

计算机网络实验 5

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使用提供的包

2. A look at the captured trace

The image shows a Wireshark packet capture analysis of an ICMP Echo request. The packet list on the left shows Frame 8, which is an Internet Protocol Version 4 packet. The packet details pane on the right shows the following information:

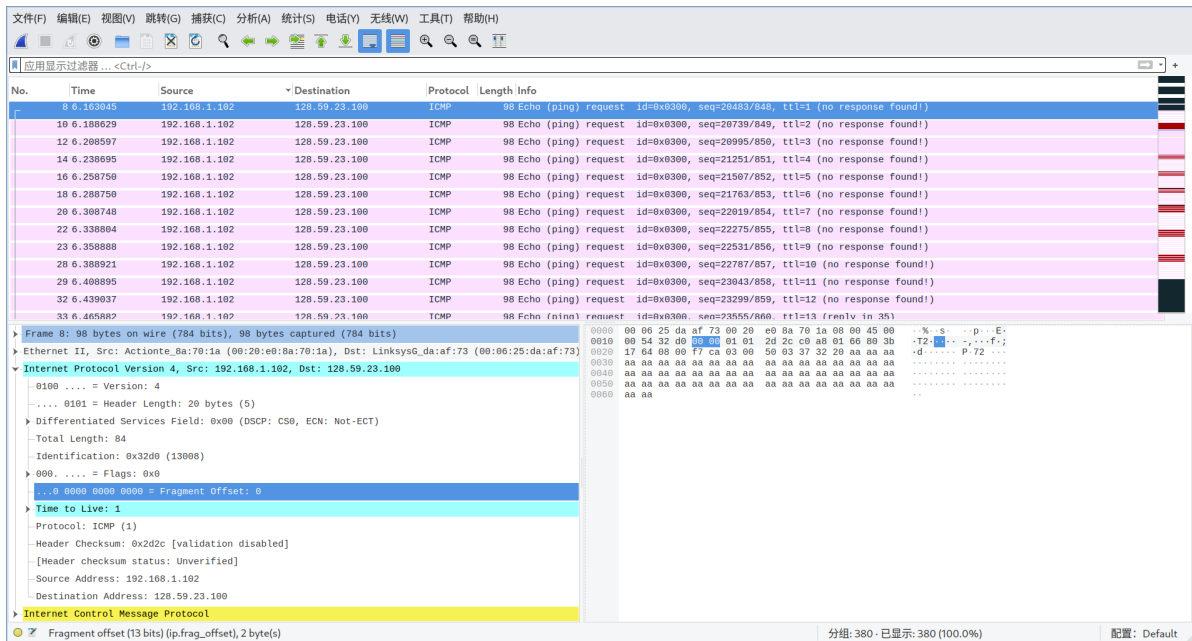
- Frame 8: 98 bytes on wire (784 bits), 98 bytes captured (784 bits)
- Ethernet II, Src: Actionte_8a:70:1a (00:20:e0:8a:70:1a), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
- Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.59.23.100
 - 0100 = Version: 4
 - 0101 = Header Length: 20 bytes (5)
 - Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
 - Total Length: 84
 - Identification: 0x32d0 (13008)
 - 000. = Flags: 0x0
 - ...0 0000 0000 0000 = Fragment Offset: 0
 - Time to Live: 1
 - Protocol: ICMP (1)
 - Header Checksum: 0x2d2c [validation disabled]
 - [Header checksum status: Unverified]
 - Source Address: 192.168.1.102
 - Destination Address: 128.59.23.100
- Internet Control Message Protocol

At the bottom, the packet bytes pane shows the following information:

No.: 8 · Time: 6.163045 · Source: 192.168.1.102 · Destination: 128.59.23.1... Echo (ping) request id=0x0300, seq=20483/848, ttl=1 (no response found!)

There is a checkbox labeled "Show packet bytes" which is currently unchecked. At the bottom right, there are two buttons: "关闭" (Close) and "帮助" (Help).

