

Final Engagement

Attack, Defense & Analysis of a Vulnerable Network

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Table of Contents

This document contains the following resources:



Network Topology & Critical Vulnerabilities



Traffic Profile



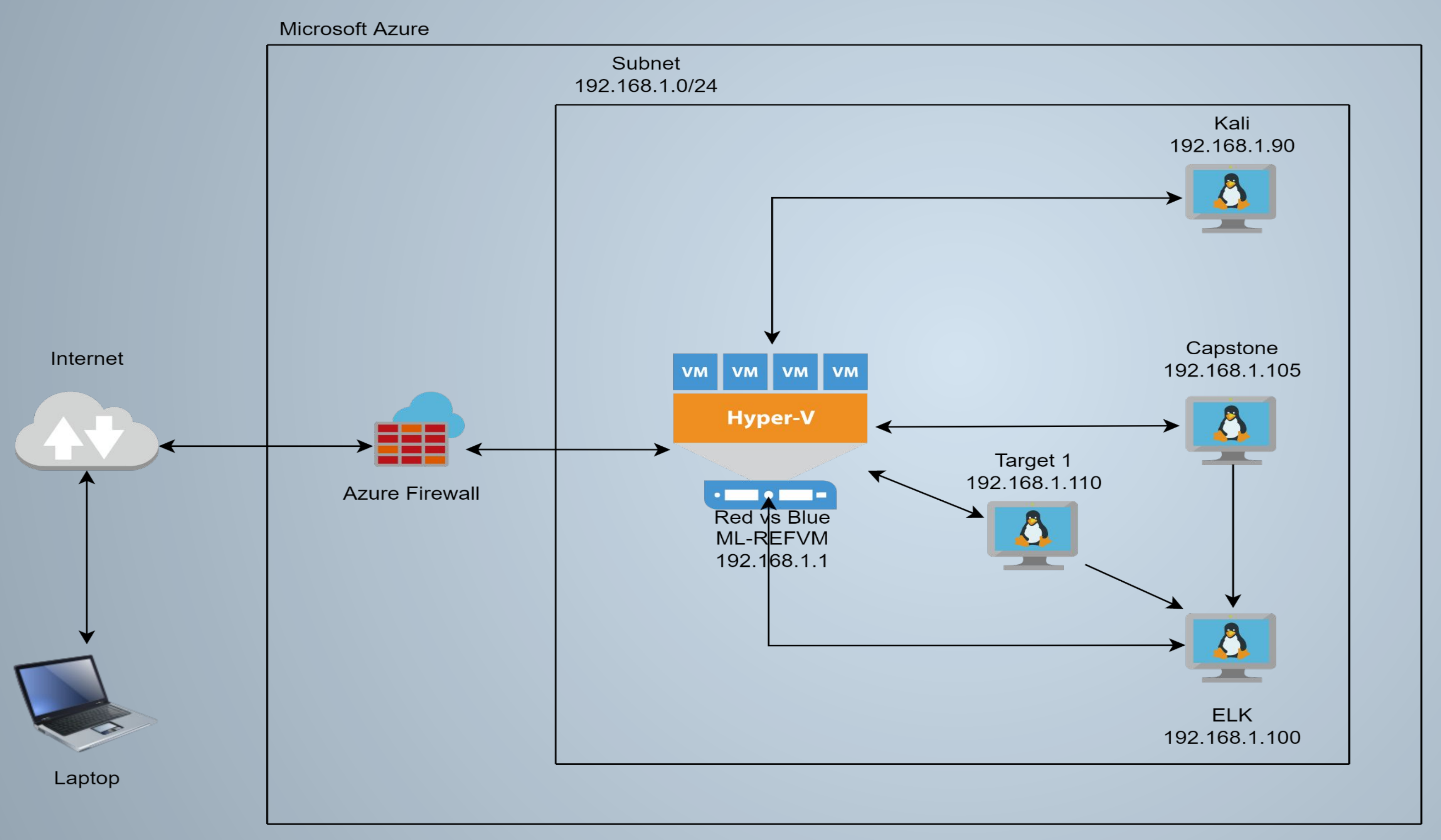
Normal Activity



Malicious Activity

Network Topology & Critical Vulnerabilities

Network Topology



Network

Address Range:
192.168.1.0/24
Netmask: 255.255.255.0
Gateway: 192.168.1.90

Machines

IPv4: 192.168.1.90
OS: Kali Linux
Hostname: Kali

IPv4: 192.168.1.100
OS: Ubuntu 18.04
Hostname: ELK

IPv4: 192.168.1.105
OS: Ubuntu 18.04
Hostname: Capstone

IPv4: 192.168.1.115
OS: Debian/GNU Linux
Hostname: Target 1

Critical Vulnerabilities: Target 1

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

Vulnerability	Description	Impact
Unnecessary Service Running	Open SSH Port 22	Allowed the attacker to gain internal access
Wordpress User Enumeration	wpscan was used to enumerate web server users	Michael and Steven's usernames we exposed
Weak Password Policy CWE-521	Weak password requirements	Michael's password was easily guessed, Steven's password was cracked
Plaintext Storage of a Password CWE-256	Storing a password in plaintext may result in a system compromise	Attacker logged into mySQL with root access

