IEEE 1722a Assumptions

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Green Text = Agreed to at a Face 2 Face (was Red)

Black Text = Not Decided

Changes Marked with Red from last version

Subtype Assignment

- N/A see current draft

- New subtypes
  - 0x02 AVTP Audio Format
  - 0x03 AVTP Video Format
  - 0x04 Control Streams (Automotive/TSCS)
  - 0x7a AVDECC Discovery
  - 0x7b AVDECC Enumeration and Control
  - 0x7c AVDECC Connection Management
  - 0x7d Clock Reference Stream
    - ~~Incorporate SMPTE Timecode as part of MCS~~
  - Divide the subtype table between C and D to clarify that these are different subtype domains

Mac Address Assignment

- N/A see current draft

- ~~MCN needs MAC address (91:E0:F0:00:FF:01)~~
  - ~~MCN has been deprecated and this is no longer needed~~

- 1722.1 has requested a block of 16k MAC addresses to by assigned by 1722a from the 1722 OUI (91:E0:F0:01:00:00 – 91:E0:F0:01:FF:FF)
  - Add a new global OUI usage table
    - Put in Annex D and shift all other Annexes
    - Include MAAP range
      - Include a reference in MAAP pointing to Annex D
    - Include 1722.1 range

Changes to current standard

- N/A see current draft

- Redefine gateway info to only be valid for 61883 formats, changed to Format Info

- Gateway info field to be replaced by a protocol specific field that can be used in new protocols

- GV bit to also be redefined to be available for use in new protocol types or reserved where not used

- Update reference to 802.1AS-2011 (done)

- Update reference to 802.1Qav (done, by updating to Q-2011)

- Update reference to 802.1Q-2011 (done)

- Update reference to 1722.1 once it becomes final

- Update other references???

Doc errors in current standard

- Page 16 "Max gPTP) Skew Time" -> "Max gPTP Skew Time)" (done)
- Figure 5.4 "Timing Uncertainty" misunderstanding (move to annex z)
  - The "AVTP max timing uncertainty" is an unfortunate name. Really it should have been called "max sample delivery time" or some such … it's supposed to be the worst case time between taking the sample and delivering it to the 1722 ingress time reference plane. THIS NEEDS TO BE CONSTANT … so "uncertainty" was a really poor term … it just meant "we don't know how to standardize this". Note the phrase "It is the Talker's responsibility to know the Timing Uncertainty of its own design …"; that's an indication of requirement for certainty in the "Timing Uncertainty". (Don, Ashley and Girault)
- Support for alternate SYT intervals for 61883-6 support for SR Classes other than SR Class A (opinion has changed on this and there is currently no interest in formalizing this most will be using AVTP Audio) (move to annex z)
- 5.4.11 "protocol subtype" should be "subtype field"
- Review usage of SRP Stream ID, Aaron to follow up (move to annex z)
- Review possible use of other time source (ie. Not 802.1AS) (discussed and agree that we will not include this as part of 1722a)

AVTP Audio Format

- N/A
- Support PCM audio
  - Support more channels
  - Simpler data parsing
- Event Markers
- Encryption will be indicated by the new Subtype security header
- Support for multiple Observation Intervals

AVTP Audio Format LPCM Format

- Timestamp ~~in every packet~~
  - Always the presentation time of the first sample
  - Sparse timestamp mode indicated by a bit in the header then every 8th packet is timestamped vs. every packet. Define new bit to indicate sparse mode, not M0.

- Supported formats
  - 32 bit float (IEEE 754) Do we need a reference added for IEEE 754?
  - 32 bit integer
  - 24 bit integer, packed
  - 16 bit integer, packed
  - Interleaved only for all formats

- New Sample Rates
  - Video Pull Up/Down (possible move to annex z)

- All packets in a single stream are the same size (i.e. Each frame contains the same number of samples)
  - ~~All frames including the final stream frame must contain valid sample data~~
  - All frames including the final frame must be assumed that they will be played out and therefore contain sample data that will play appropriately. (possible move to annex z)

AVTP Video

- N/A see current draft

- Support new native AVTP formats
  - Pro Video Formats for transporting SDI formatted video
  - ~~Support RAW sensor data (no one is claiming a desire for this, will be dropped if no further interest)~~
    - ~~IIDC formats currently support this functionality.~~

- Support RTP Payload formats
  - Support MJPEG (RFC 2435)
  - Support MJPEG2000 (RFC 5372)
  - Support H.264 (RFC 6184)
  - Remove Other to the table of formats
  - Remove all reference to RTP
  - ~~Discussed support for SMPTE 2022-6 (do not intend to support this currently)~~

- Marker Bits
  - Proposal to increase the number to 4
  - Bit marking first field
  - Bit marking second field
  - Possible use of Marker bit to indicate SOF/EOF in RTP and other formats
  - Possible use of Marker bits to indicate SOF and switching points (non normative)

- Encryption is part of Version 1 Header

- HDCP is available for use in PES with no further work in 1722a
  - Add informative Annex to describe this

Media Clock Negotiation

- N/A see current standard

- ~~Media clock management is proposed to change to new method~~

- ~~Frequency multipliers to match 1722.1~~
  - ~~1.001, 1/1.001, 24/25, 25/24~~

- ~~Clock Quality field(s) to be added between priority1 and priority2~~
  - ~~Media Clock variance should be determined by PTPDEV (16 bit field)~~
  - ~~gptp_clock_period field related to gPTP interval typically 8ns or 40ns (8 bit field)~~

