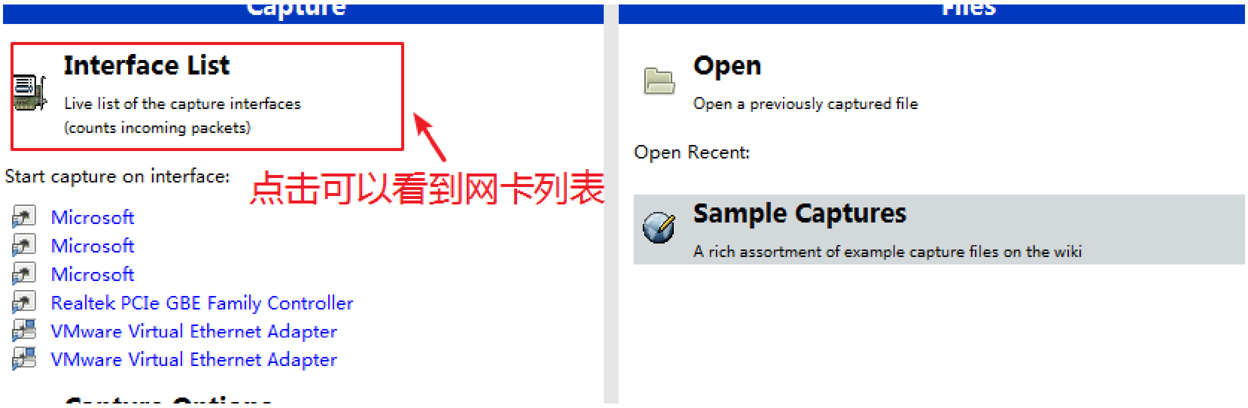
使用WireShark对网卡的进行抓包测试，步骤如下：

步骤1：



Capture

Files

Interface List

Live list of the capture interfaces (counts incoming packets)

点击可以看到网卡列表

Start capture on interface:

- Microsoft
- Microsoft
- Microsoft
- Realtek PCIe GBE Family Controller
- VMware Virtual Ethernet Adapter
- VMware Virtual Ethernet Adapter

Capture Options

Open

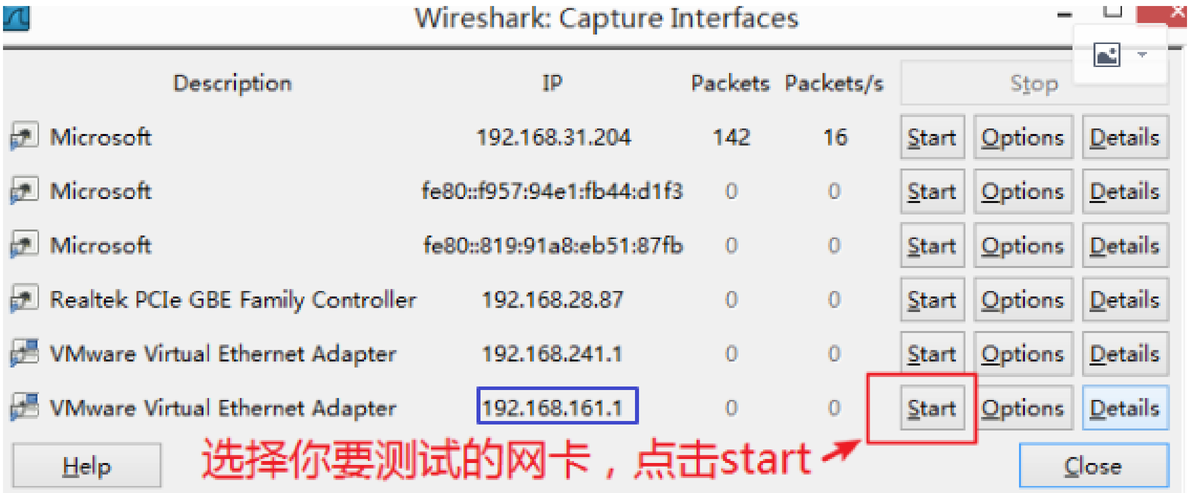
Open a previously captured file

Open Recent:

Sample Captures

A rich assortment of example capture files on the wiki

步骤2：

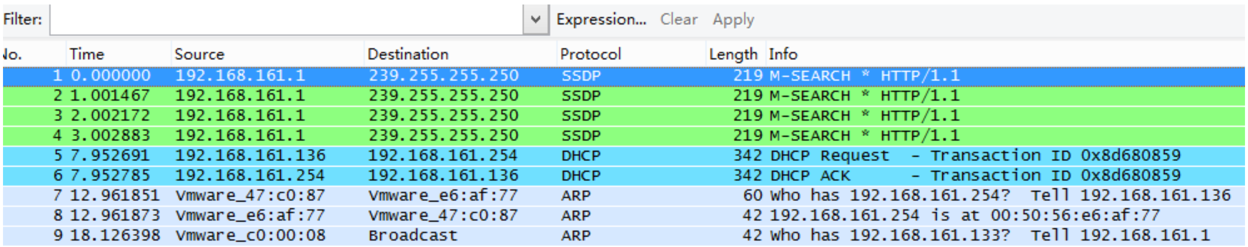


Wireshark: Capture Interfaces

Description	IP	Packets	Packets/s	Stop		
Microsoft	192.168.31.204	142	16	Start	Options	Details
Microsoft	fe80::f957:94e1:fb44:d1f3	0	0	Start	Options	Details
Microsoft	fe80::819:91a8:eb51:87fb	0	0	Start	Options	Details
Realtek PCIe GBE Family Controller	192.168.28.87	0	0	Start	Options	Details
VMware Virtual Ethernet Adapter	192.168.241.1	0	0	Start	Options	Details
VMware Virtual Ethernet Adapter	192.168.161.1	0	0	Start	Options	Details

选择你要测试的网卡，点击start

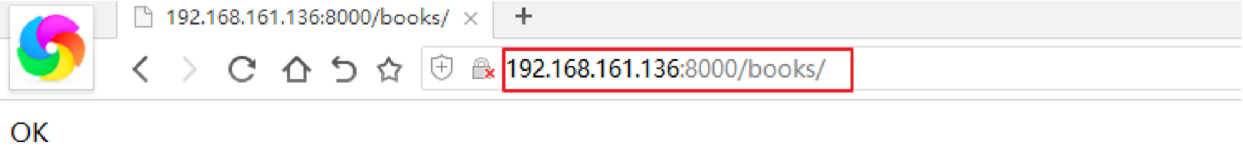
步骤3：



```
No.  Time       Source              Destination         Protocol  Length Info
   1 0.000000   192.168.161.1       239.255.255.250     SSDP         219 M-SEARCH * HTTP/1.1
   2 1.001467   192.168.161.1       239.255.255.250     SSDP         219 M-SEARCH * HTTP/1.1
   3 2.002172   192.168.161.1       239.255.255.250     SSDP         219 M-SEARCH * HTTP/1.1
   4 3.002883   192.168.161.1       239.255.255.250     SSDP         219 M-SEARCH * HTTP/1.1
   5 7.952691   192.168.161.136     192.168.161.254     DHCP         342 DHCP Request  - Transaction ID 0x8d680859
   6 7.952785   192.168.161.254     192.168.161.136     DHCP         342 DHCP ACK      - Transaction ID 0x8d680859
   7 12.961851  Vmware_47:c0:87     Vmware_e6:af:77     ARP           60 Who has 192.168.161.254?  Tell 192.168.161.136
   8 12.961873  Vmware_e6:af:77     Vmware_47:c0:87     ARP           42 192.168.161.254 is at 00:50:56:e6:af:77
   9 18.126398  Vmware_c0:00:08     Broadcast           ARP           42 Who has 192.168.161.133?  Tell 192.168.161.1
```

