

# IEEE P1722 AVBTP Encapsulations

Version 0.07, 2007-10-04

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# Revision History

Rev	Date	Comments
0.01	2007-06-24	First version using formats and notes based on what probably will start going into the draft P1722 specifications.
0.02	2007-06-27	Added draft proposal for fragmentation for discussion on how to handle large CIP packets broken up into smaller packets for the case of 1394/61883 to AVBTP /61883 interworking. Cleaned up some diagrams to correct areas “grey” or white depending on scope of fields versus the diagram (what the diagram was trying to convey as fields of interest).
0.03	2007-07-02	Changed proposed Proprietary/Experimental based on feedback from John Nels Fuller on 2007-07-02 teleconference
0.04	2007-08-08	Changed frame formats and updated diagrams to: <ul style="list-style-type: none"><li>•Accommodate latest fragmentation/reassembly proposal (Alan Bartky)</li><li>•Accommodate for latest “cross timestamp” control frame proposal (Chuck Harrison)</li><li>•Prepare for draft 0.03 of the P1722 specification.</li><li>•Updated proposal for “escape type” protocol to accommodate new proposal for standardized fragmentation/reassembly and packet length at “standard” places.</li></ul> Removed detailed description of fields (see draft 0.02 or upcoming 0.03 P1722 specification for those details) except for the new proposal for fragmentation/reassembly .
0.05	2007-08-09	Misc cleanup, fixes and also added Chuck Harrison’s Cross Timestamping encapsulations.

# Revision History (continued)

Rev	Date	Comments
0.06	2007-08-09	Continuing misc. edits (using this presentation for source of master diagrams for P1722 specification)
0.07	2007-10-04	<p>Incorporated encapsulation changes as discussed at last face to face meeting and teleconferences afterwards up to the present date (2007-10-04).</p> <ul style="list-style-type: none"><li>•Added 64 bit stream ID field to all AVBTP immediately following the Ethertype-Subtype quadlet.</li><li>•Added 1 bit Control/Data Field in the 8 bit subtype field and changed the subtype to a 7 bit field. Adjusted values accordingly in the sub-type field as well.</li><li>•Changed all text within the diagrams to a consistent 12 point Arial font.</li><li>•Removed diagram showing Intermediate fragment as my understanding of consensus is at least for 61883 over AVBTP, we will always put in the 1394-like and CIP header into each and every fragment such that the sample data is always at the same offset for each fragment.</li></ul>

# AVBTP Stream ID options

- On 2007-09-24 call agreed to :
  - Add two quadlets and use it to encapsulate the entire 64 bit Stream ID.
  - Not specify the content of the stream ID and instead refer the reader to 802.1Qat.
  - Continue working with 802.1Qat team to hash out Stream ID and MSRP details to meet each others needs.

# Encapsulation Design Assumptions

- AVBTP shall use 802.1AS for time base
- AVBTP shall be able to react to change in 802.1AS time (user changing time of day, change in Grandmaster, etc. (see 802.1AS assumptions from AVB document)).
- 61883 format over AVBTP will support presentation time in the same manner as 1394/61883 using the SYT field and in 24.576 MHz cycle time based on 802.1AS clock.
  - 61883-4 & 61883-7: Source Packet Header format with 0-127 seconds, 0-7999 8 kHz cycles, 0-3072 24.576 MHz sub-cycles.
  - All other 61883 encapsulations: CIP header format with 0-15 8 kHz cycles, 0-3072 24.576 MHz sub-cycles.
  - >> Editor's note: Is this still the case that we have consensus on this???
- AVBTP 61883 presentation time shall be relative to the 802.1AS clock
  - Adapt 1394 AV/C Function Control Protocol (FCP) for use in 61883 over AVBTP.
  - Allow for Proprietary encapsulations via different subtype
  - Allow for other future expansions via different subtypes.

# Encapsulation Assumptions

- All AVBTP frames shall contain a 64 bit 802.1Qat Stream ID field. That field shall be used for stream identification.
  - TBD: Relationship with source and destination MAC address.
  - TBD: Need to have a standard value that indicates that stream ID contains no data (perhaps all zeros or all ones?)
- For AVBTP stream control frames, MAC Destination Address may be unicast, multicast or broadcast depending on the specification of the usage of each AVBTP control frame.
  - >> Editor's question, now that we have stream IDs, will we now allow unicast MAC addresses in the destination MAC field for 802.3???

# Encapsulation Assumptions

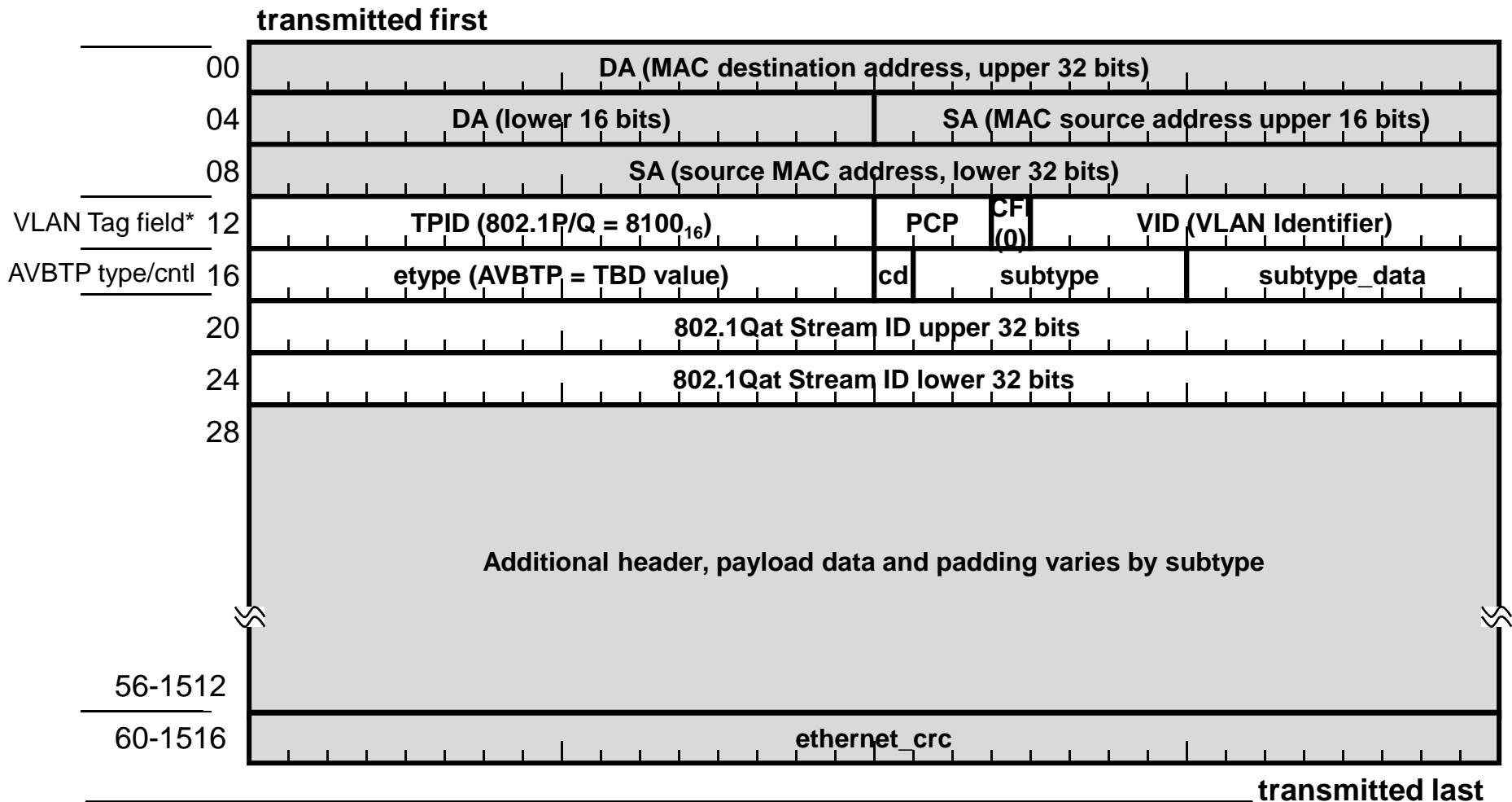
- All talkers shall always send stream data frames with 1st Ethertype field set to 0x8100 for 802.1 P/Q type.
- For AVBTP, talkers and controllers are not required to send stream control frames with an 802.1 P/Q tag.
- All AVBTP compliant devices must always be able to accept data and control frames with an 802.1 P/Q tag.



