0 dlen=1328 ID=0 flags=0 offset=0 ttl=0 chksum=34600
Protocol: 6 sport=8000 -> dport=49207

Seq=0 Ack=0 Off=5 Res=0 Flags******** Win=0 urp=49991 chksum=0
```

Alert 1 Review: pcap File

What is the MAC Address of the internal computer involved?

Alert 1 Review: pcap File

Dell (14:fe:b5:d4:15:ca)ess of the internal computer involved?



Alert 1 Review: pcap File

What is the host name of the internal machine?

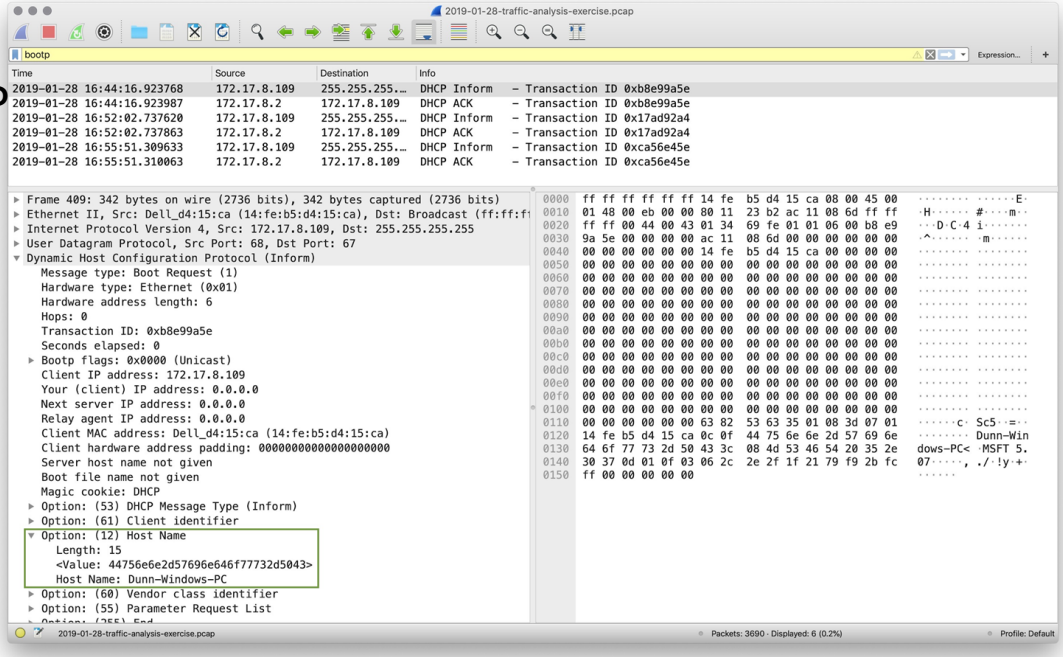
Alert 1 Review: pcap File

What is the host name of the internal machine?

Filter for DHCP traffic using bootp. bootp stands for bootstrap protocol. It is the protocol that DHCP traffic used.

Note: You can also filter for DHCP using udp.port eq 68 to filter for traffic on port 68.

Host name is Dunn-Windows-PC.



Alert 1 Review: pcap File

Filter the pcap file to show the conversation between the two machines that were identified in the Snort Alert.

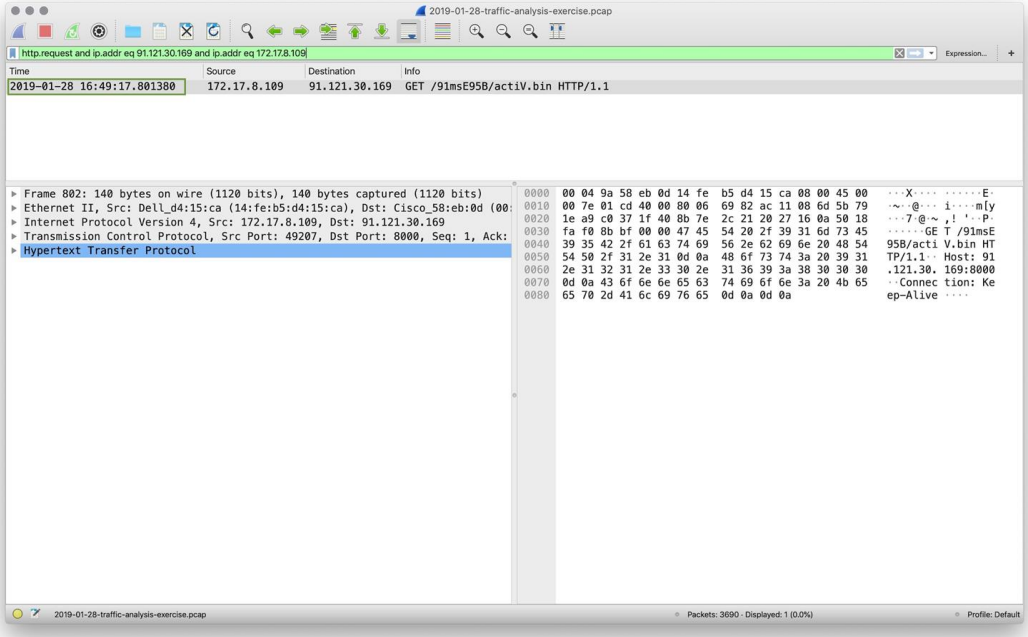
Can you confirm the date and time this issue occurred?

Alert 1 Review: pcap File

Filter the pcap file to show the conversation between the two machines that were identified in the Snort Alert

http.request and ip.addr eq 91.121.30.169 and ip.addr eq 172.12.8.109

Can you confirm the date and time this issue occurred?



Alert 1 Review: pcap File

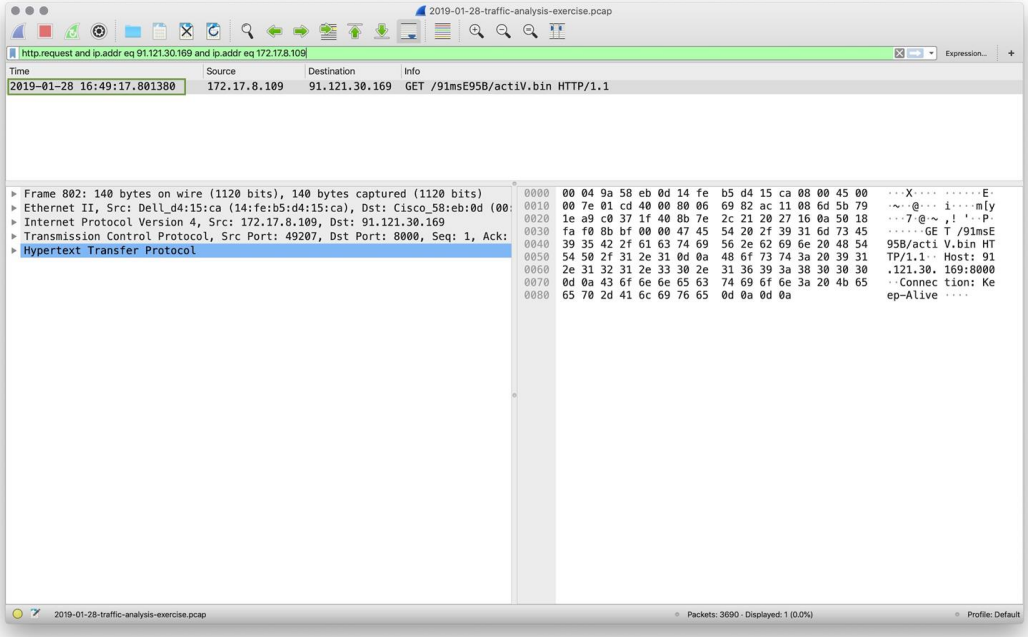
Filter the pcap file to show the conversation between the two machines that were identified in the Snort Alert

http.request and ip.addr eq 91.121.30.169 and ip.addr eq 172.12.8.109

Can you confirm the date and time this issue occurred?

Filtering on HTTP and IP addresses, we have a packet at

2019-01-28 16:49:17



Alert 1 Review: pcap File

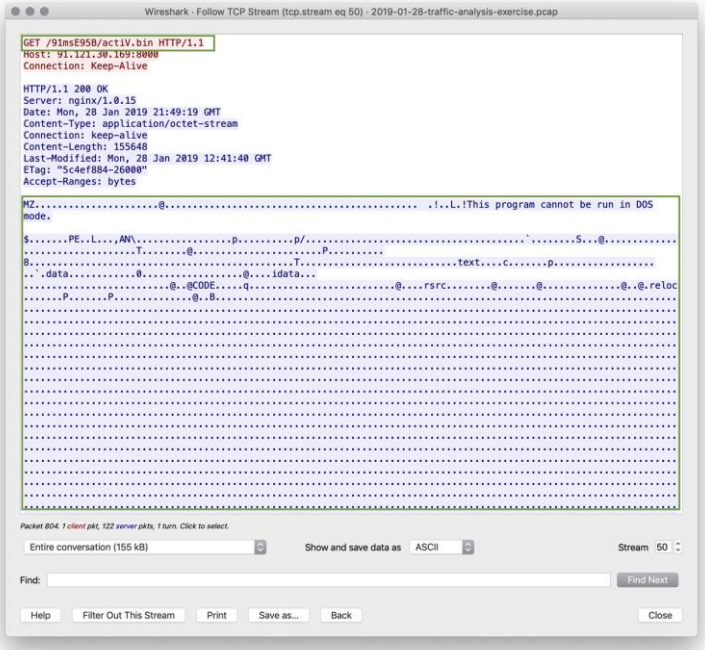
How can you confirm if the Snort alert is accurate?

Alert 1 Review: pcap File

How can you confirm if the Snort alert is accurate?

Follow the TCP stream and you will see the binary download starting with ‘MZ’ and “!This program cannot be run in DOS mode.”

The GET request ends in /actiV.bin



Alert 1 Review: pcap File

Can you safely view whether or not malware was downloaded?

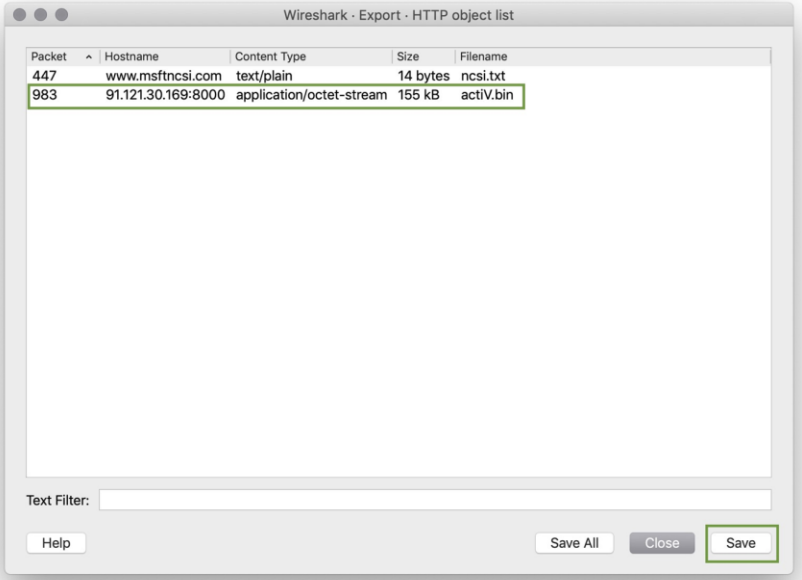
Alert 1 Review: pcap File

Can you safely view whether or not malware was downloaded?

Using File > Export Objects > HTTP find the actiV.bin file and save it.

Run md5sum actiV.bin to get a hash of the file.

Search the hash at Virus Total.



Alert 1 Review: pcap File

Would you categorize this alert as a False Positive or a True Positive?

If this issue needs to be mitigated, what steps should be taken when the infected machine?

What steps should be taken in regards to network security?

Would you categorize this issue as a Web, Email or Network attack?

Alert 1 Review: pcap File

We have verified that malware was download, so this is a True Positive.**ve?**

If this issue needs to be mitigated, what steps should be taken when the infected machine?

What steps should be taken in regards to network security?

Would you categorize this issue as a Web, Email or Network attack?

Alert 1 Review: pcap File

We have verified that malware was download, so this is a True Positive.**ve?**

The machine should be restored to a backup prior to this infection.**n when the infected machine?**

What steps should be taken in regards to network security?

Would you categorize this issue as a Web, Email or Network attack?

Alert 1 Review: pcap File

We have verified that malware was download, so this is a True Positive.**ve?**

The machine should be restored to a backup prior to this infection.**n when the infected machine?**

Using Wireshark Tools > ACL Rules we can get a rule for the offering IP:

#IPv4 source address

iptables --append INPUT --in-interface etho --source 91.121.30.169/32 --jump DROP

Would you categorize this issue as a Web, Email or Network attack?

Alert 1 Review: pcap File

We have verified that malware was download, so this is a True Positive.**ve?**

The machine should be restored to a backup prior to this infection.**n when the infected machine?**

Using Wireshark Tools > ACL Rules we can get a rule for the offering IP:

#IPv4 source address

iptables --append INPUT --in-interface etho --source 91.121.30.169/32 --jump DROP

This attack was carried out by the victim clicking on a malicious web link, so this is a **Web Attack.**

Part 2: !Alert2!

In this activity, you will work on investigating two alert files, a pcap and three emails to determine if the alerts are a false positive or a true positive.

Instructions sent via Slack

Today's exercises involve live malware.
Use your Ubuntu VM to work in a contained environment.

Suggested Time:
30 minutes

Part 2: !Alert 2!

In this activity, you will work on investigating two alert files, a pcap and three emails to determine if the alerts are a false positive or a true positive.

Snort file
1. What activity is Snort reporting on? (Provide a few alert headlines.) 2. What is the date and time of this alert? 3. What is the external IP address that Snort is flagging for the ET POLICY Binary alert? 4. What is the internal IP address that Snort is flagging for the ET POLICY Binary alert? 5. What is the source port of the activity? 6. What is the destination port of the activity?

pcap file
1. What is the MAC Address of the internal computer involved? 2. What is the host name of the internal machine? 3. Can you confirm the date and time this issue occurred? 4. How can you confirm if the Snort Alert is accurate? 5. Can you safely verify whether or not malware was downloaded? 6. Can you determine which email had a malware attachment related to the Snort Alerts? 7. Would you categorize this alert as a False Positive or a True Positive? 8. If this issue needs to be mitigated, what steps should be taken with the infected machine? 9. What steps should be taken in regards to network security? 10. Would you categorize this issue as a Web, Email or Network attack?

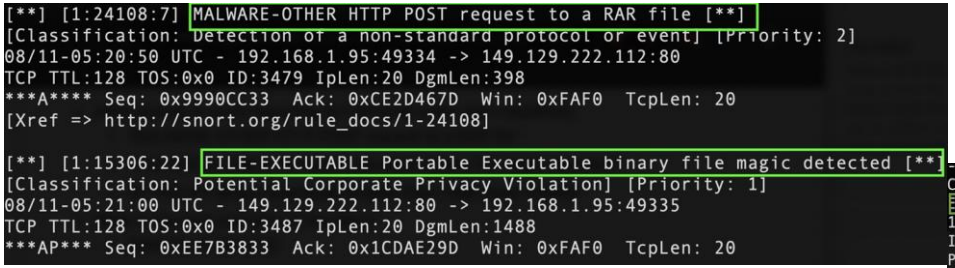
Alert 2 Review: Snort File

What is Snort reporting on? (Provide a few alert headlines.)

Alert 2 Review: Snort File

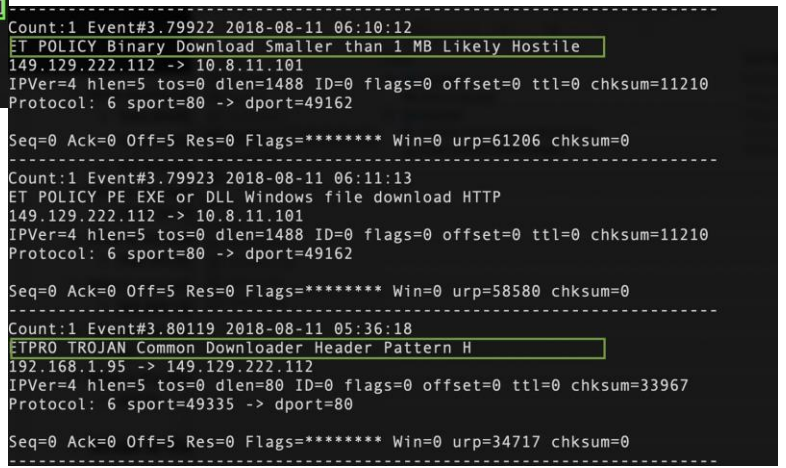
What is Snort reporting on? (Provide a few alert headlines.)

- “MALWARE -OTHER HTTP POST request to a RAR file”
- "FILE-EXECUTABLE Portable Executable binary file magic detected"



- "ET POLICY Binary Download Smaller than 1 MB Likely Hostile"

- "ETPRO TROJAN Common Downloader Header Pattern H"



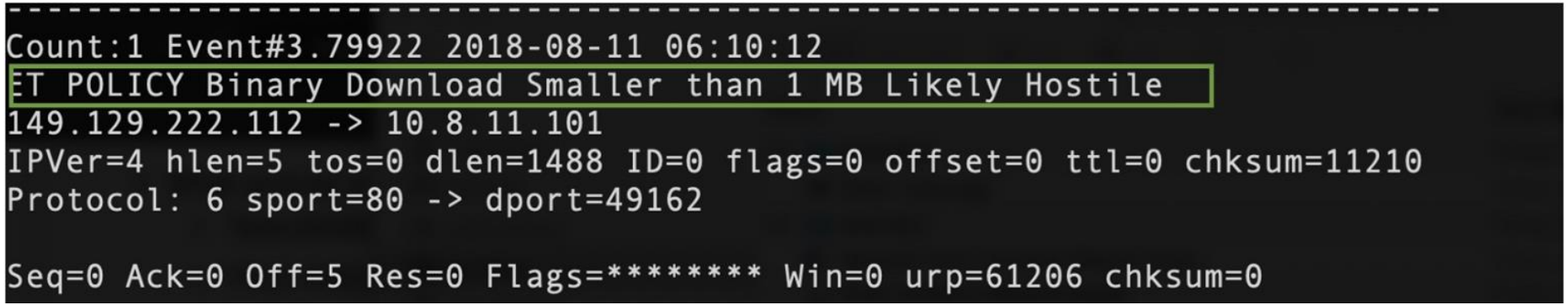
Alert 2 Review: Snort File

What is the date and time of the ET POLICY Binary alert?

What is the external IP address that Snort is flagging for the ET POLICY Binary alert?

What is the internal IP address that snort is flagging for the ET POLICY Binary alert?

What is the source port and destination port of the activity?



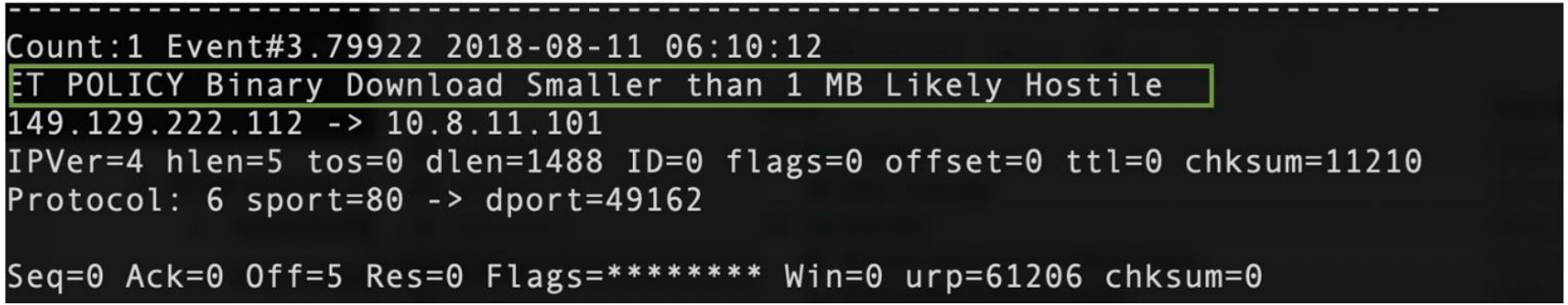
Alert 2 Review: Snort File

2018-08-11 06:10:12**d time of the ET POLICY Binary alert?**

What is the external IP address that Snort is flagging for the ET POLICY Binary alert?

What is the internal IP address that snort is flagging for the ET POLICY Binary alert?

What is the source port and destination port of the activity?



Alert 2 Review: Snort File

2018-08-11 06:10:12**d time of the ET POLICY Binary alert?**

149.129.222.112**What is the exte**rnal IP address that Snort is flagging for the ET POLICY Binary alert?

What is the internal IP address that snort is flagging for the ET POLICY Binary alert?

What is the source port and destination port of the activity?