此时就开始抓取这个网卡的数据，只要经过这个网卡的数据包，都能被抓取下来，包括ARP广播等

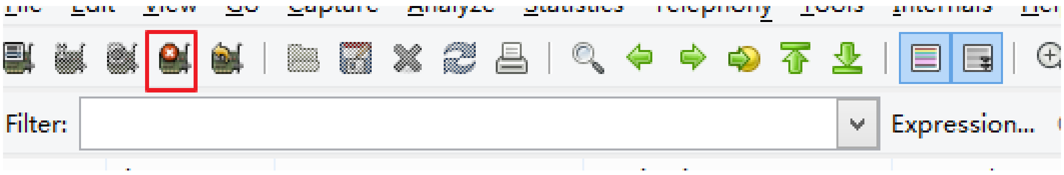
步骤4：



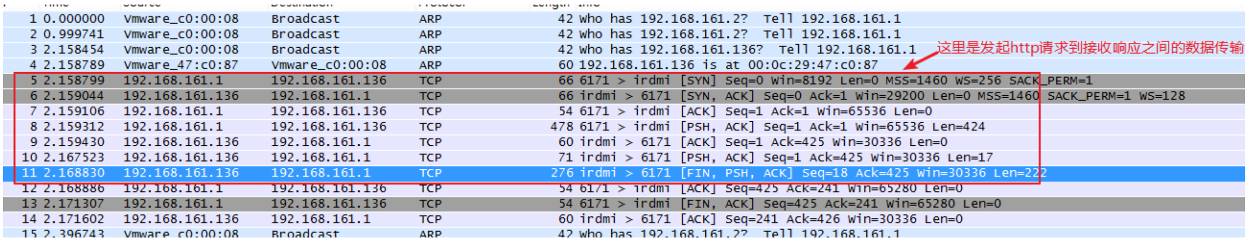
OK

打开浏览器，发起对 http://192.168.161.136:8000/books/ 这个地址的请求，最后得到响应，显示OK字符串

此时立马点击图示按钮，否则数据会非常多，影响分析


File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help
Filter:
Expression...

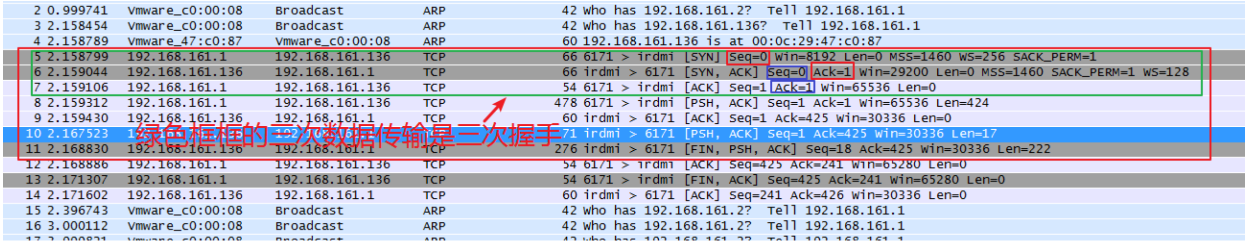
步骤5：红色框框起来的序号5到序号11代表的是http请求的数据传输情况



```
 1 0.000000  Vmware_c0:00:08  Broadcast        ARP   42 Who has 192.168.161.2?  Tell 192.168.161.1
 2 0.999741  Vmware_c0:00:08  Broadcast        ARP   42 Who has 192.168.161.2?  Tell 192.168.161.1
 3 2.158454  Vmware_c0:00:08  Broadcast        ARP   42 Who has 192.168.161.136?  Tell 192.168.161.1
 4 2.158789  Vmware_47:c0:87  Vmware_c0:00:08  ARP   60 192.168.161.136 is at 00:0c:29:47:c0:87
 5 2.158799  192.168.161.1    192.168.161.136  TCP   66 6171 > irdmi [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=256 SACK_PERM=1
 6 2.159044  192.168.161.136  192.168.161.1    TCP   66 irdmi > 6171 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1460 SACK_PERM=1 WS=128
 7 2.159106  192.168.161.1    192.168.161.136  TCP   54 6171 > irdmi [ACK] Seq=1 Ack=1 Win=65536 Len=0
 8 2.159312  192.168.161.1    192.168.161.136  TCP  478 6171 > irdmi [PSH, ACK] Seq=1 Ack=1 Win=65536 Len=424
 9 2.159430  192.168.161.136  192.168.161.1    TCP   60 irdmi > 6171 [ACK] Seq=1 Ack=425 Win=30336 Len=0
10 2.167523  192.168.161.136  192.168.161.1    TCP   71 irdmi > 6171 [PSH, ACK] Seq=1 Ack=425 Win=30336 Len=17
11 2.168830  192.168.161.136  192.168.161.1    TCP  276 irdmi > 6171 [FIN, PSH, ACK] Seq=18 Ack=425 Win=30336 Len=222
12 2.168886  192.168.161.1    192.168.161.136  TCP   54 6171 > irdmi [ACK] Seq=425 Ack=241 Win=65280 Len=0
13 2.171307  192.168.161.1    192.168.161.136  TCP   54 6171 > irdmi [FIN, ACK] Seq=425 Ack=241 Win=65280 Len=0
14 2.171602  192.168.161.136  192.168.161.1    TCP   60 irdmi > 6171 [ACK] Seq=241 Ack=426 Win=30336 Len=0
15 2.396743  Vmware_c0:00:08  Broadcast        ARP   42 Who has 192.168.161.2?  Tell 192.168.161.1
```

这里是发起http请求到接收响应之间的数据传输

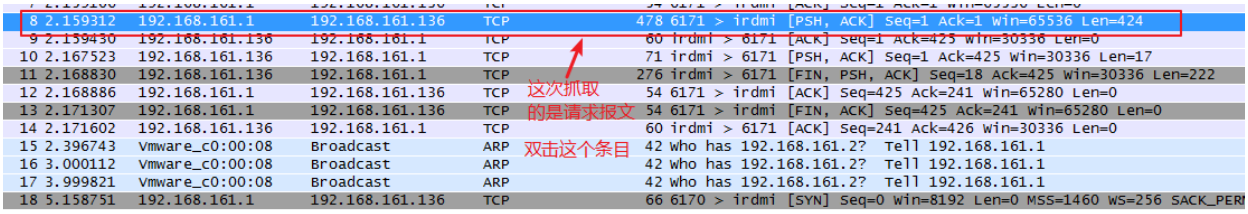
序号5到序号7是三次握手发起的数据传输



```
 2 0.999741  Vmware_c0:00:08  Broadcast        ARP   42 Who has 192.168.161.2?  Tell 192.168.161.1
 3 2.158454  Vmware_c0:00:08  Broadcast        ARP   42 Who has 192.168.161.136?  Tell 192.168.161.1
 4 2.158789  Vmware_47:c0:87  Vmware_c0:00:08  ARP   60 192.168.161.136 is at 00:0c:29:47:c0:87
 5 2.158799  192.168.161.1    192.168.161.136  TCP   66 6171 > irdmi [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=256 SACK_PERM=1
 6 2.159044  192.168.161.136  192.168.161.1    TCP   66 irdmi > 6171 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1460 SACK_PERM=1 WS=128
 7 2.159106  192.168.161.1    192.168.161.136  TCP   54 6171 > irdmi [ACK] Seq=1 Ack=1 Win=65536 Len=0
 8 2.159312  192.168.161.1    192.168.161.136  TCP  478 6171 > irdmi [PSH, ACK] Seq=1 Ack=1 Win=65536 Len=424
 9 2.159430  192.168.161.136  192.168.161.1    TCP   60 irdmi > 6171 [ACK] Seq=1 Ack=425 Win=30336 Len=0
10 2.167523  192.168.161.136  192.168.161.1    TCP   71 irdmi > 6171 [PSH, ACK] Seq=1 Ack=425 Win=30336 Len=17
11 2.168830  192.168.161.136  192.168.161.1    TCP  276 irdmi > 6171 [FIN, PSH, ACK] Seq=18 Ack=425 Win=30336 Len=222
12 2.168886  192.168.161.1    192.168.161.136  TCP   54 6171 > irdmi [ACK] Seq=425 Ack=241 Win=65280 Len=0
13 2.171307  192.168.161.1    192.168.161.136  TCP   54 6171 > irdmi [FIN, ACK] Seq=425 Ack=241 Win=65280 Len=0
14 2.171602  192.168.161.136  192.168.161.1    TCP   60 irdmi > 6171 [ACK] Seq=241 Ack=426 Win=30336 Len=0
15 2.396743  Vmware_c0:00:08  Broadcast        ARP   42 Who has 192.168.161.2?  Tell 192.168.161.1
16 3.000112  Vmware_c0:00:08  Broadcast        ARP   42 Who has 192.168.161.2?  Tell 192.168.161.1
```