# Encapsulation Assumptions

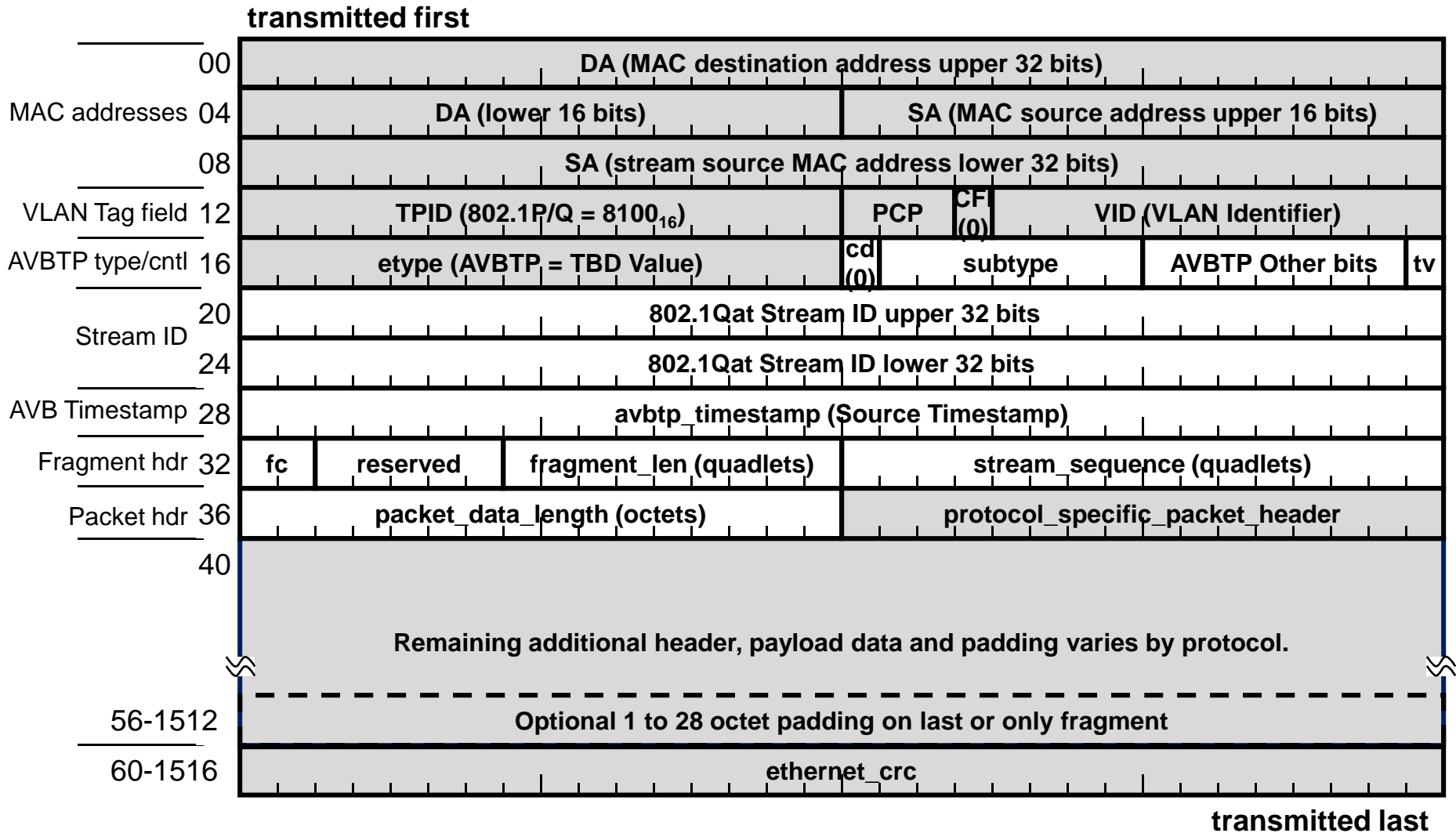
- VLAN Identifier (VID), 12 bits:
  - The VID is a VLAN and not a Stream Identifier
  - AVBTP stations must support VLAN ID of zero to send or receive for stream data traffic.
  - AVBTP stations are recommended to support other VLAN IDs, but it is not required.
  - Receiving AVBTP stations not supporting VLANs or if supported and configured for a given set of VLANs shall discard any frames for which it is not a member of the specified VLAN.
- Canonical Format Indicator (CFI), 1 bit
  - AVBTP will only support CFI of zero.
- Priority Code Point (PCP), 3 bits:
  - For data streams, AVBTP shall always specify the appropriate value (default or as administered to a different value) for IEEE 802.1Qav class A or class B traffic.