```
--------------------------------------------------------------------------------
Count:1 Event#3.79922 2018-08-11 06:10:12
ET POLICY Binary Download Smaller than 1 MB Likely Hostile
149.129.222.112 -> 10.8.11.101
IPVer=4 hlen=5 tos=0 dlen=1488 ID=0 flags=0 offset=0 ttl=0 chksum=11210
Protocol: 6 sport=80 -> dport=49162

Seq=0 Ack=0 Off=5 Res=0 Flags******** Win=0 urp=61206 chksum=0
```

Alert 2 Review: Snort File

2018-08-11 06:10:12**d time of the ET POLICY Binary alert?**

149.129.222.112**What is the external IP address that Snort is flagging for the ET POLICY Binary alert?**

10.8.11.101 **internal IP address that snort is flagging for the ET POLICY Binary alert?**

What is the source port and destination port of the activity?

```
--------------------------------------------------------------------------------
Count:1 Event#3.79922 2018-08-11 06:10:12
ET POLICY Binary Download Smaller than 1 MB Likely Hostile
149.129.222.112 -> 10.8.11.101
IPVer=4 hlen=5 tos=0 dlen=1488 ID=0 flags=0 offset=0 ttl=0 chksum=11210
Protocol: 6 sport=80 -> dport=49162

Seq=0 Ack=0 Off=5 Res=0 Flags******** Win=0 urp=61206 chksum=0
```

Alert 2 Review: Snort File

2018-08-11 06:10:12**d time of the ET POLICY Binary alert?**

149.129.222.112**rnal IP address that Snort is flagging for the ET POLICY Binary alert?**

10.8.11.101 **internal IP address that snort is flagging for the ET POLICY Binary alert?**

Source port = 80, destination port = 49162 **port of the activity?**

```
--------------------------------------------------------------------------------
Count:1 Event#3.79922 2018-08-11 06:10:12
ET POLICY Binary Download Smaller than 1 MB Likely Hostile
149.129.222.112 -> 10.8.11.101
IPVer=4 hlen=5 tos=0 dlen=1488 ID=0 flags=0 offset=0 ttl=0 chksum=11210
Protocol: 6 sport=80 -> dport=49162

