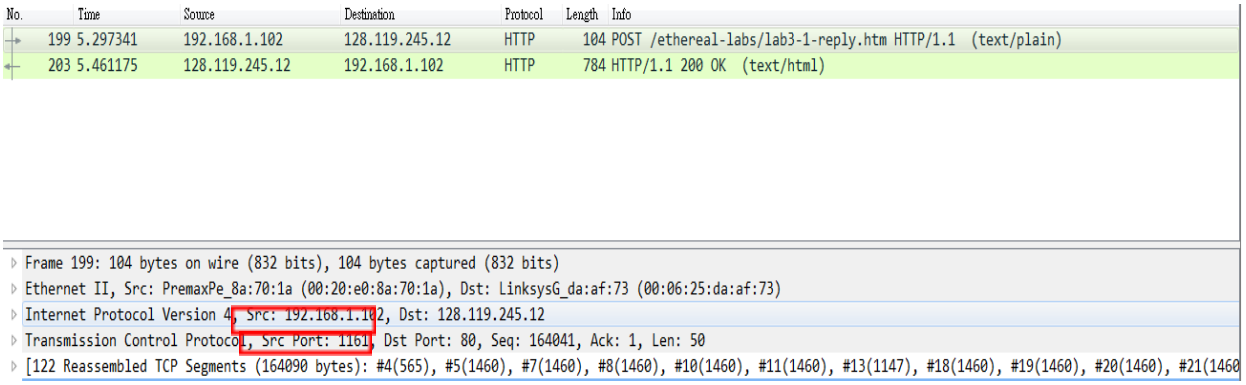
1.

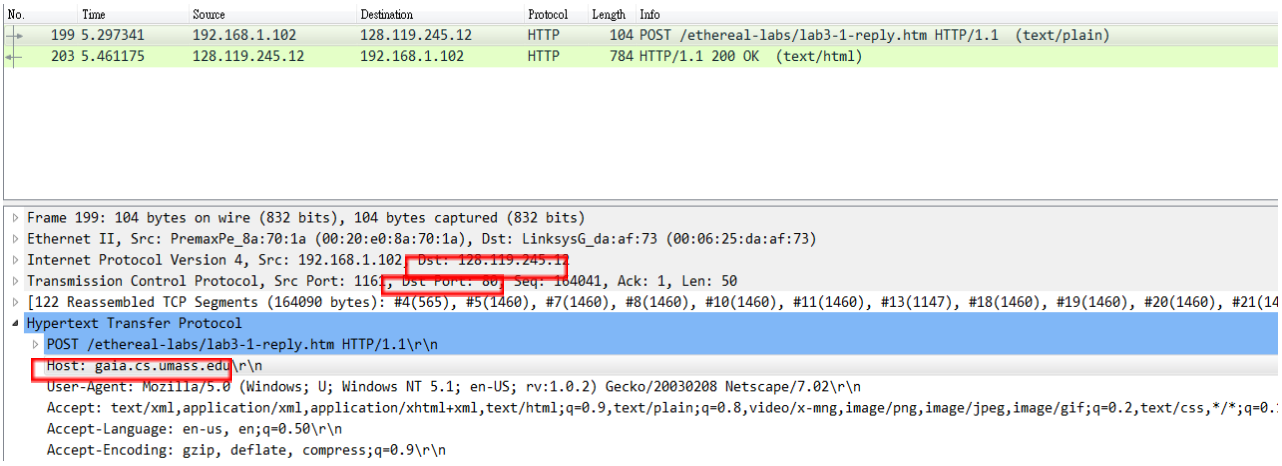


| No. | Time | Source | Destination | Protocol | Length | Info |
|---|---|---|---|---|---|---|
| 199 | 5.297341 | 192.168.1.102 | 128.119.245.12 | HTTP | 104 | POST /ethereal-labs/lab3-1-reply.htm HTTP/1.1 (text/plain) |
| 203 | 5.461175 | 128.119.245.12 | 192.168.1.102 | HTTP | 784 | HTTP/1.1 200 OK (text/html) |

```
Frame 199: 104 bytes on wire (832 bits), 104 bytes captured (832 bits)
Ethernet II, Src: PremaxPe_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: 128.119.245.12
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 164041, Ack: 1, Len: 50
[122 Reassembled TCP Segments (164090 bytes): #4(565), #5(1460), #7(1460), #8(1460), #10(1460), #11(1460), #13(1147), #18(1460), #19(1460), #20(1460), #21(1460
```