绿色框框的三次数据传输是三次握手

序号8是抓取的请求报文数据传输

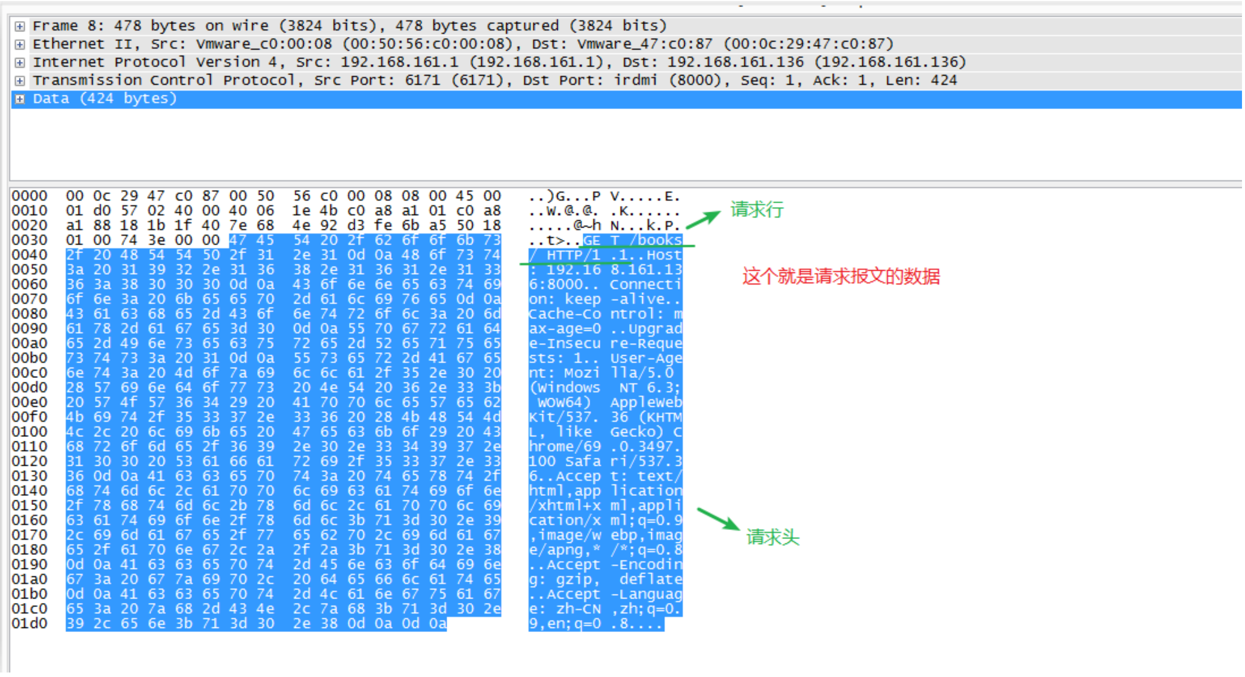


```
 7 2.159106  192.168.161.1    192.168.161.136  TCP   54 6171 > irdmi [ACK] Seq=1 Ack=1 Win=65536 Len=0
 8 2.159312  192.168.161.1    192.168.161.136  TCP  478 6171 > irdmi [PSH, ACK] Seq=1 Ack=1 Win=65536 Len=424
 9 2.159430  192.168.161.136  192.168.161.1    TCP   60 irdmi > 6171 [ACK] Seq=1 Ack=425 Win=30336 Len=0
10 2.167523  192.168.161.136  192.168.161.1    TCP   71 irdmi > 6171 [PSH, ACK] Seq=1 Ack=425 Win=30336 Len=17
11 2.168830  192.168.161.136  192.168.161.1    TCP  276 irdmi > 6171 [FIN, PSH, ACK] Seq=18 Ack=425 Win=30336 Len=222
12 2.168886  192.168.161.1    192.168.161.136  TCP   54 6171 > irdmi [ACK] Seq=425 Ack=241 Win=65280 Len=0
13 2.171307  192.168.161.1    192.168.161.136  TCP   54 6171 > irdmi [FIN, ACK] Seq=425 Ack=241 Win=65280 Len=0
14 2.171602  192.168.161.136  192.168.161.1    TCP   60 irdmi > 6171 [ACK] Seq=241 Ack=426 Win=30336 Len=0
15 2.396743  Vmware_c0:00:08  Broadcast        ARP   42 Who has 192.168.161.2?  Tell 192.168.161.1
16 3.000112  Vmware_c0:00:08  Broadcast        ARP   42 Who has 192.168.161.2?  Tell 192.168.161.1
17 3.999821  Vmware_c0:00:08  Broadcast        ARP   42 Who has 192.168.161.2?  Tell 192.168.161.1
18 5.158751  192.168.161.1    192.168.161.136  TCP   66 6170 > irdmi [SYN] Seq=0 Win=8192 Len=0 MSS=1460 WS=256 SACK_PERM
```