Seq=0 Ack=0 Off=5 Res=0 Flags******** Win=0 urp=61206 chksum=0
```

Alert 2 Review

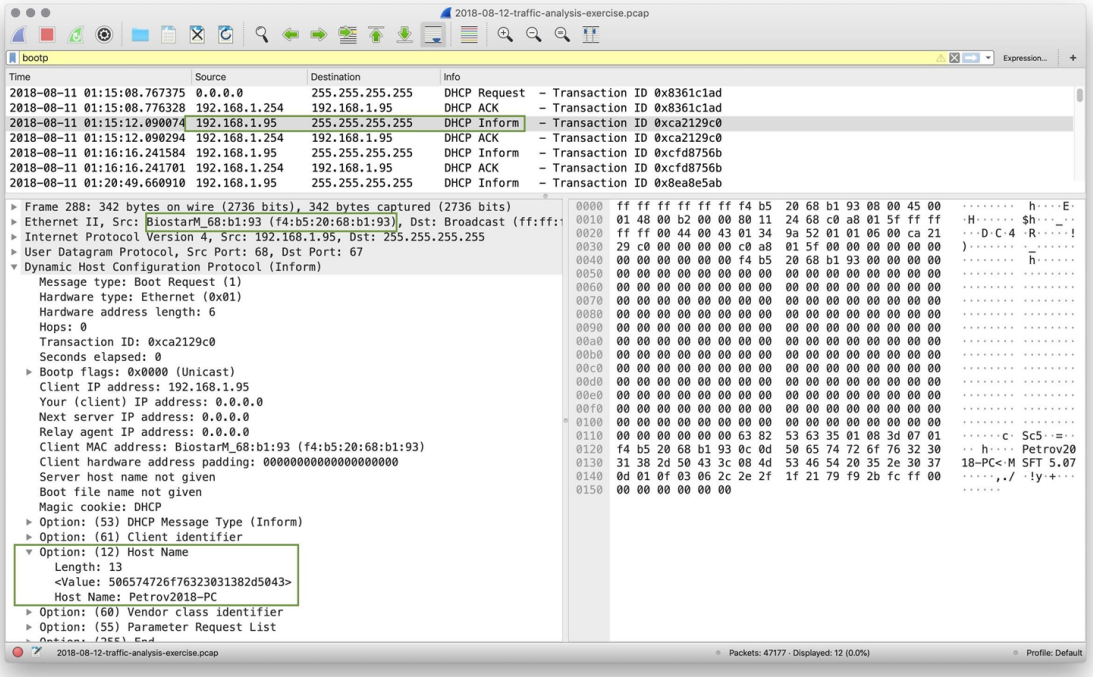
What is the MAC Address of the internal computer involved?

What is the host name of the internal machine

Alert 2 Review

What is the MAC Address of the internal computer involved?
f4:b5:20:68:b1:93

What is the host name of the internal machine



Alert 2 Review

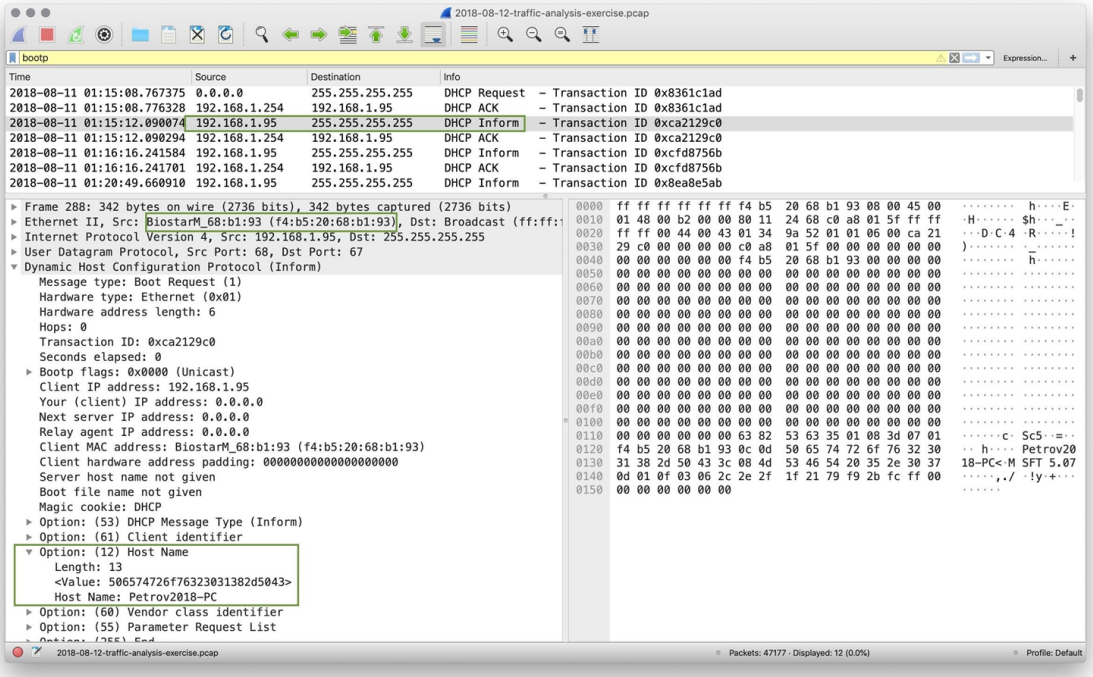
What is the MAC Address of the internal computer involved?

f4:b5:20:68:b1:93

What is the host name of the internal machine

Filter for bootp in Wireshark and inspect Option: Host Name from an Inform packet.

Petrov2018-PC



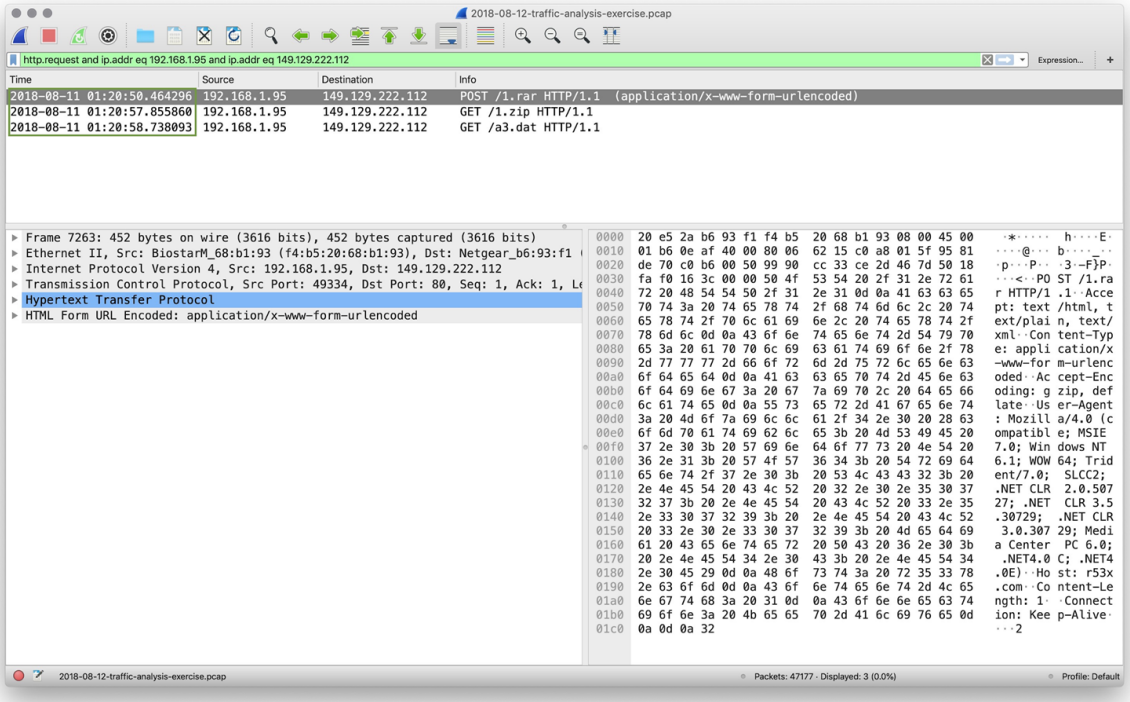
Alert 2 Review

Can you confirm the date and time this issue occurred?

Alert 2 Review

Can you confirm the date and time this issue occurred?

pcap file shows 2018-08-11 1:20 UTC



Alert 2 Review

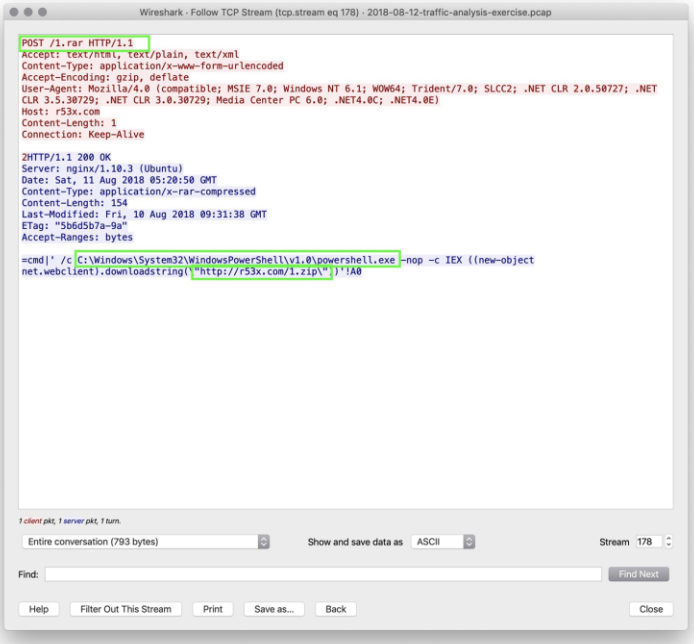
How can you confirm if the Snort alert is accurate?

Alert 2 Review

How can you confirm if the Snort alert is accurate?

Following the TCP Stream of the machines in the alert shows a POST request to **/1.rar**.

The rest of the stream shows a powershell command that downloads an executable **r53x.com/1.zip**.



Alert 2 Review

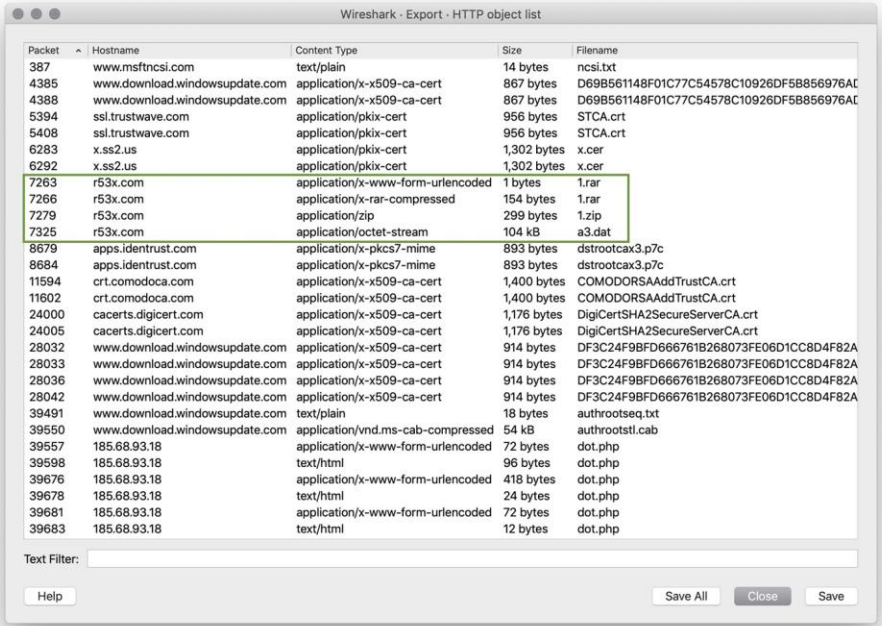
Can you safely verify whether or not malware was downloaded?

Alert 2 Review

Can you safely verify whether or not malware was downloaded?

Using File > Export Objects > HTTP, you can export 1.zip and 1.rar files.

Verify this malware using md5sum and Virus Total.



Alert 2 Review

Can you determine which email had a malware attachment related to the Snort Alerts?

Alert 2 Review

Can you determine which email had a malware attachment related to the Snort Alerts?

- Locate the .eml activity files that you downloaded at the start of the exercise.
- Open each email by right-clicking and choosing ‘Open with other application’ > Thunderbird Mail.
- Save all 3 attachments from each email in the activity directory.
- Use the file command to determine the file type of each file.
- Open the files (PIC35793.iqy) is a text file.
- Using the less command, we can see a link inside: r53x.com/1.rar
- The first email appears to be the culprit.

Alert 2 Review

Would you categorize this alert as a False Positive or a True Positive?

If this issue needs to be mitigated, what steps should be taken when the infected machine?

What steps should be taken in regards to network security?

Would you categorize this issue as a Web, Email or Network attack?

Alert 2 Review

We have confirmed a malware infection, so this is a True Positive.**Positive?**

If this issue needs to be mitigated, what steps should be taken when the infected machine?

What steps should be taken in regards to network security?

Would you categorize this issue as a Web, Email or Network attack?

Alert 2 Review

We have confirmed a malware infection, so this is a True Positive. **Positive?**

The machine should be restored to a backup prior to this infection. **n when the infected machine?**

What steps should be taken in regards to network security?

Would you categorize this issue as a Web, Email or Network attack?

Alert 2 Review

We have confirmed a malware infection, so this is a True Positive.**Positive?**

The machine should be restored to a backup prior to this infection.**n when the infected machine?**

We can block the IP address using:**gards to network security?**

iptables --append INPUT --in-interface eth0 --source 149.129.222.112/32 --jump Drop

Would you categorize this issue as a Web, Email or Network attack?

Alert 2 Review

We have confirmed a malware infection, so this is a True Positive.**Positive?**

The machine should be restored to a backup prior to this infection.**n when the infected machine?**

We can block the IP address using:**gards to network security?**

iptables --append INPUT --in-interface eth0 --source 149.129.222.112/32 --jump Drop

This issue started with an email attachment, so it would be classified as an **Email Attack**.

Take a Break!

Part 3: Alert 3!

In this activity, you will practice responding to an alert to determine if it is a false positive or a true positive alert.

Instructions sent via Slack

Today's exercises involve live malware.
Use your Ubuntu VM to work in a contained environment.

Suggested Time:
30 minutes

Part 3: !Alert 3!

In this activity, you will work on investigating two alert files, a pcap and three emails to determine if the alerts are a false positive or a true positive.

Questions:

1. What activity is Snort reporting on?
2. What is the date and time of this alert?
3. What is the external IP address that Snort is flagging for the ET TROJAN VMProtect alert?
4. What is the internal IP address that Snort is flagging for the ET TROJAN VMProtect alert?
5. What is the source port of the activity?
6. What is the destination port of the activity?
7. What are the MAC Addresses of the computers involved?
8. What is the host name of the internal machine?
9. Can you confirm the date and time this issue occurred?
10. How can you confirm if the Snort alert is accurate?
11. Can you safely verify whether or not malware was downloaded?
12. Would you categorize this alert as a False Positive or a True Positive?
14. If this issue needs to be mitigated, what steps should be taken with the infected machine?
14. What steps should be taken in regards to network security?
15. Would you categorize this issue as a Web, Email or Network attack?

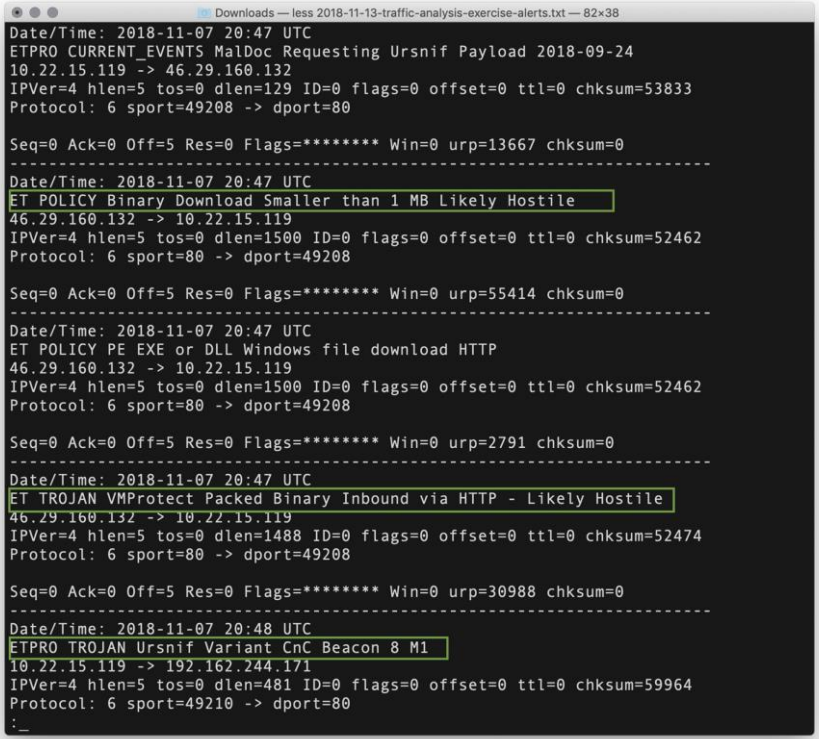
Alert 3 Review

What is Snort reporting on? (Provide a few alert headlines.)

Alert 3 Review

What is Snort reporting on? (Provide a few alert headlines.)

- “ET Policy Binary Download Smaller than 1 MB Likely Hostile”
- “ET TROJAN VMProtect Packed Binary Inbound Via HTTP - Likely Hostile”
- “ETPRO TROJAN Ursnif Variant CnC Beacon 8 M1”



Alert 3 Review

What is the date and time of this alert?

What is the external IP address that Snort is flagging for the ET POLICY Binary alert?

What is the internal IP address that snort is flagging for the ET POLICY Binary alert?

What is the source port and destination port of the activity?

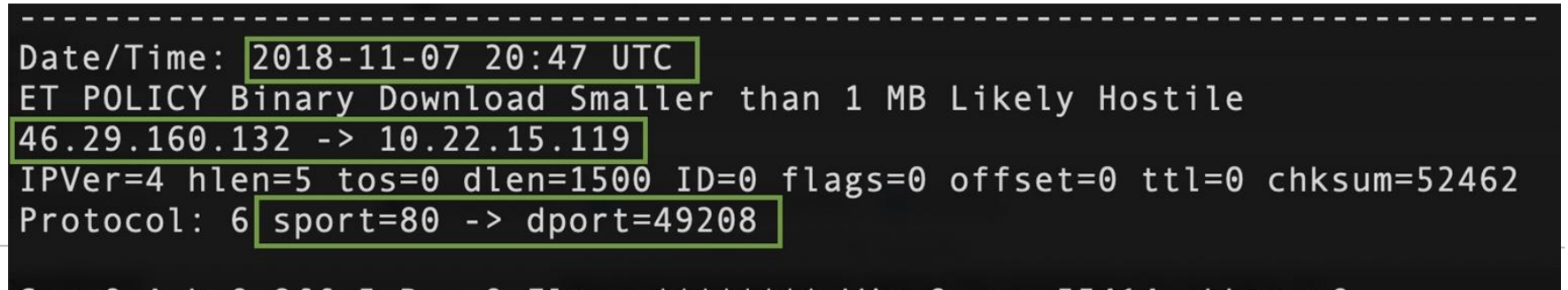
Alert 3 Review

2018-11-07 20:47 UTC**time of this alert?**

What is the external IP address that Snort is flagging for the ET TROJAN VMProtect alert?

What is the internal IP address that snort is flagging for the ET TROJAN VMProtect alert?

What is the source port and destination port of the ET TROJAN VMProtect alert?



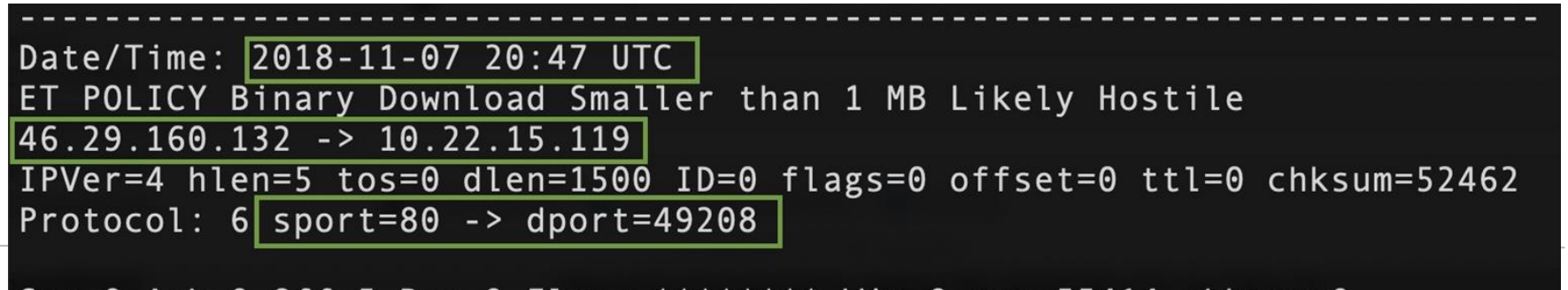
Alert 3 Review

2018-11-07 20:47 UTC**time of this alert?**

46.29.160.132**xternal IP address that Snort is flagging for the ET TROJAN VMProtect alert?**

What is the internal IP address that snort is flagging for the ET TROJAN VMProtect alert?

What is the source port and destination port of the ET TROJAN VMProtect alert?



Alert 3 Review

2018-11-07 20:47 UTC**time of this alert?**

46.29.160.132**xternal IP address that Snort is flagging for the ET TROJAN VMProtect alert?**

10.22.15.119**nternal IP address that snort is flagging for the ET TROJAN VMProtect alert?**

What is the source port and destination port of the ET TROJAN VMProtect alert?

