

First packets in program vs in the .pcap file

Wireshark packet list and packet details for the first packets in the .pcap file.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.118.20.110	10.118.255.255	UDP	82	57621 → 57621 Len=40
2	0.000214	10.118.48.70	10.118.255.255	UDP	56	5475 → 5474 Len=5
3	0.001503	129.21.75.8	255.255.255.255	GVCP	56	> DISCOVERY_CMD
4	0.001503	129.21.72.144	129.21.75.255	UDP	305	54915 → 54915 Len=263
5	0.001503	129.21.74.154	255.255.255.255	SSDP	447	NOTIFY * HTTP/1.1
6	0.001503	10.118.2.236	10.118.255.255	NBNS	110	Registration NB 80699800E<00>
7	0.001503	129.21.75.8	255.255.255.255	UDP	56	49067 → 21543 Len=13
8	0.070556	129.21.52.19	239.255.255.250	UDP	77	59328 → 15600 Len=35
9	0.102416	10.118.56.19	10.118.255.255	NBNS	110	Release NB MACBOOKPRO-B41A<00>
10	0.104298	10.118.0.76	10.118.255.255	NBNS	92	Name query NB WORKGROUP<id>
11	0.205073	10.118.62.3	10.118.255.255	UDP	82	57621 → 57621 Len=40
12	0.207199	129.21.134.239	129.21.127.255	BROWSER	237	Browser Election Request
13	0.207199	129.21.124.239	129.21.127.255	NBNS	110	Registration NB <01><02>_MSBROWSE_<02><01>
14	0.207199	129.21.125.79	129.21.127.255	NBNS	110	Release NB JACKS-AIR-2<00>
15	0.243207	fe80::b56a:c620:175e::ff02::1:3	ff02::1:3	LLMNR	95	Standard query 0xa21e A BRW402343681288
16	0.283432	129.21.65.139	239.255.255.250	UDP	77	39865 → 15600 Len=35
17	0.307167	129.21.126.227	129.21.127.255	BROWSER	216	get Backup List Request
18	0.308447	129.21.73.9	129.21.75.255	UDP	202	63623 → 51007 Len=160
19	0.308447	10.117.34.76	10.117.255.255	UDP	82	57621 → 57621 Len=40
20	0.308447	129.21.105.235	224.0.0.252	LLMNR	75	Standard query 0xa21e A BRW402343681288
21	0.308447	10.118.24.36	10.118.255.255	UDP	82	57621 → 57621 Len=40
22	0.308447	129.21.74.22	129.21.75.255	NBNS	110	Registration NB MACBOOKPRO-A93F<00>
23	0.338206	fe80::32b6:4f0f:ea8::ff02::1:1	ff02::1:1	ICMPv6	134	Router Advertisement from 30:b6:4f:86:fe2d

Packet details for Frame 1:

- > Frame 1: 82 bytes on wire (656 bits), 82 bytes captured (656 bits)
- > Ethernet II, Src: ca:72:5c:c2:bb:a6 (ca:72:5c:c2:bb:a6), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
- > Internet Protocol Version 4, Src: 10.118.20.110, Dst: 10.118.255.255
- > User Datagram Protocol, Src Port: 57621, Dst Port: 57621
- > Data (40 bytes)

Packet bytes (hex and ASCII):

