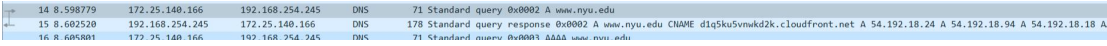

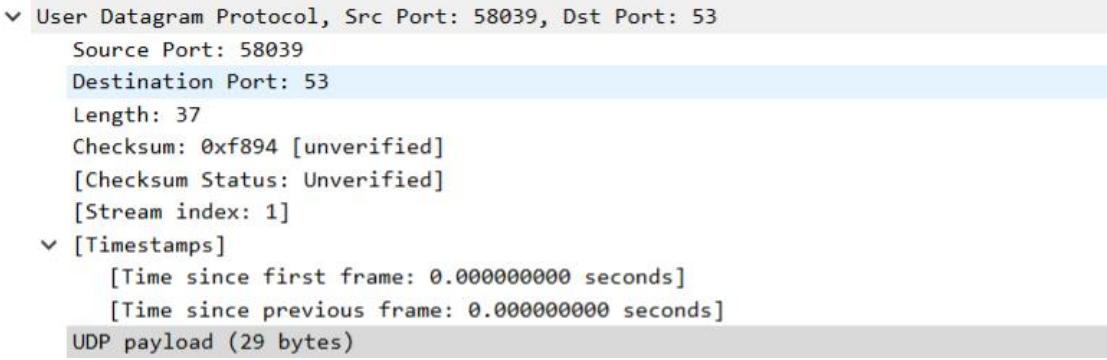


计算机学院 计算机网络 课程实验报告

实验题目： UDP		学号： 202200130048
日期： 3. 26	班级： 6	姓名： 陈静雯
Email： 1205037094@qq. com		
实验方法介绍： 通过 nslookup 访问主机，wireshark 捕获到 dns 信息，查看里面的 udp		
实验过程描述： 在 Wireshark 上启动数据包捕获后，运行 nslookup 查找您有一段时间没有访问的主机名。然后停止抓包，设置 Wireshark 包过滤，使 Wireshark 只显示主机发送和接收的 UDP 段。选择第一个 UDP 段，并在详细信息窗口中展开 UDP 字段，查看详细信息。		
结论分析： 1. Select the first UDP segment in your trace. What is the packet number 4 of this segment in the trace file? Number: 14  What type of application-layer payload or protocol message is being carried in this UDP segment? DNS  How many fields there are in the UDP header?What are the names of these fields? 4 个，Source port, destination port, length, checksum  2. By consulting the displayed information in Wireshark' s packet content		

field for this packet (or by consulting the textbook), what is the length (in bytes) of each of the UDP header fields?

8 bytes (每个部分 2bytes, $2 \times 4 = 8$)

```
Length: 37
Checksum: 0xf894 [unverified]
[Checksum Status: Unverified]
[Stream index: 1]
▼ [Timestamps]
  [Time since first frame: 0.000000000 seconds]
  [Time since previous frame: 0.000000000 seconds]
UDP payload (29 bytes)
```

3. The value in the Length field is the length of what? (You can consult the text for this answer). Verify your claim with your captured UDP packet.

37 length. 是 UDP 数据报整个的长度, UDP 头+UDP 数据=29+8=37=length

```
Source Port: 58039
Destination Port: 53
Length: 37
Checksum: 0xf894 [unverified]
```

4. What is the maximum number of bytes that can be included in a UDP payload?

$2^{16} - 1 - 8 - 20 = 65507$, 长度是用 2byte 的数来表示, 最大 2 的 16 次-1=65535, 8 是 udp 头部字节, 20 是 IPv4 头部字节

```
▼ Internet Protocol Version 4, Src: 192.168.254.245, Dst: 172.25.140.166
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
```

5. What is the largest possible source port number?

$65536 - 1 = 65535$ (从 0 开始算)

6. What is the protocol number for UDP? Give your answer in decimal notation.

17 (十进制)

```
Time to Live: 64
Protocol: UDP (17)
Header Checksum: 0x0000 [validation disabled]
```

7. Examine the pair of UDP packets in which your host sends the first UDP packet and the second UDP packet is a reply to this first UDP packet.

第一个 packet number: 14, src port: 58039, dst port: 53

第二个 packet number: 15, src port: 53, dst port: 58039

前后的源端口和目的端口相反, 前一次的源会变成响应时候的目的。

14	8.598779	172.25.140.166	192.168.254.245	DNS	71 Standard query 0x0002 A www.nyu.edu
15	8.602520	192.168.254.245	172.25.140.166	DNS	178 Standard query response 0x0002 A www.nyu.edu CNAME dlq5ku5vnmkd2k.cloudfront.net A 54.192.18.24 A 54.192.18.94 A 54.192.18.18 A
16	8.605001	172.25.140.166	192.168.254.245	DNS	71 Standard query 0x0003 AAAA www.nyu.edu

▼ User Datagram Protocol, Src Port: 58039, Dst Port: 53

Source Port: 58039

Destination Port: 53

Length: 37

Checksum: 0xf894 [unverified]

[Checksum Status: Unverified]

[Stream index: 1]

▼ [Timestamps]

[Time since first frame: 0.000000000 seconds]

[Time since previous frame: 0.000000000 seconds]

UDP payload (29 bytes)

▼ User Datagram Protocol, Src Port: 53, Dst Port: 58039

Source Port: 53

Destination Port: 58039

Length: 144

Checksum: 0x1d06 [unverified]

[Checksum Status: Unverified]

[Stream index: 1]

▼ [Timestamps]

[Time since first frame: 0.003741000 seconds]

[Time since previous frame: 0.003741000 seconds]

UDP payload (136 bytes)

结论:

1. UDP 最大有效载荷长度=IPv4 数据包最大长度-IPv4 头部长度-UDP 头部长度
2. 发送、响应的源和目的端口会互换
3. UDP 数据报长度=UDP 头+UDP 数据