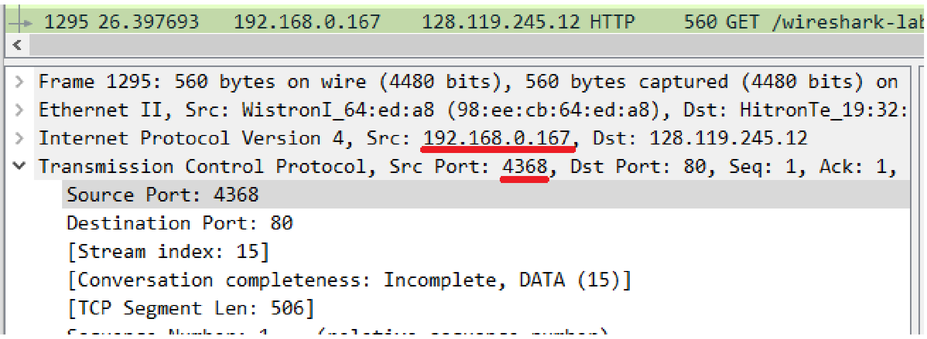
計算機網路 Lab4　　　　　　　　資工三 109590004 呂育瑋

Q1. What is the IP address and TCP port number used by the client computer?

A: client computer IP: 192.168.0.167 Port: 4368

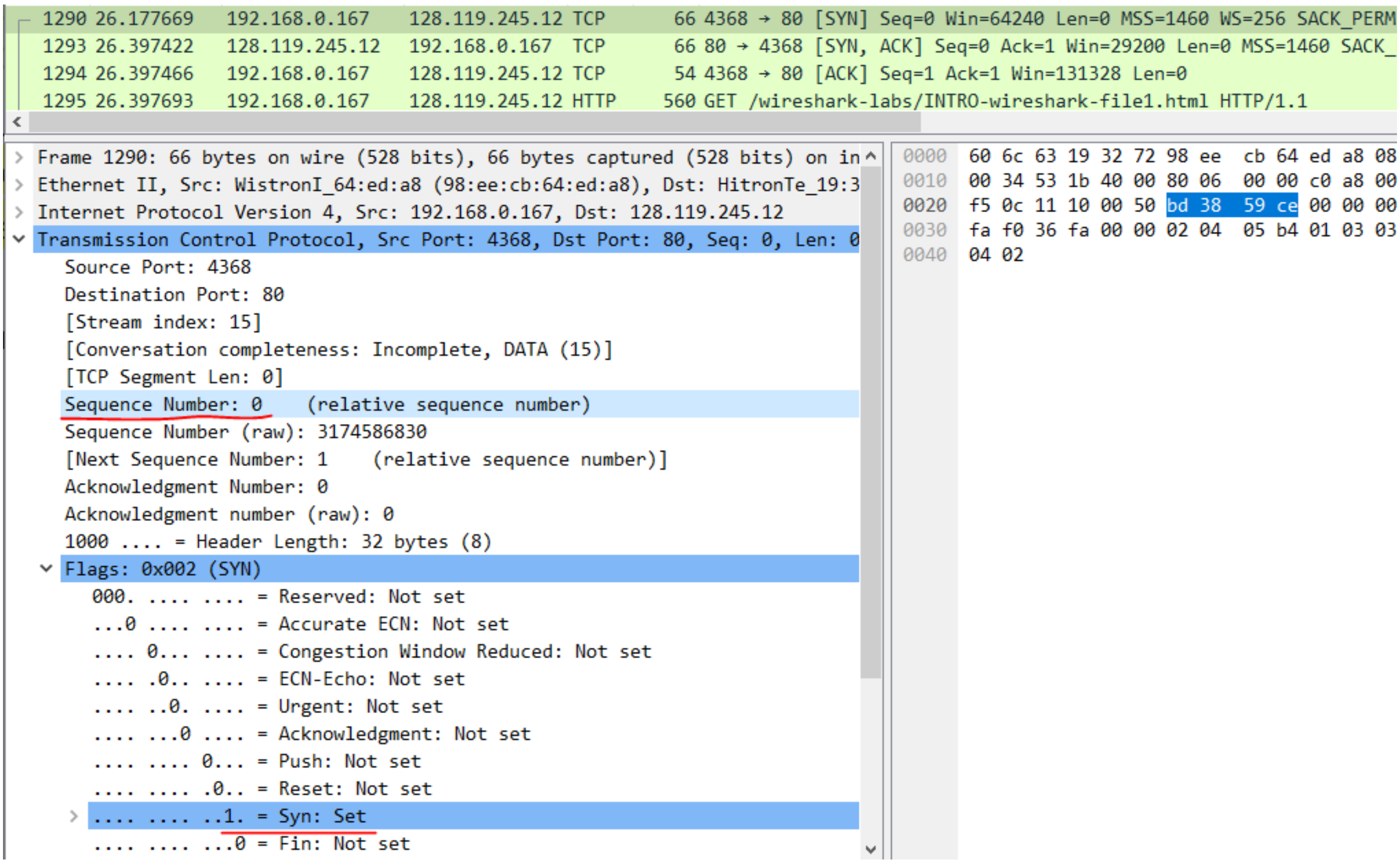


```
1295 26.397693   192.168.0.167   128.119.245.12 HTTP    560 GET /wireshark-lat

> Frame 1295: 560 bytes on wire (4480 bits), 560 bytes captured (4480 bits) on
> Ethernet II, Src: WistronI_64:ed:a8 (98:ee:cb:64:ed:a8), Dst: HitronTe_19:32:
> Internet Protocol Version 4, Src: 192.168.0.167, Dst: 128.119.245.12
v Transmission Control Protocol, Src Port: 4368, Dst Port: 80, Seq: 1, Ack: 1,
    Source Port: 4368
    Destination Port: 80
    [Stream index: 15]
    [Conversation completeness: Incomplete, DATA (15)]
    [TCP Segment Len: 506]
    Sequence Number: 1    (relative sequence number)
```

