Building the Objectives

IEEE 802.3 Multigig Automotive Ethernet PHY Study Group Ad Hoc

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Basic PHY project objectives formulae

PHY projects typically have objectives of the form:

- Preserve the 802.3 / Ethernet frame format utilizing the 802.3 MAC
- Support a data rate of ***X*** Gbps at the MAC/PLS service ***interface (may be multiple)***
- Preserve minimum and maximum Frame Size of current 802.3 standard
- Support full ***(or half)*** duplex operation
- Support a BER better than or equal to 10^{-x} at the MAC/PLS service interface
- Support optional single pair Auto-Negotiation
- Define optional Energy Efficient Ethernet
- Support point-to-point topologies
- Define or describe any link segments to be used ***(see "hard objectives")***
- Define a PHY (or PHYs) capable of operation over ***(various link segments)***
- Do not preclude meeting FCC and CISPR EMC requirements
- Support optional PoE/PoDL ***?***
- Operate in any application environments/features necessary
  - E.g., Automotive, Industrial EMC, fault conditions, fast startup

Noncontroversial

- Preserve the 802.3 / Ethernet frame format utilizing the 802.3 MAC
- Do not preclude meeting FCC and CISPR EMC requirements
  - (note – this does not limit additional EMC objectives)
- Preserve minimum and maximum Frame Size of current 802.3 standard
- Support operation in automotive environment

Usual, but need some discussion, choices and justification

- Support a data rate of ***X*** Gbps at the MAC/PLS service interface
  - ***IS THERE ONLY ONE RATE? WHAT IS X?***
- Support full duplex operation
  - (any case for half duplex?)
- Support a BER better than or equal to 10^{-X} at the MAC/PLS service interface
  - (needs support, 10^{-10} consistent w/1G, 10^{-12} consistent w/10GE)
- Support for optional single-pair Auto-Negotiation
- Define optional Energy Efficient Ethernet

Hard stuff that define our PHYs

- Define the performance characteristics of link segments and one or more PHYs to support point-to-point operation over this link segment with single twisted pair supporting up to ***X*** inline connectors using balanced cabling
  - Need to spell out rates, media & reach

Possible Automotive PHY Objectives

Automotive startup

- Define optional startup procedure which enables the time from power_on=FALSE to valid data to be less than 100ms

Powering?

- Support PoDL? PoE? (if multipair)

Big things to Consider

- Each of these can make its own separate set of PHY objectives:
  - Rate
  - Media
  - Duplex
- What special features/modes are ‘MUST HAVE’ and big enough to scope the project?
- What must we NOT PRECLUDE

Things to do

- Present on Use Cases/Needs particularly as they map to requirements
- Get analysis for:
  - Market potential vs Rates vs Link segments
  - BERs required
- Get strawmen for:
  - Rates & link segments vs
    - Market potential
    - PHY feasibility

THANK YOU!