

# 计算机网络实验报告\_UDP

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## 计算机网络实验报告\_UDP

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## 实验目的

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1. 快速了解UDP协议
2. 了解UDP的标头数据,报文段数据结构

## 实验过程

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1. 打开wireshark,开始抓包
2. 随意打开一些网站,观察到有UDP协议包产生,关闭抓包
3. 用UDP过滤器过滤结果,然后分析

## 实验结果

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1. Select one UDP packet from your trace. From this packet, determine how many fields there are in the UDP header. (You shouldn't look in the textbook! Answer these questions directly from what you observe in the packet trace.) Name these fields.

UDP头包含四个部分: Source Port, Destination Port, Length, Checksum.

68	13:10:03.510458	61.151.178.214	210.45.119.24	OICQ	129 OICQ Pro
77	13:10:03.740876	210.45.119.24	239.255.255.250	SSDP	215 M-SEARCH
94	13:10:03.989234	210.45.119.24	210.45.119.255	UDP	305 54915 →
114	13:10:04.195657	61.151.178.214	210.45.119.24	OICQ	721 OICQ Pro
116	13:10:04.195884	210.45.119.24	61.151.178.214	OICQ	97 OICQ Pro
117	13:10:04.211694	210.45.119.24	239.255.255.250	SSDP	215 M-SEARCH
158	13:10:04.740196	210.45.119.24	61.151.178.214	UDP	81 4000 → 8
160	13:10:04.741263	210.45.119.24	239.255.255.250	SSDP	215 M-SEARCH
163	13:10:04.979491	210.45.119.24	210.45.119.255	UDP	305 54915 →
168	13:10:05.198415	210.45.119.24	61.151.178.214	UDP	489 4000 → 8
169	13:10:05.202820	210.45.119.24	61.151.178.214	UDP	489 4000 → 8
Total Length: 291					
Identification: 0x6719 (26393)					
> Flags: 0x00					
Fragment Offset: 0					
Time to Live: 128					
Protocol: UDP (17)					
Header Checksum: 0x3f3e [validation disabled]					
[Header checksum status: Unverified]					
Source Address: 210.45.119.24					
Destination Address: 210.45.119.255					
User Datagram Protocol, Src Port: 54915, Dst Port: 54915					
Source Port: 54915					
Destination Port: 54915					
Length: 271					
Checksum: 0xf7b7 [unverified]					
[Checksum Status: Unverified]					
[Stream index: 1]					
> [Timestamps]					

2.By consulting the displayed information in Wireshark's packet content field for this packet, determine the length (in bytes) of each of the UDP header fields.

UDP报头长度=总长度-数据长度,一共271-263=8Byte.

Total Length: 291					
Identification: 0x6719 (26393)					
> Flags: 0x00					
Fragment Offset: 0					
Time to Live: 128					
Protocol: UDP (17)					
Header Checksum: 0x3f3e [validation disabled]					
[Header checksum status: Unverified]					
Source Address: 210.45.119.24					
Destination Address: 210.45.119.255					
User Datagram Protocol, Src Port: 54915, Dst Port: 54915					
Source Port: 54915					
Destination Port: 54915					
Length: 271					
Checksum: 0xf7b7 [unverified]					
[Checksum Status: Unverified]					
[Stream index: 1]					
> [Timestamps]					
UDP payload (263 bytes)					
> Data (263 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.

