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# 1722.1 Assumptions

Aug 2010 – F2F

**Green Text = Agreed to at a Face 2 Face**

**Black Text = Not Decided**

**Changes Marked with Red from last version**

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# Revision History

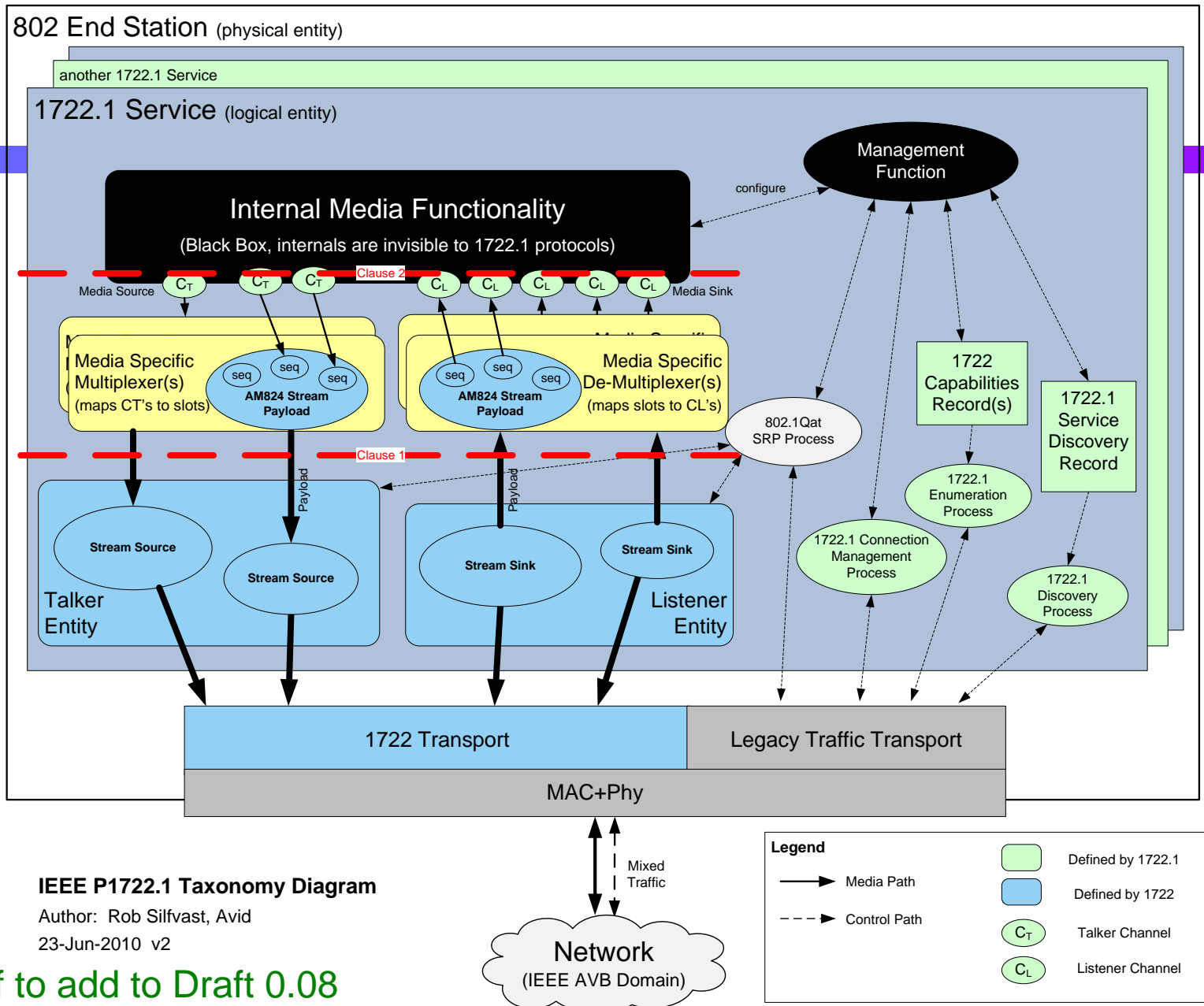
- 1722.1-pannell-assumptions-0810-v5: Aug 2010 F2F
- 1722.1-pannell-assumptions-0610-v4: June 2010 F2F
- 1722.1-pannell-assumptions-0210-v3: Feb 2010 F2F
- 1722.1-pannell-assumptions-1209-v2: Dec 2009 F2F
- 1722.1-pannell-assumptions-1009-v1: Oct 2009 F2F

