



The EFM-Copper Deadlock

IEEE802.3ah

Edinburgh, 20-22 May 2002.

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 - ◆ Reza Alavi, Analog Devices
 - ◆ Nelson Zagalsky, ADC
 - ◆ Tetsu Koyama, NEC
 - ◆ *To be completed...*



Goal of this presentation

- ◆ **History of EFM-Copper:** How did we get here?
- ◆ **Current status:** Where are we?
- ◆ **Proposal:** Where can we go?

◆ January 2001 (Irvine): All Copper Objectives Fail

- *Y: 54 N: 31 - Ethernet over Cu @ \geq X Mbps @ \geq Y km*
- *Y: 47 N: 39 - EoVDSL @ \geq X Mbps @ \geq Ykm*
- *Y: 34 N: 32 - Make recommendation re: EoVDSL*
- *Y: 33 N: 36 - EoxDSL (Ethernet over some flavor of DSL)*
- *Y: 46 N: 24 - Ethernet over Cu (for the MxU)*
- *Y: 61 N: 21 - Ethernet over Cu (for the OSP)*
- *Y: 50 N: 27 - One PMD for all Local Loop Cu Twisted Pair*

◆ **March 2001 (Hilton Head Island): After presentations by Marvell, Elastic, Cisco and Alcatel, the copper objectives finally pass.**

- *Y: 64 N: 1 A: 33 – (Topologies:) Point to point on copper*
- *Y: 68 N: 0 A: 27 – (PHY Specifications:) PHY for copper*

◆ **May 2001 (St. Louis): Copper Rate-Reach Objective**

- PHY for single pair non-loaded voice grade copper distance \geq 2500ft and speed \geq 10Mbps aggregate

◆ July 2001 (Portland): Spectrum Management Objective

- The point-to-point copper PHY shall recognize spectrum management restrictions imposed by operation in public access networks, including:
 - Recommendations from NRIC-V (USA)
 - ANSI T1.417-2001 (for frequencies up to 1.1MHz)
 - Frequency plans approved by ITU-T SG15/Q4, T1E1.4 and ETSI/TM6

◆ **November 2001 (Austin): The long-distance PHYs**

PHY for single pair non-loaded voice grade copper, distance $\geq 4600\text{m}$,
0.4mm $\geq 256\text{kbps}$

- PHY for single pair non-loaded voice grade copper, distance $\geq 3700\text{m}$,
0.5mm $\geq 4\text{Mbps}$
- Include an optional specification for combined operation on multiple copper pairs

◆ **The long-distance objectives get negative feedback at the IEEE802.3 closing plenary.**

◆ **January 2002 (Raleigh): Only one rate-reach objective survives the “rewording effort”.**

- PHY for single pair non-loaded voice grade copper distance \geq 750m and speed \geq 10Mbps full-duplex

◆ **March 2002 (St. Louis):**

- “Higher layer” baseline proposals are **approved** by CuSTF and EFM TF (*Marris, Fosmark, Simon*).
- VDSL baseline (*Rezvani*) is approved by CuSTF but **rejected** by EFM TF (*Y:43 N:37 A:47 / Y:24 N:21 A:28*)
- A motion to restrict work to higher layers (*Eckert*) received considerable support in EFM TF (*Y:51 N:32 A:68 / Y:27 N:24 A:33*)

- ◆ Why did the VDSL baseline fail in the Task Force?
 - VDSL vendors were unhappy about the lack of progress on the linecode selection criteria.
 - Some people were unhappy about the short range of the proposed PHY. Other PHYs might allow us to address a larger part of the market.
 - Some people wanted to limit the work of the CuSTF to the layer between the γ -interface and the MII. This was already proposed in Raleigh (without a motion) and brought to a vote for the first time in St.Louis.

◆ We seem to agree that...