Offset	Hex	ASCII
0000	ff ff ff ff ff ca 72 5c c2 bb a6 08 00 45 00E
0010	00 44 bd 71 40 00 40 11 53 de 0a 76 14 6e 0a 76	D q @ 0 S : v n v
0020	ff ff e1 15 e1 15 00 30 13 id 53 70 6f 74 55 640 : spot id
0030	70 30 23 aa 39 a0 d4 0a 0d f7 00 01 00 01 be	p @ 9 :A
0040	e5 19 2d 77 b8 80 6d 67 c2 44 31 73 7e c8 29 69	...w : mg D1 s ~ j
0050	23 04	.

```
Command Prompt

C:\Users\clark\OneDrive\Documents\Networks\hw01\database_hw1>python pktsniffer.py -r network_data.pcap
Provided file name: network_data.pcap
Number of packets remaining after filtering: 552
Headers for packet number 1

Ether / IP / UDP 10.118.20.110:57621 > 10.118.255.255:57621 / Raw
IP / UDP 10.118.20.110:57621 > 10.118.255.255:57621 / Raw
UDP 10.118.20.110:57621 > 10.118.255.255:57621 / Raw

Headers for packet number 2

Ether / IP / UDP 10.118.48.70:5475 > 10.118.255.255:5474 / Raw / Padding
IP / UDP 10.118.48.70:5475 > 10.118.255.255:5474 / Raw / Padding
UDP 10.118.48.70:5475 > 10.118.255.255:5474 / Raw / Padding

Headers for packet number 3

Ether / IP / UDP 129.21.75.8:57226 > 255.255.255.255:3956 / Raw / Padding
IP / UDP 129.21.75.8:57226 > 255.255.255.255:3956 / Raw / Padding
UDP 129.21.75.8:57226 > 255.255.255.255:3956 / Raw / Padding

Headers for packet number 4

Ether / IP / UDP 129.21.72.144:54915 > 129.21.75.255:54915 / Raw
IP / UDP 129.21.72.144:54915 > 129.21.75.255:54915 / Raw
UDP 129.21.72.144:54915 > 129.21.75.255:54915 / Raw

Headers for packet number 5
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Last packets in program vs in the .pcap file

> Frame 1: 82 bytes on wire (656 bits), 82 bytes captured (656 bits)
 > Ethernet II, Src: ca:72:5c:2:bba:6 (ca:72:5c:2:bba:6), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
 > Internet Protocol Version 4, Src: 10.118.20.110, Dst: 10.118.255.255
 > User Datagram Protocol, Src Port: 57621, Dst Port: 57621
 > Data (40 bytes)

0000	ff ff ff ff ff ff	ca 72	5c 2b	a6 08	00 45	00	rE
0010	00 44 bd 71 40 00 40 11	53 de	7a 76	14 6e	04 76		D-qq @ S-v n-v
0020	00 ff ff 1e 15 10 00 31	13 d3	50 70	67 74	55 64	0 -Spotdd
0030	70 32 33 a9 0d a4 04 0a	bd f7	00 01	00 00	c1 b9		p0e:-S.....
0040	e5 19 26 77 b8 08 6d 67	c2 44	31 73	78 c8	29 69		-w-mg [Dls-]>L
0050	23 04						

Showing the -c flag in use. The original has 500+ packets but the programs only has 10, as designated

o.	Time	Source	Destination	Protocol	Length	Info
531	6.354080	10.118.18.82	255.255.255.255	UDP	90	48821 → 8888 Len=48
532	6.354080	10.118.38.206	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
533	6.354080	10.118.7.150	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
534	6.354080	129.21.73.157	129.21.75.255	UDP	305	54915 → 54915 Len=263
535	6.354080	10.118.21.10	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
536	6.451727	129.21.104.26	129.21.107.255	UDP	305	54915 → 54915 Len=263
537	6.453945	10.118.45.122	10.118.255.255	UDP	82	57621 → 57621 Len=40
538	6.453945	10.118.28.148	10.118.255.255	NBNS	92	Name query NB <01><02>__MSBROWSE__<02><01>
539	6.453945	10.117.31.80	10.117.255.255	NBNS	110	Registration NB MAC-4375B4<00>
540	6.453945	10.118.2.202	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
541	6.453945	10.118.39.208	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
542	6.453945	10.118.62.39	10.118.255.255	UDP	82	57621 → 57621 Len=40
543	6.453945	10.118.62.39	10.118.255.255	UDP	82	57621 → 57621 Len=40
544	6.453945	10.118.37.79	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
545	6.454037	10.118.22.136	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
546	6.554128	10.118.1.50	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
547	6.555857	129.21.74.22	129.21.75.255	NBNS	92	Name query NB WORKGROUP<1d>
548	6.555857	129.21.74.22	129.21.75.255	NBNS	92	Name query NB WORKGROUP<1d>
549	6.555857	129.21.74.22	129.21.75.255	BROWSER	216	Get Backup List Request
550	6.555857	129.21.74.22	129.21.75.255	BROWSER	216	Get Backup List Request
551	6.559031	10.118.43.72	10.118.255.255	DB-LSP...	176	Dropbox LAN sync Discovery Protocol, JSON
552	6.656900	10.118.60.245	10.118.255.255	UDP	82	57621 → 57621 Len=40

