```
manas@manasubuntu:~$ sudo tcpdump -n host 192.168.56.1 -w manas5
[sudo] password for manas:
tcpdump: listening on enp0s3, link-type EN10MB (Ethernet), snapshot length 26214
4 bytes
^C11 packets captured
11 packets received by filter
0 packets dropped by kernel
manas@manasubuntu:~$
```

```
manas@manasubuntu:~/Downloads$ python3 socketclient.py
type message: manas
Received from server: hi anas
type message: q
manas@manasubuntu:~/Downloads$ python3 socketclient.py
type message: hi manas
Received from server: hi there
type message: q
manas@manasubuntu:~/Downloads$
```

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.0.2.15	192.168.56.1	TCP	74	58210 → 5001 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM=1 TSval=1246029712 TSecr=0 WS=...
2	0.000894	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460
3	0.000944	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=1 Ack=1 Win=64240 Len=0
4	3.044492	10.0.2.15	192.168.56.1	TCP	62	58210 → 5001 [PSH, ACK] Seq=1 Ack=1 Win=64240 Len=8
5	3.044858	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=1 Ack=9 Win=65535 Len=0
6	7.614763	192.168.56.1	10.0.2.15	TCP	62	5001 → 58210 [PSH, ACK] Seq=1 Ack=9 Win=65535 Len=8
7	7.614819	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=9 Ack=9 Win=64232 Len=0
8	10.033680	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [FIN, ACK] Seq=9 Ack=9 Win=64232 Len=0
9	10.033908	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=9 Ack=10 Win=65535 Len=0
10	10.034083	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [FIN, ACK] Seq=9 Ack=10 Win=65535 Len=0
11	10.034096	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=10 Ack=10 Win=64232 Len=0

```
[Stream index: 0]
[Conversation completeness: Complete, WITH_DATA (31)]
[TCP Segment Len: 0]
Sequence Number: 0    (relative sequence number)
Sequence Number (raw): 2884252516
[Next Sequence Number: 1    (relative sequence number)]
Acknowledgment Number: 0
Acknowledgment number (raw): 0
1010 .... = Header Length: 40 bytes (10)
Flags: 0x002 (SYN)
    000. .... .... = Reserved: Not set
    ...0 .... .... = Nonce: Not set
    .... 0... .... = Congestion Window Reduced (CWR): 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
    [TCP Flags: ·········S·]
Window: 64240
[Calculated window size: 64240]
Checksum: 0x04e7 [unverified]
[Checksum Status: Unverified]
Urgent Pointer: 0
Options: (20 bytes), Maximum segment size, SACK permitted, Timestamps, No-Operation (NOP), Window scale
[Timestamps]
```

manas5   Packets: 11 · Displayed: 11 (100.0%)   Profile: Default

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.0.2.15	192.168.56.1	TCP	74	58210 → 5001 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM=1 TSval=1246029712 TSecr=0 WS=...
2	0.000894	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460
3	0.000944	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=1 Ack=1 Win=64240 Len=0
4	3.044492	10.0.2.15	192.168.56.1	TCP	62	58210 → 5001 [PSH, ACK] Seq=1 Ack=1 Win=64240 Len=8
5	3.044858	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=1 Ack=9 Win=65535 Len=0
6	7.614763	192.168.56.1	10.0.2.15	TCP	62	5001 → 58210 [PSH, ACK] Seq=1 Ack=9 Win=65535 Len=8
7	7.614819	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=9 Ack=9 Win=64232 Len=0
8	10.033680	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [FIN, ACK] Seq=9 Ack=9 Win=64232 Len=0
9	10.033908	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=9 Ack=10 Win=65535 Len=0
10	10.034083	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [FIN, ACK] Seq=9 Ack=10 Win=65535 Len=0
11	10.034096	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=10 Ack=10 Win=64232 Len=0

```
[Stream index: 0]
[Conversation completeness: Complete, WITH_DATA (31)]
[TCP Segment Len: 0]
Sequence Number: 0      (relative sequence number)
Sequence Number (raw): 441600001
[Next Sequence Number: 1      (relative sequence number)]
Acknowledgment Number: 1      (relative ack number)
Acknowledgment number (raw): 2884252517
0110 .... = Header Length: 24 bytes (6)
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
   [TCP Flags: ·······A··S·]
Window: 65535
[Calculated window size: 65535]
Checksum: 0x5acf [unverified]
[Checksum Status: Unverified]
Urgent Pointer: 0
Options: (4 bytes), Maximum segment size
[Timestamps]
```

