1722.1 Assumptions

June 2010 – F2F

Green Text = Agreed to at a Face 2 Face
Black Text = Not Decided
Changes Marked with Red from last version

Don Pannell
Marvell
dpannell@marvell.com
Revision History

• 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

- **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

• Discoveration: The fuzzy line between Discovery and Enumeration
IEEE P1722.1 Taxonomy Diagram
Author: Rob Silfvast, Avid
23-Jun-2010 v2

- This neglects the cases of employing VLANs or multiple ports within an Endstation.
Acronyms

• 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?

• 1722.1’s Out of Scope is:
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 Zeroconf – see zeroconf.org
  - We need to define 1722.1’s Zeroconf DNS-SD (Domain Name Service – Service Discovery) record – Done
  - Draft needs to include ptr, srv & txt records

- **Services (Talker Entities and Listener Entities) shall support (Zeroconf) 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.

- **IP Address assignment is out of scope of 1722.1**
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...)
Enumeration Items

• The controlling document for this is now:

• Clock source of a stream (media clock domain(s))
• Plane-to-plane delay (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
• 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)
Common Parameters

• For interoperability between all Talkers and Listeners of the same type – need some common denominator

• Some audio mode, E.g., 44.1 KHz, uncompressed LPCM 16-bit stereo (61883-6 AM824), 48 KHz, 24-bit?

• 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

- 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:
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.)
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 1st 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 1st standard

- Consumer model is a subset of the pro model
Use Cases

• Professional

• Consumer

• Auto
  – 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

• Ref 1:
• Ref 2: