61883-over-AVB
Project Status

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61883-over-AVB Study Group

• Study Group approved at quarterly IEEE MSC meeting - January 8, 2007
• Study Group has 6 months to submit PAR
• Approved PAR will trigger formation of Working Group
• WG’s charter is to write standard detailing use of 61883 as AVB Transport Protocol
Study Group info

• To subscribe to the 61883-over-AVB Study Group reflector, send an email to Listserv@ieee.org containing the text:

    subscribe avbtp

    in the body of the message.

• The weekly 61883-over-AVB phone conference call will be held Monday, Jan 22 at 9 a.m. PST.

    Primary Dial-In  1 (866) 888-5021
    Alternate Dial-In 1 (630) 693-2119
    Enter Passcode   8451103#
IEC 61883 Standards

• IEC 61883 - Consumer Audio/video Equipment -Digital Interface
  – Part 1: General
  – Part 2: SD-DVCR data transmission
  – Part 3: HD-DVCR data transmission (unused)
  – Part 4: MPEG-2-TS data transmission
    • 1394 TA adding MPEG-4 and MP3
  – Part 5: SDL-DVCR data transmission (unused)
  – Part 6: Audio and Music data transmission
  – Part 7: Transmission of ITU-R BO.1294 System B
  – Part 8: Transmission of ITU-R BT.601 (pending)

• Overview of IEC 61883 can be found at:
IEC 61883-1

- IEC 61883-1
  - Plug Control Registers
    - Input/Output Plugs & Plug Registers
  - Connection management
    - Initiating, maintaining, and releasing connections
  - Function control protocol
    - Asynchronous control data transmission
  - Common Isochronous Packet (CIP)
    - CIP Headers
  - Payload
    - Source packets
    - Data blocks
  - Time Stamps
Plug registers

- Output “plugs” feed input “plugs” based on connection management procedure - CMP
- Plugs are controlled by special purpose CSRs known as plug registers
- Plug control registers
  - iPCR/oPCR – 1 per isochronous stream
- Master plug registers
  - iMPR/oMPR – 1 each per device
Plug registers
Connection management procedures

- Establishing, Overlaying, Breaking connections
  - Increments/decrements connection counters in PCRs
- Connection types:
  - Point-to-point
  - Broadcast-out
  - Broadcast-in
  - Protected/Uprotected
Function control protocol - FCP

- Defines procedures for transmitting asynchronous control data over IEEE1394
- FCP command frames are sent from controllers to targets
- FCP response frames are sent from targets to controllers

*Not what we want to replicate*...
# Common Isochronous Packet (CIP)

<table>
<thead>
<tr>
<th>data_length</th>
<th>tag</th>
<th>channel</th>
<th>tcode</th>
<th>sy</th>
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<tbody>
<tr>
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<tr>
<td><strong>header_CRC</strong></td>
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<tr>
<td><strong>data_block - 1st Quadlet of CIP HEADER</strong></td>
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<tr>
<td><strong>data_block - Last Quadlet of CIP HEADER</strong></td>
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<tr>
<td><strong>data_block - quadlets of data</strong></td>
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<td><strong>data_CRC</strong></td>
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CIP Header

- **EOH_n** (End of CIP header): means last quadlet of a CIP header
  - 0 = Another quadlet will follow
  - 1 = Last quadlet of CIP header
- **Form_n**: in combination with EOH shows additional structure of CHF_n
- **CHF_n** (CIP header field: CIP header filed of n<sup>th</sup> quadlet
Additional CIP Header formats

• Two quadlet CIP header
  – Defines data block sizes and counts

• CIP header with SYT field
  – CIP fields identical to two-quadlet CIP header
  – 16-bit time stamp SYT field

• CIP header with Source Packet Header (SPH)
  – CIP fields identical to two-quadlet CIP header
  – SPH has 25-bit time stamp SYT field
Source packets

- A source packet is the original media data structure from an application
  - Example: MPEG2-Transport Stream (part 4)
    - Packet length 192 bytes:
      - 4 header bytes
      - 188 data bytes
- IEC 61883 assumes source packets have a fixed length
- There is usually an event time associated with the arrival of the first bit of a source packet

Data blocks

- Source packets may be broken into 1, 2, 4, or 8 data blocks for transmission over IEEE 1394
  - Dummy quadlets may be padded into the last data block of each source packet so that all data blocks are equal size
  - Each isochronous cycle of IEEE 1394 transmits zero or more data blocks
  - If no data blocks are ready for transmit, an “empty packet” is sent
  - The receiver collects the data blocks and recombines them into a source packet

Time Stamps

- For IEC 61883 parts 2, 3, and 5 ("DVCR") a time stamp is transmitted once each video frame period.
- For part 4 (MPEG2-TS) the time stamp represents the intended delivery time of the first bit/byte of the transport stream to the transport stream decoder.
- For part 6 (Audio and Music) the time stamp represents the delivery time of the first audio or data bit to the application (codec, decoder, transmitter, etc.)
Some issues to be addressed…

- Other standards referenced in IEC 61883
  - IEEE 1394a:2000, Standard for a High Performance Serial Bus – Amendment 1
Issues (con’t.)

- Configuration ROM
- IEEE 1212 CSR registers
- No “Bus Reset” concept in AVB
- FCP not intended for bridged network
- Plug Control Registers Point-to-point
- Unused media formats
Some goals…

- Map IEEE 802.1AS to IEC 61883 SYT
- Homogenous time stamp methodology
- Extensible to additional media formats
  – Parametizable format?
- Map IEEE 802.1AS and IEEE 802.1Qat application service interfaces to 61883