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.0.2.15	192.168.56.1	TCP	74	58210 → 5001 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM=1 TSval=1246029712 TSecr=0 WS=...
2	0.000894	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460
3	0.000944	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=1 Ack=1 Win=64240 Len=0
4	3.044492	10.0.2.15	192.168.56.1	TCP	62	58210 → 5001 [PSH, ACK] Seq=1 Ack=1 Win=64240 Len=8
5	3.044858	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=1 Ack=9 Win=65535 Len=0
6	7.614763	192.168.56.1	10.0.2.15	TCP	62	5001 → 58210 [PSH, ACK] Seq=1 Ack=9 Win=65535 Len=8
7	7.614819	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=9 Ack=9 Win=64232 Len=0
8	10.033680	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [FIN, ACK] Seq=9 Ack=9 Win=64232 Len=0
9	10.033908	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=9 Ack=10 Win=65535 Len=0
10	10.034083	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [FIN, ACK] Seq=9 Ack=10 Win=65535 Len=0
11	10.034096	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=10 Ack=10 Win=64232 Len=0

```
    [Stream index: 0]
    [Conversation completeness: Complete, WITH_DATA (31)]
    [TCP Segment Len: 0]
    Sequence Number: 1      (relative sequence number)
    Sequence Number (raw): 2884252517
    [Next Sequence Number: 1     (relative sequence number)]
    Acknowledgment Number: 1      (relative ack number)
    Acknowledgment number (raw): 441600002
    0101 .... = Header Length: 20 bytes (5)
  ▾ Flags: 0x010 (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
        .... .... ..0. = Syn: Not set
        .... .... ...0 = Fin: Not set
        [TCP Flags: ·······A····]
    Window: 64240
    [Calculated window size: 64240]
    [Window size scaling factor: -2 (no window scaling used)]
    Checksum: 0x04d3 [unverified]
    [Checksum Status: Unverified]
    Urgent Pointer: 0
  ▸ [Timestamps]
```

○ ⚡ manas5   Packets: 11 · Displayed: 11 (100.0%)   Profile: Default

File   Edit   View   Go   Capture   Analyze   Statistics   Telephony   Wireless   Tools   Help

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.0.2.15	192.168.56.1	TCP	74	58210 → 5001 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM=1 TSval=1246029712 TSecr=0 WS=…
2	0.000894	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460
3	0.000944	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=1 Ack=1 Win=64240 Len=0
4	3.044492	10.0.2.15	192.168.56.1	TCP	62	58210 → 5001 [PSH, ACK] Seq=1 Ack=1 Win=64240 Len=8
5	3.044858	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=1 Ack=9 Win=65535 Len=0
6	7.614763	192.168.56.1	10.0.2.15	TCP	62	5001 → 58210 [PSH, ACK] Seq=1 Ack=9 Win=65535 Len=8
7	7.614819	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=9 Ack=9 Win=64232 Len=0
8	10.033680	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [FIN, ACK] Seq=9 Ack=9 Win=64232 Len=0
9	10.033908	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=9 Ack=10 Win=65535 Len=0
10	10.034083	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [FIN, ACK] Seq=9 Ack=10 Win=65535 Len=0
11	10.034096	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=10 Ack=10 Win=64232 Len=0

```
[Stream index: 0]
[Conversation completeness: Complete, WITH_DATA (31)]
[TCP Segment Len: 0]
Sequence Number: 9    (relative sequence number)
Sequence Number (raw): 2884252525
[Next Sequence Number: 10    (relative sequence number)]
Acknowledgment Number: 9    (relative ack number)
Acknowledgment number (raw): 441600010
0101 .... = Header Length: 20 bytes (5)
Flags: 0x011 (FIN, 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
    .... .... ..0. = Syn: Not set
    .... .... ...1 = Fin: Set
    [TCP Flags: ·······A···F]
Window: 64232
[Calculated window size: 64232]
[Window size scaling factor: -2 (no window scaling used)]
Checksum: 0x04d3 [unverified]
[Checksum Status: Unverified]
Urgent Pointer: 0
[Timestamps]
```

manas5   Packets: 11 · Displayed: 11 (100.0%)   Profile: Default

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.0.2.15	192.168.56.1	TCP	74	58210 → 5001 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM=1 TSval=1246029712 TSecr=0 WS=…
2	0.000894	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460
3	0.000944	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=1 Ack=1 Win=64240 Len=0
4	3.044492	10.0.2.15	192.168.56.1	TCP	62	58210 → 5001 [PSH, ACK] Seq=1 Ack=1 Win=64240 Len=8
5	3.044858	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=1 Ack=9 Win=65535 Len=0
6	7.614763	192.168.56.1	10.0.2.15	TCP	62	5001 → 58210 [PSH, ACK] Seq=1 Ack=9 Win=65535 Len=8
7	7.614819	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=9 Ack=9 Win=64232 Len=0
8	10.033680	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [FIN, ACK] Seq=9 Ack=9 Win=64232 Len=0
9	10.033908	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=9 Ack=10 Win=65535 Len=0
10	10.034083	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [FIN, ACK] Seq=9 Ack=10 Win=65535 Len=0
11	10.034096	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=10 Ack=10 Win=64232 Len=0

```
[Stream index: 0]
[Conversation completeness: Complete, WITH_DATA (31)]
[TCP Segment Len: 0]
Sequence Number: 9     (relative sequence number)
Sequence Number (raw): 441600010
[Next Sequence Number: 9     (relative sequence number)]
Acknowledgment Number: 10     (relative ack number)
Acknowledgment number (raw): 2884252526
0101 .... = Header Length: 20 bytes (5)
Flags: 0x010 (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
    .... .... ..0. = Syn: Not set
    .... .... ...0 = Fin: Not set
    [TCP Flags: ·······A····]
Window: 65535
[Calculated window size: 65535]
[Window size scaling factor: -2 (no window scaling used)]
Checksum: 0x727b [unverified]
[Checksum Status: Unverified]
Urgent Pointer: 0
[Timestamps]
```

manas5   Packets: 11 · Displayed: 11 (100.0%)   Profile: Default

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.0.2.15	192.168.56.1	TCP	74	58210 → 5001 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM=1 TSval=1246029712 TSecr=0 WS=...
2	0.000894	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460
3	0.000944	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=1 Ack=1 Win=64240 Len=0
4	3.044492	10.0.2.15	192.168.56.1	TCP	62	58210 → 5001 [PSH, ACK] Seq=1 Ack=1 Win=64240 Len=8
5	3.044858	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=1 Ack=9 Win=65535 Len=0
6	7.614763	192.168.56.1	10.0.2.15	TCP	62	5001 → 58210 [PSH, ACK] Seq=1 Ack=9 Win=65535 Len=8
7	7.614819	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=9 Ack=9 Win=64232 Len=0
8	10.033680	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [FIN, ACK] Seq=9 Ack=9 Win=64232 Len=0
9	10.033908	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=9 Ack=10 Win=65535 Len=0
10	10.034083	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [FIN, ACK] Seq=9 Ack=10 Win=65535 Len=0
11	10.034096	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=10 Ack=10 Win=64232 Len=0

```
[Stream index: 0]
[Conversation completeness: Complete, WITH_DATA (31)]
[TCP Segment Len: 0]
Sequence Number: 9     (relative sequence number)
Sequence Number (raw): 441600010
[Next Sequence Number: 10     (relative sequence number)]
Acknowledgment Number: 10     (relative ack number)
Acknowledgment number (raw): 2884252526
0101 .... = Header Length: 20 bytes (5)
Flags: 0x011 (FIN, 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
    .... .... ..0. = Syn: Not set
    .... .... ...1 = Fin: Set
    [TCP Flags: ·······A···F]
Window: 65535
[Calculated window size: 65535]
[Window size scaling factor: -2 (no window scaling used)]
Checksum: 0x727a [unverified]
[Checksum Status: Unverified]
Urgent Pointer: 0
[Timestamps]
```

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.0.2.15	192.168.56.1	TCP	74	58210 → 5001 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM=1 TSval=1246029712 TSecr=0 WS=…
2	0.000894	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460
3	0.000944	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=1 Ack=1 Win=64240 Len=0
4	3.044492	10.0.2.15	192.168.56.1	TCP	62	58210 → 5001 [PSH, ACK] Seq=1 Ack=1 Win=64240 Len=8
5	3.044858	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=1 Ack=9 Win=65535 Len=0
6	7.614763	192.168.56.1	10.0.2.15	TCP	62	5001 → 58210 [PSH, ACK] Seq=1 Ack=9 Win=65535 Len=8
7	7.614819	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=9 Ack=9 Win=64232 Len=0
8	10.033680	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [FIN, ACK] Seq=9 Ack=9 Win=64232 Len=0
9	10.033908	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [ACK] Seq=9 Ack=10 Win=65535 Len=0
10	10.034083	192.168.56.1	10.0.2.15	TCP	60	5001 → 58210 [FIN, ACK] Seq=9 Ack=10 Win=65535 Len=0
11	10.034096	10.0.2.15	192.168.56.1	TCP	54	58210 → 5001 [ACK] Seq=10 Ack=10 Win=64232 Len=0

```
[Stream index: 0]
[Conversation completeness: Complete, WITH_DATA (31)]
[TCP Segment Len: 0]
Sequence Number: 10     (relative sequence number)
Sequence Number (raw): 2884252526
[Next Sequence Number: 10     (relative sequence number)]
Acknowledgment Number: 10     (relative ack number)
Acknowledgment number (raw): 441600011
0101 .... = Header Length: 20 bytes (5)
Flags: 0x010 (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
    .... .... ..0. = Syn: Not set
    .... .... ...0 = Fin: Not set
    [TCP Flags: ·······A····]
Window: 64232
[Calculated window size: 64232]
[Window size scaling factor: -2 (no window scaling used)]
Checksum: 0x7791 [unverified]
[Checksum Status: Unverified]
Urgent Pointer: 0
[Timestamps]
```

manas5   Packets: 11 · Displayed: 11 (100.0%)   Profile: Default