[TCP Segment Len: 14]

```
Time
                       Source
                                             Destination
                                                                    Protocol Length Info
      1 0.000000000
                       127.0.0.1
                                             127.0.0.1
                                                                    TCP
                                                                             74
                                                                                    57564 → 1883 [SYN] Seq=0 Win=65495 Len=0
MSS=65495 SACK PERM=1 TSval=3669304788 TSecr=0 WS=128
Frame 1: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface \theta
Ethernet II, Src: 00:00:00 00:00:00 (00:00:00:00:00), Dst: 00:00:00 00:00:00 (00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 57564, Dst Port: 1883, Seq: 0, Len: 0
    Source Port: 57564
    Destination Port: 1883
    [Stream index: 0]
    [TCP Segment Len: 0]
    Sequence number: 0
                          (relative sequence number)
    [Next sequence number: 0
                                (relative sequence number)]
    Acknowledgment number: 0
    1010 .... = Header Length: 40 bytes (10)
    Flags: 0x002 (SYN)
    Window size value: 65495
    [Calculated window size: 65495]
    Checksum: 0xfe30 [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (20 bytes), Maximum segment size, SACK permitted, Timestamps, No-Operation (NOP), Window scale
    [Timestamps]
        Time
                       Source
                                             Destination
                                                                    Protocol Length Info
      2 0.000025548
                       127.0.0.1
                                             127.0.0.1
                                                                    TCP
                                                                             74
                                                                                    1883 → 57564 [SYN, ACK] Seq=0 Ack=1
Win=65483 Len=0 MSS=65495 SACK PERM=1 TSval=3669304788 TSecr=3669304788 WS=128
Frame 2: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface 0
Ethernet II, Src: 00:00:00 00:00:00 (00:00:00:00:00:00), Dst: 00:00:00 00:00:00 (00:00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 1883, Dst Port: 57564, Seq: 0, Ack: 1, Len: 0
    Source Port: 1883
    Destination Port: 57564
    [Stream index: 0]
    [TCP Segment Len: 0]
                          (relative sequence number)
    Sequence number: 0
    [Next sequence number: 0
                               (relative sequence number)
    Acknowledgment number: 1
                                (relative ack number)
    1010 .... = Header Length: 40 bytes (10)
    Flags: 0x012 (SYN, ACK)
    Window size value: 65483
    [Calculated window size: 65483]
    Checksum: 0xfe30 [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (20 bytes), Maximum segment size, SACK permitted, Timestamps, No-Operation (NOP), Window scale
    [SEQ/ACK analysis]
    [Timestamps]
No.
        Time
                       Source
                                             Destination
                                                                    Protocol Length Info
      3 0.000040478
                       127.0.0.1
                                                                                    57564 \rightarrow 1883 [ACK] Seq=1 Ack=1 Win=65536
                                             127.0.0.1
                                                                    TCP
                                                                             66
Len=0 TSval=3669304788 TSecr=3669304788
Frame 3: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
Ethernet II, Src: 00:00:00 00:00:00 (00:00:00:00:00:00), Dst: 00:00:00 00:00:00 (00:00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 57564, Dst Port: 1883, Seq: 1, Ack: 1, Len: 0
    Source Port: 57564
    Destination Port: 1883
    [Stream index: 0]
    [TCP Segment Len: 0]
    Sequence number: 1
                          (relative sequence number)
    [Next sequence number: 1
                                (relative sequence number)]
    Acknowledgment number: 1
                                (relative ack number)
    1000 .... = Header Length: 32 bytes (8)
    Flags: 0x010 (ACK)
    Window size value: 512
    [Calculated window size: 65536]
    [Window size scaling factor: 128]
    Checksum: 0xfe28 [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
No.