```

Command Prompt
Ether / IP / UDP / NBNSHeader / Register Unique name b'8N609800L0' at 10.118.2.236
IP / UDP / NBNSHeader / Register Unique name b'8N609800L0' at 10.118.2.236
UDP / NBNSHeader / Register Unique name b'8N609800L0' at 10.118.2.236

Headers for packet number 7
Ether / IP / UDP 129.21.75.8:49667 > 255.255.255.255:21543 / Raw / Padding
IP / UDP 129.21.75.8:49667 > 255.255.255.255:21543 / Raw / Padding
UDP 129.21.75.8:49667 > 255.255.255.255:21543 / Raw / Padding

Headers for packet number 8
Ether / IP / UDP 129.21.52.19:59328 > 239.255.255.250:15600 / Raw
IP / UDP 129.21.52.19:59328 > 239.255.255.250:15600 / Raw
UDP 129.21.52.19:59328 > 239.255.255.250:15600 / Raw

Headers for packet number 9
Ether / IP / UDP 10.118.56.19:netbios_ns > 10.118.255.255:netbios_ns / NBNSHeader / Raw
IP / UDP 10.118.56.19:netbios_ns > 10.118.255.255:netbios_ns / NBNSHeader / Raw
UDP 10.118.56.19:netbios_ns > 10.118.255.255:netbios_ns / NBNSHeader / Raw

Headers for packet number 10
Ether / IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'

C:\Users\clark\OneDrive\Documents\Networks\hw01\database_hw1>

```

Showing usage of the port filter. The port filter removed about half of the packets, which are ones that had a port that did not match.

```
Command Prompt

Ether / IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'

Headers for packet number 277

Ether / IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'

Headers for packet number 278

Ether / IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'

Headers for packet number 279

Ether / IP / UDP / NBTDatagram / SMB_Header / Tran b'\\MAILSLOT\\BROWSE' GetBackupListRequest
IP / UDP / NBTDatagram / SMB_Header / Tran b'\\MAILSLOT\\BROWSE' GetBackupListRequest
UDP / NBTDatagram / SMB_Header / Tran b'\\MAILSLOT\\BROWSE' GetBackupListRequest