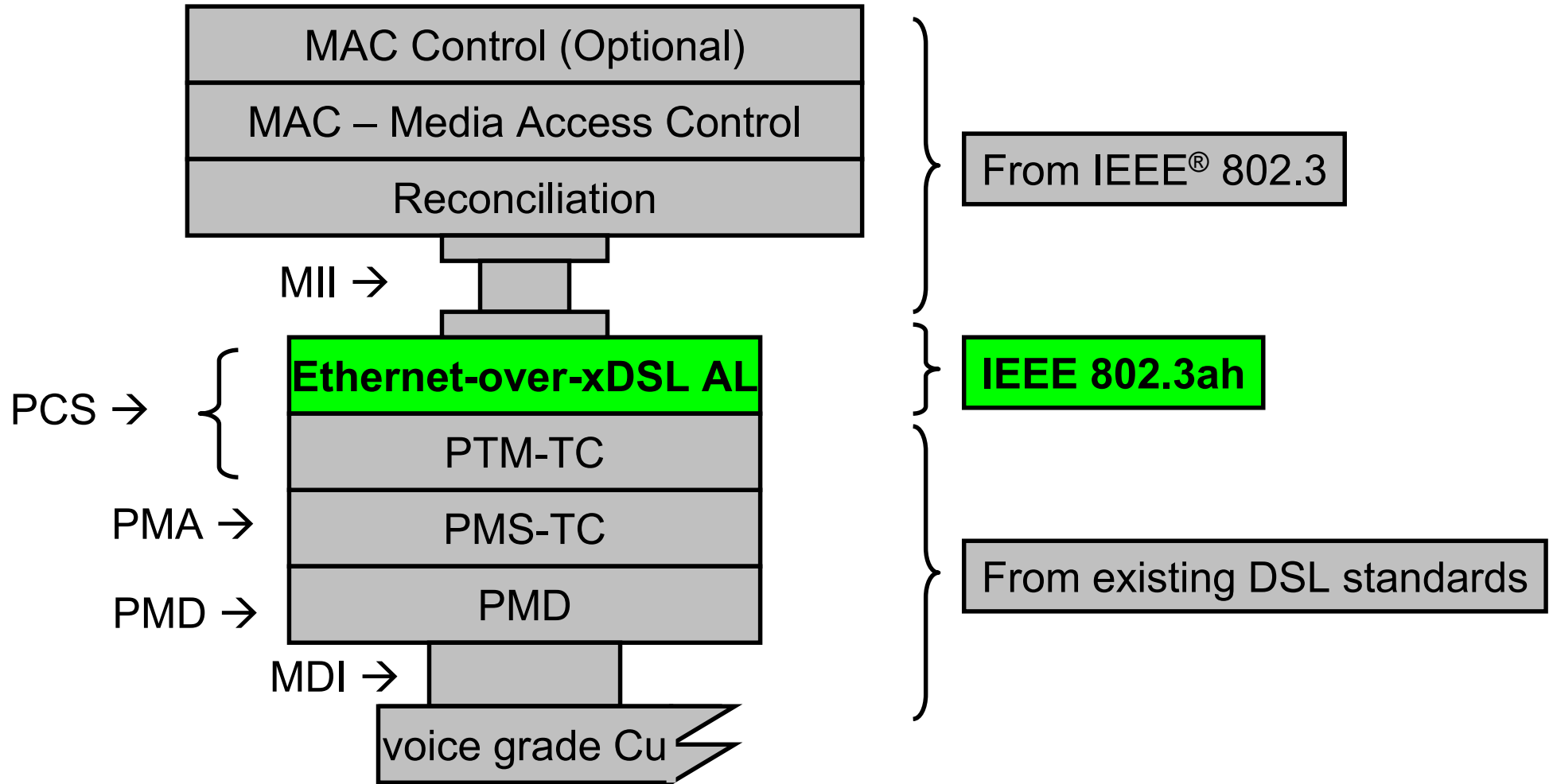
- We want to do something on point-to-point copper.
- It may have applications in the public network, it may have applications in MTU/MDUs.
- Different xDSL flavors can be used, if we define the layer between the γ -interface and the MII.

◆ But we disagree on...

- The rate-reach pair that will optimize the potential of EFM-Copper.
- The choice of a technology and/or a linecode for EFM-Copper.

- ◆ Three “higher layer” baseline proposals have been approved.
- ◆ Below the γ -interface, we don't have (and may never have) 75% support in the Task Force for any technology or linecode.
- ◆ We could stop now and write a draft around what we have, but the IEEE 802.3 Working Group will never call it a PHY.
- ◆ If we don't think of something quickly, the Copper Track will die without a standard.

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- ◆ The authors and supporters of this presentation are seeking support for the following motion:
 - ***Change the Copper PHY objective into: “A specification of the functions needed to transport IEEE 802.3 MAC frames over xDSL systems that have a PTM specific γ -interface as defined in ITU-T Recommendation G.993.1 Annex H.”***
 - ◆ This change would allow us to save the work we have done so far, while getting out of the linecode deadlock.
 - ◆ The specification may become a separate Clause or Annex in the IEEE 802.3 standard.



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- ◆ “Ethernet-over-xDSL” has been proposed in these presentations:
 - staszak_1_01_2001.pdf
 - easley_1_0501.pdf
 - kimpe_1_0901.pdf
 - langston_1_0901.pdf
 - bar-or_1_1101.pdf
 - langston_1_1101.pdf
 - kimpe_1_0102.pdf
 - haas_1_0102.pdf
 - beck_1_0102.pdf