这次抓取的是请求报文

双击这个条目

步骤6：



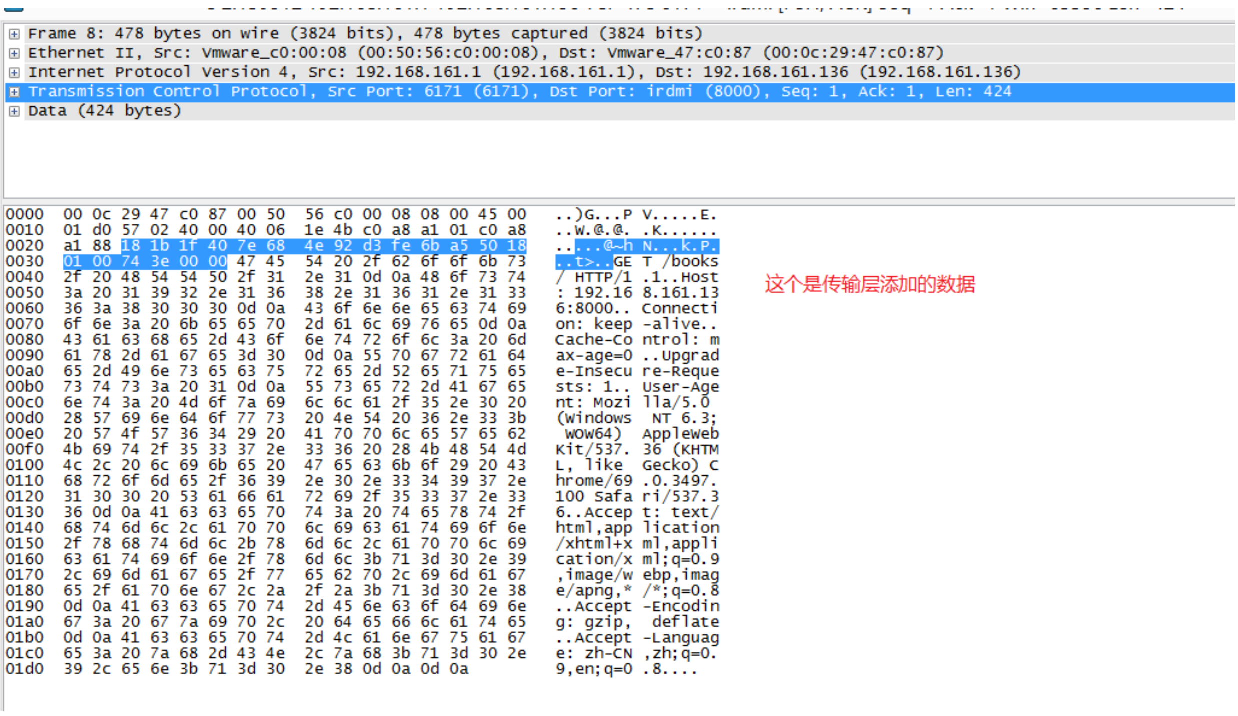
```
⊞ Frame 8: 478 bytes on wire (3824 bits), 478 bytes captured (3824 bits)
⊞ Ethernet II, Src: Vmware_c0:00:08 (00:50:56:c0:00:08), Dst: Vmware_47:c0:87 (00:0c:29:47:c0:87)
⊞ Internet Protocol Version 4, Src: 192.168.161.1 (192.168.161.1), Dst: 192.168.161.136 (192.168.161.136)
⊞ Transmission Control Protocol, Src Port: 6171 (6171), Dst Port: irdmi (8000), Seq: 1, Ack: 1, Len: 424
⊞ Data (424 bytes)

0000  00 0c 29 47 c0 87 00 50  56 c0 00 08 08 00 45 00   ..)G...P V.....E.
0010  01 d0 57 02 40 00 40 06  1e 4b c0 a8 a1 01 c0 a8   ..W.@.@. .K......
0020  a1 88 18 1b 1f 40 7e 68  4e 92 d3 fe 6b a5 50 18   .....@~h N...k.P.
0030  01 00 74 3e 00 00 47 45  54 20 2f 62 6f 6f 6b 73   ..t>..GE T /books
0040  2f 20 48 54 54 50 2f 31  2e 31 0d 0a 48 6f 73 74   / HTTP/1 .1..Host
0050  3a 20 31 39 32 2e 31 36  38 2e 31 36 31 2e 31 33   : 192.16 8.161.13
0060  36 3a 38 30 30 30 0d 0a  43 6f 6e 6e 65 63 74 69   6:8000.. Connecti
0070  6f 6e 3a 20 6b 65 65 70  2d 61 6c 69 76 65 0d 0a   on: keep -alive..
0080  43 61 63 68 65 2d 43 6f  6e 74 72 6f 6c 3a 20 6d   Cache-Co ntrol: m
0090  61 78 2d 61 67 65 3d 30  0d 0a 55 70 67 72 61 64   ax-age=0 ..Upgrad
00a0  65 2d 49 6e 73 65 63 75  72 65 2d 52 65 71 75 65   e-Insecu re-Reque
00b0  73 74 73 3a 20 31 0d 0a  55 73 65 72 2d 41 67 65   sts: 1.. User-Age
00c0  6e 74 3a 20 4d 6f 7a 69  6c 6c 61 2f 35 2e 30 20   nt: Mozi lla/5.0 
00d0  28 57 69 6e 64 6f 77 73  20 4e 54 20 36 2e 33 3b   (Windows  NT 6.3;
00e0  20 57 4f 57 36 34 29 20  41 70 70 6c 65 57 65 62    WOW64)  AppleWeb
00f0  4b 69 74 2f 35 33 37 2e  33 36 20 28 4b 48 54 4d   Kit/537. 36 (KHTM
0100  4c 2c 20 6c 69 6b 65 20  47 65 63 6b 6f 29 20 43   L, like  Gecko) C
0110  68 72 6f 6d 65 2f 36 39  2e 30 2e 33 34 39 37 2e   hrome/69 .0.3497.
0120  31 30 30 20 53 61 66 61  72 69 2f 35 33 37 2e 33   100 Safa ri/537.3
0130  36 0d 0a 41 63 63 65 70  74 3a 20 74 65 78 74 2f   6..Accep t: text/
0140  68 74 6d 6c 2c 61 70 70  6c 69 63 61 74 69 6f 6e   html,app lication
0150  2f 78 68 74 6d 6c 2b 78  6d 6c 2c 61 70 70 6c 69   /xhtml+x ml,appli
0160  63 61 74 69 6f 6e 2f 78  6d 6c 3b 71 3d 30 2e 39   cation/x ml;q=0.9
0170  2c 69 6d 61 67 65 2f 77  65 62 70 2c 69 6d 61 67   ,image/w ebp,imag
0180  65 2f 61 70 6e 67 2c 2a  2f 2a 3b 71 3d 30 2e 38   e/apng,* /*;q=0.8
0190  0d 0a 41 63 63 65 70 74  2d 45 6e 63 6f 64 69 6e   ..Accept -Encodin
01a0  67 3a 20 67 7a 69 70 2c  20 64 65 66 6c 61 74 65   g: gzip,  deflate
01b0  0d 0a 41 63 63 65 70 74  2d 4c 61 6e 67 75 61 67   ..Accept -Languag
01c0  65 3a 20 7a 68 2d 43 4e  2c 7a 68 3b 71 3d 30 2e   e: zh-CN ,zh;q=0.
01d0  39 2c 65 6e 3b 71 3d 30  2e 38 0d 0a 0d 0a         9,en;q=0 .8....
```