2.目的地(gaia.cs.umass.edu)IP是128.1169.245.12

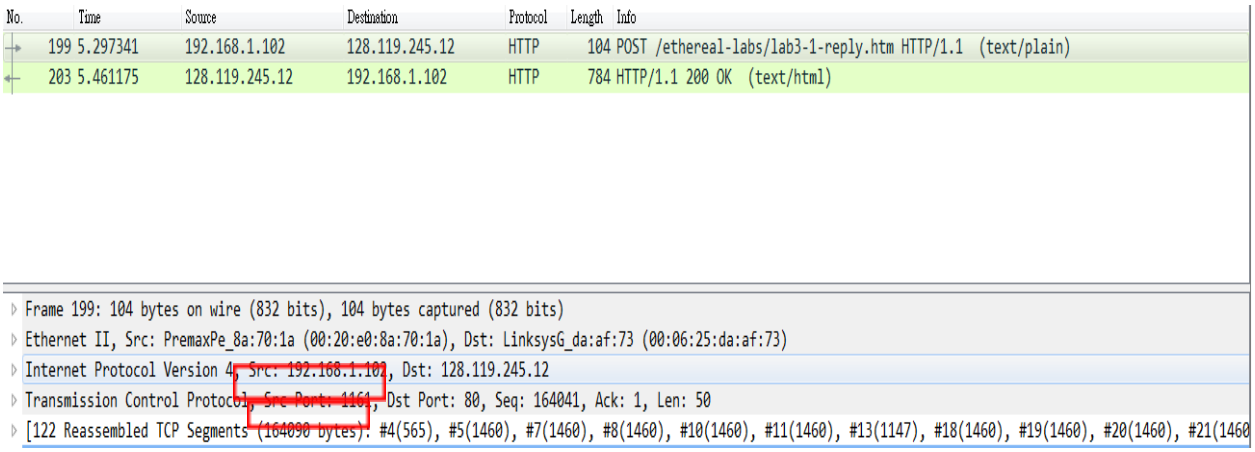
Port:80



| No. | Time | Source | Destination | Protocol | Length | Info |
|---|---|---|---|---|---|---|
| 199 | 5.297341 | 192.168.1.102 | 128.119.245.12 | HTTP | 104 | POST /ethereal-labs/lab3-1-reply.htm HTTP/1.1 (text/plain) |
| 203 | 5.461175 | 128.119.245.12 | 192.168.1.102 | HTTP | 784 | HTTP/1.1 200 OK (text/html) |

```
Frame 199: 104 bytes on wire (832 bits), 104 bytes captured (832 bits)
Ethernet II, Src: PremaxPe_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: 128.119.245.12
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 164041, Ack: 1, Len: 50
[122 Reassembled TCP Segments (164090 bytes): #4(565), #5(1460), #7(1460), #8(1460), #10(1460), #11(1460), #13(1147), #18(1460), #19(1460), #20(1460), #21(14
Hypertext Transfer Protocol
  POST /ethereal-labs/lab3-1-reply.htm HTTP/1.1\r\n
  Host: gaia.cs.umass.edu\r\n
  User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.0.2) Gecko/20030208 Netscape/7.02\r\n
  Accept: text/xml,application/xml,application/xhtml+xml,text/html;q=0.9,text/plain;q=0.8,video/x-mng,image/png,image/jpeg,image/gif;q=0.2,text/css,*/*;q=0.
  Accept-Language: en-us, en;q=0.50\r\n
  Accept-Encoding: gzip, deflate, compress;q=0.9\r\n
```

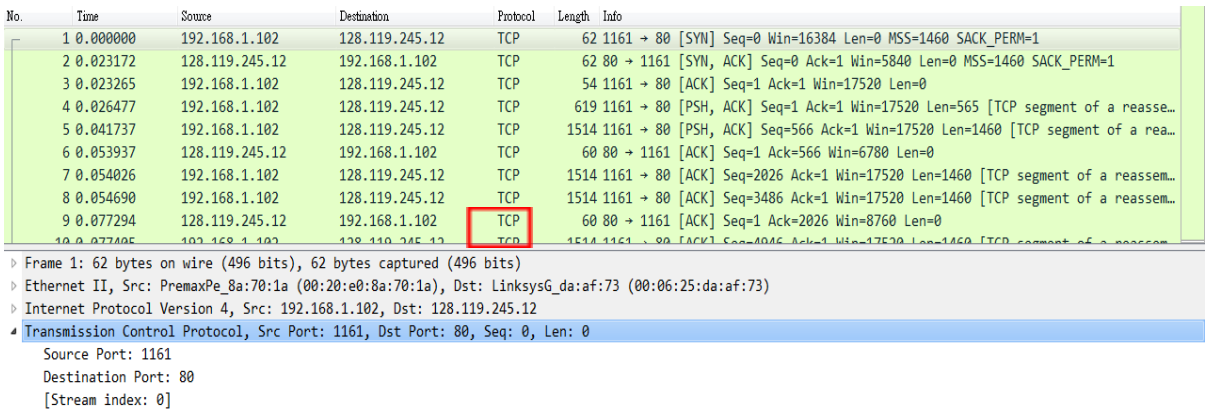
3.