# AVBTP packet common fields

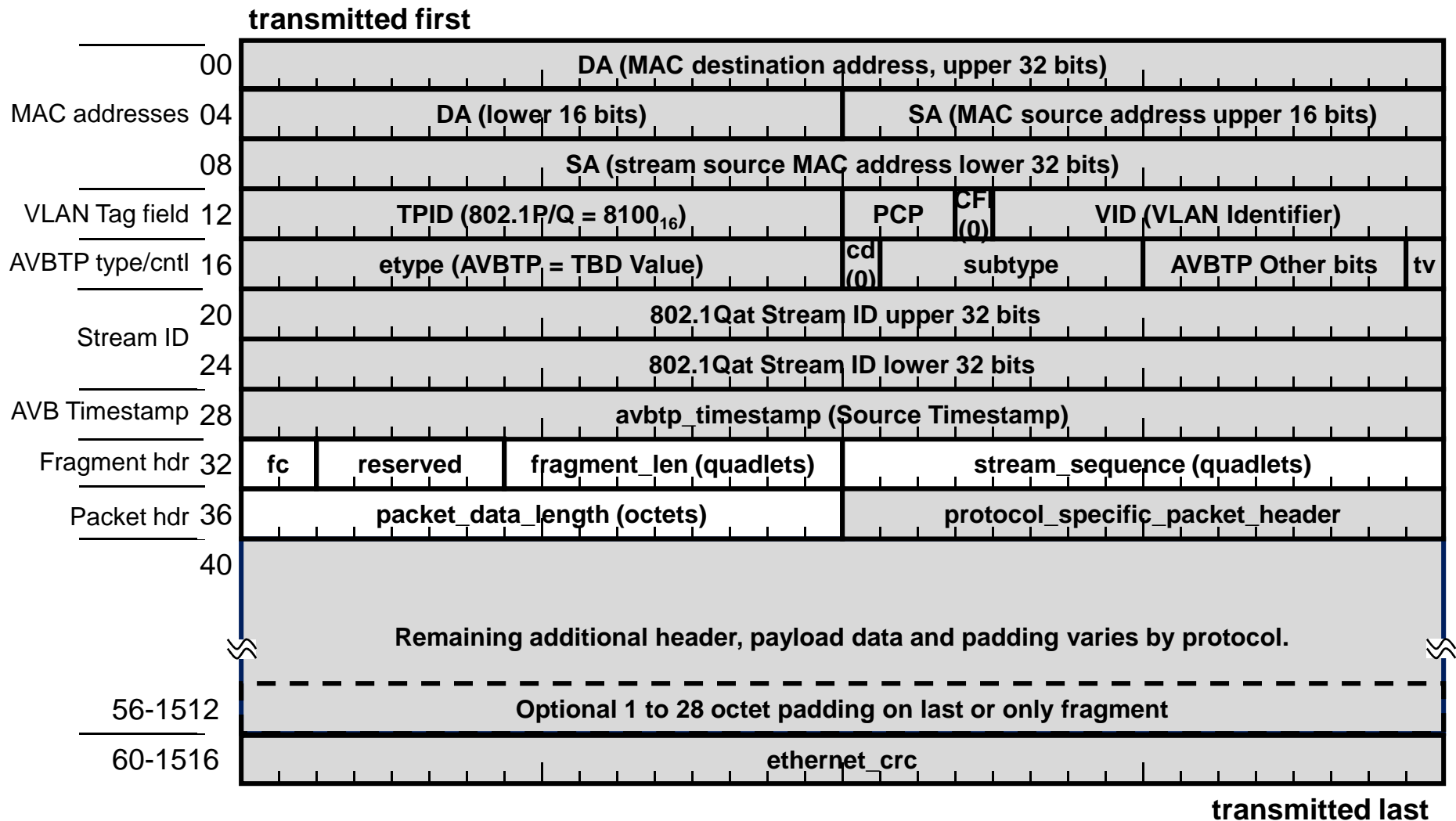


**\*Note: VLAN Tag field is mandatory for some subtypes and optional for others**

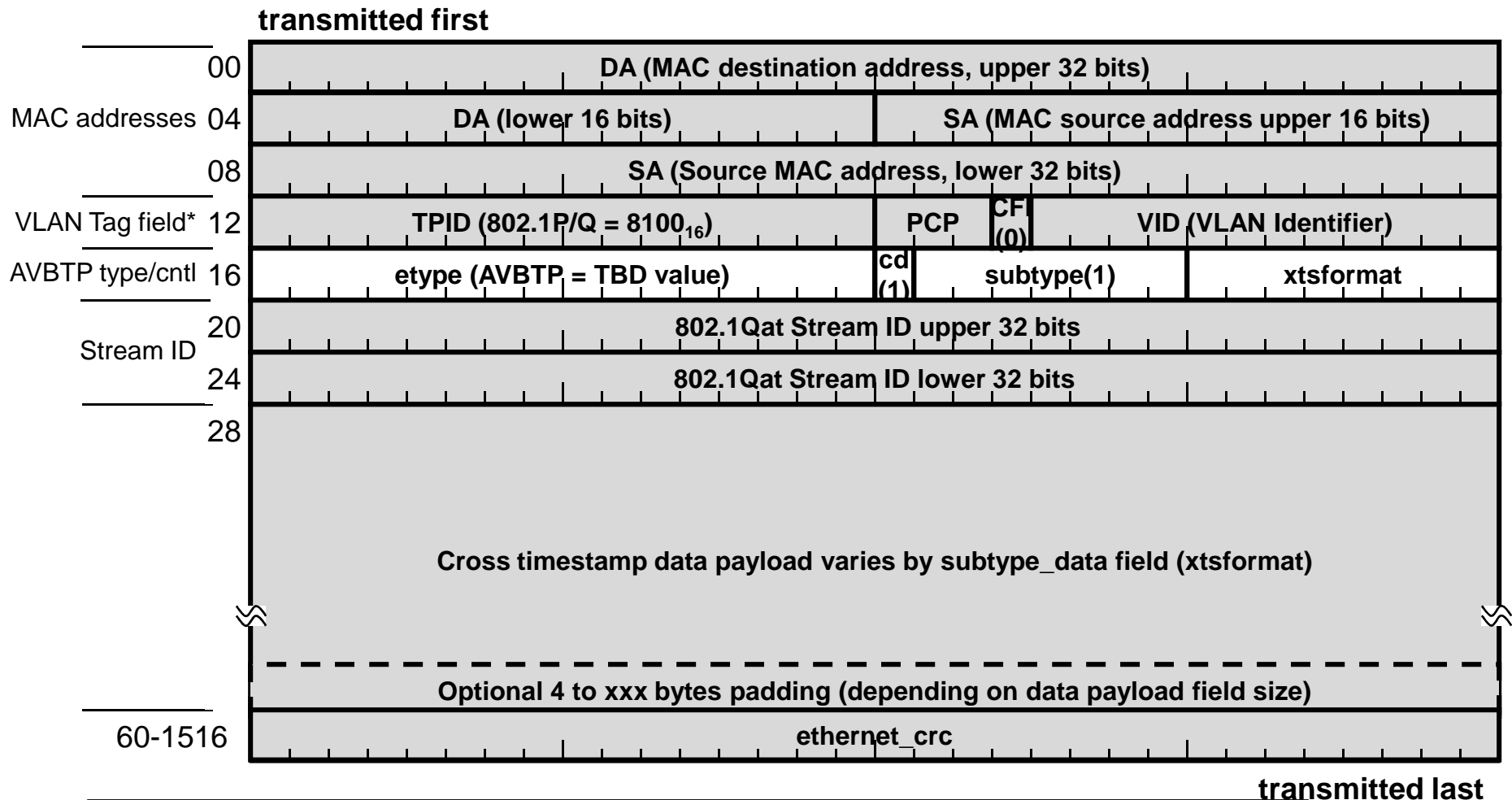