请求行

这个就是请求报文的数据

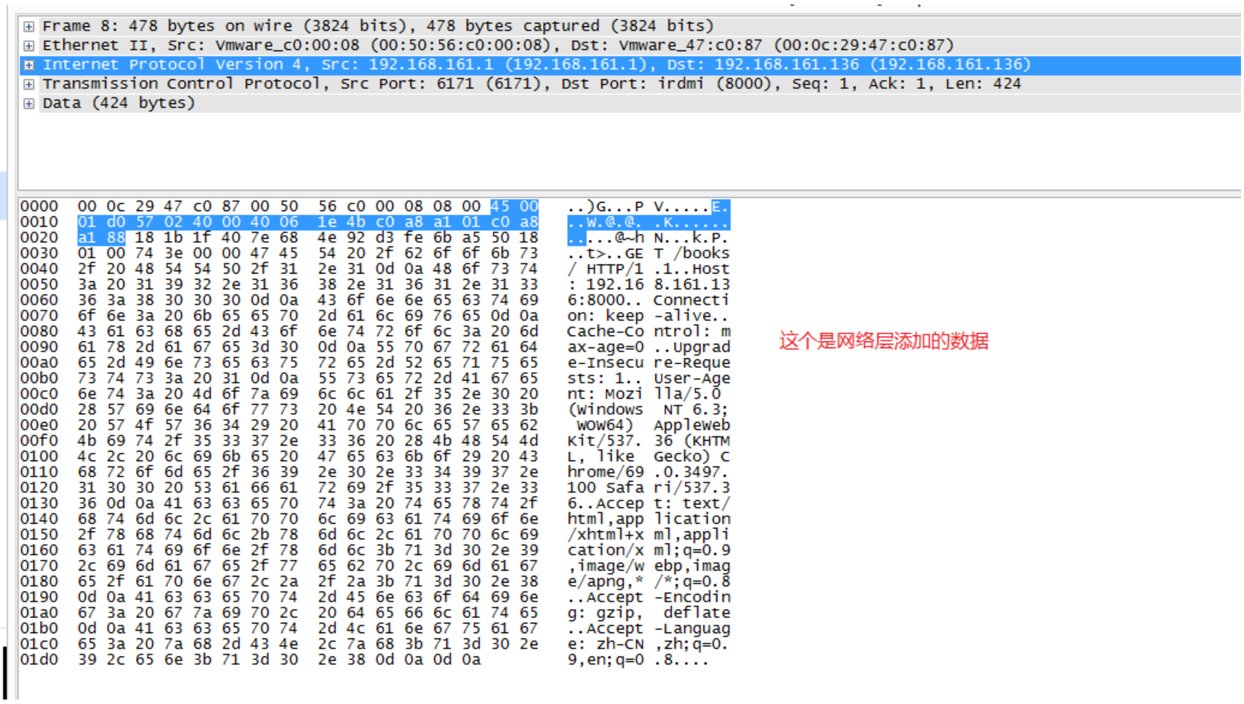
请求头



```
⊞ Frame 8: 478 bytes on wire (3824 bits), 478 bytes captured (3824 bits)
⊞ Ethernet II, Src: Vmware_c0:00:08 (00:50:56:c0:00:08), Dst: Vmware_47:c0:87 (00:0c:29:47:c0:87)
⊞ Internet Protocol Version 4, Src: 192.168.161.1 (192.168.161.1), Dst: 192.168.161.136 (192.168.161.136)
⊞ Transmission Control Protocol, Src Port: 6171 (6171), Dst Port: irdmi (8000), Seq: 1, Ack: 1, Len: 424
⊞ Data (424 bytes)

0000  00 0c 29 47 c0 87 00 50  56 c0 00 08 08 00 45 00   ..)G...P V.....E.
0010  01 d0 57 02 40 00 40 06  1e 4b c0 a8 a1 01 c0 a8   ..W.@.@. .K......
0020  a1 88 18 1b 1f 40 7e 68  4e 92 d3 fe 6b a5 50 18   .....@~h N...k.P.
0030  01 00 74 3e 00 00 47 45  54 20 2f 62 6f 6f 6b 73   ..t>..GE T /books
0040  2f 20 48 54 54 50 2f 31  2e 31 0d 0a 48 6f 73 74   / HTTP/1 .1..Host
0050  3a 20 31 39 32 2e 31 36  38 2e 31 36 31 2e 31 33   : 192.16 8.161.13
0060  36 3a 38 30 30 30 0d 0a  43 6f 6e 6e 65 63 74 69   6:8000.. Connecti
0070  6f 6e 3a 20 6b 65 65 70  2d 61 6c 69 76 65 0d 0a   on: keep -alive..
0080  43 61 63 68 65 2d 43 6f  6e 74 72 6f 6c 3a 20 6d   Cache-Co ntrol: m
0090  61 78 2d 61 67 65 3d 30  0d 0a 55 70 67 72 61 64   ax-age=0 ..Upgrad
00a0  65 2d 49 6e 73 65 63 75  72 65 2d 52 65 71 75 65   e-Insecu re-Reque
00b0  73 74 73 3a 20 31 0d 0a  55 73 65 72 2d 41 67 65   sts: 1.. User-Age
00c0  6e 74 3a 20 4d 6f 7a 69  6c 6c 61 2f 35 2e 30 20   nt: Mozi lla/5.0 
00d0  28 57 69 6e 64 6f 77 73  20 4e 54 20 36 2e 33 3b   (Windows  NT 6.3;
00e0  20 57 4f 57 36 34 29 20  41 70 70 6c 65 57 65 62    WOW64)  AppleWeb
00f0  4b 69 74 2f 35 33 37 2e  33 36 20 28 4b 48 54 4d   Kit/537. 36 (KHTM
0100  4c 2c 20 6c 69 6b 65 20  47 65 63 6b 6f 29 20 43   L, like  Gecko) C
0110  68 72 6f 6d 65 2f 36 39  2e 30 2e 33 34 39 37 2e   hrome/69 .0.3497.
0120  31 30 30 20 53 61 66 61  72 69 2f 35 33 37 2e 33   100 Safa ri/537.3
0130  36 0d 0a 41 63 63 65 70  74 3a 20 74 65 78 74 2f   6..Accep t: text/
0140  68 74 6d 6c 2c 61 70 70  6c 69 63 61 74 69 6f 6e   html,app lication
0150  2f 78 68 74 6d 6c 2b 78  6d 6c 2c 61 70 70 6c 69   /xhtml+x ml,appli
0160  63 61 74 69 6f 6e 2f 78  6d 6c 3b 71 3d 30 2e 39   cation/x ml;q=0.9
0170  2c 69 6d 61 67 65 2f 77  65 62 70 2c 69 6d 61 67   ,image/w ebp,imag
0180  65 2f 61 70 6e 67 2c 2a  2f 2a 3b 71 3d 30 2e 38   e/apng,* /*;q=0.8
0190  0d 0a 41 63 63 65 70 74  2d 45 6e 63 6f 64 69 6e   ..Accept -Encodin
01a0  67 3a 20 67 7a 69 70 2c  20 64 65 66 6c 61 74 65   g: gzip,  deflate
01b0  0d 0a 41 63 63 65 70 74  2d 4c 61 6e 67 75 61 67   ..Accept -Languag
01c0  65 3a 20 7a 68 2d 43 4e  2c 7a 68 3b 71 3d 30 2e   e: zh-CN ,zh;q=0.
01d0  39 2c 65 6e 3b 71 3d 30  2e 38 0d 0a 0d 0a         9,en;q=0 .8....
```

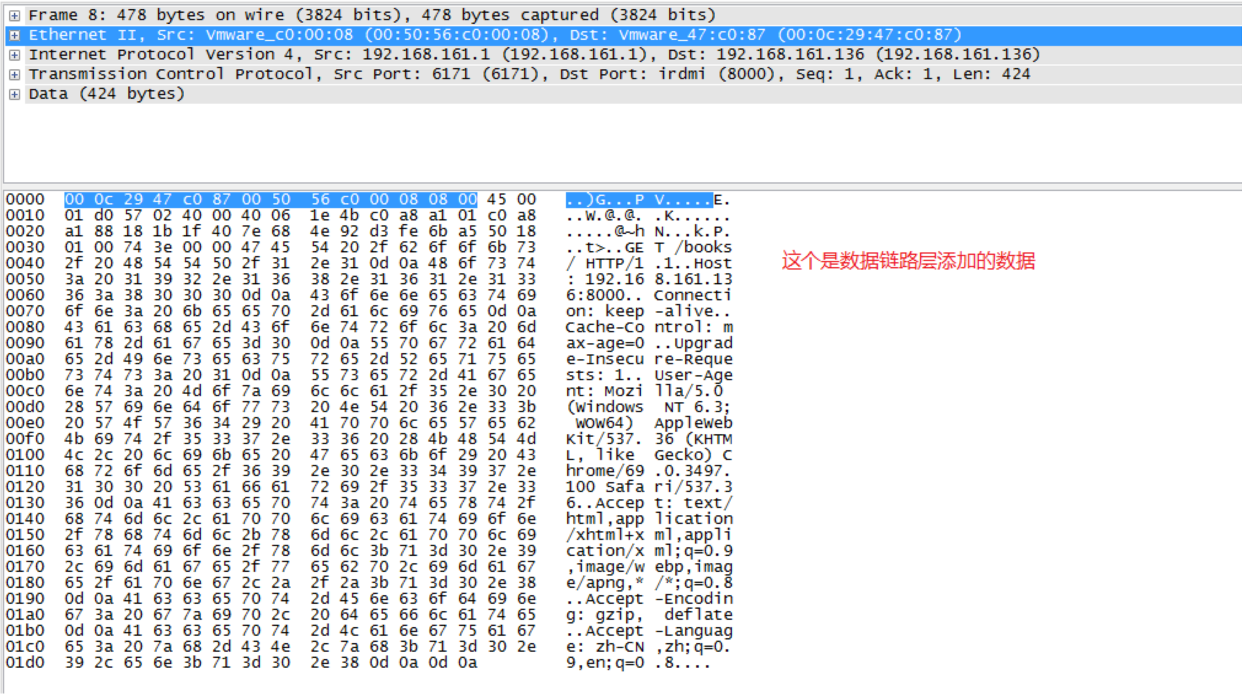
这个是传输层添加的数据



```
⊞ Frame 8: 478 bytes on wire (3824 bits), 478 bytes captured (3824 bits)
⊞ Ethernet II, Src: Vmware_c0:00:08 (00:50:56:c0:00:08), Dst: Vmware_47:c0:87 (00:0c:29:47:c0:87)
⊞ Internet Protocol Version 4, Src: 192.168.161.1 (192.168.161.1), Dst: 192.168.161.136 (192.168.161.136)
⊞ Transmission Control Protocol, Src Port: 6171 (6171), Dst Port: irdmi (8000), Seq: 1, Ack: 1, Len: 424
⊞ Data (424 bytes)

0000  00 0c 29 47 c0 87 00 50  56 c0 00 08 08 00 45 00   ..)G...P V.....E.
0010  01 d0 57 02 40 00 40 06  1e 4b c0 a8 a1 01 c0 a8   ..W.@.@. .K......
0020  a1 88 18 1b 1f 40 7e 68  4e 92 d3 fe 6b a5 50 18   .....@~h N...k.P.
0030  01 00 74 3e 00 00 47 45  54 20 2f 62 6f 6f 6b 73   ..t>..GE T /books
0040  2f 20 48 54 54 50 2f 31  2e 31 0d 0a 48 6f 73 74   / HTTP/1 .1..Host
0050  3a 20 31 39 32 2e 31 36  38 2e 31 36 31 2e 31 33   : 192.16 8.161.13
0060  36 3a 38 30 30 30 0d 0a  43 6f 6e 6e 65 63 74 69   6:8000.. Connecti
0070  6f 6e 3a 20 6b 65 65 70  2d 61 6c 69 76 65 0d 0a   on: keep -alive..
0080  43 61 63 68 65 2d 43 6f  6e 74 72 6f 6c 3a 20 6d   Cache-Co ntrol: m
0090  61 78 2d 61 67 65 3d 30  0d 0a 55 70 67 72 61 64   ax-age=0 ..Upgrad
00a0  65 2d 49 6e 73 65 63 75  72 65 2d 52 65 71 75 65   e-Insecu re-Reque
00b0  73 74 73 3a 20 31 0d 0a  55 73 65 72 2d 41 67 65   sts: 1.. User-Age
00c0  6e 74 3a 20 4d 6f 7a 69  6c 6c 61 2f 35 2e 30 20   nt: Mozi lla/5.0 
00d0  28 57 69 6e 64 6f 77 73  20 4e 54 20 36 2e 33 3b   (Windows  NT 6.3;
00e0  20 57 4f 57 36 34 29 20  41 70 70 6c 65 57 65 62    WOW64)  AppleWeb
00f0  4b 69 74 2f 35 33 37 2e  33 36 20 28 4b 48 54 4d   Kit/537. 36 (KHTM
0100  4c 2c 20 6c 69 6b 65 20  47 65 63 6b 6f 29 20 43   L, like  Gecko) C
0110  68 72 6f 6d 65 2f 36 39  2e 30 2e 33 34 39 37 2e   hrome/69 .0.3497.
0120  31 30 30 20 53 61 66 61  72 69 2f 35 33 37 2e 33   100 Safa ri/537.3
0130  36 0d 0a 41 63 63 65 70  74 3a 20 74 65 78 74 2f   6..Accep t: text/
0140  68 74 6d 6c 2c 61 70 70  6c 69 63 61 74 69 6f 6e   html,app lication
0150  2f 78 68 74 6d 6c 2b 78  6d 6c 2c 61 70 70 6c 69   /xhtml+x ml,appli
0160  63 61 74 69 6f 6e 2f 78  6d 6c 3b 71 3d 30 2e 39   cation/x ml;q=0.9
0170  2c 69 6d 61 67 65 2f 77  65 62 70 2c 69 6d 61 67   ,image/w ebp,imag
0180  65 2f 61 70 6e 67 2c 2a  2f 2a 3b 71 3d 30 2e 38   e/apng,* /*;q=0.8
0190  0d 0a 41 63 63 65 70 74  2d 45 6e 63 6f 64 69 6e   ..Accept -Encodin
01a0  67 3a 20 67 7a 69 70 2c  20 64 65 66 6c 61 74 65   g: gzip,  deflate
01b0  0d 0a 41 63 63 65 70 74  2d 4c 61 6e 67 75 61 67   ..Accept -Languag
01c0  65 3a 20 7a 68 2d 43 4e  2c 7a 68 3b 71 3d 30 2e   e: zh-CN ,zh;q=0.
01d0  39 2c 65 6e 3b 71 3d 30  2e 38 0d 0a 0d 0a         9,en;q=0 .8....
```

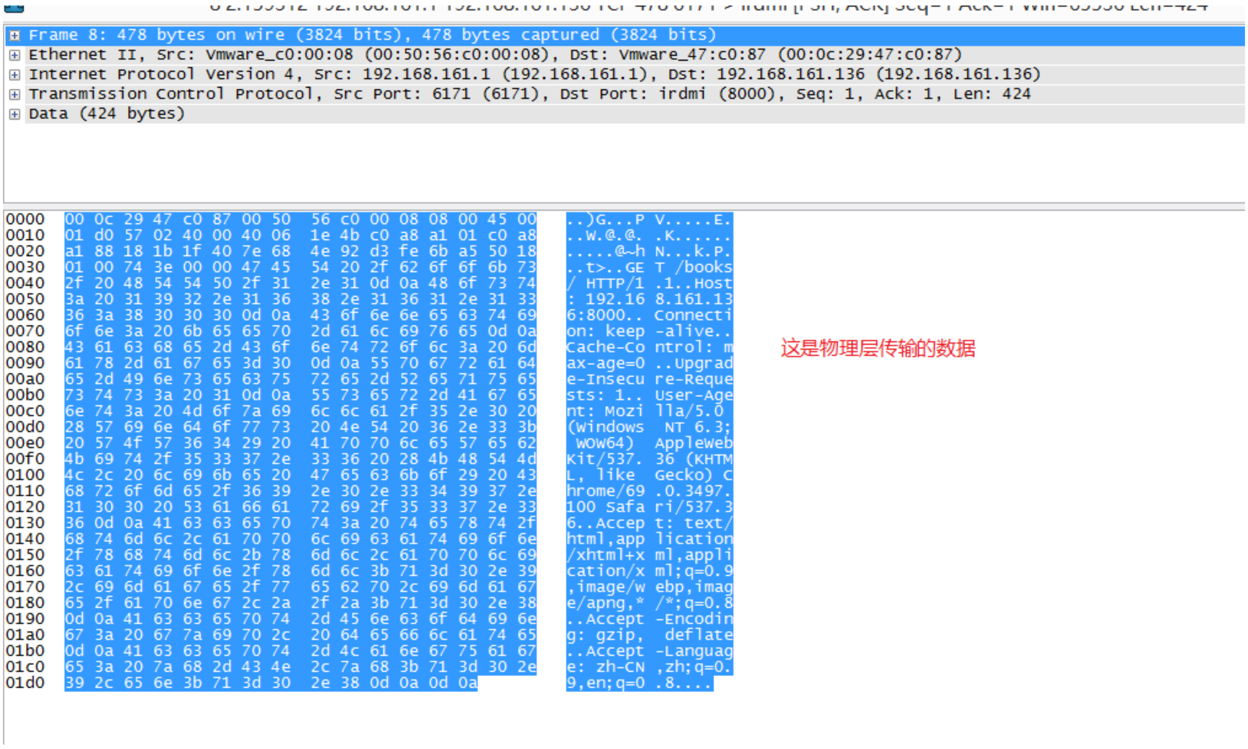
这个是网络层添加的数据



```
⊞ Frame 8: 478 bytes on wire (3824 bits), 478 bytes captured (3824 bits)
⊞ Ethernet II, Src: Vmware_c0:00:08 (00:50:56:c0:00:08), Dst: Vmware_47:c0:87 (00:0c:29:47:c0:87)
⊞ Internet Protocol Version 4, Src: 192.168.161.1 (192.168.161.1), Dst: 192.168.161.136 (192.168.161.136)
⊞ Transmission Control Protocol, Src Port: 6171 (6171), Dst Port: irdmi (8000), Seq: 1, Ack: 1, Len: 424
⊞ Data (424 bytes)

0000  00 0c 29 47 c0 87 00 50  56 c0 00 08 08 00 45 00   ..)G...P V.....E.
0010  01 d0 57 02 40 00 40 06  1e 4b c0 a8 a1 01 c0 a8   ..W.@.@. .K......
0020  a1 88 18 1b 1f 40 7e 68  4e 92 d3 fe 6b a5 50 18   .....@~h N...k.P.
0030  01 00 74 3e 00 00 47 45  54 20 2f 62 6f 6f 6b 73   ..t>..GE T /books
0040  2f 20 48 54 54 50 2f 31  2e 31 0d 0a 48 6f 73 74   / HTTP/1 .1..Host
0050  3a 20 31 39 32 2e 31 36  38 2e 31 36 31 2e 31 33   : 192.16 8.161.13
0060  36 3a 38 30 30 30 0d 0a  43 6f 6e 6e 65 63 74 69   6:8000.. Connecti
0070  6f 6e 3a 20 6b 65 65 70  2d 61 6c 69 76 65 0d 0a   on: keep -alive..
0080  43 61 63 68 65 2d 43 6f  6e 74 72 6f 6c 3a 20 6d   Cache-Co ntrol: m
0090  61 78 2d 61 67 65 3d 30  0d 0a 55 70 67 72 61 64   ax-age=0 ..Upgrad
00a0  65 2d 49 6e 73 65 63 75  72 65 2d 52 65 71 75 65   e-Insecu re-Reque
00b0  73 74 73 3a 20 31 0d 0a  55 73 65 72 2d 41 67 65   sts: 1.. User-Age
00c0  6e 74 3a 20 4d 6f 7a 69  6c 6c 61 2f 35 2e 30 20   nt: Mozi lla/5.0 
00d0  28 57 69 6e 64 6f 77 73  20 4e 54 20 36 2e 33 3b   (Windows  NT 6.3;
00e0  20 57 4f 57 36 34 29 20  41 70 70 6c 65 57 65 62    WOW64)  AppleWeb
00f0  4b 69 74 2f 35 33 37 2e  33 36 20 28 4b 48 54 4d   Kit/537. 36 (KHTM
0100  4c 2c 20 6c 69 6b 65 20  47 65 63 6b 6f 29 20 43   L, like  Gecko) C
0110  68 72 6f 6d 65 2f 36 39  2e 30 2e 33 34 39 37 2e   hrome/69 .0.3497.
0120  31 30 30 20 53 61 66 61  72 69 2f 35 33 37 2e 33   100 Safa ri/537.3
0130  36 0d 0a 41 63 63 65 70  74 3a 20 74 65 78 74 2f   6..Accep t: text/
0140  68 74 6d 6c 2c 61 70 70  6c 69 63 61 74 69 6f 6e   html,app lication
0150  2f 78 68 74 6d 6c 2b 78  6d 6c 2c 61 70 70 6c 69   /xhtml+x ml,appli
0160  63 61 74 69 6f 6e 2f 78  6d 6c 3b 71 3d 30 2e 39   cation/x ml;q=0.9
0170  2c 69 6d 61 67 65 2f 77  65 62 70 2c 69 6d 61 67   ,image/w ebp,imag
0180  65 2f 61 70 6e 67 2c 2a  2f 2a 3b 71 3d 30 2e 38   e/apng,* /*;q=0.8
0190  0d 0a 41 63 63 65 70 74  2d 45 6e 63 6f 64 69 6e   ..Accept -Encodin
01a0  67 3a 20 67 7a 69 70 2c  20 64 65 66 6c 61 74 65   g: gzip,  deflate
01b0  0d 0a 41 63 63 65 70 74  2d 4c 61 6e 67 75 61 67   ..Accept -Languag
01c0  65 3a 20 7a 68 2d 43 4e  2c 7a 68 3b 71 3d 30 2e   e: zh-CN ,zh;q=0.
01d0  39 2c 65 6e 3b 71 3d 30  2e 38 0d 0a 0d 0a         9,en;q=0 .8....
```