        Time
                       Source
                                             Destination
                                                                    Protocol Length Info
      4 0.003286336
                       127.0.0.1
                                             127.0.0.1
                                                                    MOTT
                                                                             80
                                                                                    Connect Command
Frame 4: 80 bytes on wire (640 bits), 80 bytes captured (640 bits) on interface 0
Ethernet II, Src: 00:00:00 00:00:00 (00:00:00:00:00:00), Dst: 00:00:00 00:00:00 (00:00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 57564, Dst Port: 1883, Seq: 1, Ack: 1, Len: 14
    Source Port: 57564
    Destination Port: 1883
    [Stream index: 0]
```

[Timestamps]

```
Sequence number: 1
                         (relative sequence number)
    [Next sequence number: 15
                                 (relative sequence number)]
                                (relative ack number)
    Acknowledgment number: 1
    1000 .... = Header Length: 32 bytes (8)
    Flags: 0x018 (PSH, ACK)
    Window size value: 512
    [Calculated window size: 65536]
    [Window size scaling factor: 128]
    Checksum: 0xfe36 [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
    TCP payload (14 bytes)
    [PDU Size: 14]
MQ Telemetry Transport Protocol, Connect Command
    Header Flags: 0x10, Message Type: Connect Command
    Msa Len: 12
    Protocol Name Length: 4
    Protocol Name: MQTT
    Version: MQTT v3.1.1 (4)
    Connect Flags: 0x02, QoS Level: At most once delivery (Fire and Forget), Clean Session Flag
        0... = User Name Flag: Not set
        .0.. .... = Password Flag: Not set
        ..0. .... = Will Retain: Not set
        ...0 O... = QoS Level: At most once delivery (Fire and Forget) (0)
        .... .0.. = Will Flag: Not set
        .... ..1. = Clean Session Flag: Set
        \dots 0 = (Reserved): Not set
    Keep Alive: 15
    Client ID Length: 0
    Client ID:
No.
        Time
                       Source
                                             Destination
                                                                    Protocol Length Info
      5 0.003299021
                                                                                    1883 \rightarrow 57564 [ACK] Seq=1 Ack=15 Win=65536
                       127.0.0.1
                                             127.0.0.1
                                                                    TCP
                                                                             66
Len=0 TSval=3669304791 TSecr=3669304791
Frame 5: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
Ethernet II, Src: 00:00:00 00:00:00 (00:00:00:00:00), Dst: 00:00:00 00:00:00 (00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 1883, Dst Port: 57564, Seq: 1, Ack: 15, Len: 0
    Source Port: 1883
    Destination Port: 57564
    [Stream index: 0]
    [TCP Segment Len: 0]
    Sequence number: 1
                         (relative sequence number)
                               (relative sequence number)]
    [Next sequence number: 1
    Acknowledgment number: 15
                                 (relative ack number)
    1000 .... = Header Length: 32 bytes (8)
    Flags: 0x010 (ACK)
    Window size value: 512
    [Calculated window size: 65536]
    [Window size scaling factor: 128]
    Checksum: 0xfe28 [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
No.
        Time
                       Source
                                             Destination
                                                                    Protocol Length Info
      6 0.005174728
                       127.0.0.1
                                             127.0.0.1
                                                                    MOTT
                                                                             70
                                                                                    Connect Ack
Frame 6: 70 bytes on wire (560 bits), 70 bytes captured (560 bits) on interface 0
Ethernet II, Src: 00:00:00 00:00:00 (00:00:00:00:00:00), Dst: 00:00:00 00:00:00 (00:00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 1883, Dst Port: 57564, Seq: 1, Ack: 15, Len: 4
    Source Port: 1883
    Destination Port: 57564
    [Stream index: 0]
    [TCP Segment Len: 4]
    Sequence number: 1
                          (relative sequence number)
    [Next sequence number: 5
                               (relative sequence number)]
    Acknowledgment number: 15
                                 (relative ack number)
    1000 .... = Header Length: 32 bytes (8)
    Flags: 0x018 (PSH, ACK)
    Window size value: 512
    [Calculated window size: 65536]
    [Window size scaling factor: 128]
    Checksum: 0xfe2c [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
```

Flags: 0x010 (ACK) Window size value: 511

```
TCP payload (4 bytes)
    [PDU Size: 4]
MQ Telemetry Transport Protocol, Connect Ack
    Header Flags: 0x20, Message Type: Connect Ack
    Msa Len: 2
    Acknowledge Flags: 0x00
    Return Code: Connection Accepted (0)
No.
        Time
                       Source
                                              Destination
                                                                    Protocol Length Info
      7 0.005187530
                       127.0.0.1
                                              127.0.0.1
                                                                                     57564 → 1883 [ACK] Seq=15 Ack=5 Win=65536
                                                                             66
Len=0 TSval=3669304793 TSecr=3669304793
Frame 7: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
Ethernet II, Src: 00:00:00 00:00:00 (00:00:00:00:00:00), Dst: 00:00:00 00:00:00 (00:00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 57564, Dst Port: 1883, Seq: 15, Ack: 5, Len: 0
    Source Port: 57564
    Destination Port: 1883
    [Stream index: 0]
    [TCP Segment Len: 0]
    Sequence number: 15
                           (relative sequence number)
    [Next sequence number: 15
                                 (relative sequence number)]
    Acknowledgment number: 5
                                 (relative ack number)
    1000 .... = Header Length: 32 bytes (8)
    Flags: 0x010 (ACK)
    Window size value: 512
    [Calculated window size: 65536]
    [Window size scaling factor: 128]
    Checksum: 0xfe28 [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
No.