# AVBTP stream type data, general



# Fragmentation, sequence, length stream fields

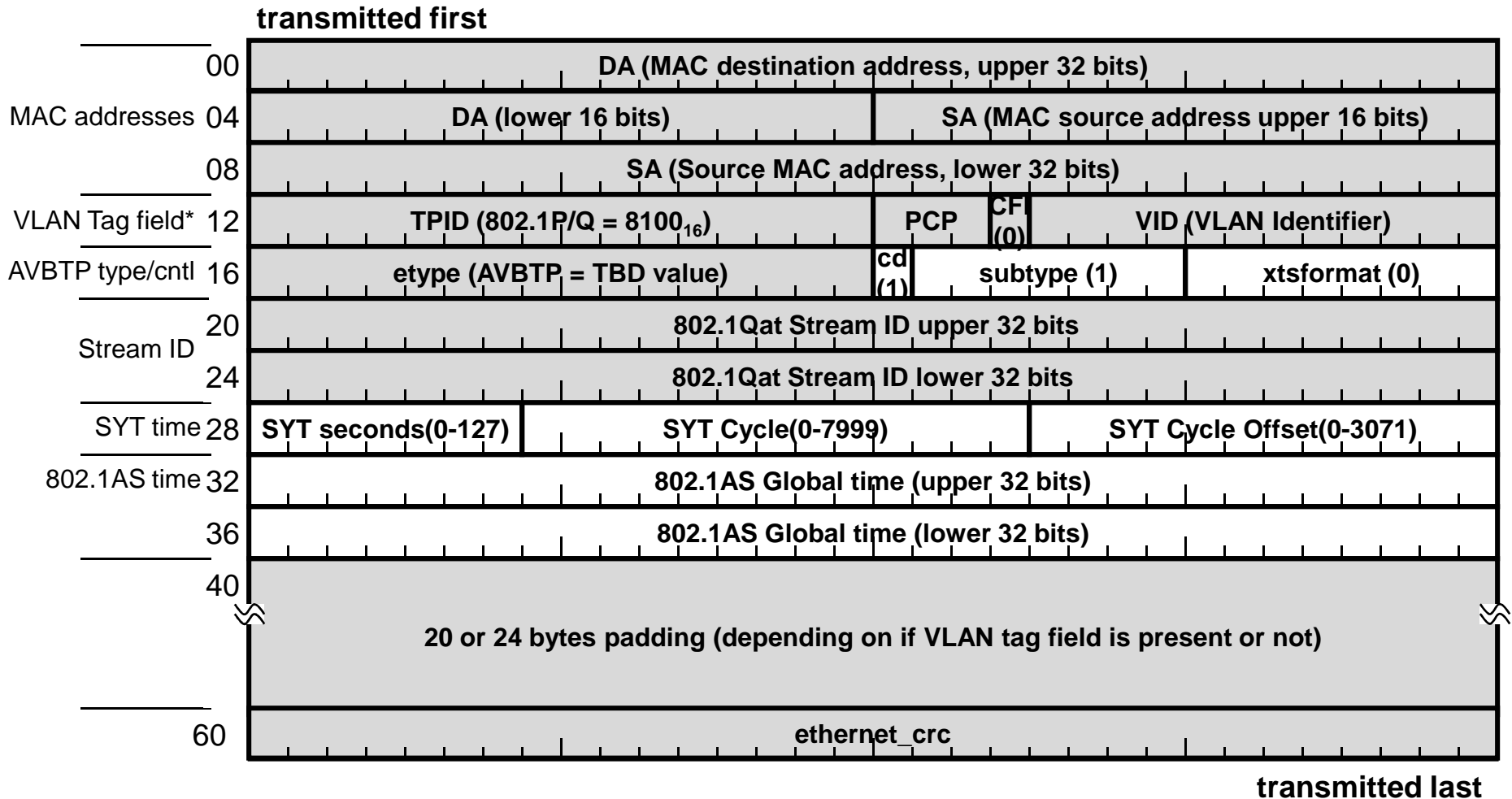


# Cross Timestamp (XTS) packet



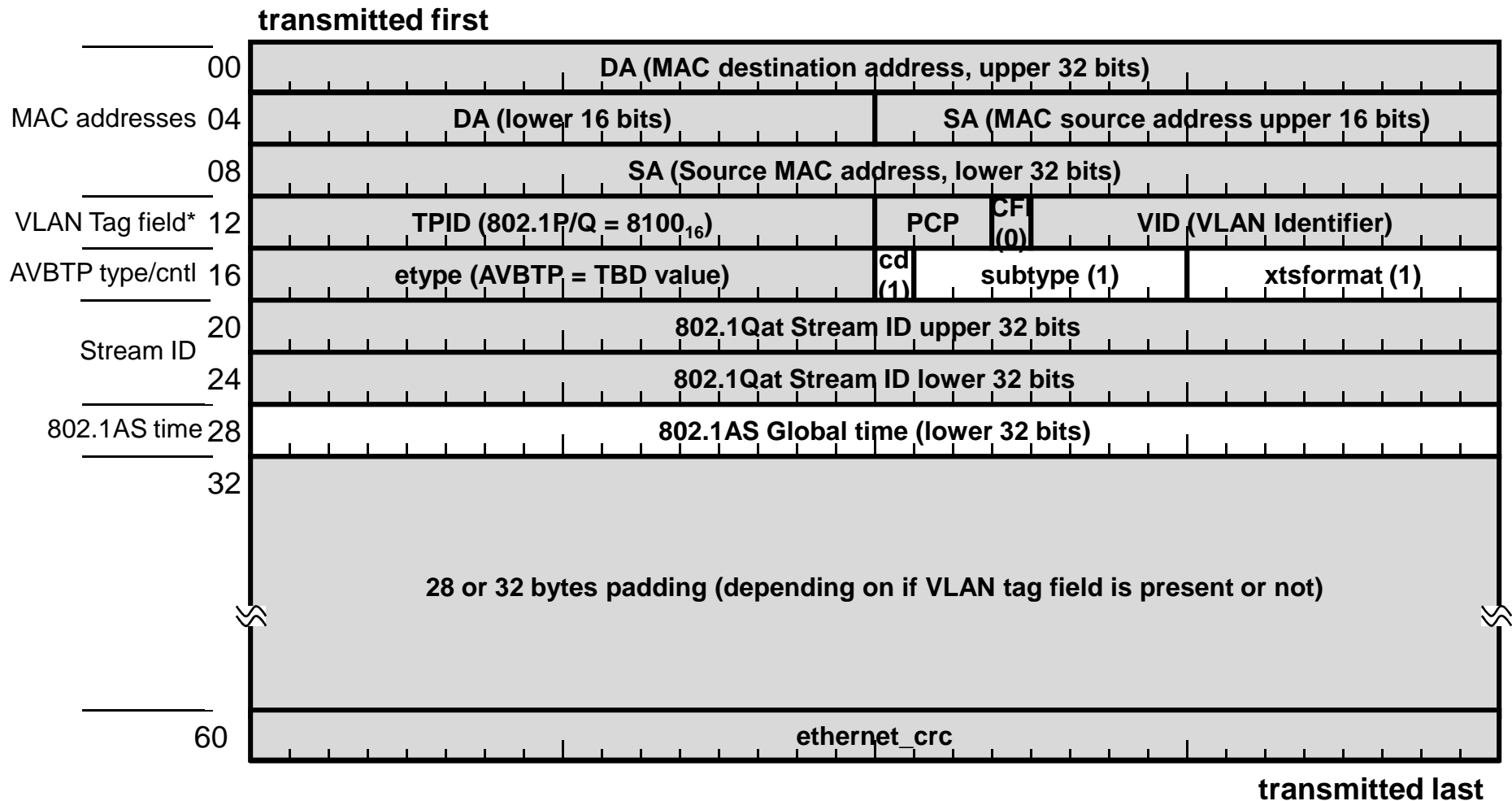
**\*Note: VLAN Tag field is optional