这个是数据链路层添加的数据

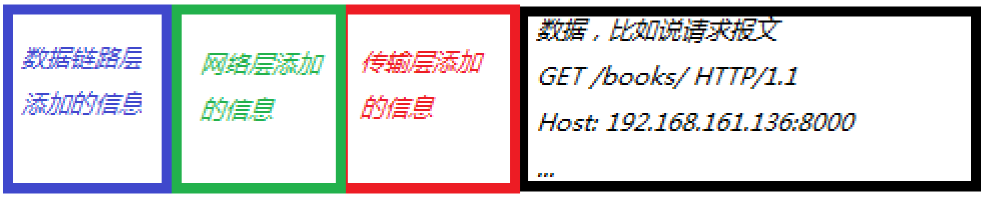


```
⊞ Frame 8: 478 bytes on wire (3824 bits), 478 bytes captured (3824 bits)
⊞ Ethernet II, Src: Vmware_c0:00:08 (00:50:56:c0:00:08), Dst: Vmware_47:c0:87 (00:0c:29:47:c0:87)
⊞ Internet Protocol Version 4, Src: 192.168.161.1 (192.168.161.1), Dst: 192.168.161.136 (192.168.161.136)
⊞ Transmission Control Protocol, Src Port: 6171 (6171), Dst Port: irdmi (8000), Seq: 1, Ack: 1, Len: 424
⊞ Data (424 bytes)
```

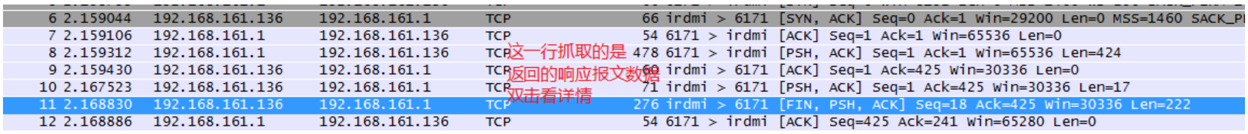
```
0000  00 0c 29 47 c0 87 00 50  56 c0 00 08 08 00 45 00   ..)G...P V.....E.
0010  01 d0 57 02 40 00 40 06  1e 4b c0 a8 a1 01 c0 a8   ..W.@.@. .K......
0020  a1 88 18 1b 1f 40 7e 68  4e 92 d3 fe 6b a5 50 18   .....@~h N...k.P.
0030  01 00 74 3e 00 00 47 45  54 20 2f 62 6f 6f 6b 73   ..t>..GE T /books
0040  2f 20 48 54 54 50 2f 31  2e 31 0d 0a 48 6f 73 74   / HTTP/1 .1..Host
0050  3a 20 31 39 32 2e 31 36  38 2e 31 36 31 2e 31 33   : 192.16 8.161.13
0060  36 3a 38 30 30 30 0d 0a  43 6f 6e 6e 65 63 74 69   6:8000.. Connecti
0070  6f 6e 3a 20 6b 65 65 70  2d 61 6c 69 76 65 0d 0a   on: keep -alive..
0080  43 61 63 68 65 2d 43 6f  6e 74 72 6f 6c 3a 20 6d   Cache-Co ntrol: m
0090  61 78 2d 61 67 65 3d 30  0d 0a 55 70 67 72 61 64   ax-age=0 ..Upgrad
00a0  65 2d 49 6e 73 65 63 75  72 65 2d 52 65 71 75 65   e-Insecu re-Reque
00b0  73 74 73 3a 20 31 0d 0a  55 73 65 72 2d 41 67 65   sts: 1.. User-Age
00c0  6e 74 3a 20 4d 6f 7a 69  6c 6c 61 2f 35 2e 30 20   nt: Mozi lla/5.0 
00d0  28 57 69 6e 64 6f 77 73  20 4e 54 20 36 2e 33 3b   (Windows  NT 6.3;
00e0  20 57 4f 57 36 34 29 20  41 70 70 6c 65 57 65 62    WOW64)  AppleWeb
00f0  4b 69 74 2f 35 33 37 2e  33 36 20 28 4b 48 54 4d   Kit/537. 36 (KHTM
0100  4c 2c 20 6c 69 6b 65 20  47 65 63 6b 6f 29 20 43   L, like  Gecko) C
0110  68 72 6f 6d 65 2f 36 39  2e 30 2e 33 34 39 37 2e   hrome/69 .0.3497.
0120  31 30 30 20 53 61 66 61  72 69 2f 35 33 37 2e 33   100 Safa ri/537.3
0130  36 0d 0a 41 63 63 65 70  74 3a 20 74 65 78 74 2f   6..Accep t: text/
0140  68 74 6d 6c 2c 61 70 70  6c 69 63 61 74 69 6f 6e   html,app lication
0150  2f 78 68 74 6d 6c 2b 78  6d 6c 2c 61 70 70 6c 69   /xhtml+x ml,appli
0160  63 61 74 69 6f 6e 2f 78  6d 6c 3b 71 3d 30 2e 39   cation/x ml;q=0.9
0170  2c 69 6d 61 67 65 2f 77  65 62 70 2c 69 6d 61 67   ,image/w ebp,imag
0180  65 2f 61 70 6e 67 2c 2a  2f 2a 3b 71 3d 30 2e 38   e/apng,* /*;q=0.8
0190  0d 0a 41 63 63 65 70 74  2d 45 6e 63 6f 64 69 6e   ..Accept -Encodin
01a0  67 3a 20 67 7a 69 70 2c  20 64 65 66 6c 61 74 65   g: gzip,  deflate
01b0  0d 0a 41 63 63 65 70 74  2d 4c 61 6e 67 75 61 67   ..Accept -Languag
01c0  65 3a 20 7a 68 2d 43 4e  2c 7a 68 3b 71 3d 30 2e   e: zh-CN ,zh;q=0.
01d0  39 2c 65 6e 3b 71 3d 30  2e 38 0d 0a 0d 0a         9,en;q=0 .8....
```

