

# IEEE P1722 enhanced fragmentation/reassembly proposal

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# Revision History

<b>\Rev</b>	<b>Date</b>	<b>Comments</b>
0.01	2007-06-24	First version . Edited from previous works and amended to show how enhancing it some could allow for both source packet alignment and with still allowing to reassemble into original from if desired.

# Design Goals

- Continue work from design discussed to date
- Add features:
  - Force it so CIP data payload (data blocks) can be at the same fixed location for each fragment
  - Bring back concept and put into this design of creating CIP headers in each Ethernet Frame so newer Ethernet only stations can process them as individual CIP packets
    - Also decreases latency, if device doesn't need to reassemble back to source, it doesn't need to.
- NOTE:
  - So far, I've only had time to show a 61883-4 example with MPEG packets, but concepts are transferable to all 61883 types and IIDC.
    - SYT field would be set to “no data”  $\text{FFFFFFFF}_{16}$  for intermediate and last fragments for CIP packets with SPH=0.
  - IIDC could also do something similar with length fields, but would not have to bother with creating CIP headers on fragmentation and stripping them on reassembly.

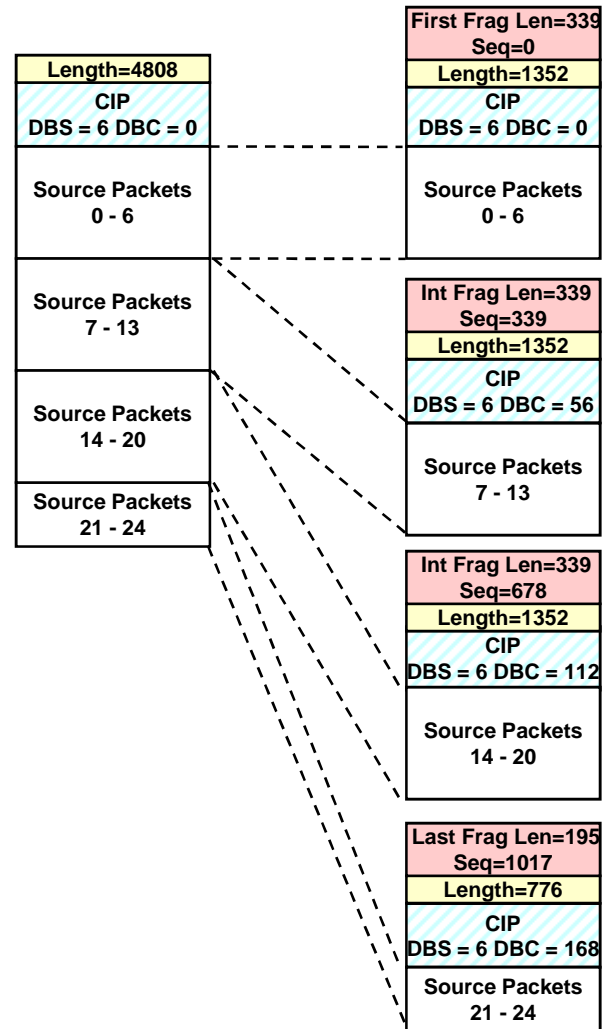
# Example Source Packet Fragmentation

- Example fragmentation based on Source Packets
- Use case, 300 megabits/second 422P@HL MPEG-2 (1920x1080 @ 30Hz)
  - ~ 25 MPEG packets per 8 kHz cycle
  - 188 byte packets with 1 quadlet header(192 bytes per Source packet), 8 x 6 quadlet Data Blocks per source packer as per 61883-4 specification.
  - SYT field in source packet headers, not in CIP header.

Length=4808
CIP DBS = 6 DBC = 0
Source Packets 0 - 6
Source Packets 7 - 13
Source Packets 14 - 20
Source Packets 21 - 24

# Example Source Packet Fragmentation

- Need to break into 4 Ethernet Frames
- First Fragment:
  - 7 x 192 byte source packets
  - CIP header copied “as is”
  - Length field set to byte count of source packets + CIP header length.
  - Fragment data:
    - First Fragment
    - Length = 339 quadlets
    - Sequence 0
  - Length 339 quadlets
- Second & Third Frames
  - 7 x 192 byte source packets
  - CIP header
    - DBC calculated based on DBC plus number of data blocks from the previous fragment
    - other data copied.
  - Fragment Data
    - Intermediate Fragment
    - Length = 339 quadlets
    - Sequence updated by adding quadlet length of each previous fragment
- Last Fragment
  - 4 x 192 byte source packets
  - CIP header
    - Same processing as second and third Fragment
  - Fragment Data
    - Last Fragment
    - Length = 195 Quadlets



# Example Source Packet Reassembly

- Reassembly if needed is straight forward:
  - Length, CIP header and Source packet data is copied from first fragment
  - For each intermediate fragment:
    - Length field is added to current length.
    - CIP header is discarded.
    - Source packet data copied from start of source packet data , length to copy = byte length field -8.
  - On last fragment, calculation is the same except the last fragment indicates that reassembly can complete.