for all control messages (subtype is odd number)**

# Full SYT format XTS packet



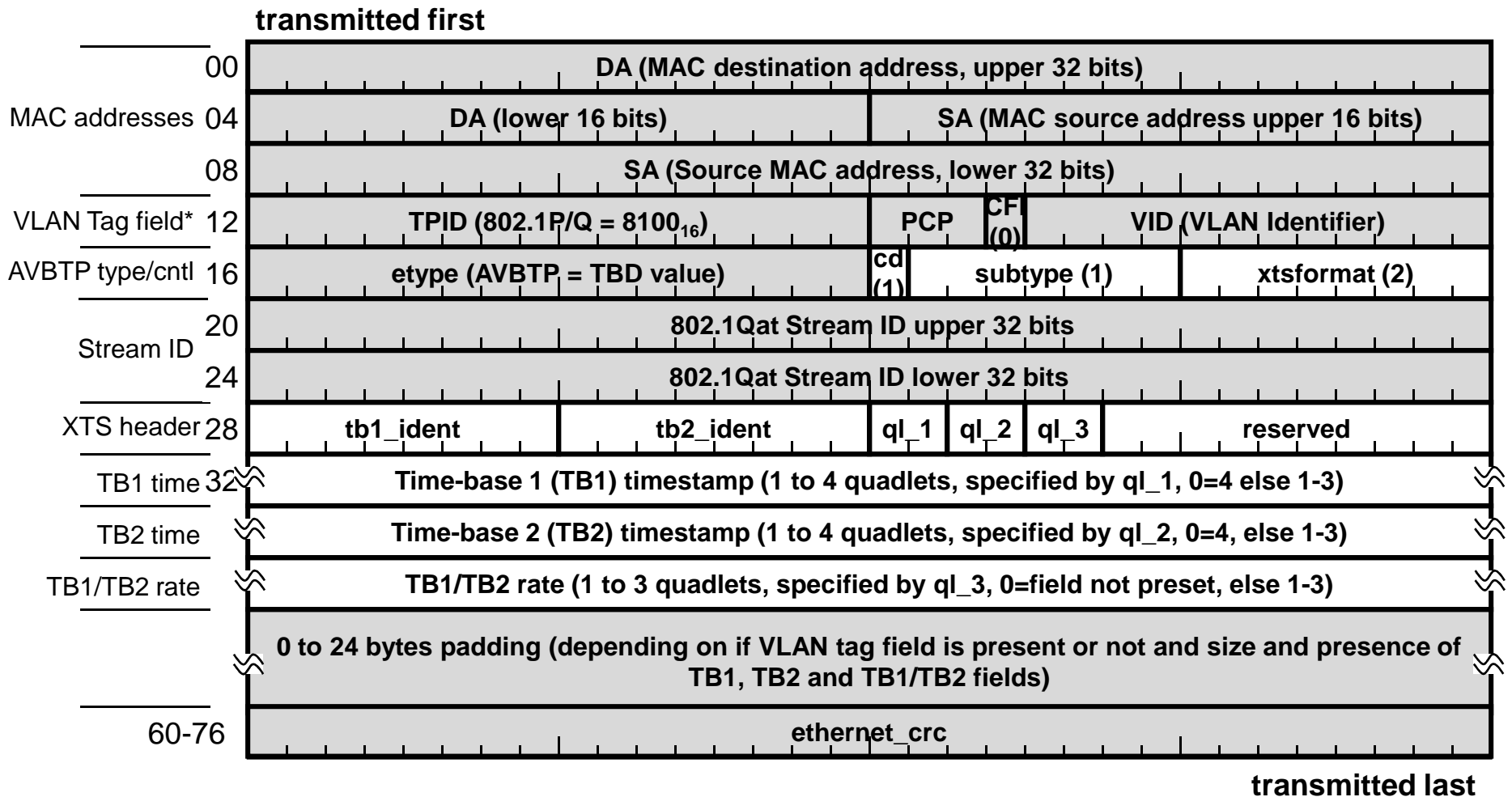
**\*Note: VLAN Tag field is optional for all control messages (subtype is odd number)**