        Time
                                              Destination
                                                                    Protocol Length Info
                       Source
      8 0.005474783
                       127.0.0.1
                                              127.0.0.1
                                                                    MOTT
                                                                             197
                                                                                     Publish Message [resources/
0c350791-4971-46a0-8b00-9034df38a36c/temperature]
Frame 8: 197 bytes on wire (1576 bits), 197 bytes captured (1576 bits) on interface \theta
Ethernet II, Src: 00:00:00 00:00:00 (00:00:00:00:00:00), Dst: 00:00:00 00:00:00 (00:00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 57564, Dst Port: 1883, Seq: 15, Ack: 5, Len: 131
    Source Port: 57564
    Destination Port: 1883
    [Stream index: 0]
    [TCP Segment Len: 131]
                           (relative sequence number)
    Sequence number: 15
    [Next sequence number: 146
                                  (relative sequence number)]
    Acknowledgment number: 5
                                 (relative ack number)
    1000 .... = Header Length: 32 bytes (8)
    Flags: 0x018 (PSH, ACK)
    Window size value: 512
    [Calculated window size: 65536]
    [Window size scaling factor: 128]
    Checksum: Oxfeab [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
    TCP payload (131 bytes)
    [PDU Size: 131]
MQ Telemetry Transport Protocol, Publish Message
    Header Flags: 0x30, Message Type: Publish Message, QoS Level: At most once delivery (Fire and Forget)
    Msg Len: 128
    Topic Length: 58
    Topic: resources/0c350791-4971-46a0-8b00-9034df38a36c/temperature
    Message: {"data":[{"temperature":10,"timestamp":"2017-06-14T17:52:25.428Z"}]}
No.
        Time
                       Source
                                              Destination
                                                                    Protocol Length Info
      9 0.005485450
                       127.0.0.1
                                              127.0.0.1
                                                                    TCP
                                                                             66
                                                                                     1883 \rightarrow 57564 \text{ [ACK] Seg=5 Ack=146 Win=65408}
Len=0 TSval=3669304794 TSecr=3669304794
Frame 9: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
Ethernet II, Src: 00:00:00_00:00:00 (00:00:00:00:00:00), Dst: 00:00:00_00:00:00 (00:00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 1883, Dst Port: 57564, Seq: 5, Ack: 146, Len: 0
    Source Port: 1883
    Destination Port: 57564
    [Stream index: 0]
    [TCP Segment Len: 0]
    Sequence number: 5
                          (relative sequence number)
    [Next sequence number: 5
                                (relative sequence number)]
    Acknowledgment number: 146
                                  (relative ack number)
    1000 .... = Header Length: 32 bytes (8)
```

Checksum: 0xfe28 [unverified]

```
[Calculated window size: 65408]
    [Window size scaling factor: 128]
    Checksum: 0xfe28 [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEO/ACK analysis]
    [Timestamps]
No.
        Time
                       Source
                                              Destination
                                                                    Protocol Length Info
     10 0.005546546
                       127.0.0.1
                                              127.0.0.1
                                                                    MOTT
                                                                             68
                                                                                    Disconnect Req
Frame 10: 68 bytes on wire (544 bits), 68 bytes captured (544 bits) on interface 0
Ethernet II, Src: 00:00:00 00:00:00 (00:00:00:00:00:00), Dst: 00:00:00 00:00:00 (00:00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 57564, Dst Port: 1883, Seq: 146, Ack: 5, Len: 2
    Source Port: 57564
    Destination Port: 1883
    [Stream index: 0]
    [TCP Segment Len: 2]
    Sequence number: 146
                            (relative sequence number)
    [Next sequence number: 148
                                 (relative sequence number)1
    Acknowledgment number: 5
                                 (relative ack number)
    1000 .... = Header Length: 32 bytes (8)
    Flags: 0x018 (PSH, ACK)
    Window size value: 512
    [Calculated window size: 65536]
    [Window size scaling factor: 128]
    Checksum: 0xfe2a [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
    TCP payload (2 bytes)
    [PDU Size: 2]
MQ Telemetry Transport Protocol, Disconnect Req
    Header Flags: 0xe0, Message Type: Disconnect Req
    Msa Len: 0
No.
