

Lab - 6

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• Part 1

1. The packet number of the trace is **37**. This segment carries a **DNS** protocol message.

No.	Time	Source	Destination	Protocol	Length	Info
37	09:27:11.728783	192.168.114.139	192.168.114.20	DNS	71	Standard query 0x0002 A www.nyu.edu

The UDP header contains mainly **4** fields. These fields include Source Port, Destination Port, Length and Checksum.

```
▼ User Datagram Protocol, Src Port: 56072, Dst Port: 53
  Source Port: 56072
  Destination Port: 53
  Length: 37
  Checksum: 0x6627 [unverified]
  [Checksum Status: Unverified]
  [Stream index: 0]
  > [Timestamps]
    UDP payload (29 bytes)
```

2. We can observe that each header has a size of **8 bytes**.

```
35 b8 44 84 70 9c d1 e8 bc 5a
d9 fd 00 00 80 11 00 00 c0 a8
db 08 00 35 00 25 66 27 00 02
00 00 00 00 03 77 77 77 03 6e
00 00 01 00 01
```

3. The length field represents the Header field + Payload length. We can verify it by taking sum of 4 headers + payload = $4 * 8 + 29 =$ **37 bytes**.

4. The checksum field contains **4** hexadecimal digits. Therefore, the maximum length represented is **FFFF** which is **65535** bytes in decimal. Subtracting **8** bytes for headers, the payload has a maximum size of **65527**.

5. Since even the port number has a maximum representation of **FFFF**, a maximum of **65535** source port numbers are possible.

6. The protocol number for UDP is **17** as shown below.

```
...0 0000 0000 0000 = fragment offset 0
Time to Live: 128
Protocol: UDP (17)
Header Checksum: 0x0000 [validation disabled]
```

7. The packet number for the query is **37**, while the packet number for the response is **106**.

37 09:27:11.728783	192.168.114.139	192.168.114.20	DNS	71 Standard query 0x0002 A www.nyu.edu
105 09:27:13.741983	192.168.114.139	192.168.114.20	DNS	71 Standard query 0x0003 AAAA www.nyu.edu
106 09:27:13.755797	192.168.114.20	192.168.114.139	DNS	178 Standard query response 0x0002 A www.nyu.edu

The source port of query is equal to destination port of response.
The destination port of query is equal to source port of response.

Query

```
User Datagram Protocol, Src Port: 53
Source Port: 56072
Destination Port: 53
```

Response

```
User Datagram Protocol, Src Port: 56072
Source Port: 53
Destination Port: 56072
```