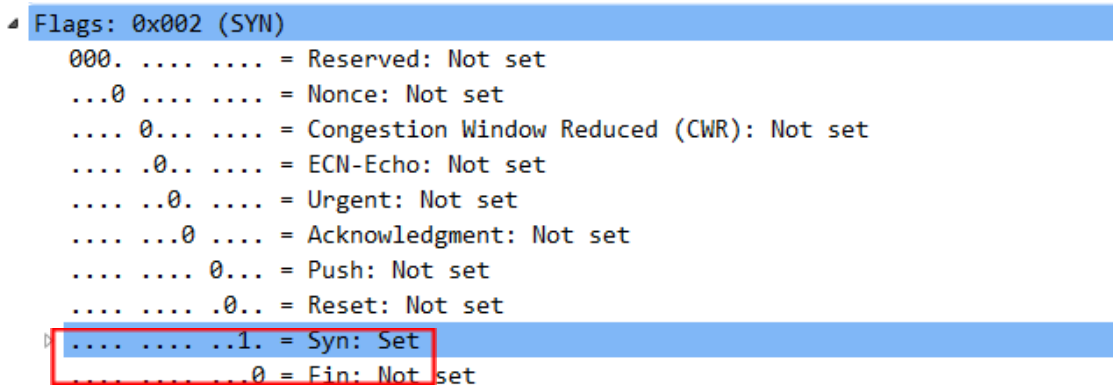
| No. | Time | Source | Destination | Protocol | Length | Info |
|---|---|---|---|---|---|---|
| 199 | 5.297341 | 192.168.1.102 | 128.119.245.12 | HTTP | 104 | POST /ethereal-labs/lab3-1-reply.htm HTTP/1.1 (text/plain) |
| 203 | 5.461175 | 128.119.245.12 | 192.168.1.102 | HTTP | 784 | HTTP/1.1 200 OK (text/html) |

```
Frame 199: 104 bytes on wire (832 bits), 104 bytes captured (832 bits)
Ethernet II, Src: PremaxPe_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: 128.119.245.12
Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 164041, Ack: 1, Len: 50
[122 Reassembled TCP Segments (164090 bytes): #4(565), #5(1460), #7(1460), #8(1460), #10(1460), #11(1460), #13(1147), #18(1460), #19(1460), #20(1460), #21(1460
```

4.



