

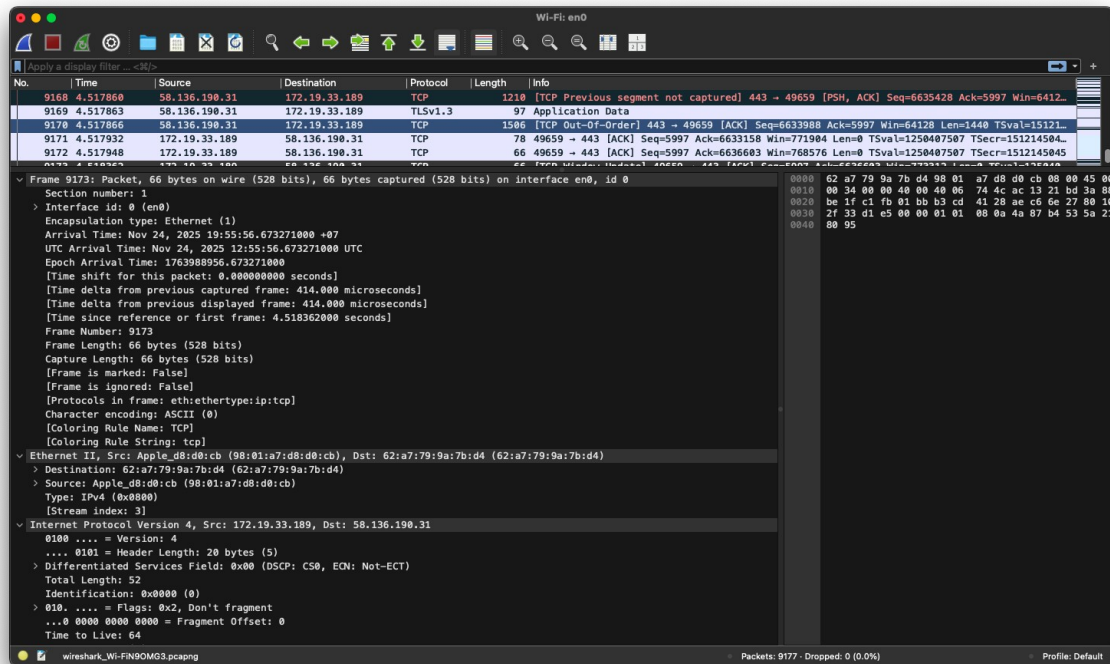
SYS-207 – Networks (Assessment Only)

00030 - Understand how framing, network-layer interfacing, multiplexing, link properties, and maximum frame size address issues of the Link Layer

Name: Thanawin Pattanaphol

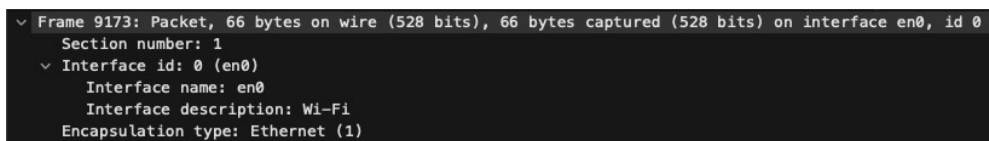
ID: 01324096

- 1) Wireshark
 - a) Capture & Show a traffic trace

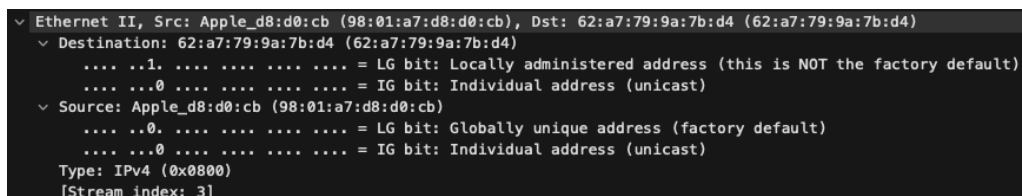


- b) Show three Link-Layer techniques.
 - 1) Framing

Framing is shown here under the Ethernet II section



- 2) Multiplexing



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3) Network-layer interfacing