Q2. What is the sequence number of the TCP SYN segment that is used to initiate the TCP connection between the client computer and server? What is the value in the segment that identifies the segment as a SYN segment?

A: Sequence number: 0, SYN segment value: Syn: Set (1)



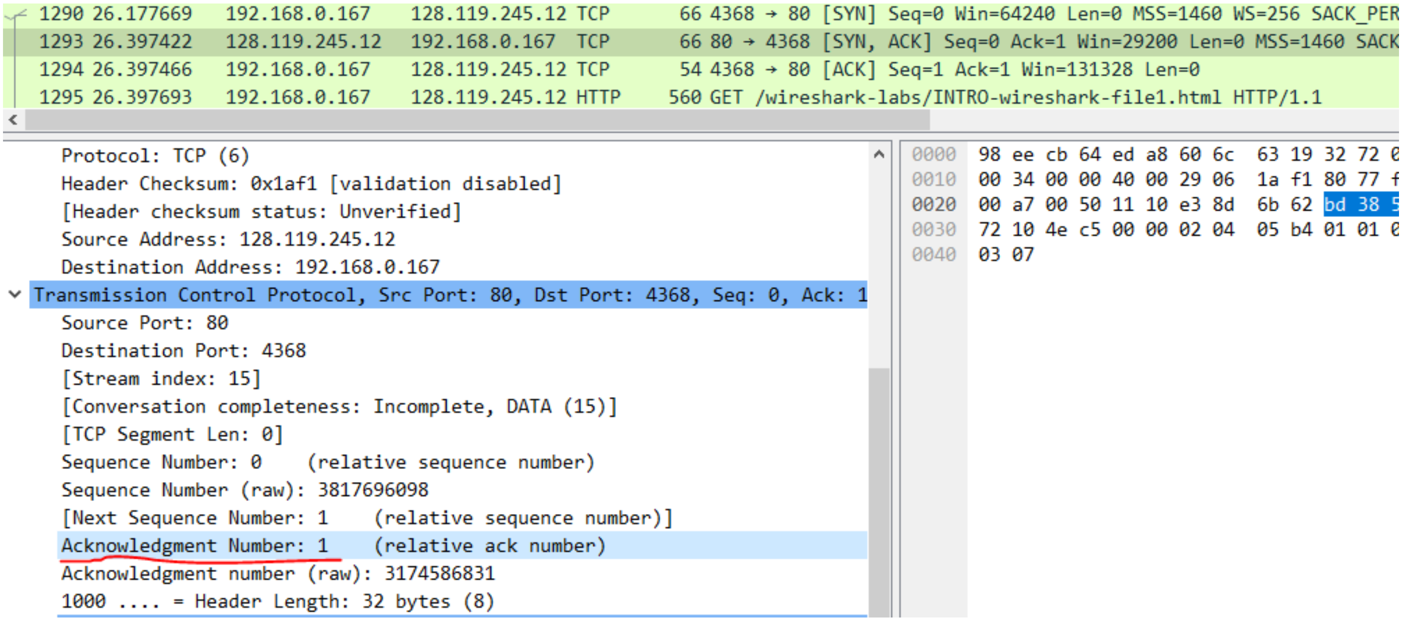
```
1290 26.177669   192.168.0.167   128.119.245.12 TCP     66 4368 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM
1293 26.397422   128.119.245.12  192.168.0.167  TCP     66 80 → 4368 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1460 SACK_
1294 26.397466   192.168.0.167   128.119.245.12 TCP     54 4368 → 80 [ACK] Seq=1 Ack=1 Win=131328 Len=0
1295 26.397693   192.168.0.167   128.119.245.12 HTTP   560 GET /wireshark-labs/INTRO-wireshark-file1.html HTTP/1.1
```

```
> Frame 1290: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on in
> Ethernet II, Src: WistronI_64:ed:a8 (98:ee:cb:64:ed:a8), Dst: HitronTe_19:3
> Internet Protocol Version 4, Src: 192.168.0.167, Dst: 128.119.245.12
v Transmission Control Protocol, Src Port: 4368, Dst Port: 80, Seq: 0, Len: 0
    Source Port: 4368
    Destination Port: 80
    [Stream index: 15]
    [Conversation completeness: Incomplete, DATA (15)]
    [TCP Segment Len: 0]
    Sequence Number: 0    (relative sequence number)
    Sequence Number (raw): 3174586830
    [Next Sequence Number: 1    (relative sequence number)]
    Acknowledgment Number: 0
    Acknowledgment number (raw): 0
    1000 .... = Header Length: 32 bytes (8)
  v Flags: 0x002 (SYN)
      000. .... .... = Reserved: Not set
      ...0 .... .... = Accurate ECN: Not set
      .... 0... .... = Congestion Window Reduced: Not set
      .... .0.. .... = ECN-Echo: Not set
      .... ..0. .... = Urgent: Not set
      .... ...0 .... = Acknowledgment: Not set
      .... .... 0... = Push: Not set
      .... .... .0.. = Reset: Not set
    > .... .... ..1. = Syn: Set
      .... .... ...0 = Fin: Not set
```

```
0000  60 6c 63 19 32 72 98 ee  cb 64 ed a8 08
0010  00 34 53 1b 40 00 80 06  00 00 c0 a8 00
0020  f5 0c 11 10 00 50 bd 38  59 ce 00 00 00
0030  fa f0 36 fa 00 00 02 04  05 b4 01 03 03
0040  04 02
```

Q3. What is the value of the ACKnowledgement field in the SYNACK segment? How did server determine that value?