这是物理层传输的数据

TCP/IP协议对数据的处理大致如下：

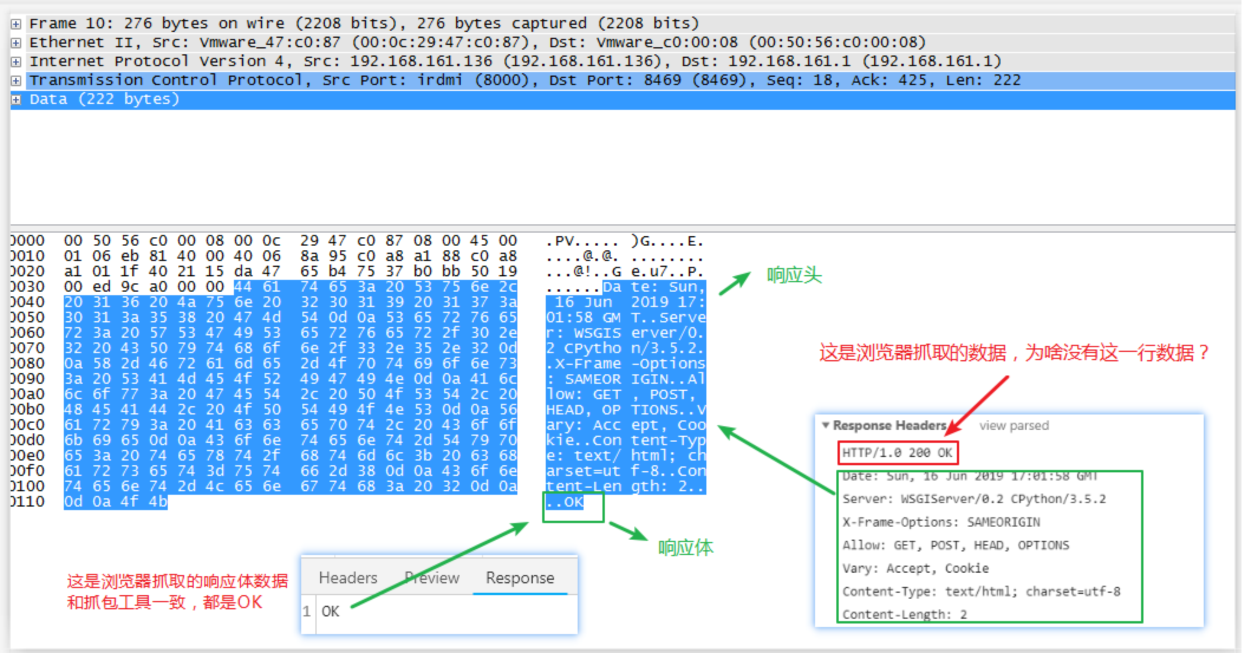


步骤7：序号11代表的是响应报文数据传输的抓取



```
 6 2.159044  192.168.161.136  192.168.161.1    TCP   66 irdmi > 6171 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1460 SACK_PI
 7 2.159106  192.168.161.1    192.168.161.136  TCP   54 6171 > irdmi [ACK] Seq=1 Ack=1 Win=65536 Len=0
 8 2.159312  192.168.161.1    192.168.161.136  TCP  478 6171 > irdmi [PSH, ACK] Seq=1 Ack=1 Win=65536 Len=424
 9 2.159430  192.168.161.136  192.168.161.1    TCP   60 irdmi > 6171 [ACK] Seq=1 Ack=425 Win=30336 Len=0
10 2.167523  192.168.161.136  192.168.161.1    TCP   71 irdmi > 6171 [PSH, ACK] Seq=1 Ack=425 Win=30336 Len=17
11 2.168830  192.168.161.136  192.168.161.1    TCP  276 irdmi > 6171 [FIN, PSH, ACK] Seq=18 Ack=425 Win=30336 Len=222
12 2.168886  192.168.161.1    192.168.161.136  TCP   54 6171 > irdmi [ACK] Seq=425 Ack=241 Win=65280 Len=0
```

这一行抓取的是
返回的响应报文数据
双击看详情



```
⊞ Frame 10: 276 bytes on wire (2208 bits), 276 bytes captured (2208 bits)
⊞ Ethernet II, Src: Vmware_47:c0:87 (00:0c:29:47:c0:87), Dst: Vmware_c0:00:08 (00:50:56:c0:00:08)
⊞ Internet Protocol Version 4, Src: 192.168.161.136 (192.168.161.136), Dst: 192.168.161.1 (192.168.161.1)
⊞ Transmission Control Protocol, Src Port: irdmi (8000), Dst Port: 8469 (8469), Seq: 18, Ack: 425, Len: 222
⊞ Data (222 bytes)
```

```
0000  00 50 56 c0 00 08 00 0c  29 47 c0 87 08 00 45 00   .PV..... )G....E.
0010  01 06 eb 81 40 00 40 06  8a 95 c0 a8 a1 88 c0 a8   ....@.@. ........
0020  a1 01 1f 40 21 15 da 47  65 b4 75 37 b0 bb 50 19   ...@!..G e.u7..P.
0030  00 ed 9c a0 00 00 44 61  74 65 3a 20 53 75 6e 2c   ......Da te: Sun,
0040  20 31 36 20 4a 75 6e 20  32 30 31 39 20 31 37 3a    16 Jun  2019 17:
0050  30 31 3a 35 38 20 47 4d  54 0d 0a 53 65 72 76 65   01:58 GM T..Serve
0060  72 3a 20 57 53 47 49 53  65 72 76 65 72 2f 30 2e   r: WSGIS erver/0.
0070  32 20 43 50 79 74 68 6f  6e 2f 33 2e 35 2e 32 0d   2 CPytho n/3.5.2.
0080  0a 58 2d 46 72 61 6d 65  2d 4f 70 74 69 6f 6e 73   .X-Frame -Options
0090  3a 20 53 41 4d 45 4f 52  49 47 49 4e 0d 0a 41 6c   : SAMEOR IGIN..Al
00a0  6c 6f 77 3a 20 47 45 54  2c 20 50 4f 53 54 2c 20   low: GET , POST, 
00b0  48 45 41 44 2c 20 4f 50  54 49 4f 4e 53 0d 0a 56   HEAD, OP TIONS..V
00c0  61 72 79 3a 20 41 63 63  65 70 74 2c 20 43 6f 6f   ary: Acc ept, Coo
00d0  6b 69 65 0d 0a 43 6f 6e  74 65 6e 74 2d 54 79 70   kie..Con tent-Typ
00e0  65 3a 20 74 65 78 74 2f  68 74 6d 6c 3b 20 63 68   e: text/ html; ch
00f0  61 72 73 65 74 3d 75 74  66 2d 38 0d 0a 43 6f 6e   arset=ut f-8..Con
0100  74 65 6e 74 2d 4c 65 6e  67 74 68 3a 20 32 0d 0a   tent-Len gth: 2..
0110  0d 0a 4f 4b                                        ..OK
```

响应头

这是浏览器抓取的数据，为啥没有这一行数据？

响应体

这是浏览器抓取的响应体数据
和抓包工具一致，都是OK

```
1 OK
```

```
HTTP/1.0 200 OK
Date: Sun, 16 Jun 2019 17:01:58 GMT
Server: WSGIServer/0.2 CPython/3.5.2
X-Frame-Options: SAMEORIGIN
Allow: GET, POST, HEAD, OPTIONS
Vary: Accept, Cookie
Content-Type: text/html; charset=utf-8
Content-Length: 2
```