```
--------------------------------------------------------------------------------
Date/Time: 2018-11-07 20:47 UTC
ET POLICY Binary Download Smaller than 1 MB Likely Hostile
46.29.160.132 -> 10.22.15.119
IPVer=4 hlen=5 tos=0 dlen=1500 ID=0 flags=0 offset=0 ttl=0 chksum=52462
Protocol: 6 sport=80 -> dport=49208
```

Alert 3 Review

2018-11-07 20:47 UTC**time of this alert?**

46.29.160.132**xternal IP address that Snort is flagging for the ET TROJAN VMProtect alert?**

10.22.15.119**nternal IP address that snort is flagging for the ET TROJAN VMProtect alert?**

Source port = 80, destination port = 49208 **port of the ET TROJAN VMProtect alert?**

```
--------------------------------------------------------------------------------
Date/Time: 2018-11-07 20:47 UTC
ET POLICY Binary Download Smaller than 1 MB Likely Hostile
46.29.160.132 -> 10.22.15.119
IPVer=4 hlen=5 tos=0 dlen=1500 ID=0 flags=0 offset=0 ttl=0 chksum=52462
Protocol: 6 sport=80 -> dport=49208
```

Alert 3 Review

What is the MAC Address of the internal computer involved?

What is the host name of the internal machine

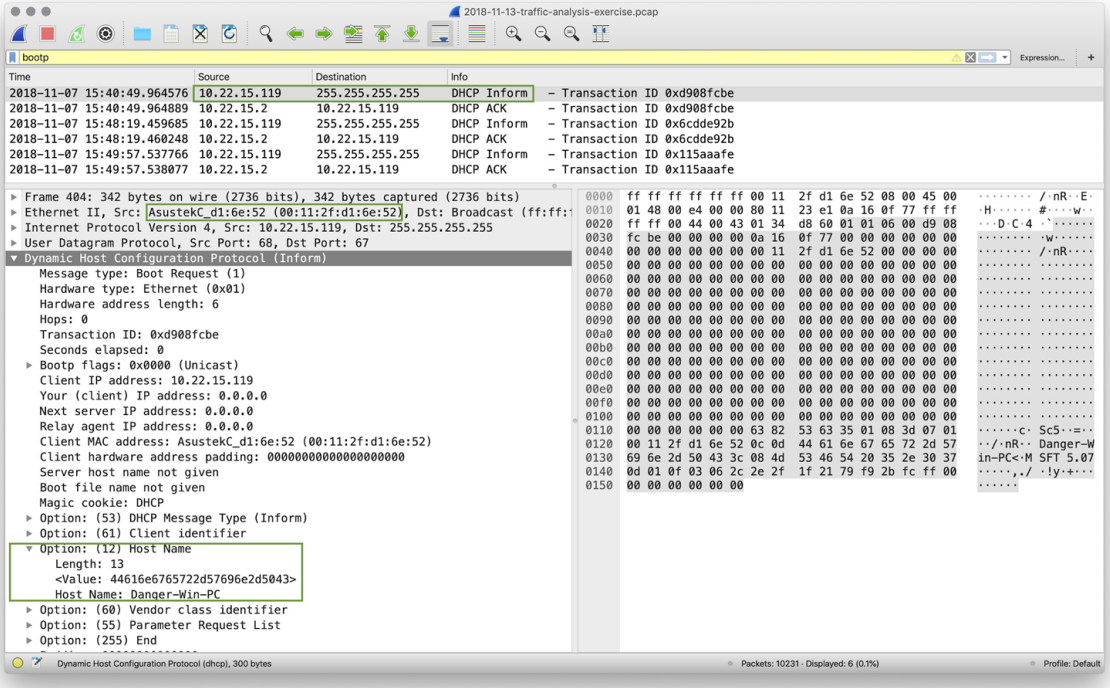
Alert 3 Review

What is the MAC Address of the internal computer involved?

Asustek (possibly a mobile device)

MAC (00:11:2f:d1:6e:52)

What is the host name of the internal machine



Alert 3 Review

What is the MAC Address of the internal computer involved?

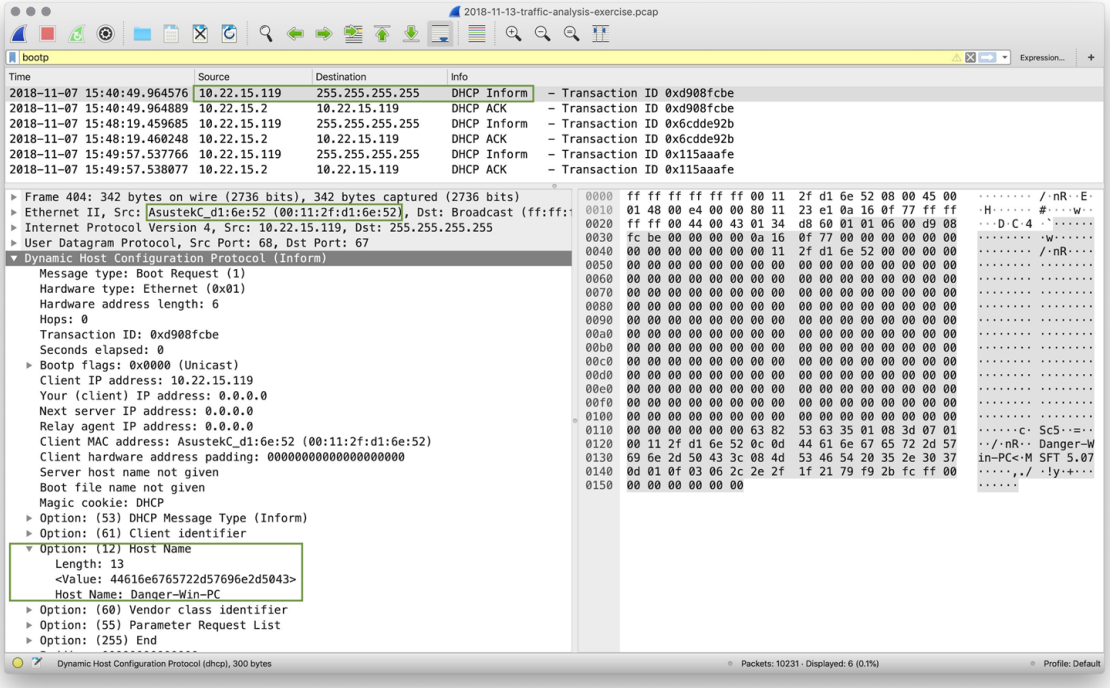
Asustek (possibly a mobile device)

MAC (00:11:2f:d1:6e:52)

What is the host name of the internal machine

Wireshark filter on bootp to get DHCP information.

Host Name is Danger-Win-PC



Alert 3 Review

Filter to show the conversation between the two machines that were identified in the Snort alert.

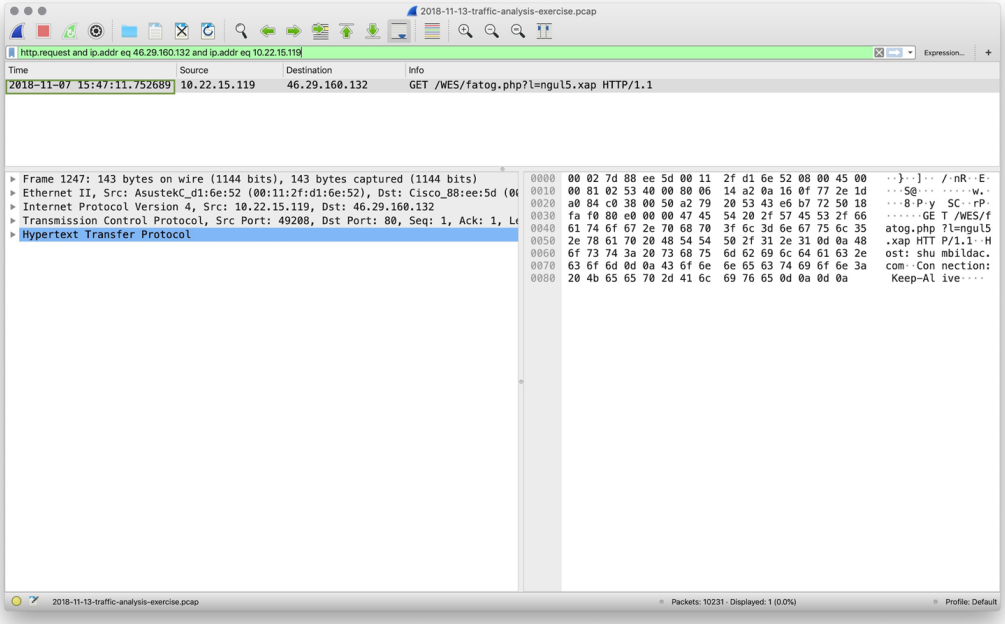
Can you confirm the date and time this issue occurred?

Alert 3 Review

Filter to show the conversation between the two machines that were identified in the Snort alert.

http.request and ip.addr eq 46.29.160.132 and ip.addr eq 10.22.15.119

Can you confirm the date and time this issue occurred?



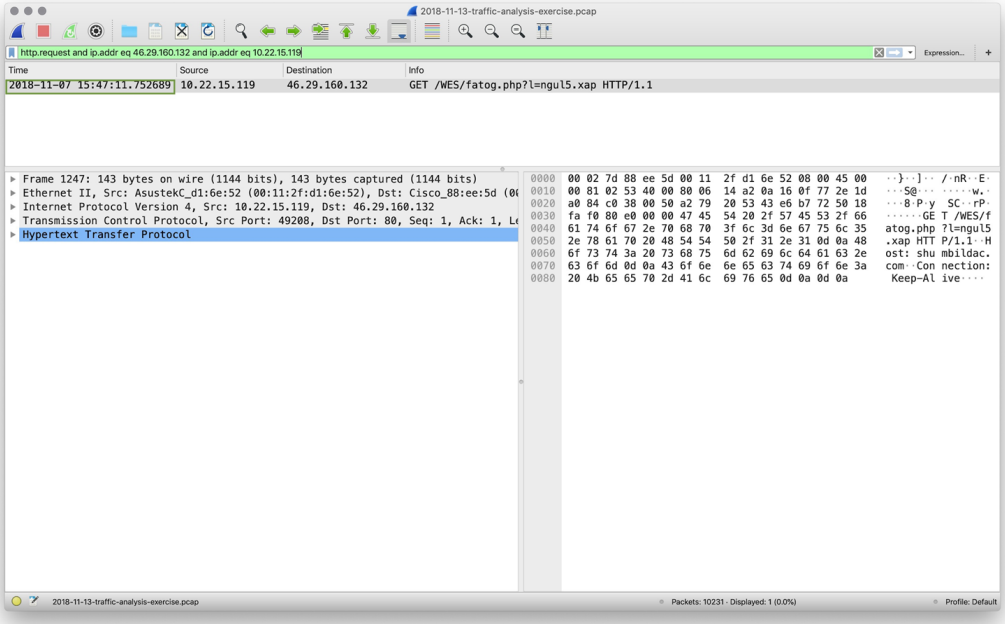
Alert 3 Review

Filter to show the conversation between the two machines that were identified in the Snort alert.

http.request and ip.addr eq 46.29.160.132 and ip.addr eq 10.22.15.119

Can you confirm the date and time this issue occurred?

2018-11-07 15:47:11



Alert 3 Review

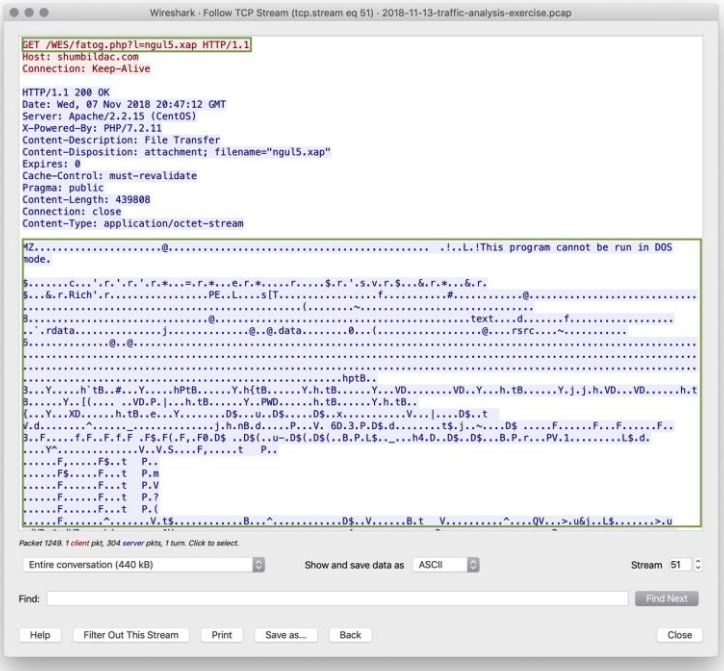
How can you confirm if the Snort alert is accurate?

Alert 3 Review

How can you confirm if the Snort alert is accurate?

Following the TCP Stream shows a binary download “This program cannot be run in DOS mode.”

Binary file is fatog.php?l=ngul5.xap



Alert 3 Review

Can you safely verify whether or not malware was downloaded?

Alert 3 Review

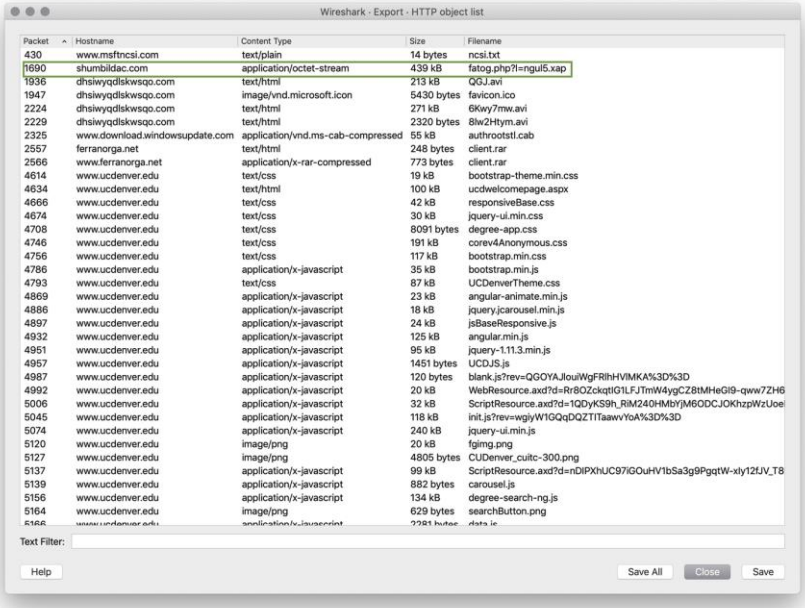
Can you safely verify whether or not malware was downloaded?

Using File > Export Objects > HTTP

Find can fatog.php?l=ngu5.xap in the list and save it.

Make an md5sum hash of the file

and check it with Virus Total.



Alert 3 Review

Would you categorize this alert as a False Positive or a True Positive?

If this issue needs to be mitigated, what steps should be taken when the infected machine?

What steps should be taken in regards to network security?

Would you categorize this issue as a Web, Email or Network attack?

Alert 3 Review

We have confirmed that malware was downloaded, so this is a True Positive.

If this issue needs to be mitigated, what steps should be taken when the infected machine?

What steps should be taken in regards to network security?

Would you categorize this issue as a Web, Email or Network attack?

Alert 3 Review

We have confirmed that malware was downloaded, so this is a True Positive.

The machine should be restored to a backup prior to this infection.

n when the infected machine?

What steps should be taken in regards to network security?

Would you categorize this issue as a Web, Email or Network attack?

Alert 3 Review

We have confirmed that malware was downloaded, so this is a True Positive.

The machine should be restored to a backup prior to this infection.**n when the infected machine?**

We can block the malicious IP by using Wireshark and navigating to Tools > Firewall ACL Rules.

#IPv4 Destination IP