Critical Vulnerabilities: Target 1

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

Vulnerability	Description	Impact
Use of a One-Way Hash without a Salt CWE-759 Use of Weak Hash CWE-328	This makes it easier for attackers to pre-compute the hash value using dictionary attack techniques and or determine the original input	Michael and Steven's usernames we exposed
Escalation of Privileges	Executed " sudo python -c 'import pty;pty.spawn ("bin/bash")' "	Attacker was able to gain root access and take complete control of the system

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 & 185.243.115.84 166.62.111.64	Machines that sent the most traffic.
Most Common Protocols	TLS(7272), HTTP(2848), NetBIOS Service Session	Three most common protocols on the network.
# of Unique IP Addresses	810	Count of observed IP addresses.
Subnets	/24	Observed subnet ranges.
# of Malware Species	1	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.

“Normal” Activity

- Watching YouTube
- Sending images
- Browsing websites

Suspicious Activity

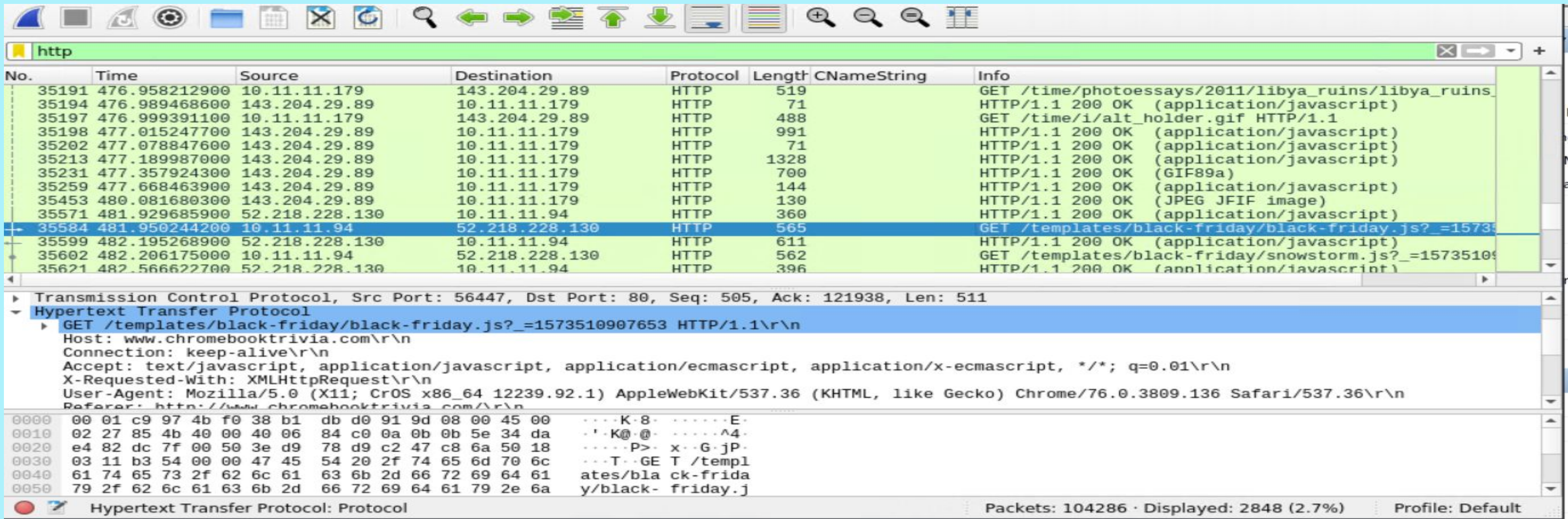
- Sending malware file (june11.dll)
- Downloaded torrent file (Betty_Boop_Rythm_on_the_Reservation.avi.torrent)
- frank-n-ted.com