# Definitions

- Jeff to move into Draft 0.08:
- Talker: (1722's words) An end station that is the source or producer of a stream
- Listener: (1722's words) An end station that is the destination, receiver or consumer of a stream
- Talker Entity: An entity in an AVB end station that can source one or more streams
- Listener Entity: An entity in an AVB end station that can sink one or more streams
- Controller: Any entity that initiates a 1722.1 exchange with 1722.1 end stations
- End station: (from 802.1Q) A device attached to a LAN or MAN, which acts as a source of, and/or destination for, data traffic carried on the LAN or MAN.
- Stream: A series of IEEE 1722 packets with the same Stream ID
- Stream Source: Source of a single 1722 stream
- Stream Sink: Destination of a single 1722 stream
- Media Component: Fundamental data within a 1722 stream payload
- Media Source: Source of a Media Component
- Media Sink: Destination of a Media Component

# Definitions – Cont'd

- Seq (Sequence): Needed for AM824's Multiplexer
- Potential Stream: A stream that is advertised via SRP but has no Listeners associated with it
- Reserved Stream: A successful SRP (Qat) reservation associated with a given Talker but data is not flowing
- Active Stream: A successful SRP (Qat) reservation associated with a given Talker and data is flowing
- Discovery: The fuzzy line between Discovery and Enumeration



**IEEE P1722.1 Taxonomy Diagram**  
 Author: Rob Silfvast, Avid  
 23-Jun-2010 v2

Jeff to add to Draft 0.08

*Q: This neglects the cases of employing VLANs or multiple ports within an Endstation*

# Acronyms

- Jeff to add to Draft 0.08:
- CIF – Common Intermediate Format (Video)
- DSD – Direct Stream Digital
- DV – Digital Video
- IIDC – Instrumentation & Industrial Digital Camera
- MIDI – Musical Instrument Digital Interface
- OSC – Open Sound Control

# 1722.1 Scope

- 1722.1's Scope is:
  - Complete the patch panel model?
  - Discovery, Enumeration, Connection Management and Limited Control
    - Limited Control is Audio Mute and Audio Level Control?
- 1722.1's Out of Scope is:
  - Obsolete formats from 61883 (i.e., no need to support that which will no longer be used going forward with new AVB products)
  - The committee needs contributions to document what formats are needed
  - IP Address assignment is out of scope of 1722.1 as we will point to other STDs that do this

# Phase 1 - Service Discovery

- Definition: The process that a 1722.1 Controller uses to identify other 1722.1 capable end stations
  - Discovery is done with a multicast DA
  - This standard will use **mDNS-SD**
  - We need to define 1722.1's DNS-SD (Domain Name Service – Service Discovery) record – Done
- Services (Talker Entities and Listener Entities) shall support DNS-SD
- Talker Entities must guarantee they are using unique StreamID's and Stream DA's. 1722 MAAP shall be used to acquire the unique multicast stream addresses if the devices does not support any other method.



# Phase 2 - Enumeration

- Definition: Finding the capabilities of the device
  - Enumeration is done with the end station's unicast DA and ends when no more data is needed
- Use the concepts defined in 1722 (i.e., 61883...)(See Guy's presentation...)
  - Obsolete formats from 61883 will not be included (i.e., no need to support that which will no longer be used going forward with new AVB products)
  - The committee needs contributions to document what formats are needed and choose interoperable formats
    - i.e., the current list of supported formats is empty and those that are needed will start to fill the list
  - Will have a Vendor Specific escape method to support formats that are not initially defined in this version of the standard

# Enumeration Items

- Clock source of a stream (media clock domain(s))
  - A media clock domain ID is a Qat Stream ID
- Plane-to-plane delay (e.g., 1722 to human interface and visa versa)
- Version Control – i.e., 1722.1 STD Rev of the Spec
- ID Record
  - Mfg fixed and User settable (when set – I'm configured)...
- Pass-through for generic communications
  - For example: to get Latency numbers for non-integrated devices

# Common Parameters

- For interoperability between all Talkers and Listeners of the same type – need some common denominator
- Some audio mode, E.g., 44.1 &/or 48 KHz?, uncompressed LPCM 16-bit stereo (61883-6 AM824), 48 KHz, 24-bit? 8-Channel? Need separate solutions for separate profiles/markets?
- Some video mode, E.g., Video mode for displays – (61883-8 - BT.601)? Uncompressed and/or Compressed – two options?
- What layer do we use? – should control packets be routable from the internet? It would be nice for this to work over a VPN. To just talk to Controllers or to talk directly to end nodes?
- We want low cost end nodes (i.e., UDP?).