A: ACKnowledgement value: 1, ACKnowledgement value = Sequence number + 1 = 0 + 1 = 1



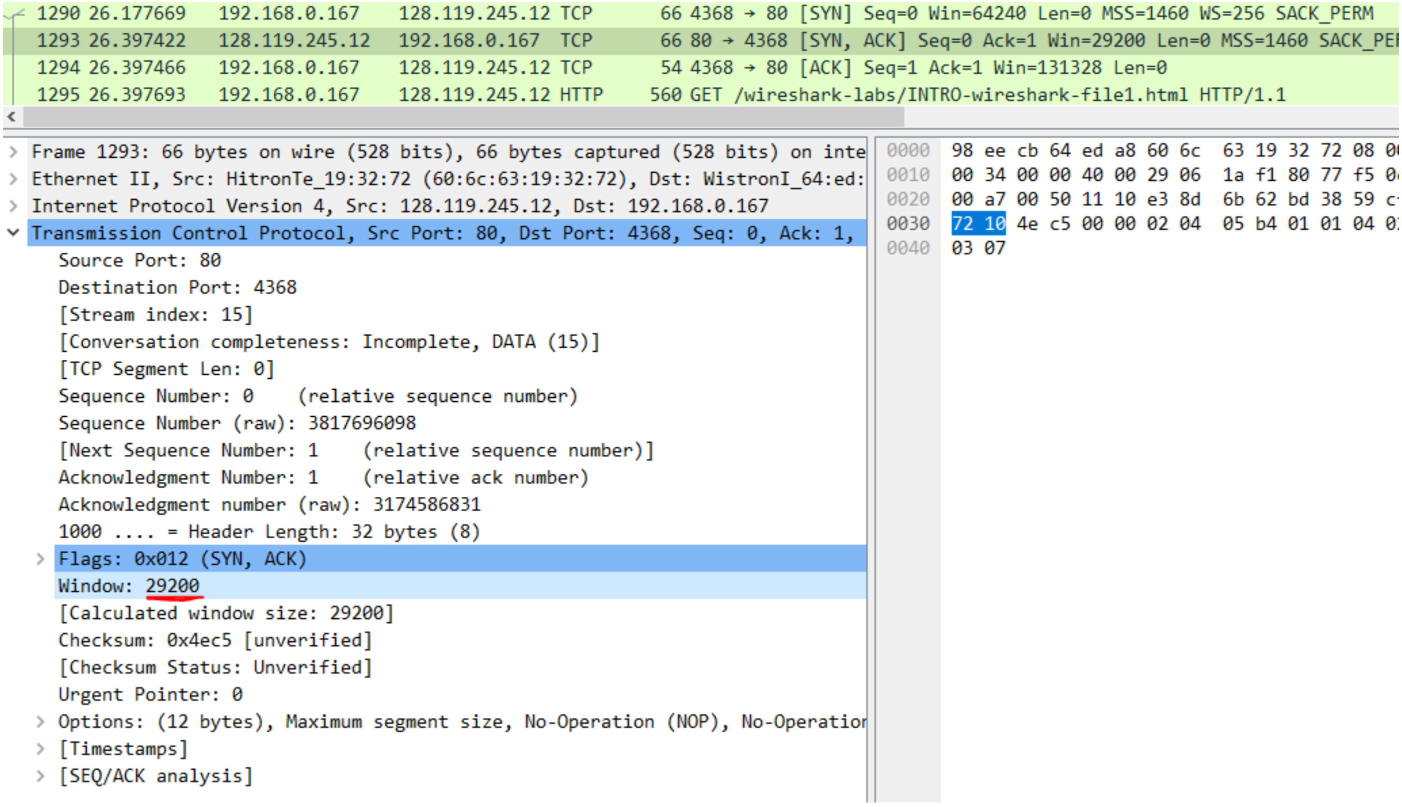
```
1290 26.177669   192.168.0.167    128.119.245.12 TCP      66 4368 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PER
1293 26.397422   128.119.245.12   192.168.0.167  TCP      66 80 → 4368 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1460 SACK
1294 26.397466   192.168.0.167    128.119.245.12 TCP      54 4368 → 80 [ACK] Seq=1 Ack=1 Win=131328 Len=0
1295 26.397693   192.168.0.167    128.119.245.12 HTTP    560 GET /wireshark-labs/INTRO-wireshark-file1.html HTTP/1.1
```

```
    Protocol: TCP (6)
    Header Checksum: 0x1af1 [validation disabled]
    [Header checksum status: Unverified]
    Source Address: 128.119.245.12
    Destination Address: 192.168.0.167
Transmission Control Protocol, Src Port: 80, Dst Port: 4368, Seq: 0, Ack: 1
    Source Port: 80
    Destination Port: 4368
    [Stream index: 15]
    [Conversation completeness: Incomplete, DATA (15)]
    [TCP Segment Len: 0]
    Sequence Number: 0    (relative sequence number)
    Sequence Number (raw): 3817696098
    [Next Sequence Number: 1    (relative sequence number)]
    Acknowledgment Number: 1    (relative ack number)
    Acknowledgment number (raw): 3174586831
    1000 .... = Header Length: 32 bytes (8)
```

```
0000  98 ee cb 64 ed a8 60 6c  63 19 32 72 0
0010  00 34 00 00 40 00 29 06  1a f1 80 77 f
0020  00 a7 00 50 11 10 e3 8d  6b 62 bd 38 5
0030  72 10 4e c5 00 00 02 04  05 b4 01 01 0
0040  03 07
```