# Update SYT format XTS packet



**\*Note: VLAN Tag field is optional for all control messages (subtype is odd number)**

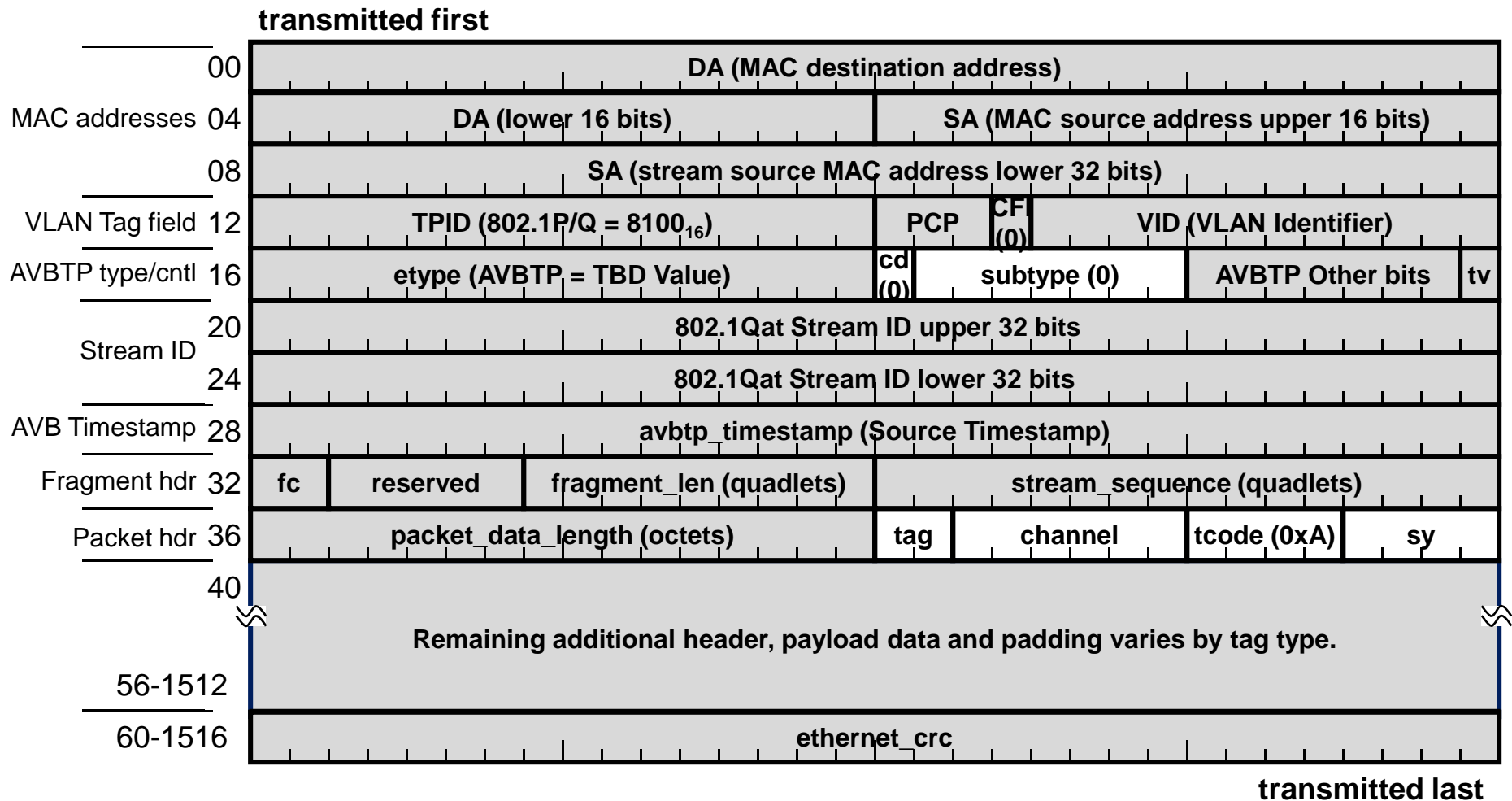
# Generic format XTS packet



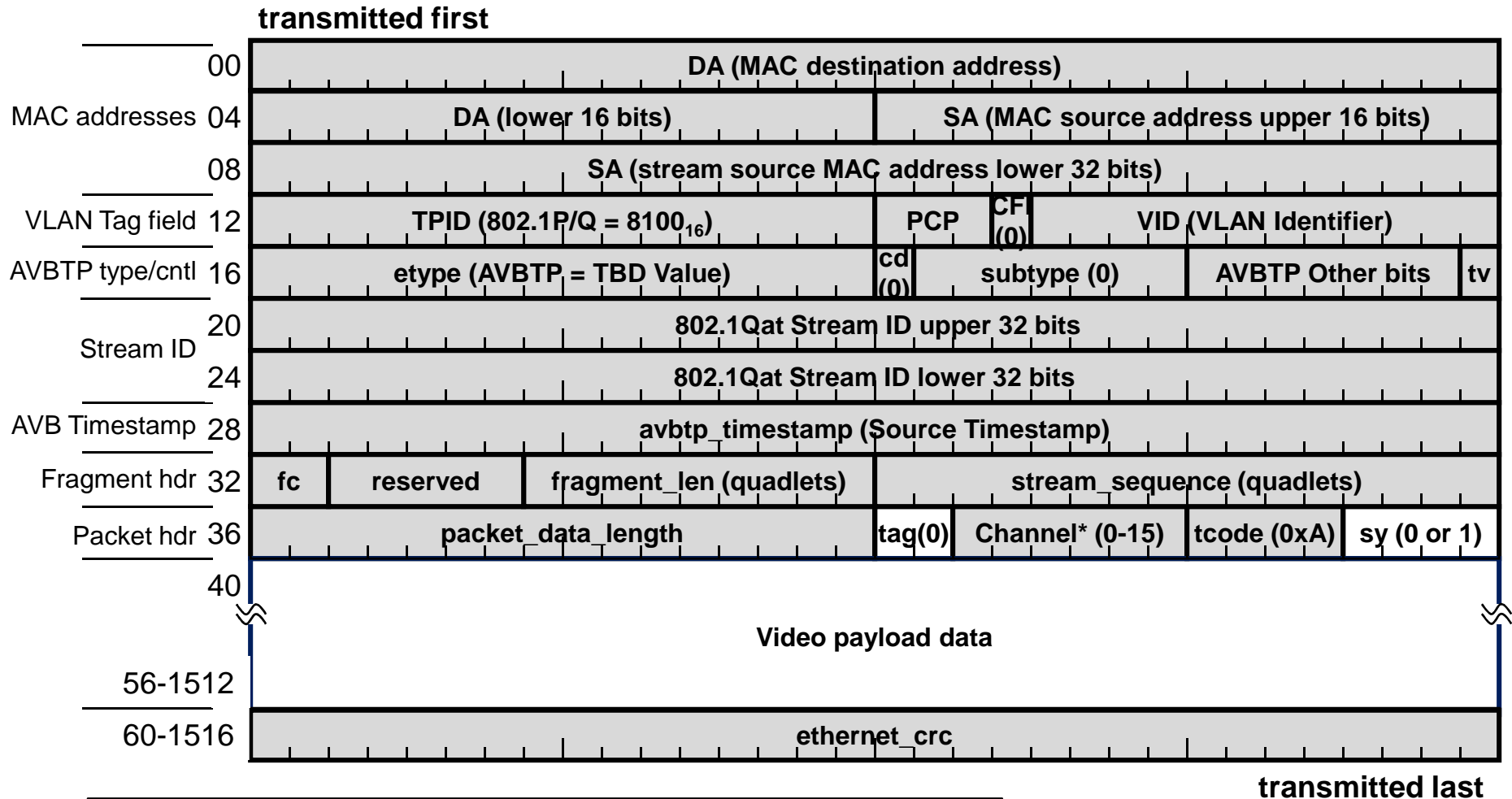
**\*Note: VLAN Tag field is optional for all control messages (subtype is odd number)**