Headers for packet number 280

Ether / IP / UDP 10.118.60.245:57621 > 10.118.255.255:57621 / Raw
IP / UDP 10.118.60.245:57621 > 10.118.255.255:57621 / Raw
UDP 10.118.60.245:57621 > 10.118.255.255:57621 / Raw
```

No.	Time	Source	Destination	Protocol	Length	Info
531	6.354080	10.118.18.82	255.255.255.255	UDP	90	48821 → 8888 Len=48
532	6.354080	10.118.38.206	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
533	6.354080	10.118.7.150	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
534	6.354080	129.21.73.157	129.21.75.255	UDP	305	54915 → 54915 Len=263
535	6.354080	10.118.21.10	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
536	6.451727	129.21.104.26	129.21.107.255	UDP	305	54915 → 54915 Len=263
537	6.453945	10.118.45.122	10.118.255.255	UDP	82	57621 → 57621 Len=40
538	6.453945	10.118.28.148	10.118.255.255	NBNS	92	Name query NB <01><02>__MSBROWSE__<02><01>
539	6.453945	10.117.31.80	10.117.255.255	NBNS	110	Registration NB MAC-4375B4<00>
540	6.453945	10.118.2.202	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
541	6.453945	10.118.39.208	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
542	6.453945	10.118.62.39	10.118.255.255	UDP	82	57621 → 57621 Len=40
543	6.453945	10.118.62.39	10.118.255.255	UDP	82	57621 → 57621 Len=40
544	6.453945	10.118.37.79	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
545	6.454037	10.118.22.136	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
546	6.554128	10.118.1.50	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
547	6.555857	129.21.74.22	129.21.75.255	NBNS	92	Name query NB WORKGROUP<1d>
548	6.555857	129.21.74.22	129.21.75.255	NBNS	92	Name query NB WORKGROUP<1d>
549	6.555857	129.21.74.22	129.21.75.255	BROWSER	216	Get Backup List Request
550	6.555857	129.21.74.22	129.21.75.255	BROWSER	216	Get Backup List Request
551	6.559031	10.118.43.72	10.118.255.255	DB-LSP_	176	Dropbox LAN sync Discovery Protocol, JSON
552	6.656900	10.118.60.245	10.118.255.255	UDP	82	57621 → 57621 Len=40

Showing use of protocol sorting by only tcp protocol. This removed about half of the packets since these packets had no tcp protocol

```

Command Prompt
Ether / IP / UDP 10.118.62.39:57621 > 10.118.255.255:57621 / Raw
IP / UDP 10.118.62.39:57621 > 10.118.255.255:57621 / Raw
UDP 10.118.62.39:57621 > 10.118.255.255:57621 / Raw

Headers for packet number 285

Ether / IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'

Headers for packet number 286

Ether / IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'

Headers for packet number 287

Ether / IP / UDP / NBTDatagram / SMB_Header / Tran b'\\MAILSLOT\\BROWSE' GetBackupListRequest
IP / UDP / NBTDatagram / SMB_Header / Tran b'\\MAILSLOT\\BROWSE' GetBackupListRequest
UDP / NBTDatagram / SMB_Header / Tran b'\\MAILSLOT\\BROWSE' GetBackupListRequest

Headers for packet number 288

Ether / IP / UDP 10.118.43.72:17500 > 10.118.255.255:17500 / Raw
IP / UDP 10.118.43.72:17500 > 10.118.255.255:17500 / Raw
UDP 10.118.43.72:17500 > 10.118.255.255:17500 / Raw

```

No.	Time	Source	Destination	Protocol	Length	Info
531	6.354080	10.118.18.82	255.255.255.255	UDP	90	48821 → 8888 Len=48
532	6.354080	10.118.38.206	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
533	6.354080	10.118.7.150	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
534	6.354080	129.21.73.157	129.21.75.255	UDP	305	54915 → 54915 Len=263
535	6.354080	10.118.21.10	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
536	6.451727	129.21.104.26	129.21.107.255	UDP	305	54915 → 54915 Len=263
537	6.453945	10.118.45.122	10.118.255.255	UDP	82	57621 → 57621 Len=40
538	6.453945	10.118.28.148	10.118.255.255	NBNS	92	Name query NB <01><02>__MSBROWSE__<02><01>
539	6.453945	10.117.31.80	10.117.255.255	NBNS	110	Registration NB MAC-4375B4<00>
540	6.453945	10.118.2.202	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
541	6.453945	10.118.39.208	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
542	6.453945	10.118.62.39	10.118.255.255	UDP	82	57621 → 57621 Len=40
543	6.453945	10.118.62.39	10.118.255.255	UDP	82	57621 → 57621 Len=40
544	6.453945	10.118.37.79	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
545	6.454037	10.118.22.136	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
546	6.554128	10.118.1.50	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
547	6.555857	129.21.74.22	129.21.75.255	NBNS	92	Name query NB WORKGROUP<1d>
548	6.555857	129.21.74.22	129.21.75.255	NBNS	92	Name query NB WORKGROUP<1d>
549	6.555857	129.21.74.22	129.21.75.255	BROWSER	216	Get Backup List Request
550	6.555857	129.21.74.22	129.21.75.255	BROWSER	216	Get Backup List Request
551	6.559031	10.118.43.72	10.118.255.255	DB-LSP...	176	Dropbox LAN sync Discovery Protocol, JSON
552	6.656900	10.118.60.245	10.118.255.255	UDP	82	57621 → 57621 Len=40

Showing the use of the ip filter, which removed around half of the packets that didn't have a matching ip