Normal Activity

Normal Behavior #1

Summarize the following:

- We observed normal traffic such as web browsing. In these packets the GET method was used to access several websites.
- An example of this is a user accessing website: www.chromebooktrivia.com
- The user specifically accessed a Black Friday shopping website.



Normal Behavior #2

Summarize the following:

- We observed the user utilizing HTTP protocols to look at images.
- The user visited the following website: cdn.iphonehacks.com that contained pictures of an Apple watch series 5 case.

No.	Time	Source	Destination	Protocol	Length	CNameString	Info
43050	543.993551500	94.31.29.96	10.11.11.217	HTTP	832		HTTP/1.1 200 OK (PNG)
43053	544.026431700	94.31.29.96	10.11.11.217	HTTP	237		HTTP/1.1 200 OK (JPEG JFIF image)
43060	544.069269700	94.31.29.96	10.11.11.217	HTTP	619		HTTP/1.1 200 OK (JPEG JFIF image)
43063	544.106499700	10.11.11.217	94.31.29.96	HTTP	507		GET /wp-content/uploads/2019/10/note10plus-iphone1
43064	544.112372700	94.31.29.96	10.11.11.217	HTTP	367		HTTP/1.1 200 OK (JPEG JFIF image)
43065	544.120419400	10.11.11.217	94.31.29.96	HTTP	501		GET /wp-content/uploads/2019/07/macbook-pro-2019-6
43070	544.132292500	10.11.11.217	94.31.29.96	HTTP	495		GET /wp-content/uploads/2019/11/BentoStack-67x67.j
43071	544.141618200	10.11.11.217	94.31.29.96	HTTP	593		GET /wp-content/uploads/2019/09/Apple_watch_series
43076	544.187850800	94.31.29.96	10.11.11.217	HTTP	272		HTTP/1.1 200 OK (JPEG JFIF image)
43079	544.224233100	94.31.29.96	10.11.11.217	HTTP	450		HTTP/1.1 200 OK (JPEG JFIF image)
43085	544.237248300	10.11.11.217	94.31.29.96	HTTP	503		GET /wp-content/uploads/2019/02/AirPods-Ear-Covers
43087	544.251728500	10.11.11.217	94.31.29.96	HTTP	496		GET /wp-content/uploads/2018/02/appleglassdisplay.
43092	544.330712500	94.31.29.96	10.11.11.217	HTTP	292		HTTP/1.1 200 OK (JPEG JFIF image)
43094	544.361281100	94.31.29.96	10.11.11.217	HTTP	503		HTTP/1.1 200 OK (JPEG JFIF image)

Frame 43071: 593 bytes on wire (4744 bits), 593 bytes captured (4744 bits) on interface eth0, id 0

Ethernet II, Src: Apple_ac:b2:49 (e8:b2:ac:ac:b2:49), Dst: Cisco_97:4b:f0 (00:01:c9:97:4b:f0)

Internet Protocol Version 4, Src: 10.11.11.217, Dst: 94.31.29.96

Transmission Control Protocol, Src Port: 62539, Dst Port: 80, Seq: 1363, Ack: 10397, Len: 539

Hypertext Transfer Protocol

GET /wp-content/uploads/2019/09/Apple_watch_series_5-gold-aluminum-case-pomegranate-band-and-space-gray-aluminum-case-pine-green-band-091019-67x67.jpg HTTP/1.1