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▼ Ethernet II, Src: Apple_d8:d0:cb (98:01:a7:d8:d0:cb), Dst: 62:a7:79:9a:7b:d4 (62:a7:79:9a:7b:d4)
  ▼ Destination: 62:a7:79:9a:7b:d4 (62:a7:79:9a:7b:d4)
    .... ..1. .... = LG bit: Locally administered address (this is NOT the factory default)
    .... ..0. .... = IG bit: Individual address (unicast)
  > Source: Apple_d8:d0:cb (98:01:a7:d8:d0:cb)
    Type: IPv4 (0x0800)
    [Stream index: 3]
  ▼ Internet Protocol Version 4, Src: 172.19.33.189, Dst: 58.136.190.31
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 52
    Identification: 0x0000 (0)
  > 010. .... = Flags: 0x2, Don't fragment
    ...0 0000 0000 0000 = Fragment Offset: 0
    Time to Live: 64
    Protocol: TCP (6)
    Header Checksum: 0x744c [validation disabled]
    [Header checksum status: Unverified]
    Source Address: 172.19.33.189
    Destination Address: 58.136.190.31
    [Stream index: 3]
  ▼ Transmission Control Protocol, Src Port: 49659, Dst Port: 443, Seq: 5997, Ack: 6636603, Len: 0
    Source Port: 49659
    Destination Port: 443
    [Stream index: 0]
    [Stream Packet Number: 8160]
  > [Conversation completeness: Incomplete, DATA (15)]
    [TCP Segment Len: 0]
    Sequence Number: 5997 (relative sequence number)
    Sequence Number (raw): 3016573224
    [Next Sequence Number: 5997 (relative sequence number)]
    Acknowledgment Number: 6636603 (relative ack number)
    Acknowledgment number (raw): 2932239911
```

2) Referring to protocol standards...

a) Examine one Link-Layer techniques

The Framing Link-Layer technique seen in the Wireshark “Frame” section is defined in the IEEE 802.3-2022 standard, in which, defines the frame format e.g. destination and source addresses, length/type field, data/payload, and frame check sequences (FCS).

3.1.1 Packet format

Figure 3–1 shows the fields of a packet: the Preamble, Start Frame Delimiter (SFD), the addresses of the MAC frame’s destination and source, a length or type field to indicate the length or protocol type of the following field that contains the MAC client data, a field that contains padding if required, and the Frame Check Sequence (FCS) field containing a cyclic redundancy check value to detect errors in a received MAC frame. An Extension field is added, if required (for 1000 Mb/s half duplex operation only). Of these fields, all are of fixed size except for the MAC Client Data, Pad and Extension fields, which may contain an integer number of octets between the minimum and maximum values that are determined by the specific implementation of the MAC. See 4.4 for particular MAC parameters.

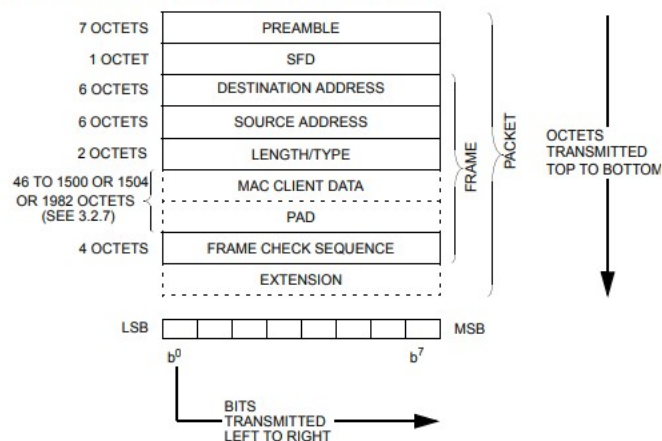


Figure 3–1—Packet format