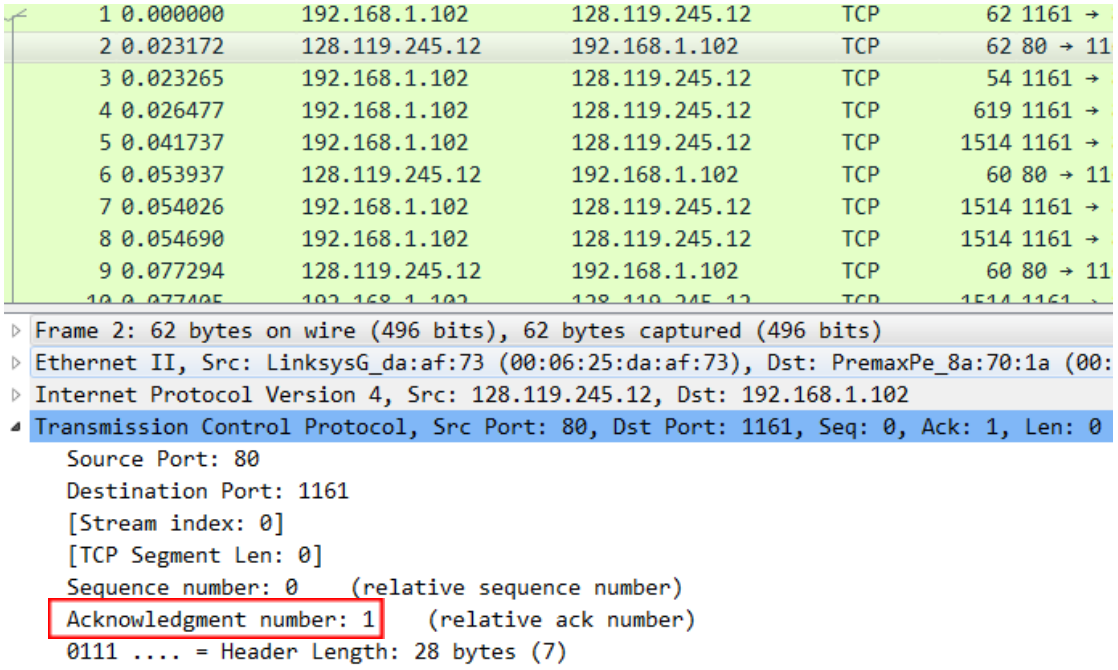

Sequence number:0

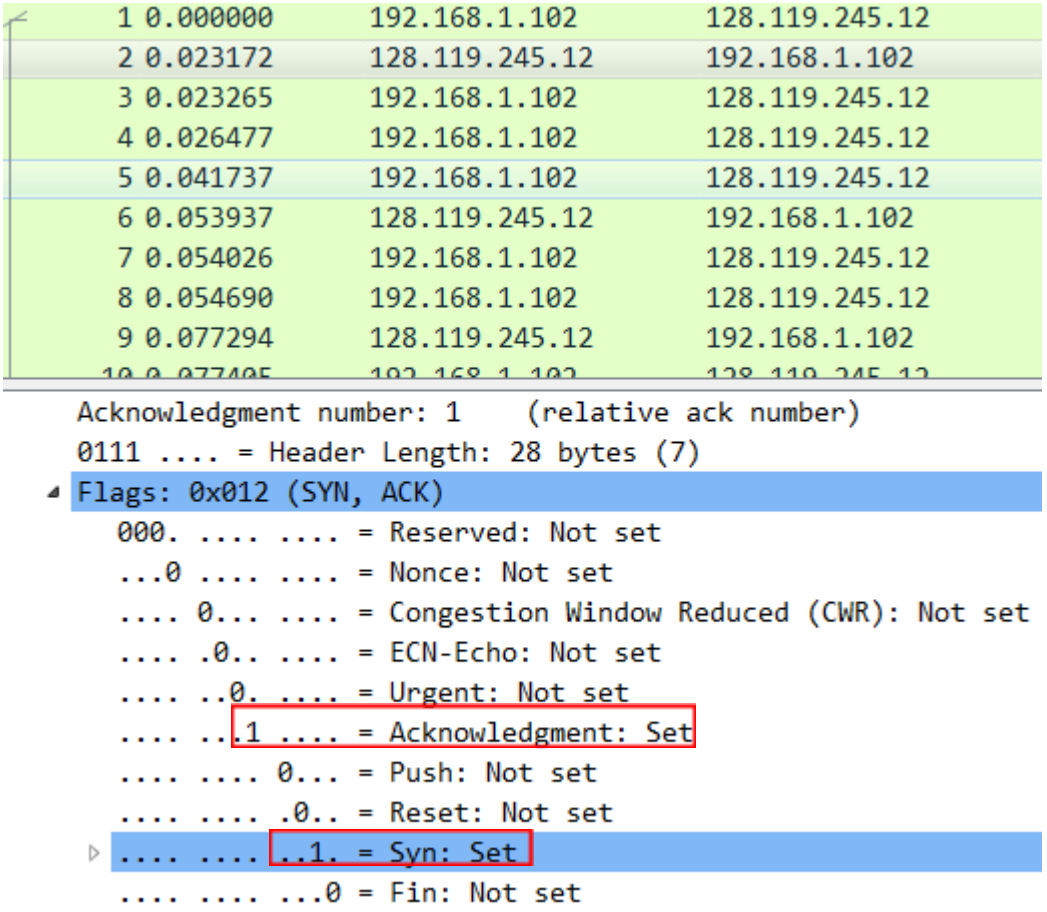



因為flag中的syn被set了，所以我們可以知道這是一個syn segment

5.