Host: cdn.iphonehacks.com\r\n

Connection: keep-alive\r\n

0000	00 01 c9 97 4b f0 e8 b2 ac ac b2 49 08 00 45 02	...K... ..I..E..
0010	02 43 00 00 40 00 40 06 a7 50 0a 0b 0b d9 5e 1f	.C..@..@..P....^.
0020	1d 60 f4 4b 00 50 9d 91 ee 9a c0 1a 62 10 50 18	..K.P... ..b.P..
0030	08 00 09 2d 00 00 47 45 54 20 2f 77 70 2d 63 6fGE T /wp-co
0040	6e 74 65 6e 74 2f 75 70 6c 6f 61 64 73 2f 32 30	ntent/up loads/20
0050	31 39 2f 30 39 2f 41 70 70 6c 65 5f 77 61 74 63	19/09/Apple_watc

Hypertext Transfer Protocol: Protocol

Packets: 104286 · Displayed: 2848 (2.7%)

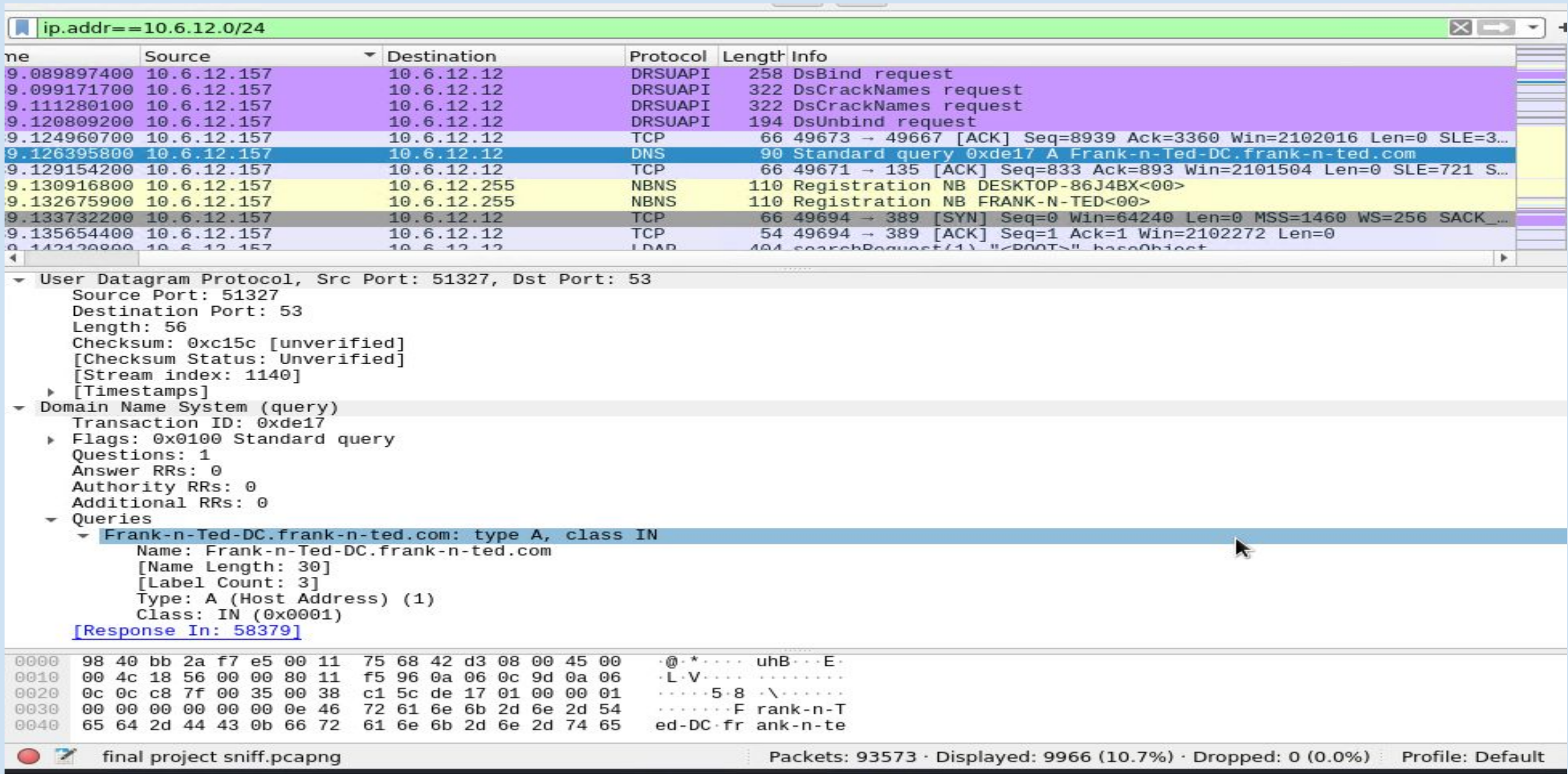
Profile: Default

Malicious Activity

Malicious Behavior #1

Summarize the following:

- We observed traffic containing malicious activity containing the protocols HTTP.
 - What, specifically, was the user doing? Which site were they browsing? Etc
 - The user was trying to send a malicious file containing a trojan through the network, that was captured in the HTTP protocol. The user also created their own website, in which they navigated into it multiple times.
- <http://205.185.125.104/files/june11.dll>
 - matthijs.devries
 - <http://frank-n-ted-dc.frank-n-ted.com>



Malicious Behavior #1 Cont.

The image shows a Wireshark network traffic capture. The top pane displays a list of network packets. The selected packet (No. 58752) is an HTTP GET request from 10.6.12.203 to 205.185.125.104 for the file /files/june11.dll. The bottom pane shows the details of this packet, including the Hypertext Transfer Protocol section with the full request URI: http://205.185.125.104/files/june11.dll. The packet bytes pane at the bottom shows the raw data of the request.

No.	Time	Source	Destination	Protocol	Length	CNameString	Info
12825	194.257406900	172.16.4.205	93.95.100.178	HTTP	419		GET /docs/article.php?y=241&c=123080&m=8491edf39d1a8b498bb
38941	508.067091600	10.11.11.195	12.133.50.21	HTTP	478		GET /docs/envelope_icon.png HTTP/1.1
39910	515.908130400	10.11.11.195	12.133.50.21	HTTP	520		GET /docs/health-bk.jpg HTTP/1.1
39016	508.582554300	10.11.11.195	12.133.50.21	HTTP	474		GET /docs/menu_lock.png 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=40C236A13
67493	754.296424700	10.0.0.201	151.139.242.30	HTTP	427		GET /eminimalls/mm.js HTTP/1.1
35045	475.453369600	10.11.11.179	13.33.255.25	HTTP	421		GET /epq2dmc.js HTTP/1.1
67807	756.854476400	10.0.0.201	168.215.194.14	HTTP	336		GET /favicon.ico HTTP/1.1
58752	658.636633700	10.6.12.203	205.185.125.104	HTTP	312		GET /files/june11.dll HTTP/1.1
3664	51.890703500	172.16.4.205	209.197.3.15	HTTP	411		GET /font-awesome/latest/css/font-awesome.min.css?ver=5.2.
42311	537.964672800	10.11.11.179	34.98.72.95	HTTP	485		GET /fonts/robotoc condensed_700_bold_normal/robotoc condensed
42283	537.735996000	10.11.11.179	34.98.72.95	HTTP	486		GET /fonts/robotoc condensed_700_bold_normal/stylesheet.css
6038	84.777039000	172.16.4.205	54.230.89.184	HTTP	416		GET /forms-cache/139743/182416/index-1469573231.html HTTP/

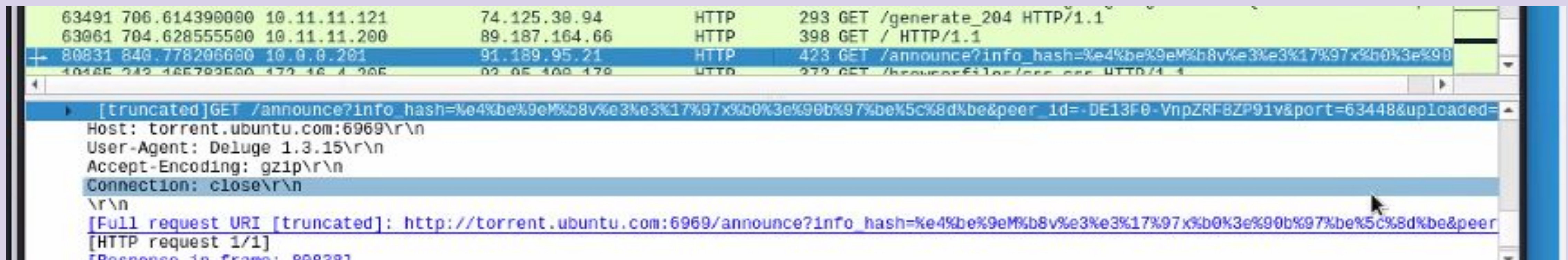
Urgent pointer: 0
[SEQ/ACK analysis]
[Timestamps]
TCP payload (258 bytes)
Hypertext Transfer Protocol
GET /files/june11.dll HTTP/1.1\r\n
Accept: */*\r\n
Accept-Encoding: gzip, deflate\r\n
User-Agent: Mozilla/4.0 (compatible; MSIE 7.0; Windows NT 10.0; WOW64; Trident/7.0; .NET4.0C; .NET4.0E)\r\n
Host: 205.185.125.104\r\n
Connection: Keep-Alive\r\n
Cookie: _subid=3mmhfnd8jp\r\n
[Full request URI: http://205.185.125.104/files/june11.dll]
[HTTP request 2/2]
[Prev request in frame: 58748]