Iptables --append INPUT --in-interface eth0 --source 46.29.160.132/32 --jump DROP

Would you categorize this issue as a Web, Email or Network attack?

Alert 3 Review

We have confirmed that malware was downloaded, so this is a True Positive.

The machine should be restored to a backup prior to this infection.**n when the infected machine?**

We can block the malicious IP by using Wireshark and navigating to Tools > Firewall ACL Rules.

#IPv4 Destination IP

Iptables --append INPUT --in-interface eth0 --source 46.29.160.132/32 --jump DROP

This issue was propagated using a malicious Web link, so it is a **Web Attack**.

Part 4: Alert 4!

In this activity, you will investigate an interesting Snort file.

Instructions sent via Slack

Today's exercises involve live malware.
Use your Ubuntu VM to work in a contained environment.

Suggested Time:
30 minutes

Part 4: !Alert 4!

In this final activity, students will investigate an interesting Snort alert...

Questions:

1. What activity is Snort reporting on?
2. Is there a CVE associated with the OS-OTHER Bash alert?
3. What are the IP Addresses flagged in the OS-OTHER Bash alert?
4. Is this attack coming from outside the network?
5. What is the source port of the activity?
6. What is the destination port of the activity?
7. What are the MAC Addresses of the computers involved?
9. Can you confirm the date and time this issue occurred?
10. What was the target of this attack?
11. How can you confirm if the Snort alert is accurate?
12. Can you verify whether or not sensitive data has been obtained by the attacker?
13. Would you categorize this alert as a False Positive or a True Positive?
14. If this issue needs to be mitigated, what steps should be taken with the infected machine?
15. Would you categorize this issue as a Web, Email, Network or Application attack?

Alert 4 Review

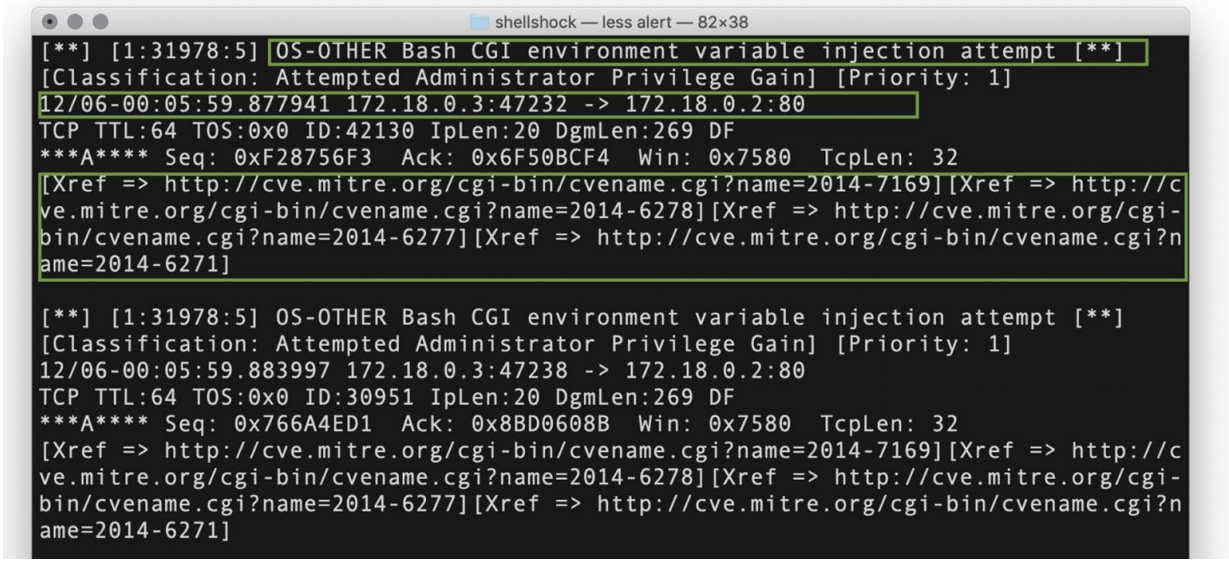
What is Snort reporting on? (Provide a few alert headlines.)

Alert 4 Review

What is Snort reporting on? (Provide a few alert headlines.)

- “Attempted Administrator Privilege Gain”

- “OS-OTHER Bash CGI environment variable injection attempt”



Alert 4 Review

Is there a CVE associated for the OS-OTHER Bash alert?

Alert 4 Review

Is there a CVE associated for the OS-OTHER Bash alert?

- CVE-2014-6271
- CVE-2014-7169
- CVE-2014-6278
- CVE-2014-6277

Alert 4 Review

What are the IP Addresses flagged for the OS-OTHER Bash alert?

Is this attack coming from outside the network?

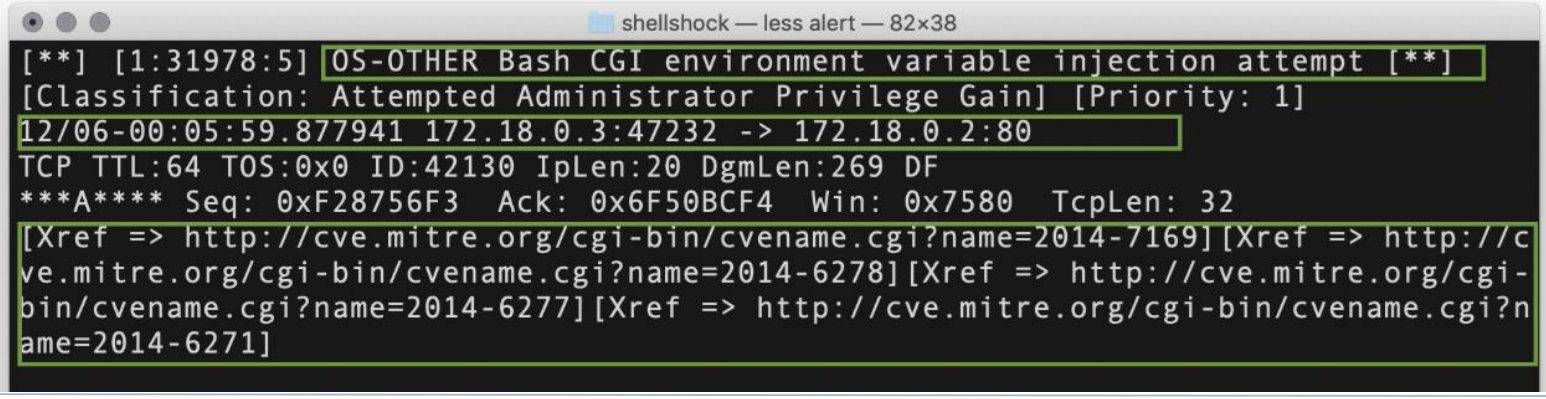
What is the source port and destination port of the ET TROJAN VMProtect alert?

Alert 4 Review

172.18.0.2 and 172.18.0.3es flagged for the OS-OTHER Bash alert?

Is this attack coming from outside the network?

What is the source port and destination port of the ET TROJAN VMProtect alert?

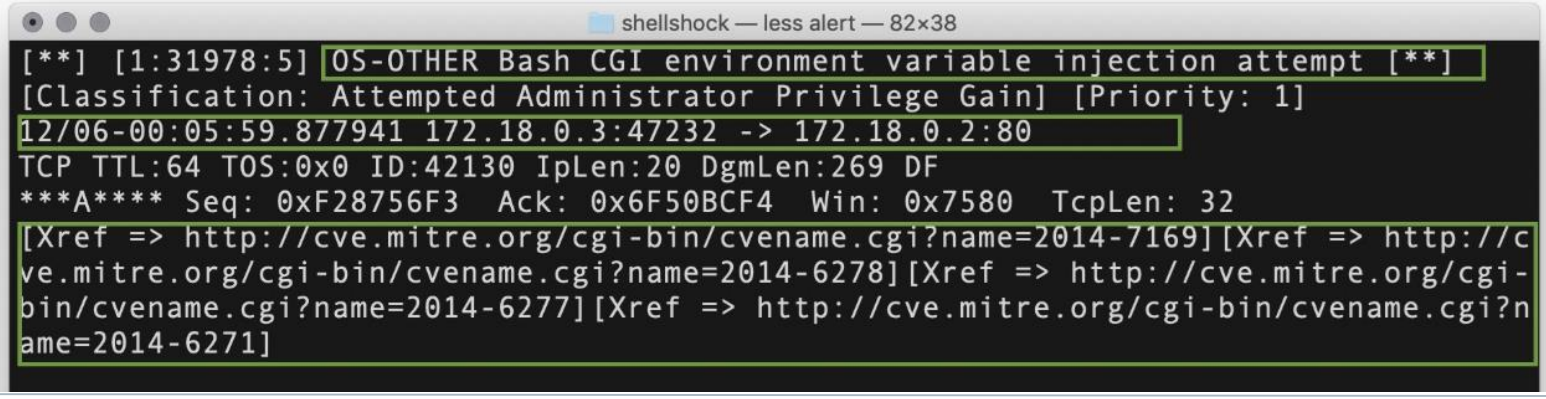


Alert 4 Review

172.18.0.2 and 172.18.0.3**es flagged for the OS-OTHER Bash alert?**

Both IP addresses are internal, so this is one internal machine attacking another.

What is the source port and destination port of the ET TROJAN VMProtect alert?

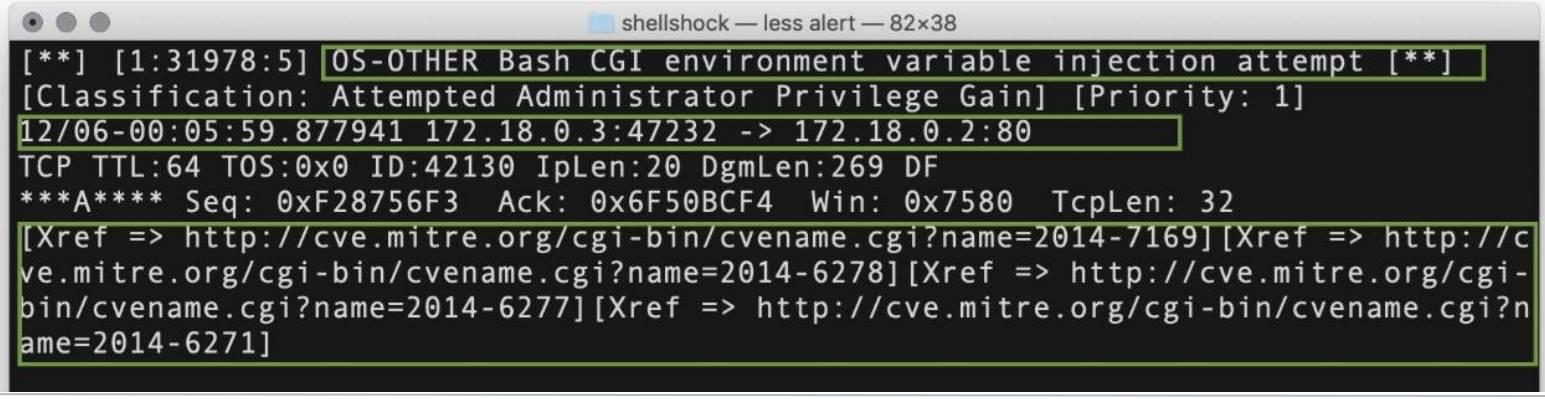


Alert 4 Review

172.18.0.2 and 172.18.0.3**es flagged for the OS-OTHER Bash alert?**

Both IP addresses are internal, so this is one internal machine attacking another.

Source port = 47232, destination port = 80 **port of the ET TROJAN VMProtect alert?**



Alert 4 Review

What is the MAC Address of the computers involved?

Can you confirm the date and time this issue occurred?

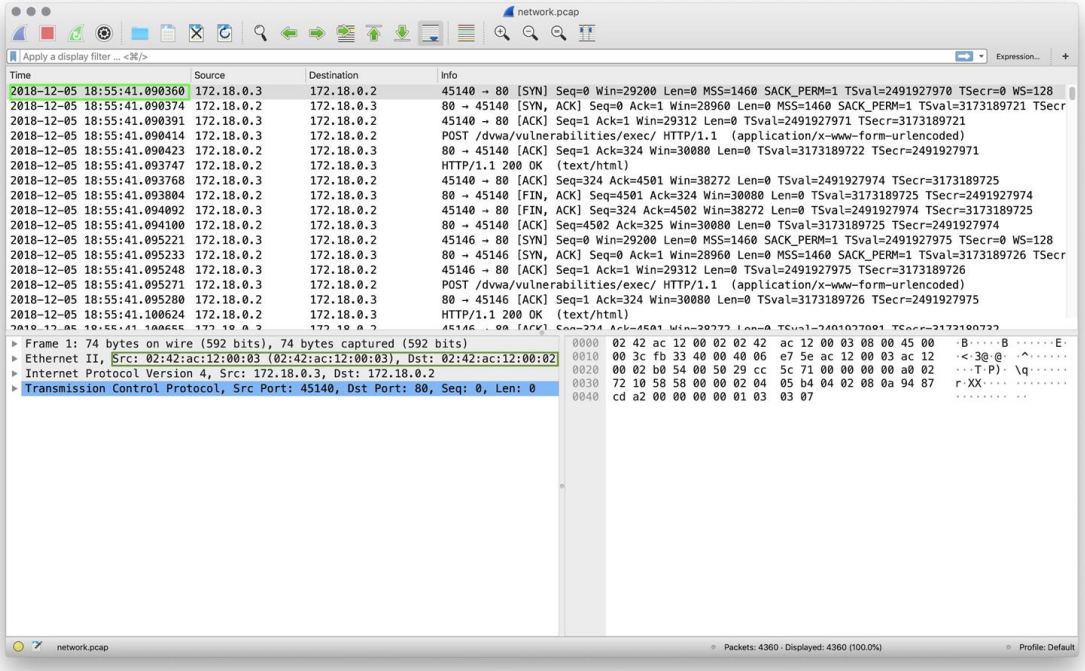
Alert 4 Review

What is the MAC Address of the computers involved?

02:42:ac:12:00:02

02:42:ac:12:00:03

Can you confirm the date and time this issue occurred?



Alert 4 Review

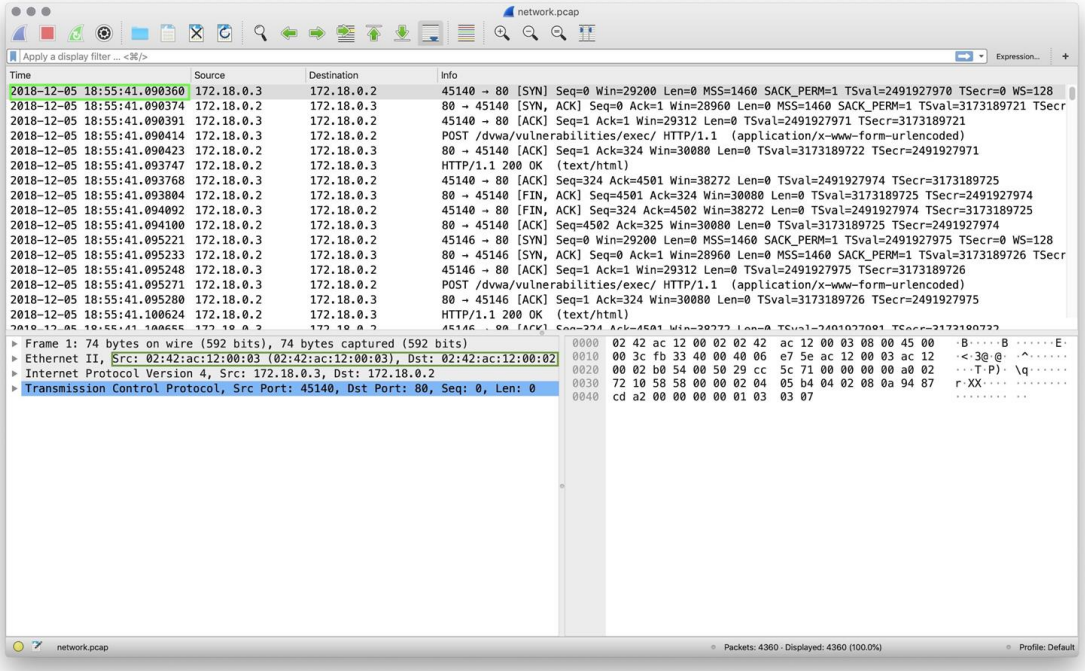
What is the MAC Address of the computers involved?

02:42:ac:12:00:02

02:42:ac:12:00:03

Can you confirm the date and time this issue occurred?

The attack started on 2018-12-05 at 18:55:41 UTC.



Alert 4 Review

What was the target of the attack?

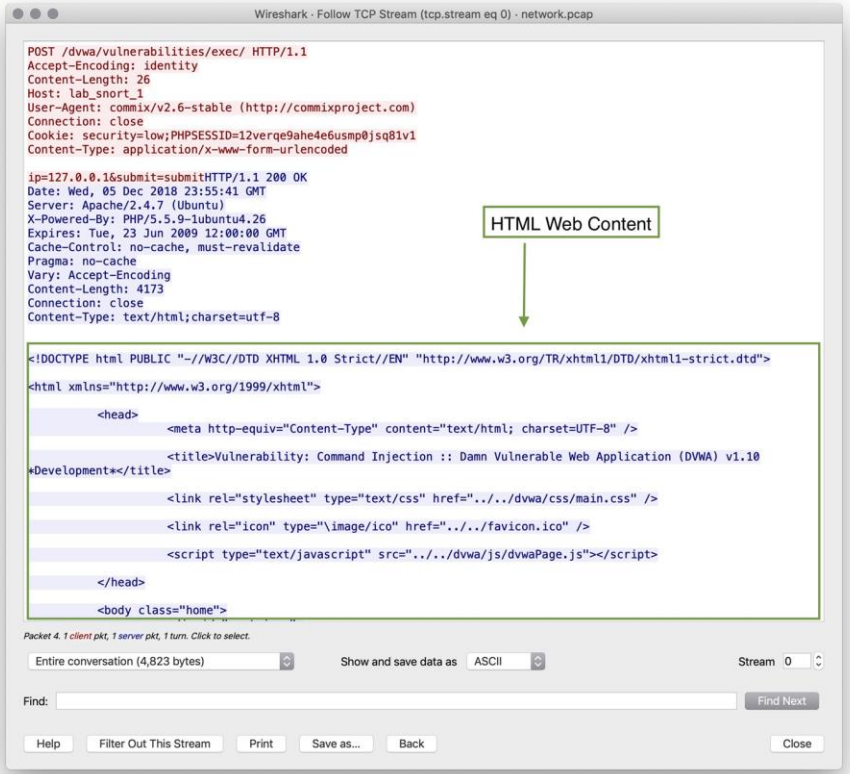
Alert 4 Review

What was the target of the attack?

The bash CGI Variable Injection Attempt alert suggests that this is a possible bash code injection attack.

The TCP Stream of the first packet listed shows the contents of the webpage returned.

