

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128.119.245.12

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)
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[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)]
Hypertext Transfer Protocol
POST /ethereal-labs/lab3-1-reply.htm HTTP/1.1\r\nHost: gaia.cs.umass.edu\r\nUser-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.0.2) Gecko/20030208 Netscape/7.02\r\nAccept: 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=0.1\r\nAccept-Language: en-us,en;q=0.50\r\nAccept-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.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	192.168.1.102	128.119.245.12	TCP	62	1161 → 80 [SYN] Seq=0 Win=16384 Len=0 MSS=1460 SACK_PERM=1
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=1460 SACK_PERM=1
3	0.023265	192.168.1.102	128.119.245.12	TCP	54	1161 → 80 [ACK] Seq=1 Ack=1 Win=17520 Len=0
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 [TCP segment of a reasse...
5	0.041737	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=1460 [TCP segment of a rea...
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 [TCP segment of a reassem...
8	0.054690	192.168.1.102	128.119.245.12	TCP	1514	1161 → 80 [ACK] Seq=3486 Ack=1 Win=17520 Len=1460 [TCP segment of a reassem...
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=4046 Ack=1 Win=17520 Len=1460 [TCP segment of a reassem...

▶ Frame 1: 62 bytes on wire (496 bits), 62 bytes captured (496 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: 0, Len: 0
 Source Port: 1161
 Destination Port: 80
 [Stream index: 0]

Sequence number:0

000. = Reserved: Not set ...0 = Nonce: Not set 0... = Congestion Window Reduced (CWR): Not set0.. = ECN-Echo: Not set0. = Urgent: Not set0 = Acknowledgment: Not set 0... = Push: Not set 0.. = Reset: Not set1. = Syn: Set 0 = Fin: Not set
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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

1	0.000000	192.168.1.102	128.119.245.12	TCP	62	1161 →
2	0.023172	128.119.245.12	192.168.1.102	TCP	62	80 → 11
3	0.023265	192.168.1.102	128.119.245.12	TCP	54	1161 →
4	0.026477	192.168.1.102	128.119.245.12	TCP	619	1161 →
5	0.041737	192.168.1.102	128.119.245.12	TCP	1514	1161 →
6	0.053937	128.119.245.12	192.168.1.102	TCP	60	80 → 11
7	0.054026	192.168.1.102	128.119.245.12	TCP	1514	1161 →
8	0.054690	192.168.1.102	128.119.245.12	TCP	1514	1161 →
9	0.077294	128.119.245.12	192.168.1.102	TCP	60	80 → 11
10	0.077405	192.168.1.102	128.119.245.12	TCP	1514	1161 →

▶ Frame 2: 62 bytes on wire (496 bits), 62 bytes captured (496 bits)
 ▶ Ethernet II, Src: LinksysG_da:af:73 (00:06:25:da:af:73), Dst: PremaxPe_8a:70:1a (00:20:e0:8a:70:1a)
 ▶ Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.102
 ▶ Transmission Control Protocol, Src Port: 80, Dst Port: 1161, Seq: 0, Ack: 1, Len: 0
 Source Port: 80
 Destination Port: 1161
 [Stream index: 0]
 [TCP Segment Len: 0]
 Sequence number: 0 (relative sequence number)
 Acknowledgment number: 1 (relative ack number)
 0111 = Header Length: 28 bytes (7)

1	0.000000	192.168.1.102	128.119.245.12
2	0.023172	128.119.245.12	192.168.1.102
3	0.023265	192.168.1.102	128.119.245.12
4	0.026477	192.168.1.102	128.119.245.12
5	0.041737	192.168.1.102	128.119.245.12
6	0.053937	128.119.245.12	192.168.1.102
7	0.054026	192.168.1.102	128.119.245.12
8	0.054690	192.168.1.102	128.119.245.12
9	0.077294	128.119.245.12	192.168.1.102
10	0.077405	192.168.1.102	128.119.245.12

Acknowledgment number: 1 (relative ack number)

0111 = Header Length: 28 bytes (7)

Flags: 0x012 (SYN, ACK)

000. = Reserved: Not set

...0 = Nonce: Not set

.... 0... = Congestion Window Reduced (CWR): Not set

.... .0.. = ECN-Echo: Not set

.... ..0. = Urgent: Not set

.... ..1 = Acknowledgment: Set

.... 0... = Push: Not set

....0.. = Reset: Not set

▷1. = Syn: Set

....0 = Fin: Not set

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

6.

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▷ 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)]
Hypertext Transfer Protocol
POST /ethereal-labs/lab3-1-reply.htm HTTP/1.1\r\n
Host: gaia.cs.umass.edu\r\n

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7.

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[122 Reassembled TCP Segments (164090 bytes): #4(565), #5(1460), #7(1460)]
[Frame: 4, payload: 0-564 (565 bytes)]
[Frame: 5, payload: 565-2024 (1460 bytes)]
[Frame: 7, payload: 2025-3484 (1460 bytes)]

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Seq number:

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▷ Frame 4: 619 bytes on wire (4952 bits), 619 bytes captured (4952 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: 1, Ack: 1, Len: 565
▷ Frame 5: 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: 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: 566, Ack: 1, Len: 1460

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▶ 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: Linksys_00:06:25: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=56
5	0.041737	192.168.1.102	128.119.245.12	TCP	1514 1161 → 80 [PSH, ACK] Seq=566 Ack=1 Win=17520 Len=
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
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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

12. [122 Reassembled TCP Segments (164090 bytes): #4(565), #5(1460), #7(1460), #8(1460), #10(1460), #11(1460)]

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.