Q4. What is the amount of available buffer space advertised at the web server for the connection?

A: 29200 bytes



```
1290 26.177669   192.168.0.167    128.119.245.12 TCP      66 4368 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM
1293 26.397422   128.119.245.12   192.168.0.167  TCP      66 80 → 4368 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1460 SACK_PE
1294 26.397466   192.168.0.167    128.119.245.12 TCP      54 4368 → 80 [ACK] Seq=1 Ack=1 Win=131328 Len=0
1295 26.397693   192.168.0.167    128.119.245.12 HTTP    560 GET /wireshark-labs/INTRO-wireshark-file1.html HTTP/1.1
```

```
> Frame 1293: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on inte
> Ethernet II, Src: HitronTe_19:32:72 (60:6c:63:19:32:72), Dst: WistronI_64:ed:
> Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.0.167
v Transmission Control Protocol, Src Port: 80, Dst Port: 4368, Seq: 0, Ack: 1,
    Source Port: 80
    Destination Port: 4368
    [Stream index: 15]
    [Conversation completeness: Incomplete, DATA (15)]
    [TCP Segment Len: 0]
    Sequence Number: 0    (relative sequence number)
    Sequence Number (raw): 3817696098
    [Next Sequence Number: 1    (relative sequence number)]
    Acknowledgment Number: 1    (relative ack number)
    Acknowledgment number (raw): 3174586831
    1000 .... = Header Length: 32 bytes (8)
  > Flags: 0x012 (SYN, ACK)
    Window: 29200
    [Calculated window size: 29200]
    Checksum: 0x4ec5 [unverified]
    [Checksum Status: Unverified]
    Urgent Pointer: 0
  > Options: (12 bytes), Maximum segment size, No-Operation (NOP), No-Operatior
  > [Timestamps]
  > [SEQ/ACK analysis]
```

```
0000  98 ee cb 64 ed a8 60 6c  63 19 32 72 08 0
0010  00 34 00 00 40 00 29 06  1a f1 80 77 f5 0
0020  00 a7 00 50 11 10 e3 8d  6b 62 bd 38 59 c
0030  72 10 4e c5 00 00 02 04  05 b4 01 01 04 0
0040  03 07
```