- ~~Required Crystal GUID to be added for informational purposes to MCN Advertise packet~~

- MCN has been removed from 1722a has been replaced by CRS

Clock Reference Stream

- N/A see current draft

- Need to define an optimized media clock stream frame format
  - Reduced network bandwidth required for MCS
  - Tolerant of dropped frames

- Common format for Audio and Video if technically feasible

- Audio clocks based on sample clock

- Video clocks based on
  - Frame clock
  - Line clock
  - No Pixel clock
  - Look at correlation of frame and line clock
    - Use of Marker bits

- Study alignment of Audio and Video

Clock Reference Stream

- Create abstract model for MCS that includes following items (Rob)
- CRS Timestamps must land on the media clock grid (within tolerance TBD)
- Receive stream presentation times must be on the intended clock grid by no more than +/- 1/3 clock period
    - We need some examples for how to get a stream to land on the grid by calculating appropriate presentation times
    - AES requires +/- 5% TX, +/- 25% RX
    - We may want to tighten this up in the future
- ~~SMPTE time code support~~
- ~~8 bit labels~~
    - ~~Audio~~
    - ~~Frame sync~~
    - ~~Line sync~~
    - ~~SMPTE~~
    - ~~Sample Number~~
- 64 bit timestamps
- CRS streams shall be reserved streams (move to annex Z)

Media Clock Stream

- Start here on next call

- New possible names for MCS
  - ~~Global Clock Streams~~
  - Clock Reference Streams
  - ~~Working Clock Streams~~

- Need presentation on what happens on MCS failure and when to freewheel/fail or switch

- Do we want to address fail over streams? (There is concern that this is unsolvable)

Real Time Format Change
(the HDMI problem)

- ~~Include markers to indicate change~~
    - ~~Prechange indication??~~
    - ~~Format identifier??~~
    - ~~Formats are prenegotiated~~
    - ~~One bit could set to indicate a change is coming and then reset to indicate the change is here~~
- ~~Required in AVTP audio/video formats~~
- ~~Add bits to 61883 base formats~~
- ~~Could this be used by the 802.1 multitalker problem??~~
- ~~This feature relies on HDCP and so we should put this on hold until we solve the HDCP Problem~~
- HDMI content must be HDCP protected and therefore must be carried in a MPEG2-TS so this problem does not exist

Diagnostics

- Diagnostic Counter to be included with 1722a
    - List included in current draft

1722/1722a PICS

- 1722/1722a only (no PICS will be derived from IEC 61883 specific standards)
- Need PICS for AVTP audio/video
- Need PICS for AVTP Control Streams
- Need PICS for CRS
- Need PICS for all new subtypes

DTCP/HDCP

- Informative Annex to be written to describe HDCP IIA 2.0 usage

- No change need in 1722a to support HDCP IIA

- 1722a will not work with the DTCP to get approval for custom HDCP

- 1722a will not work with the DTLA to get approval

- HDCP IIA APM protocol moved into 1722.1

Control Streams

- Automotive base format
    - FlexRay Protocol
    - CAN Protocol/CAN-FD [4/13]
    - LIN Protocol
    - MOST Control protocol to be added in multiprotocol format [4/13]
    - ~~MOST Data to be studied [4/13]~~
    - Support for multiple protocols in a single frame
- TSCS Protocol (Time Sensitive Control Stream) Separate TSCS to new subtype
- We will not be defining FlexRay synchronization
- ~~Should we rename AVTP Control to AVTP Command Streams or AVTP Signal Streams, or something else more useful?~~

Security with minimal latency

- ~~Informative Annex~~

- ~~MacSec – per link encryption~~

- ~~802.1X – per LAN authentication~~

- ~~How do I secure a live performance?~~
  - ~~Class A Stream latency~~

- ~~Need a volunteer or this will be dropped~~

Marker bits

- Need ~~Event~~ Marker bits
- Currently M0, M1,M2 and M3
- ~~Do we need more bits? Yes, 4 bits~~
- Marker bits are format dependent and application dependent
- Can we add these same bits to the 61883 streaming formats? No

Version 1 Format

- Encrypted payloads will be new subtype and there will be no Version 1 Format

- New format to support security header
  - Packet signing
    - ECC
  - Encryption
    - AES-GCM encryption
    - ECC
  - Make use of IEEE 1363a

Liaisons

- Liaison letter received from IEC
- Liaison letter received from SMPTE 32NF
- We no longer Expect to receive liaison from SMPTE 33TS

SRP Reservations

- Does 1722-2011 specify if control/data is reserved?
- Should 1722a specify if control/data should be reserved?
- AVTP CRS is data (i.e. it is a reserved stream)
- AVTP Controls streams are data (i.e. it is a reserved stream)

Goals

- Draft 7 to be released by Mid January
- Section reviews to be available for December meeting
  - Clause 5 (jeff)
  - Clause 6 (jeff)
  - Clause outline for other clauses
  - AAF Clause (Aaron)
  - Encryption Clause (jeff)
  - RTP derived video (Dave/Ashley)
  - Automotive (LIN CAN FlexRay Most) (Gordon/Aaron)
  - Vendor defined subtype clause (Ashley)
  - Active Video (Willem-Jan/Aaron)
  - CRS (Dave)
  - Coded Audio (Ethan)