A Question of Power

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First, panic ...

- This is not necessarily a proposal to increase the scope of p1394a
- This IS an effort to drive discussion of certain power issues that are pressing for the portable system and device ends of the PC and CE industries
  - It needs to be discussed
  - We have to start some time

Portables and Internals

- Portable PC designers count milliwatts
  - 1394-1995 and 1394a signaling consumes considerable power, p1394b signaling still more ... More than Portable designers like.
- Within a system, we don’t really need to drive signals at levels sufficient for 4.5 m cabling
  - Within a portable 0.5 m is a very long way
  - 0.5 m is roughly equivalent to IDE cabling

Per-Port Power

- As we move to finer feature and lower voltage technologies, PHY cores and Links become progressively less power hungry
- Signaling requirements determine the technology and power consumption for PHY ports -- They DON'T experience the power savings cores and Links do
- Long-term, per-port power dominates, if we can't move to lower power signaling

The Basic Question

- Can we define short-haul versions of cabled 1394 that will make it more generally acceptable and useful within systems, particularly portables?
  - Can we reduce launch voltages and signal swings to work with current receivers over short distances?
  - Can we increase the sensitivity of receivers to allow even lower launch and swings?

Use existing receivers …

- Can’t change receiver input voltages
- Max. Diff. Output signal amp. is 265 mV
  - How low can we go?
    - 175 mV would save about 56% on transmit power
    - What value could we use?
    - Fiberglass is a poor dielectric
  - Can we move to a finer feature/lower voltage technology with this min. transmit voltage?

More sensitive receivers ...

- How hard is it to make the receivers significantly more sensitive?
  - 100 mV receivers and 120 mV transmission yields about an 80% power savings
  - What about common mode signaling?
  - Can we use a much finer technology?
- How would these play with existing parts?
- What are the costs?

Do we standardize?

- If we assume “captive” connections, do we need to standardize new short-haul transmission characteristics?
  - “Captive” connections mean we don’t need to worry about identifying whether a connection is or isn’t short-haul
  - No standard means little likelihood of different vendors short-haul parts being interoperable

Who writes the standard?

- P1394a is addressing arbitration enhancements, clean-ups and the like
  - This is a little out of it current scope
- P1394b has its own problems with signaling for intermediate- and long-haul digital only signaling, over Cu and fiber
  - May choose to deal with 8B/10B short-haul
- Handle in a p1394c effort?