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

Malicious Behavior #2

Summarize the following:

- We observed traffic containing packets with HTTP protocols.
- The user was downloading files through torrent which could contain malicious content. They were trying to access the following websites containing torrent files.
 - /bt/btdownload.php?type=torrent&file=Betty_Boop_Rythm_on_the_Reservation.avi.torrent
 - orrent.org
 - publicdomaintorrents.info,
- Impact: Torrent files are open source and anyone can upload or download anything, which could potentially contain malicious content and unbeknownst to the recipient.



Malicious Behavior #2 Cont.

No.	Time	Source	Destination	Protocol	Length	Info
69142	765.263272500	10.0.0.201	168.215.194.14	HTTP	471	GET /yellow-star.gif HTTP/1.1
69150	765.279673000	10.0.0.201	172.217.9.2	HTTP	434	GET /pagead/show_ads.js HTTP/1.1
69155	765.290109300	10.0.0.201	50.18.44.131	HTTP	412	GET /tools/diggthis.js HTTP/1.1
69167	765.416418700	10.0.0.201	168.215.194.14	HTTP	500	GET /grabs/bettybooprythmonthereservationgrab.jpg HTTP/1.1
69213	765.837950500	10.0.0.201	168.215.194.14	HTTP	465	GET /divxi.jpg HTTP/1.1
69298	766.857868300	10.0.0.201	52.94.240.125	HTTP	415	GET /s/ads.js HTTP/1.1
69347	767.585292600	10.0.0.201	168.215.194.14	HTTP	531	GET /usercomments.html?movieid=513 HTTP/1.1
69434	768.625230500	10.0.0.201	52.94.240.125	HTTP	427	GET /s/ads-common.js HTTP/1.1
69470	768.919511100	10.0.0.201	72.21.202.62	HTTP	885	GET /e/cm?t=publicdomain-20&o=1&p=48&l=op1&pvid=40C236A13FDD0B68&ref-ur...
69542	769.560506300	10.0.0.201	52.94.233.131	HTTP	1067	GET /1/associates-ads/1/OP/?cb=1531628232887&p=%7B%22program%22%3A%221%2...
69706	770.366956400	10.0.0.201	168.215.194.14	HTTP	589	GET /bt/btdownload.php?type=torrent&file=Betty_Boop_Rhythm_on_the_Reserv...
69750	770.563257500	10.0.0.201	140.211.166.134	HTTP	195	GET /version-1.0 HTTP/1.1
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%b0%3e%90b%97%be%5c%8...
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%81%5c%7d2%ee%836o%03%
70040	774.203040000	10.0.0.201	168.215.194.14	HTTP	434	GET /bt/announce.php?info_hash=%1d%da%0dH%a8%98%bd%81%5c%7d2%ee%836o%03%
[Time since first frame in this TCP stream: 0.012269100 seconds]						
[Time since previous frame in this TCP stream: 0.009429400 seconds]						
TCP payload (535 bytes)						
Hypertext Transfer Protocol						
GET /bt/btdownload.php?type=torrent&file=Betty_Boop_Rhythm_on_the_Reservat...						
[Expert Info (Chat/Sequence): GET /bt/btdownload.php?type=torrent&file=Betty_Boop_Rhythm_on_the_Reservat...						
[GET /bt/btdownload.php?type=torrent&file=Betty_Boop_Rhythm_on_the_Reservat...						
[Severity level: Chat]						
[Group: Sequence]						
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 18P...%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				
0060	65 74 74 79 5f 42 6f 6f 70 5f 52 68 79 74 68 6d	etty_Boo p_Rhythm				
0070	5f 6f 6e 5f 74 68 65 5f 52 65 73 65 72 76 61 74	_on_the_ Reservat				
0080	69 6f 6e 2e 61 76 69 2e 74 6f 72 72 65 6e 74 20	ion.avi. torrent				
0090	48 54 54 50 2f 31 2e 31 0d 0a 52 65 66 65 72 65	HTTP/1.1 ..Refere				
00a0	72 3a 20 68 74 74 70 3a 2f 2f 70 75 62 6c 69 63	r: http: //public				
00b0	64 6f 6d 61 69 6e 74 6f 72 72 65 6e 74 73 2e 69	domaino rrents.i				