This attack appears to be a code injection against an internal web server from an internal machine.



Alert 4 Review

How can we confirm the Snort alert is accurate?

Alert 4 Review

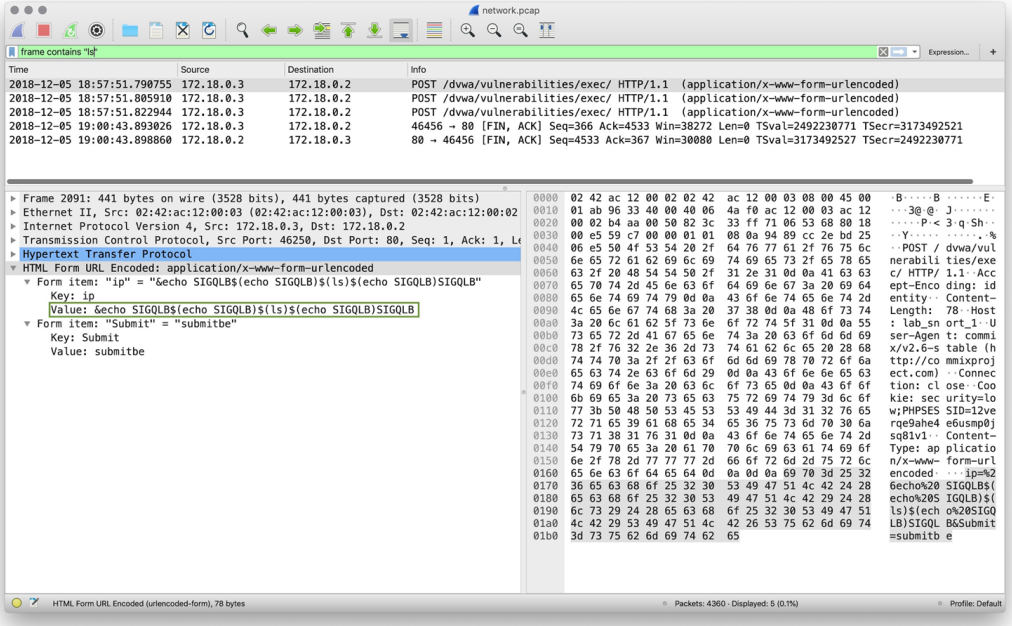
How can we confirm the snort alert is accurate?

Filtering on “Frame contains [bash-command]” gives us many packets showing bash command execution.

Try frame contains “echo” and frame contains ls.

Under the HTML Form URL Encoded: section we can see values entered such as &echo SIGQLB$ (echo SIGQLOLB)(ls)(echo SIGQLB)SIGQLB

These are code injection attempts. The alert is accurate.



Alert 4 Review

Can you verify whether or not sensitive data has been obtained by the attacker?

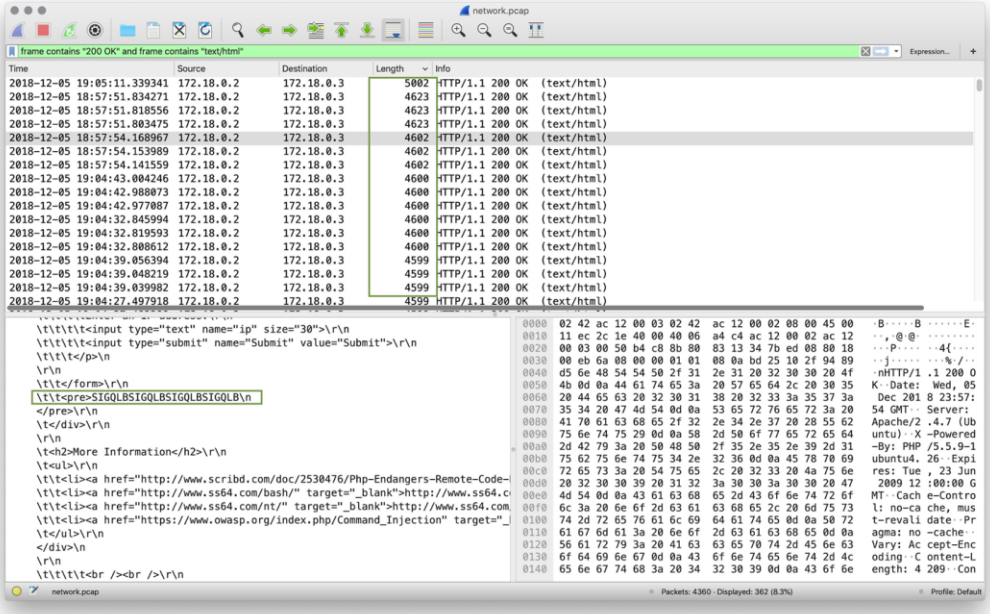
Alert 4 Review

Can you verify whether or not sensitive data has been obtained by the attacker?

Filtering for frame contains “200 OK” and frame contains “text/html”, we can see all the information returned by the server in it’s HTML content.

When we sort the packets by Length, we can see the largest packets returned which contain the most data.

It appears that the attacker only listed the contents of the webpage directory, but did not gain access to any sensitive data.



Alert 4 Review

Would you categorize this alert as a False Positive or a True Positive?

If this issue needs to be mitigated, what steps should be taken when the infected machine?

Would you categorize this issue as a Web, Email or Network attack?

Alert 4 Review

This is a True Positive, because the code injection was successful.**ositive?**

If this issue needs to be mitigated, what steps should be taken when the infected machine?

Would you categorize this issue as a Web, Email or Network attack?

Alert 4 Review

This is a True Positive, because the code injection was successful.**ositive?**

The internal machine that is attacking should be further investigated.**when the infected machine?**

The web server application needs to be secured and data input better sanitized on this page.

Would you categorize this issue as a Web, Email or Network attack?

Alert 4 Review

This is a True Positive, because the code injection was successful.**ositive?**

The internal machine that is attacking should be further investigated.**when the infected machine?**

The web server application needs to be secured and data input better sanitized on this page.

Would you categorize this issue as a Web, Email or Network attack?

This is a code injection attack on a Web Application. The most appropriate classification would be **Application Attack**.

Part 5: Alert 5!

In this activity, you will respond to an alert and determine is it is a false positive or a true positive.

Instructions sent via Slack

Today's exercises involve live malware.
Use your Ubuntu VM to work in a contained environment.

Suggested Time:
30 minutes

Alert 5 Review

What activity is Snort Reporting On?

What is the time and date of the alert?

Alert 5 Review

What activity is Snort Reporting On?

2 Count:1 Event#3.81745 2019-04-15 16:42 UTC
3 ETPRO CURRENT_EVENTS MalDoc Requesting Ursnif Payload 2018-09-24
...
10 Count:2 Event#3.81747 2019-04-15 16:42 UTC
11 ET POLICY Binary Download Smaller than 1 MB Likely Hostile
...
18 Count:31 Event#3.81749 2019-04-15 16:42 UTC
19 ET POLICY PE EXE or DLL Windows file download HTTP
...
34 Count:5 Event#3.81877 2019-04-15 16:43 UTC
35 ETPRO TROJAN Ursnif Variant CnC Beacon 8 M1

What is the time and date of the alert?

Alert 5 Review

What activity is Snort Reporting On?

2 Count:1 Event#3.81745 2019-04-15 16:42 UTC
3 ETPRO CURRENT_EVENTS MalDoc Requesting Ursnif Payload 2018-09-24
...
10 Count:2 Event#3.81747 2019-04-15 16:42 UTC
11 ET POLICY Binary Download Smaller than 1 MB Likely Hostile
...
18 Count:31 Event#3.81749 2019-04-15 16:42 UTC
19 ET POLICY PE EXE or DLL Windows file download HTTP
...
34 Count:5 Event#3.81877 2019-04-15 16:43 UTC
35 ETPRO TROJAN Ursnif Variant CnC Beacon 8 M1

What is the time and date of the alert?

2019-04-15 16:42 UTC

Alert 5 Review

What is the external IP address and port that Snort is flagging?

What is the internal IP address and port that Snort is flagging?

Alert 5 Review

What is the external IP address and port that Snort is flagging?

91.240.87.19:80 #Malware is downloaded from this IP:Port

37.230.112.226:80 #Malware reaches out to this IP:Port for CNC commands