```

ether / IP / UDP 10.118.62.39:57621 > 10.118.255.255:57621 / Raw
IP / UDP 10.118.62.39:57621 > 10.118.255.255:57621 / Raw
UDP 10.118.62.39:57621 > 10.118.255.255:57621 / Raw

Headers for packet number 282

Ether / IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'

Headers for packet number 283

Ether / IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
IP / UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'
UDP / NBNSHeader / NBNSQueryRequest who has '\\WORKGROUP'

Headers for packet number 284

Ether / IP / UDP / NBTDatagram / SMB_Header / Tran b'\\MAILSLOT\\BROWSE' GetBackupListRequest
IP / UDP / NBTDatagram / SMB_Header / Tran b'\\MAILSLOT\\BROWSE' GetBackupListRequest
UDP / NBTDatagram / SMB_Header / Tran b'\\MAILSLOT\\BROWSE' GetBackupListRequest

Headers for packet number 285

Ether / IP / UDP 10.118.43.72:17500 > 10.118.255.255:17500 / Raw
IP / UDP 10.118.43.72:17500 > 10.118.255.255:17500 / Raw
UDP 10.118.43.72:17500 > 10.118.255.255:17500 / Raw

```

o.	Time	Source	Destination	Protocol	Length	Info
531	6.354080	10.118.18.82	255.255.255.255	UDP	90	48821 → 8888 Len=48
532	6.354080	10.118.38.206	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
533	6.354080	10.118.7.150	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
534	6.354080	129.21.73.157	129.21.75.255	UDP	305	54915 → 54915 Len=263
535	6.354080	10.118.21.10	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
536	6.451727	129.21.104.26	129.21.107.255	UDP	305	54915 → 54915 Len=263
537	6.453945	10.118.45.122	10.118.255.255	UDP	82	57621 → 57621 Len=40
538	6.453945	10.118.28.148	10.118.255.255	NBNS	92	Name query NB <01><02>__MSBROWSE__<02><01>
539	6.453945	10.117.31.80	10.117.255.255	NBNS	110	Registration NB MAC-4375B4<00>
540	6.453945	10.118.2.202	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
541	6.453945	10.118.39.208	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
542	6.453945	10.118.62.39	10.118.255.255	UDP	82	57621 → 57621 Len=40
543	6.453945	10.118.62.39	10.118.255.255	UDP	82	57621 → 57621 Len=40
544	6.453945	10.118.37.79	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
545	6.454037	10.118.22.136	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
546	6.554128	10.118.1.50	10.118.255.255	NBNS	92	Name query NB WORKGROUP<1d>
547	6.555857	129.21.74.22	129.21.75.255	NBNS	92	Name query NB WORKGROUP<1d>
548	6.555857	129.21.74.22	129.21.75.255	NBNS	92	Name query NB WORKGROUP<1d>
549	6.555857	129.21.74.22	129.21.75.255	BROWSER	216	Get Backup List Request
550	6.555857	129.21.74.22	129.21.75.255	BROWSER	216	Get Backup List Request
551	6.559031	10.118.43.72	10.118.255.255	DB-LSP...	176	Dropbox LAN sync Discovery Protocol, JSON
552	6.656900	10.118.60.245	10.118.255.255	UDP	82	57621 → 57621 Len=40