FinalProject.pcapng

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

http

Return the main window text to its normal size

No.	Time	Source	Destination	Protocol	Length	Info
6111	52.058967500	10.0.0.201	72.21.91.29	HTTP	288	GET /MFEwTzBNMEswSTAJBgUrDgMCGGUABBSAUQYBMq2awn1Rh6Doh%2FsBY
6115	52.066264400	10.0.0.201	72.21.91.29	HTTP	290	GET /MFEwTzBNMEswSTAJBgUrDgMCGGUABBTBL0V27RVZ7LBduom%2FnYB45
6138	52.295375300	10.0.0.201	72.21.91.29	HTTP	292	GET /MFEwTzBNMEswSTAJBgUrDgMCGGUABBTnvAI%2FnN49qPTJY2qTQtfkL
78115	822.536769200	10.0.0.201	168.215.194.14	HTTP	463	GET /nshowcat.html?category=animation HTTP/1.1
78129	822.646544400	10.0.0.201	168.215.194.14	HTTP	474	GET /srsbanner.gif HTTP/1.1
78155	822.881941300	10.0.0.201	168.215.194.14	HTTP	477	GET /grabs/hdsale.png HTTP/1.1
78183	823.086998000	10.0.0.201	168.215.194.14	HTTP	469	GET /ipod.jpg HTTP/1.1
78195	823.094076000	10.0.0.201	168.215.194.14	HTTP	469	GET /ipod.jpg HTTP/1.1

Accept-Encoding: gzip, deflate\r\n

Host: publicdomaintorrents.info\r\n

Connection: Keep-Alive\r\n

\r\n

[Full request URI: http://publicdomaintorrents.info/nshowcat.html?category=animation]

[HTTP request 1/3]

[Response in frame: 78153]

[Next request in frame: 78155]

0000

00 09 b7 27 a1 3e 00 16 17 18 66 c8 08 00 45 00

...'.>...f...E.

0010

01 c1 76 34 40 00 80 06 0d 54 0a 00 00 c9 a8 d7

..v4@...T.....

0020

c2 0e c2 5d 00 50 78 06 e8 5c 02 e3 57 71 50 18

...]Px...WqP.

0030

ff ff 78 fc 00 00 47 45 54 20 2f 6e 73 68 6f 77

..x...GE T /nshow

0040

63 61 74 2e 68 74 6d 6c 3f 63 61 74 65 67 6f 72

cat.html ?categor

0050

79 3d 61 6e 69 6d 61 74 69 6f 6e 20 48 54 54 50

y=animat ion HTTP

0060

2f 31 2e 31 0d 0a 55 73 65 72 2d 41 67 65 6e 74

/1.1..Us er-Agent

0070

3a 20 4d 6f 7a 69 6c 6c 61 2f 35 2e 30 20 28 57

: Mozill a/5.0 (W

0080

69 6e 64 6f 77 73 20 4e 54 20 31 30 2e 30 3b 20

indows N T 10.0;

0090

57 69 6e 36 34 3b 20 78 36 34 29 20 41 70 70 6c

Win64; x 64) Appl

Hypertext Transfer Protocol: Protocol

Packets: 111010 · Displayed: 4926 (4.4%) · Profile: Default



The End