# Phase 3 - Connection Management

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- Definition: Virtual Patch Panel – point of connection management is to connect and disconnect virtual cables between Media Sources (virtual plugs) and Media Sinks (virtual jacks)

# Phase 4 - Control

- Definition:
- Propose to support at least what USB supports?
- What does a consumer need as a minimum?
- Support may be different per profile?
- Is this a Version 2 of this standard issue?
- Create a control model that can be expanded - Yes
- Locate device
  - Light up an LED on a specific device – or a Label display
  - Press a button on a device
  - Enumerated I'm OK or I'm not OK bit (i.e., low battery)
- Subscribe or Unmask to a Parameter change on a device to generate a message to the Controller (i.e., plane-to-plane delay changed)

# 1722.1 Goals

- Need to be able to send out a single 7.1 (8 channel) stream where each speaker attached to it receives this stream and attaches its single speaker to one of the stream's channels
  - This requires a device like this has some form of an enumerator (a switch to select left-rear, etc.)
  - The devices will have to support the same sample rate or this won't work
  - Talkers may be more restrictive compared to Listeners

# Device Requirements/Profiles

- Consumer
  - True Plug-n-Play
  - Control: Standardize Mute, Volume up/down
  - Support for WiFi and/or other wireless technologies
  - User settable and readable settings (i.e., left read speaker)
- Professional
  - True Plug-n-Play
  - Redundancy
  - Control: Don't want in 1<sup>st</sup> standard
  - No support for WiFi (as it is today) – but support future low latency wireless
  - Wireless for intercom
  - Recover in the absence of a Controller back to the last known state
  - New Controller need to sync to existing network state
  - Be able to swap devices in and out
  - Fast boot up time in the order of ?? secs

# Device Requirements/Profiles

- Automotive
  - 2 sec power-on to working sound
- Standardize a way to control devices (volume)
  - Report what a device is capable of doing (aka, USB 2.0)
  - Although desirable, this may be too much for a 1<sup>st</sup> standard
- Consumer model is a subset of the pro model
  - Goal is to have consumer bridges to work in pro networks at least at the edges of the pro network



# Use Cases

- Professional
  - <http://grouper.ieee.org/groups/1722/1/contributions/1772.1-fedorkow-AVB-connection-sequencing-1209-v1.pdf>
- Consumer
  - <http://grouper.ieee.org/groups/1722/1/contributions/1722.1-keving-usecases-1209-v1.pdf>
- Auto
  - [http://grouper.ieee.org/groups/1722/1/contributions/1722.1\\_busch\\_automotive\\_use\\_cases\\_1209.v2.pdf](http://grouper.ieee.org/groups/1722/1/contributions/1722.1_busch_automotive_use_cases_1209.v2.pdf)

# Diagnostics

- Cloud Issues
  - New issues that are introduced by AVB
- Legal Issues (e-911 – IEC 60849 & ISO 7240, 7241)
  - Life safety issues

# Problems

- Support a roaming endpoints
  - Need 802.11 to support full bridging protocols
- Security
- Authentication
- Device Naming
  - One from manufacture & one for user
  - Stream name & its alias
  - Canned default names/attributes
- Redundancy
- Fault Diagnosis
  - Reporting failures and why – where is the error

# Other Issues/Questions

- Use Multicast DA's only?
- **Require support for Talker pruning – NO!**
- HTML base line for control with tightly defined semantics?
- Is it in scope of 1722.1 to standardize device association?
- UDP sequencing issues?
- TCP slow start issues? And long timeouts?
- Synchronized startup issues? Pacing out the requests?
- Reporting post Presentation Time to Cone latency?
- Optimizing Presentation Time adjustment based on a stream's worst case latency? Manual override only?
- Need to define a minimum 'stretch' buffer size? Separate numbers per Class?
- How do we handle, or do we need to worry about what to do with multiple controllers on the network?

# References

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- Ref 1:
- Ref 2: