

1394b

Santa Clara, 5th May 1997

PMD for Long Distance 1394 Kick-off meeting

Colin Whitby-Strevens



Agenda

1. Introductions
2. Approval of Agenda
3. Background
4. Review objectives and guidelines
5. Proposed model
6. Review requirements
7. Contributions
 - David Smith - Honeywell
 - Taka Fujimori - Sony
8. Discussion
9. Action items
10. AOB



Background

- ▢ VESA Home Network Committee has selected IEEE 1394-1995 as the "cluster interconnect"
- ▢ VESA HN has also selected 1394 as the basis for the home backbone
 - needs an appropriate physical layer
 - needs protocols for IP, etc.
- ▢ PHY working group set up within VESA HN to develop a technology demonstrator as the first step towards developing a specification
 - part of an overall home network system demonstrator (scheduled for June 1997)
- ▢ Working group has studied requirements and environmental constraints
- ▢ Several fairly similar developments/demonstrators give confidence in feasibility



Need for a new standard

- 1394 is the technology of choice for the domestic environment for digital video and consumer PC applications
 - selection by VESA Home Network
 - selection by DAVIC for A0 interface and the Data Port on the Set Top Box

- The current specification is not entirely suitable for VESA HN requirements
 - reach of 50 - 100m required
 - amateur installable
 - UTP and Plastic Optical Fibre media, but pass FCC Class B emissions requirements (or better)

- Demonstrations show that it is possible to meet these requirements (at S100 at least), whilst interoperating with IEEE 1394-1995 immediately above the Physical Media Dependent level.

- Need a growth path to gigabit speeds



Motion (1394 Long Distance Ad Hoc meeting - Eindhoven)

The Ad Hoc long-distance PHY group requests the P1394b group to

- 1) expand its scope to include coding techniques suitable for long-distance data transmission
- 2) establish a Task Group to address the physical medium concerns for long-distance 1394

Prop: Richard Churchill, Compaq

Sec: John Fuller, Microsoft

Passed: 19 - 1 - 0



Objectives for the task group

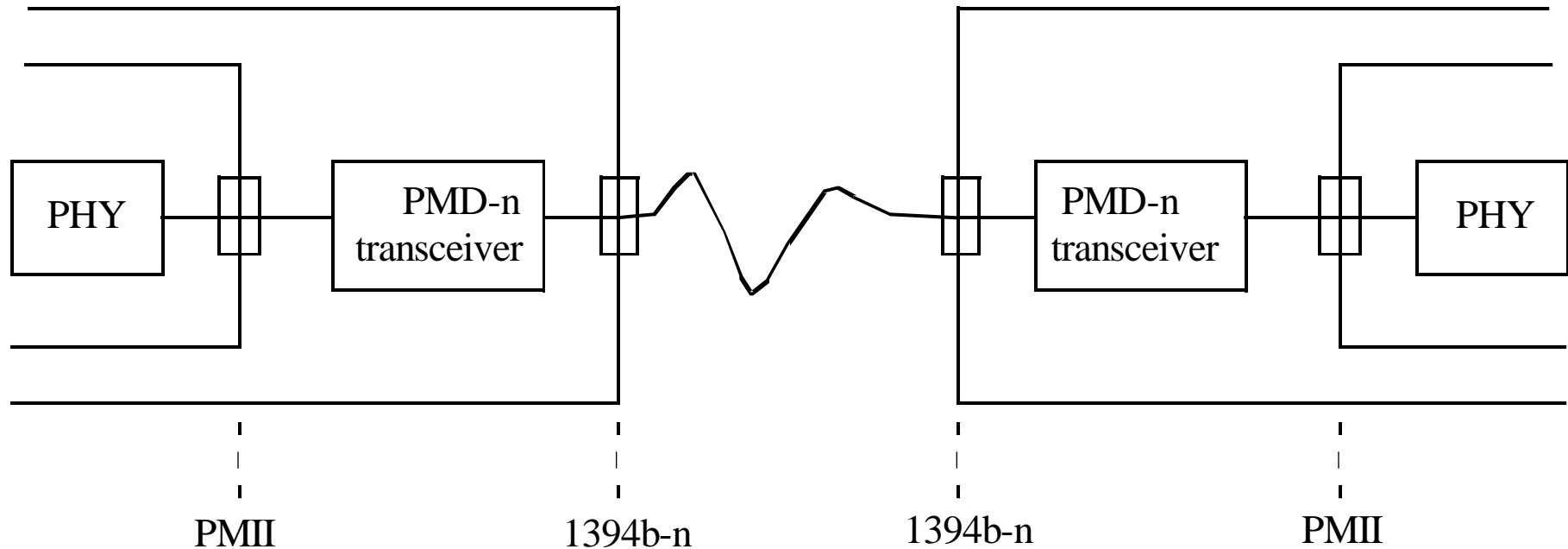
- ▣ Evaluate and refine the requirements
- ▣ Consider the use of Optical Fibre and UTP transmission
- ▣ Consider the long distance transmission at all 1394 cable environments speeds, not just those currently under consideration in P1394b
- ▣ Prioritise the determination of a medium recommendation for new domestic installation

Guidelines

- ▣ Leverage appropriate specifications developed by (or under development) in other standards bodies
 - avoid developing new PMD specifications, cable types and connectors
- ▣ Establish requirements
- ▣ Establish requirements on P1394b and P1394a
- ▣ Determine priority for specifications
 - may select specific speed constraints for early work
- ▣ Review existing specifications, evaluate against our requirements, and select



Model - 1




- ▣ A new reference point is defined, called PMII (Physical Media Independent Interface). The current P1394b work defines everything towards the PHY from this interface, the new PMD subgroup defines everything towards the medium from this interface.


Model - 2


- ▮ There is one specification for PMII, but a range of specifications for 1394b-n (n is used to distinguish one from another).
- ▮ The PMD-n transceivers are unintelligent and unconfigurable. The role of a transceiver is to convert between the signals provided by the PMII and a suitable format for long distance transmission.
- ▮ The PMII electrical specification is the specification currently being defined within P1394b for S800 and upwards short copper links. In this case, the PMD transceiver is null, and the PMII = 1394b-N, (where N is the value of n which identifies this interface).
- ▮ The PMII may or may not be connectorised. When connectorised, it uses the standard 1394 connector.



Model-3

-  The following packaging options are permitted (non-exhaustive list):-
 - The external interface of the device is the current 1394 connector. A short 1394 copper cable leads to a dongle, which converts to an appropriate optical interface and a short optical cable is terminated in an optical connector.
 - As above, with the optical cable replaced by a long-haul copper cable (e.g. UTP-5).
 - The external interface of the device is the current 1394 connector. A 1394 copper cable leads to an active wall plate with another 1394 connector, the transceiver, and connections to installed fibre (or long-haul copper)
 - The external interface of the device is an appropriate optical or long haul copper connector. The long reach transceiver is internal to the device, the PMII is not connectorised and may be subsumed within an integrated implementation.

-  The speed capabilities of the PHY may exceed the speed capabilities of the PMD transceiver. The PHY needs to discover the bandwidth capabilities of the channel with no user involvement.

-  The start-up procedure is therefore defined across the PMII.



PMD Proposed Requirements

- ▮ 50 m reach (100 m preferred) per hop
 - determine worst case delay
- ▮ UTP-5 and Optical Fibres
 - minimise the differences between these two media
 - low complexity implementation
- ▮ Facilitate FCC Class B emissions compliance
- ▮ P1394b above the PMD layers
 - same tree-ID algorithm, self-ID algorithm
 - fully interoperable with current 1394 - no bus bridging required
- ▮ Amateur installable
 - Installation guidelines, installation test



Considerations

- ▮ High speed optical transceivers are incompatible with lower speed optical transceivers
 - designed to transmit at a specific Baud rate

- ▮ Probably need to prioritise the specifications for specific speeds and media, from the following list:-
 - S100 UTP
 - S100 POF
 - S200 MMF
 - S400 MMF
 - S800 MMF
 - S800 SMF?
 - S1600 SMF
 - S3200 SMF