        Time
                       Source
                                              Destination
                                                                    Protocol Length Info
     11 0.005552144
                       127.0.0.1
                                                                                    1883 \rightarrow 57564 \text{ [ACK] Seq=5 Ack=148 Win=65408}
                                              127.0.0.1
                                                                    TCP
                                                                             66
Len=0 TSval=3669304794 TSecr=3669304794
Frame 11: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
Ethernet II, Src: 00:00:00 00:00:00 (00:00:00:00:00:00), Dst: 00:00:00 00:00:00 (00:00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 1883, Dst Port: 57564, Seq: 5, Ack: 148, Len: 0
    Source Port: 1883
    Destination Port: 57564
    [Stream index: 0]
    [TCP Seament Len: 0]
    Sequence number: 5
                          (relative sequence number)
    [Next sequence number: 5 (relative sequence number)]
    Acknowledgment number: 148
                                  (relative ack number)
    1000 .... = Header Length: 32 bytes (8)
    Flags: 0x010 (ACK)
    Window size value: 511
    [Calculated window size: 65408]
    [Window size scaling factor: 128]
    Checksum: 0xfe28 [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
Nο
        Time
                       Source
                                              Destination
                                                                    Protocol Length Info
     12 0.005570683
                       127.0.0.1
                                              127.0.0.1
                                                                    TCP
                                                                             66
                                                                                    57564 → 1883 [FIN, ACK] Seq=148 Ack=5
Win=65536 Len=0 TSval=3669304794 TSecr=3669304794
Frame 12: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
Ethernet II, Src: 00:00:00 00:00:00 (00:00:00:00:00:00), Dst: 00:00:00 00:00:00 (00:00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 57564, Dst Port: 1883, Seq: 148, Ack: 5, Len: 0
    Source Port: 57564
    Destination Port: 1883
    [Stream index: 0]
    [TCP Segment Len: 0]
    Sequence number: 148
                            (relative sequence number)
    [Next sequence number: 148
                                (relative sequence number)]
    Acknowledgment number: 5
                                 (relative ack number)
    1000 .... = Header Length: 32 bytes (8)
    Flags: 0x011 (FIN, ACK)
    Window size value: 512
    [Calculated window size: 65536]
    [Window size scaling factor: 128]
```

```
[Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [Timestamps]
No.
       Time
                       Source
                                             Destination
                                                                   Protocol Length Info
     13 0.005715764
                                                                                   1883 → 57564 [FIN, ACK] Seq=5 Ack=149
                       127.0.0.1
                                             127.0.0.1
                                                                   TCP
                                                                            66
Win=65536 Len=0 TSval=3669304794 TSecr=3669304794
Frame 13: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
Ethernet II, Src: 00:00:00 00:00:00 (00:00:00:00:00), Dst: 00:00:00 00:00:00 (00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 1883, Dst Port: 57564, Seq: 5, Ack: 149, Len: 0
    Source Port: 1883
    Destination Port: 57564
    [Stream index: 0]
    [TCP Segment Len: 0]
    Sequence number: 5
                         (relative sequence number)
    [Next sequence number: 5
                               (relative sequence number)]
    Acknowledgment number: 149
                                 (relative ack number)
    1000 .... = Header Length: 32 bytes (8)
    Flags: 0x011 (FIN, ACK)
    Window size value: 512
    [Calculated window size: 65536]
    [Window size scaling factor: 128]
    Checksum: 0xfe28 [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
No.
        Time
                       Source
                                             Destination
                                                                   Protocol Length Info
     14 0.005723864
                       127.0.0.1
                                             127.0.0.1
                                                                                   57564 → 1883 [ACK] Seq=149 Ack=6 Win=65536
                                                                            66
Len=0 TSval=3669304794 TSecr=3669304794
Frame 14: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0
Ethernet II, Src: 00:00:00 00:00:00 (00:00:00:00:00), Dst: 00:00:00 00:00:00 (00:00:00:00:00)
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
Transmission Control Protocol, Src Port: 57564, Dst Port: 1883, Seq: 149, Ack: 6, Len: 0
    Source Port: 57564
    Destination Port: 1883
    [Stream index: 0]
    [TCP Segment Len: 0]
    Sequence number: 149
                            (relative sequence number)
    [Next sequence number: 149 (relative sequence number)]
    Acknowledgment number: 6
                               (relative ack number)
    1000 .... = Header Length: 32 bytes (8)
    Flags: 0x010 (ACK)
    Window size value: 512
    [Calculated window size: 65536]
    [Window size scaling factor: 128]
    Checksum: 0xfe28 [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
    Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
    [SEQ/ACK analysis]
    [Timestamps]
```