这里的长度是UDP头的长度+数据的长度(本例子中报头长度为 8Byte),而这里的Total Length指的是上述长度加上IP头的长度

163	13:10:04.979491	210.45.119.24	210.45.119.255	UDP	305
168	13:10:05.198415	210.45.119.24	61.151.178.214	UDP	489
169	13:10:05.203030	210.45.119.24	61.151.178.214	UDP	489
Total Length: 291					
Identification: 0x6710 (26393)					
> Flags: 0x00					
Fragment Offset: 0					
Time to Live: 128					
Protocol: UDP (17)					
Header Checksum: 0x3f3e [validation disabled]					
[Header checksum status: Unverified]					
Source Address: 210.45.119.24					
Destination Address: 210.45.119.255					
User Datagram Protocol, Src Port: 54915, Dst Port: 54915					
Source Port: 54915					
Destination Port: 54915					
Length: 271					
Checksum: 0xf7b7 [unverified]					
[Checksum Status: Unverified]					
[Stream index: 1]					
> [Timestamps]					
UDP payload (263 bytes)					
> Data (263 bytes)					
0010	01 23 67 19 00 00 80 11	3f 3e d2 2d 77 18 d2 2d	·#g····· ?>·-w···		
0020	77 ff d6 83 d6 83 01 0f	f7 b7 00 4c 41 50 54 4f	w······· ···LAPTO		
0030	50 2d 50 34 35 4c 55 4c	41 56 00 00 00 00 00 00	P-P45LUL AV······		
0040	00 00 a0 f6 b6 75 89 02	00 00 a0 b7 ef ec d6 00	····ku·· ········		

4.What is the maximum number of bytes that can be included in a UDP payload? (Hint: the answer to this question can be determined by your answer to 2. above)

理论上UDP整个包的长度最大为65536Byte,其中报头8Byte,所以最多可以用65536-8=65528Byte(但是由上一问知道达不到这么大,因为还有IP头长度)

5.What is the maximum number of bytes that can be included in a UDP payload? (Hint: the answer to this question can be determined by your answer to 2. above)

端口号从0开始,从而最大为65536-1=65535.

6.What is the protocol number for UDP? Give your answer in both hexadecimal and decimal notation. To answer this question, you'll need to look into the Protocol field of the IP datagram containing this UDP segment (see Figure 4.13 in the text, and the discussion of IP header fields).

UDP协议号为: 17(10进制), 11(16进制)

Time to Live: 128	
Protocol: UDP (17)	
Header Checksum: 0x3f3e [validation disabled]	
[Header checksum status: Unverified]	
Source Address: 210.45.119.24	
Destination Address: 210.45.119.255	
010	01 23 67 19 00 00 80 11 3f 3e d2 2d 77 18 d2 2d ·#g····· ?>·-w···
020	77 ff d6 83 d6 83 01 0f f7 b7 00 4c 41 50 54 4f w······· ···LAPTO
030	50 2d 50 34 35 4c 55 4c 41 56 00 00 00 00 00 00 P-P45LUL AV······

7.Examine a 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. (Hint: for a second packet to be sent in response to a first packet, the sender of the first packet should be the destination of the second packet). Describe the relationship between the port numbers in the two packets.

发送的UDP数据包源端口号是响应数据包的目标端口号,发送的UDP数据包目标端口号是响应数据包的源端口号

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    Total Length: 731
    Identification: 0x8d18 (36120)
    > Flags: 0x00
    Fragment Offset: 0
    Time to Live: 128
    Protocol: UDP (17)
    Header Checksum: 0x7146 [validation disabled]
    [Header checksum status: Unverified]
    Source Address: 210.45.119.24
    Destination Address: 61.151.178.214
    ✓ User Datagram Protocol, Src Port: 4000, Dst Port: 8000
      Source Port: 4000
      Destination Port: 8000
      Length: 711
      Checksum: 0xc24c [unverified]
      [Checksum Status: Unverified]
      [Stream index: 4]
    ✓ [Timestamp]
      Time to Live: 128
      Protocol: UDP (17)
      Header Checksum: 0x739d [validation disabled]
      [Header checksum status: Unverified]
      Source Address: 210.45.119.24
      Destination Address: 61.151.178.214
    ✓ User Datagram Protocol, Src Port: 4000, Dst Port: 8000
      Source Port: 4000
      Destination Port: 8000
      Length: 111
      Checksum: 0x6fdc [unverified]
      [Checksum Status: Unverified]
      [Stream index: 4]
```

## 实验心得

本次实验巩固加深了UDP相关的知识,同时对其有了进一步的了解.