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Re-Viewing Preemption

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(This is ~ a replay of what was presented at the 802.1/3 Meeting in July 2012)

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Re-examining the”problem”

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- Pre-emption was presented to 802.3 as “the problem” to be solved. (Pre-emption CFI, 802.3 Mar 2012)
- That didn't go smoothly
- Many viewed Pre-emption as a pre-chosen solution rather than the problem.
- Lets take another look at the problem

Automotive Problems:

- Too many networks...
  - Too many kinds/per car
  - Too many networks/per car
- Too much copper in harnesses
- Growing real-time requirements
- Want open networks (Ethernet) for:
  - Factory accessory entertainment systems
  - After market systems
  - Customer devices

Industry desire:

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- Go to one kind of network
  (Ethernet considered to be the answer)
- Converge traffic from multiple networks onto a single net, fewer pairs (less Cu)
- Preserve/establish real-time “network” for on-board process control stuff.
- Go to higher speed
  - Accomodate converged traffic
  - Allow for traffic growth
- Meet auto environ. needs (temp. vibe. etc.)

Network Convergence:

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- It is a traffic multiplexing problem
- The Question: Where in the stack to put the mux point?
  - In software (good efficiency, poor real-time performance)
  - Above the MAC in hdw (Granularity of muxing not fine enough given defined interface)
  - In the MAC at octet level (Major redesign of MAC, MAC concepts)
  - In the PHY at code group level (Redo every new PHY)

In the MAC at octet level:

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- Proposed by 802.1 to 802.3
- Would impose new segmentation/reassembly requirement onto MACs
- Would require redo of long established, stable MAC verification and test tools
- Breaks long standing (unspecified) behavior of Ethernet MAC.
- Doesn't solve PHY transit variability (EEE)

In the PHY at code group level:

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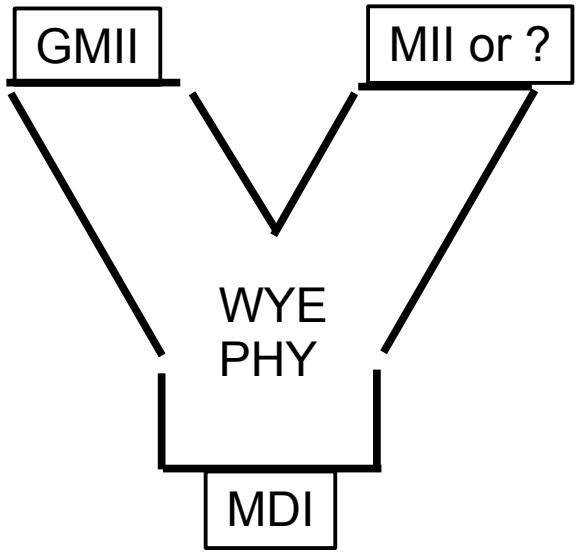
- Proposed by Thompson
- PHY with 2 upper ports
- Done before in 802: Std 802.9a-1995 (10BASE-T and B-ISDN)
- Allows greater flexibility (2 ports into 1 bridge OR separate bridges)



PHY MUX Advantages:

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- May not need any 802.1 work at all
- Could be add on to RTPGE
- Hooks can be added to RTPGE while the the paper is still blank
- Provides complete and transparent separation between two networks
- Allocate one network as closed with engineered and fully simulated timing behavior
- Second network would be more open, less deterministic
- Easy simulation w/ existing tools

PHY MUX Advantages (2):

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- Completely transparent to MAC & above.
- Mux is VERY simple state machine
- Two ends sync Muxes during IDL
- Design verification pretty simple
- 2 Speeds can be symmetrical or assymmetrical
- ….
-

Major closing point

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The problem should be fully open to creative solutions at this point.

Points to Remember

- There is no such thing as a FREE LUNCH.

  The accomodation of added traffic and its requirements for fast access time has to be paid for with something

- The Wishes of Marketing Have Remarkably Little To Do With The Laws of Physics.

THANK YOU !

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