1. IP 地址为 192.168.1.102 .
2. 上层协议为 ICMP (1)
3. 报头有 20 字节, 报文总共 84 字节, 因此载荷有 64 字节.
4. Flags 字段为 0, 因此没有分片.



5. 标识 **Identification** 和首部校验和 **Header Checksum** 每次都改变。

6. 保持不变的字段:

- 版本号 **Version**
- 首部长度 **Header Length**
- 区分服务 **Differentiated Services**
- 上层协议 **Protocol**
- 源地址 **Source Address**
- 目的地址 **Destination Address**

必须保持不变的字段:

- 版本号 **Version**: 因为所有的数据报都使用 IPv4.
- 首部长度 **Header Length**: 因为数据报都是无选项的, 首部长度应该为 20 字节.
- 区分服务 **Differentiated Services**: 因为所有数据报使用的是同样的服务类型.
- 协议 **Protocol**: 因为所有数据报都是 ICMP 报文.
- 源地址 **Source Address**: 因为我们在查看所有相同源地址的报文.
- 目的地址 **Destination Address**: 因为所有报文都被发往同一个地址.

必须发生改变的字段:

- 标识 **Identification**: 因为不同的包的标识不同.
- 首部校验和 **Header Checksum**: 因为其他字段的改变必然导致校验和的改变.

7. 每发送一个 ICMP Echo 报文, 标识字段都加 1.

▶ Frame 92: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits)
 ▶ Ethernet II, Src: Actionte_8a:70:1a (00:20:e0:8a:70:1a), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
 ▼ Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.59.23.100

- 0100 = Version: 4
- 0101 = Header Length: 20 bytes (5)
- ▶ Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
- Total Length: 1500
- Identification: 0x32f9 (13049)
- ▶ 001. = Flags: 0x1, More fragments
- ...0 0000 0000 0000 = Fragment Offset: 0
- ▶ Time to Live: 1
- Protocol: ICMP (1)
- Header Checksum: 0x077b [validation disabled]
- [Header checksum status: Unverified]
- Source Address: 192.168.1.102
- Destination Address: 128.59.23.100
- [\[Reassembled IPv4 in frame: 93\]](#)

▼ Data (1480 bytes)

- Data: 0800d0c603007703373620aaa...
- [Length: 1480]

No.: 92 · Time: 28.441511 · Source: 192.168.1.102 · Destination: 128.59.23.100 · mented IP protocol (proto=ICMP 1, off=0, ID=32f9) [Reassembled in #93]

☐ Show packet bytes

关闭 帮助

11. 标志 **Flags** 为 **0x1**, 说明发生了分片. 片偏移为 **0**, 说明这是第一个片. 数据报的长度为 **1500** 字节.

▶ Frame 93: 562 bytes on wire (4496 bits), 562 bytes captured (4496 bits)
 ▶ Ethernet II, Src: Actionte_8a:70:1a (00:20:e0:8a:70:1a), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
 ▼ Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.59.23.100

- 0100 = Version: 4
- 0101 = Header Length: 20 bytes (5)
- ▶ Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
- Total Length: 548
- Identification: 0x32f9 (13049)
- ▶ 000. = Flags: 0x0
- ...0 0000 1011 1001 = Fragment Offset: 1480
- ▶ Time to Live: 1
- Protocol: ICMP (1)
- Header Checksum: 0x2a7a [validation disabled]
- [Header checksum status: Unverified]
- Source Address: 192.168.1.102
- Destination Address: 128.59.23.100
- ▶ [2 IPv4 Fragments (2008 bytes): #92(1480), #93(528)]
- ▶ Internet Control Message Protocol

No.: 93 · Time: 28.442185 · Source: 192.168.1.102 · Destination: 128.59.23.100 · ho (ping) request id=0x0300, seq=30467/887, ttl=1 (no response found!)

☐ Show packet bytes

关闭 帮助

12. 片偏移为 **1480** 说明这不是第一个片. 标识为 **0x0** 说明没有其他的片.

13. 数据报长度 **Total Length** , 标志 **Flags** , 片偏移 **Fragment Offset** 和首部校验和 **Header Checksum** 发生了变化.

文件(F) 编辑(E) 视图(V) 跳转(G) 捕获(C) 分析(A) 统计(S) 电话(V) 无线(W) 工具(T) 帮助(H)

icmp || ip

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14. 总共分为了三片 (编号分别为 216, 217 和 218)

15. 数据报长度 **Total Length** , 标志 **Flags** , 片偏移 **Fragment Offset** 和首部校验和 **Header Checksum** 发生了变化.