```
# Malware is downloaded
10 Count:2 Event#3.81747 2019-04-15 16:42 UTC
11 ET POLICY Binary Download Smaller than 1 MB Likely Hostile
12 91.240.87.19 -> 10.0.90.175
13 IPVer=4 hlen=5 tos=0 dlen=1500 ID=0 flags=0 offset=0 ttl=0 chksum=40298
14 Protocol: 6 sport=80 -> dport=49201

# Reaching out for CNC commands
34 Count:5 Event#3.81877 2019-04-15 16:43 UTC
35 ETPRO TROJAN Ursnif Variant CnC Beacon 8 M1
36 10.0.90.175 -> 37.230.112.226
37 IPVer=4 hlen=5 tos=0 dlen=480 ID=0 flags=0 offset=0 ttl=0 chksum=48545
38 Protocol: 6 sport=49203 -> dport=80
```

What is the internal IP address and port that Snort is flagging?

Alert 5 Review

What is the external IP address and port that Snort is flagging?

91.240.87.19:80 #Malware is downloaded from this IP:Port

37.230.112.226:80 #Malware reaches out to this IP:Port for CNC commands

```
# Malware is downloaded
10 Count:2 Event#3.81747 2019-04-15 16:42 UTC
11 ET POLICY Binary Download Smaller than 1 MB Likely Hostile
12 91.240.87.19 -> 10.0.90.175
13 IPVer=4 hlen=5 tos=0 dlen=1500 ID=0 flags=0 offset=0 ttl=0 chksum=40298
14 Protocol: 6 sport=80 -> dport=49201