# Draft AVBTP Subtype 0, 61883/IIDC data packet

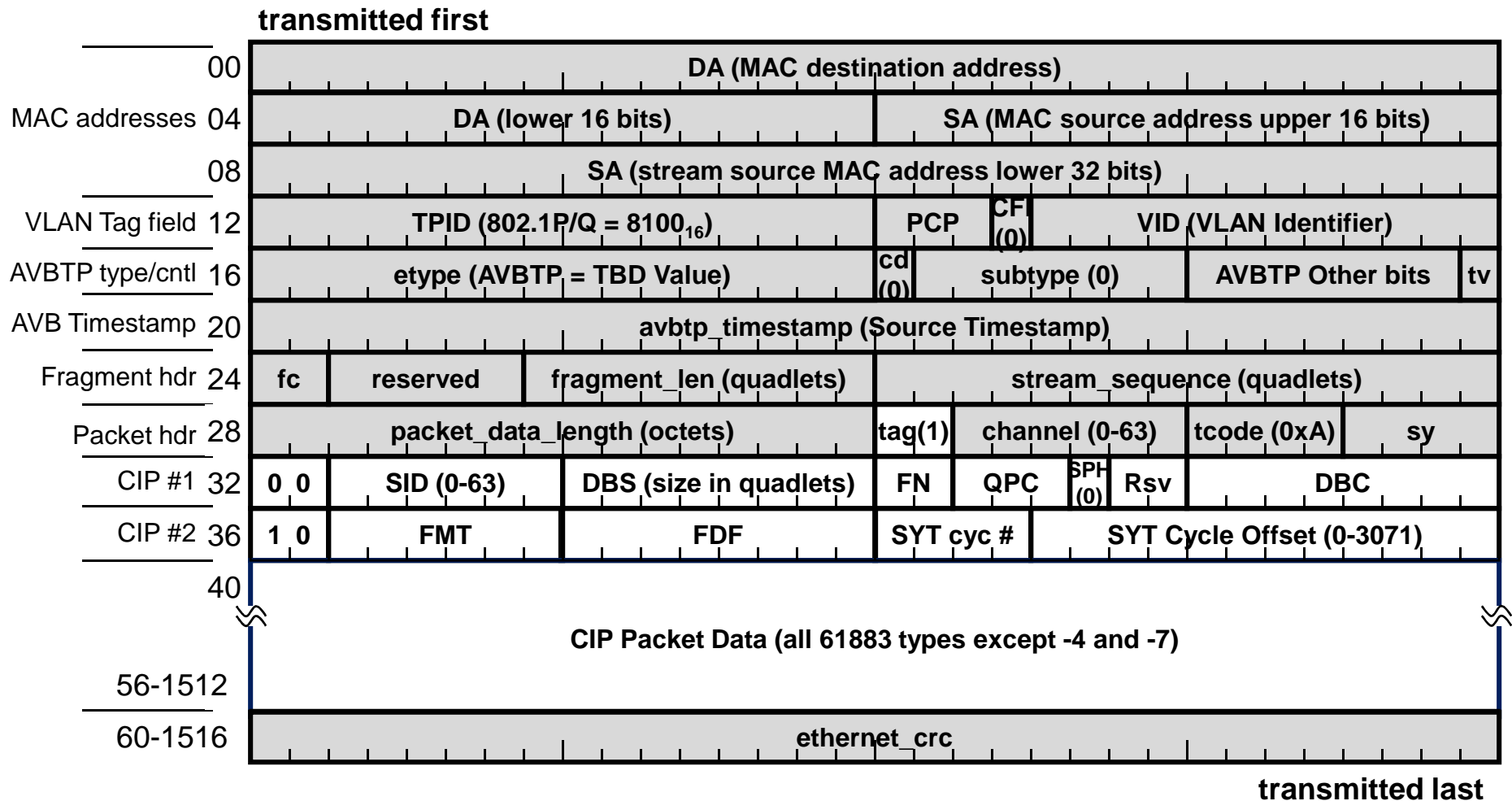


# Draft AVBTP IIDC Stream Data packet

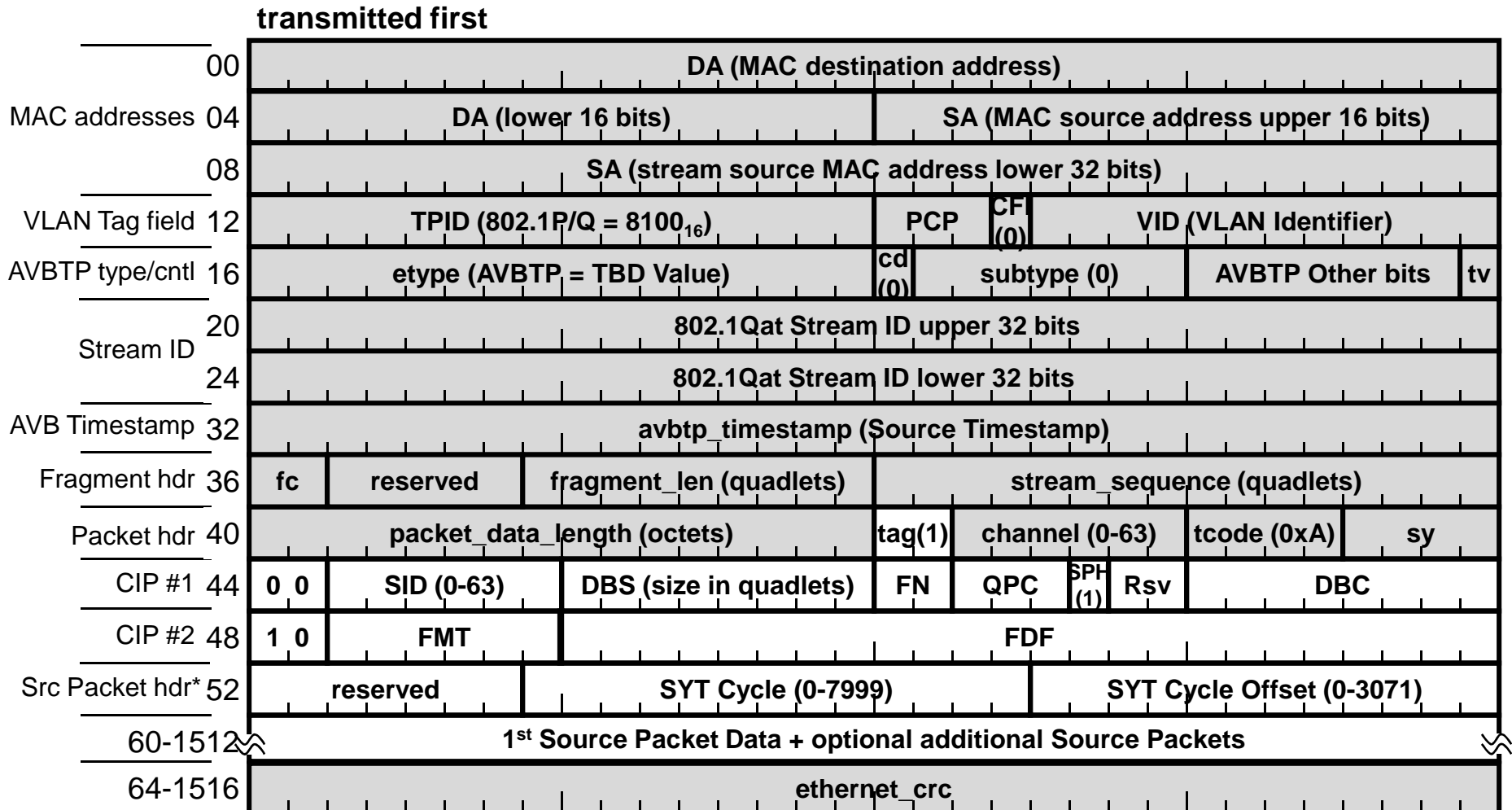


**\*Note: Current standard for IIDC restricts channel ID to 0-15**

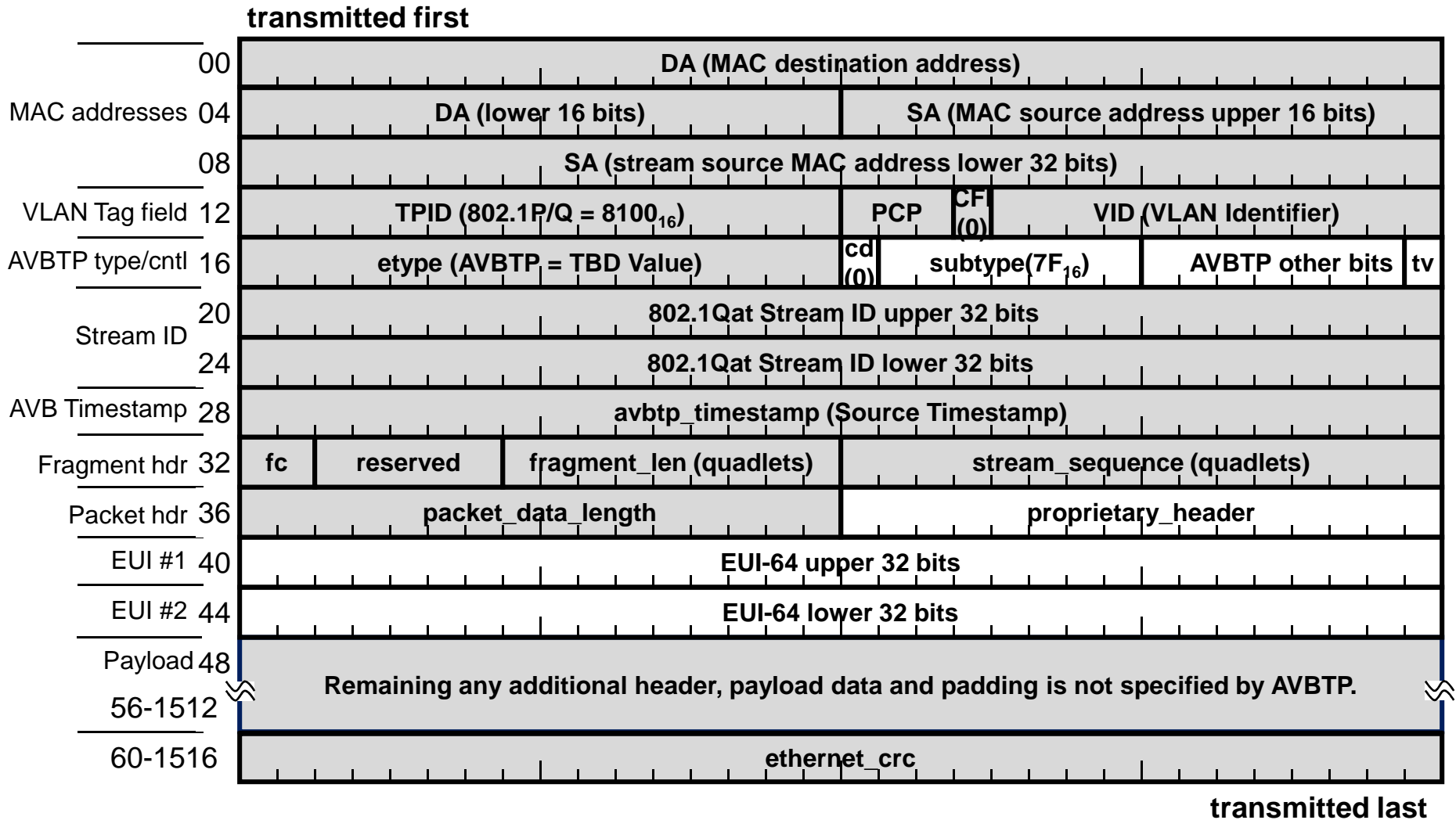
# Draft AVBTP CIP Stream Data packet, SPH(0)



# Draft AVBTP CIP Stream Data packet, SPH(1)



# AVBTP Proprietary/Experimental Stream Data format



Contribution

# AVBTP Proprietary/Experimental control format