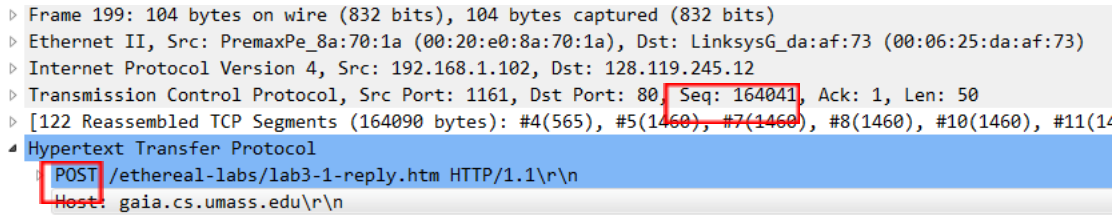
因為此時正在初始化，所以傳回的(ACK)值會是sequence number+1，所以就是1了



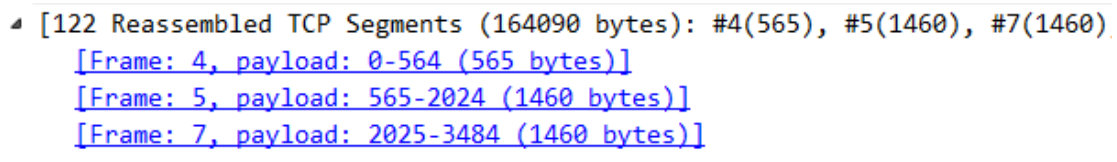



因為flag中的ACK跟syn都被set了，所以可以知道他是一SYNACK segment

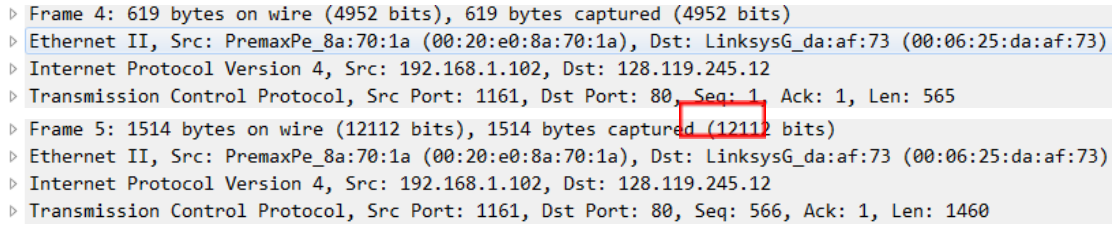
6.




7.




Seq number:



```
▷ Frame 7: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits)
▷ Ethernet II, Src: PremaxPe_8a:70:1a (00:20:e0:8a:70:1a), Dst: Linksys6_da:af:73 (00:06:25:da:af:73)
▷ Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
▷ Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 2026, Ack: 1, Len: 1460
```

```
   4 0.026477    192.168.1.102    128.119.245.12    TCP     619 1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565
   5 0.041737    192.168.1.102    128.119.245.12    TCP    1514 1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1
   6 0.053937    128.119.245.12   192.168.1.102     TCP      60 80 → 1161 [ACK] Seq=1 Ack=566 Win=6780 Len=0
   7 0.054026    192.168.1.102    128.119.245.12    TCP    1514 1161 → 80 [ACK] Seq=2026 Ack=1 Win=17520 Len=1460
   8 0.054690    192.168.1.102    128.119.245.12    TCP    1514 1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460
   9 0.077294    128.119.245.12   192.168.1.102     TCP      60 80 → 1161 [ACK] Seq=1 Ack=2026 Win=8760 Len=0
  10 0.077405    192.168.1.102    128.119.245.12    TCP    1514 1161 → 80 [ACK] Seq=4946 Ack=1 Win=17520 Len=1460
  11 0.078157    192.168.1.102    128.119.245.12    TCP    1514 1161 → 80 [ACK] Seq=6406 Ack=1 Win=17520 Len=1460
  12 0.124085    128.119.245.12   192.168.1.102     TCP      60 80 → 1161 [ACK] Seq=1 Ack=3486 Win=11680 Len=0
```

0.053937-0.026477=0.027460

0.875*0.02746+0.125*0.035557=0.0240275+0.00444462=0.02847212

0.875*0.02847212+0.125*0.070059=0.0249131+0.00875738=0.03367048

8.看第7題的三個截圖，len=565，1460，1460

9. 最小值是5840

```
   2 0.023172    128.119.245.12   192.168.1.102     TCP      62 80 → 1161 [SYN, ACK] Seq=0 Ack=1 Win=5840 Len=0 MSS=14
```

沒有，因為window size一直都是增加的，並沒有減少

10.沒有，因為seq number都沒有重複

11.由截圖可看見大部分大小都是1460

```
▲ [122 Reassembled TCP Segments (164090 bytes): #4(565), #5(1460), #7(1460), #8(1460), #10(1460), #11(1
```

12.throughput=amount of transmitted data (傳輸總資料量)/ time (傳輸過程所花時間)

416/0.163834=2539.15549(byte/s)

13.