# Reaching out for CNC commands
34 Count:5 Event#3.81877 2019-04-15 16:43 UTC
35 ETPRO TROJAN Ursnif Variant CnC Beacon 8 M1
36 10.0.90.175 -> 37.230.112.226
37 IPVer=4 hlen=5 tos=0 dlen=480 ID=0 flags=0 offset=0 ttl=0 chksum=48545
38 Protocol: 6 sport=49203 -> dport=80
```

What is the internal IP address and port that Snort is flagging?

10.0.90.175 over port 49201 and 49203

Alert 5 Review

Use the pcap file to answer the following questions:

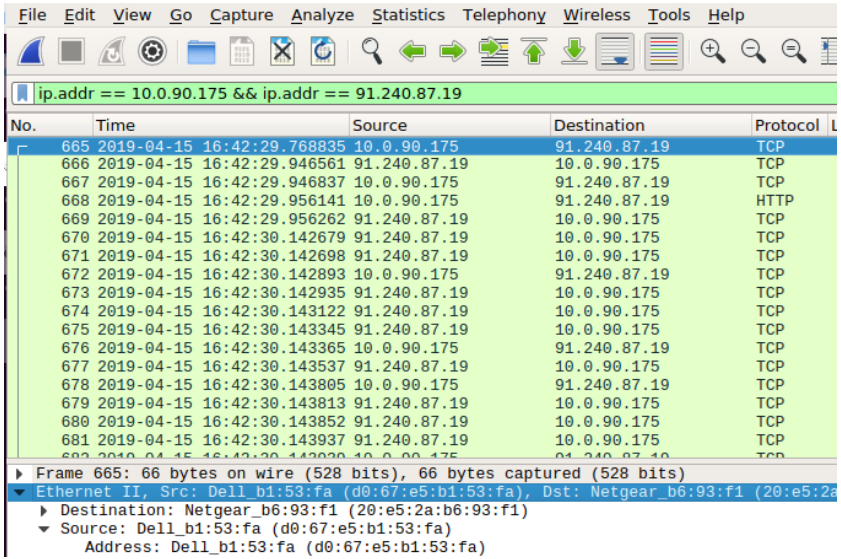
What is the MAC Address of the internal computer involved?

Alert 5 Review

Use the pcap file to answer the following questions:

What is the MAC Address of the internal computer involved?

Ethernet II, Src: Dell_b1:53:fa (d0:67:e5:b1:53:fa)



Alert 5 Review

Use the pcap file to answer the following questions:

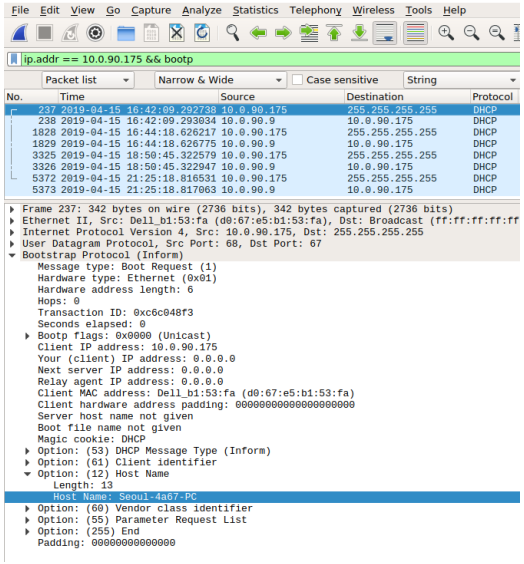
What is the host name of the internal machine?

Alert 5 Review

Use the pcap file to answer the following questions:

What is the host name of the internal machine?

Seoul-4a67-PC



Alert 5 Review

Can you confirm the date and time this issue occurred? Does it match the snort alert?

Alert 5 Review

Can you confirm the date and time this issue occurred? Does it match the snort alert?

```
2019-04-15 16:42 UTC # snort alert
...
 2 Count:1 Event#3.81745 2019-04-15 16:42 UTC
 3 ETPRO CURRENT_EVENTS MalDoc Requesting Ursnif Payload 2018-09-24
 4 10.0.90.175 -> 91.240.87.19
 5 IPVer=4 hlen=5 tos=0 dlen=131 ID=0 flags=0 offset=0 ttl=0 chksum=41667
 6 Protocol: 6 sport=49201 -> dport=80
 7
 8 Seq=0 Ack=0 Off=5 Res=0 Flags******** Win=0 urp=29384 chksum=0
```

Wireshark reports 2019-04-15 16:42:29.956141

ip.addr == 10.0.90.175 && ip.addr == 91.240.87.19 && http

No.	Time	Source	Destination	Protocc	Length	Info
668	2019-04-15 16:42:29.956141	10.0.90.175	91.240.87.19	HTTP	145	GET /skoex/po2.php?l=cupk6.fgs HTTP/1.1
997	2019-04-15 16:42:31.045091	91.240.87.19	10.0.90.175	HTTP	56	HTTP/1.1 200 OK

Alert 5 Review

Can you confirm if the Snort alert was accurate and malware was downloaded?

Alert 5 Review

Can you confirm if the Snort alert was accurate and malware was downloaded?

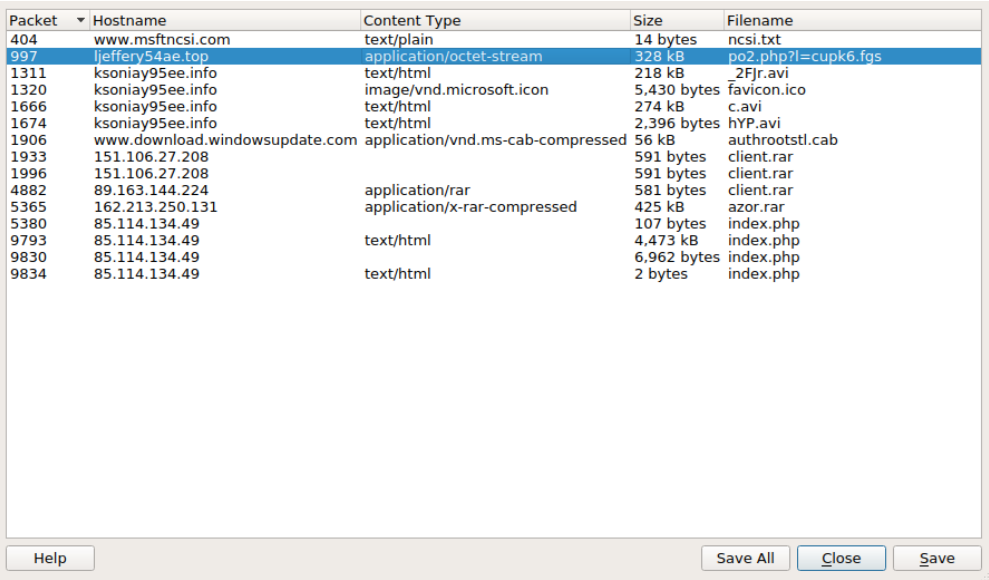
We can confirm that the Snort alert time was correct. We can follow the TCP stream and see that there was indeed a binary downloaded with the file name po2.php?1=cupk6.fgs:

```
GET /skoex/po2.php?l=cupk6.fgs HTTP/1.1
Host: ljeffery54ae.top
Connection: Keep-Alive

HTTP/1.1 200 OK
Date: Mon, 15 Apr 2019 16:40:40 GMT
Server: Apache/2.2.15 (CentOS)
X-Powered-By: PHP/7.2.17
Content-Description: File Transfer
Content-Disposition: attachment; filename="cupk6.fgs"
Expires: 0
Cache-Control: must-revalidate
Pragma: public
Content-Length: 328192
Connection: close
Content-Type: application/octet-stream

MZ.....@.....  .!..L.!This program cannot be run in DOS mode.

$.......p...4..I4..I4..I.vqI5..I9.iI#..I9.VI...I9.WI...I=.
%I-..I4..I...I7.SI5..I9.mI5..I7.hI5..IRich4..I........PE..L.....LS.................H..........-.......`....@.........................P............@.....
.........................`...........@.....................0......0c..
8.....................................@.............`.....................text....F.......H...................
..`.rdata..>....`.......L..............@..@.data...Lf...0...H..................@....rsrc...@.............`..............@..@.reloc.......
0.....................@..B.....................................................................................................................
.....................................................................................................................................................
.....................................................h.VB......Y.....h.VB......Y.....h.VB......Y......D$..V.....pB.t       V..........^.....D
$..T$....H.......T$.....t$.R.P..T$..H.;J.u...;.u.........2.....................D$.;H.u
```

Alert 5 Review

Can you confirm if the Snort alert was accurate and malware was downloaded?

We can export this file from wireshark, hash it and run the hash through virustotal to verify that it is malware:



Packet	Hostname	Content Type	Size	Filename
404	www.msftncsi.com	text/plain	14 bytes	ncsi.txt
997	ljeffery54ae.top	application/octet-stream	328 kB	po2.php?l=cupk6.fgs
1311	ksoniay95ee.info	text/html	218 kB	_2FJr.avi
1320	ksoniay95ee.info	image/vnd.microsoft.icon	5,430 bytes	favicon.ico
1666	ksoniay95ee.info	text/html	274 kB	c.avi
1674	ksoniay95ee.info	text/html	2,396 bytes	hYP.avi
1906	www.download.windowsupdate.com	application/vnd.ms-cab-compressed	56 kB	authrootstl.cab
1933	151.106.27.208		591 bytes	client.rar
1996	151.106.27.208		591 bytes	client.rar
4882	89.163.144.224	application/rar	581 bytes	client.rar
5365	162.213.250.131	application/x-rar-compressed	425 kB	azor.rar
5380	85.114.134.49		107 bytes	index.php
9793	85.114.134.49	text/html	4,473 kB	index.php
9830	85.114.134.49		6,962 bytes	index.php
9834	85.114.134.49	text/html	2 bytes	index.php

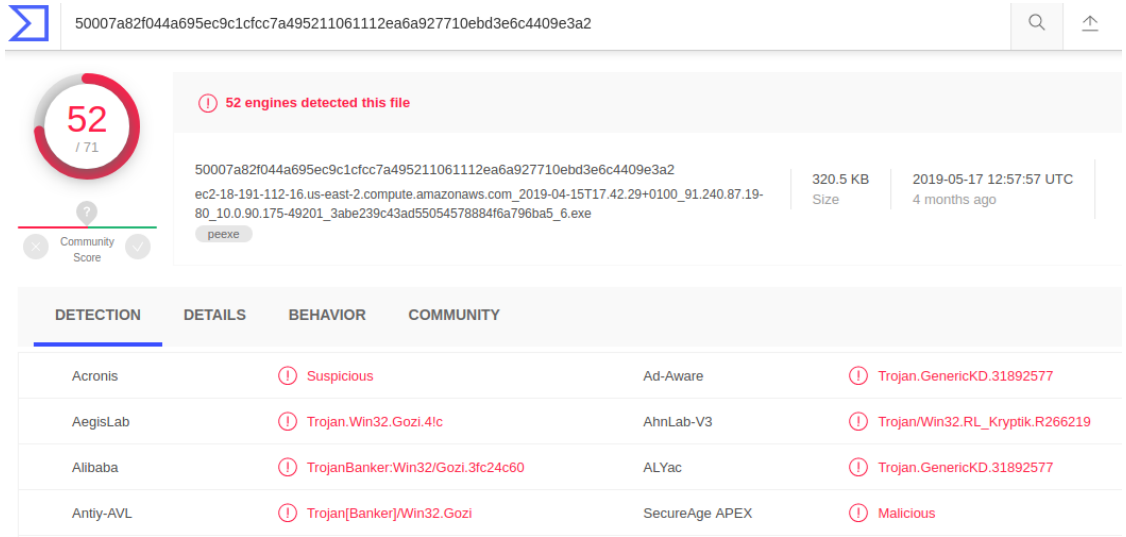
Help | Save All | Close | Save

Alert 5 Review

Can you confirm if the Snort alert was accurate and malware was downloaded?

```
# hash the file with md5sum
$ md5sum po2.php?1=cupk6.fgs
   3abe239c43ad55054578884f6a796ba5  po2.php%3fl=cupk6.fgs
```

Check with virustotal:



Alert 5 Review

Would you categorize this alert as a False Positive or a True Positive?

If this issue needs to be mitigated, what steps should be taken with the infected machine?

What steps should be taken in regards to network security?

Would you categorize this issue as a Web, Email or Network Attack?

Alert 5 Review

Would you categorize this alert as a False Positive or a True Positive?
This is a true positive because malware was downloaded.

If this issue needs to be mitigated, what steps should be taken with the infected machine?

What steps should be taken in regards to network security?

Would you categorize this issue as a Web, Email or Network Attack?

Alert 5 Review

Would you categorize this alert as a False Positive or a True Positive?

This is a true positive because malware was downloaded.

If this issue needs to be mitigated, what steps should be taken with the infected

This machine should be restored from a backup point before the incident.

What steps should be taken in regards to network security?

Would you categorize this issue as a Web, Email or Network Attack?

Alert 5 Review

Would you categorize this alert as a False Positive or a True Positive?

This is a true positive because malware was downloaded.

If this issue needs to be mitigated, what steps should be taken with the infected

This machine should be restored from a backup point before the incident.

What steps should be taken in regards to network security?

The IP address 91.240.87.19 and 37.230.112.226 should be blocked by a firewall.

Would you categorize this issue as a Web, Email or Network Attack?

Alert 5 Review

Would you categorize this alert as a False Positive or a True Positive?

This is a true positive because malware was downloaded.

If this issue needs to be mitigated, what steps should be taken with the infected

This machine should be restored from a backup point before the incident.

What steps should be taken in regards to network security?

The IP address 91.240.87.19 and 37.230.112.226 should be blocked by a firewall.

Would you categorize this issue as a Web, Email or Network Attack?

This is a trojan horse web attack because the malicious file was disguised as normal traffic, sent from a website while the user was browsing the site.