



NGEABT Study Group

Why 2.5G/5G Data Rates

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Background

- This deck presents reasons why 2.5G and 5G are preferred data rates for NGEABT rather than other data rates

Supporters

David Chalupsky - Intel

Kamal Dalmia – Aquantia

Christopher T. Diminico – MC Communications

Ramin Farjad - Aquantia

Peter Jones – Cisco

Paul Langner – Aquantia

George Zimmerman – CME Consulting

Why 2.5G/5G Rates: Technical

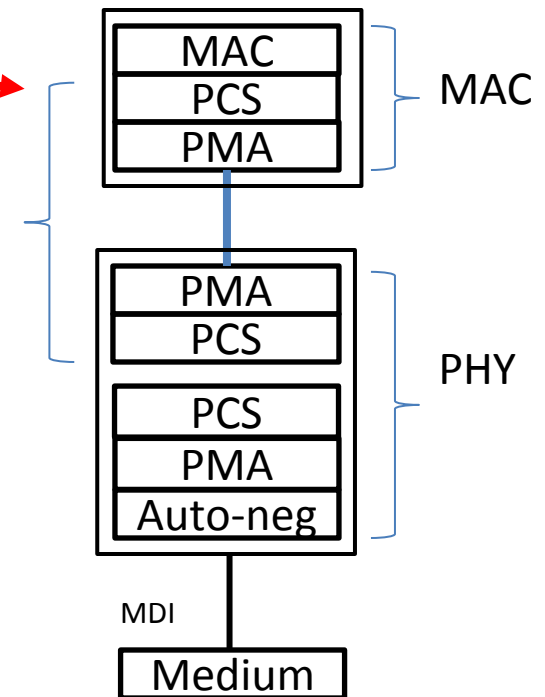
PHY/MAC Interface

➤ 100M/1G/2.5G PHY option

- Enables use of existing PHY/MAC SERDES protocols for up to 2.5G using 8b/10b
- 1000BASE-X for 100M/1G with SGMII – allows MDI speed change while PMA remains at 1.25Gbps
- 2500BASE-X for 2.5G – MDI speed change require fractional (x2.5) clock vs. 100M/1G data rate

➤ 100M/1G/2.5G/5G and 10G PHY option

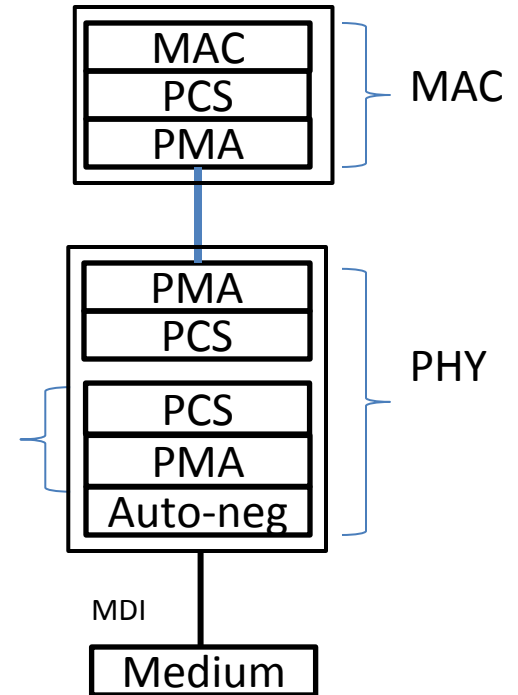
- Allows extension of SGMII to 10Gbps to support 100M/1G/2.5G/5G/10G over common PCS/PMA
- Clause 49 PCS/PMA PCS/PMA - 10.3125Gbps independent of MDI speed
- Data replication used to maintain 10.3125 PMA speed for 100M/1G/2.5G and 5G (similar to SGMII for 10M/100M)
- Integer divider for 100M/1G/2.5G/5G and 10G – Don't need fractional synthesizers which may result in jitter issues
- Simplifies auto-negotiation between PHY/MAC interface with faster speed convergence



Why 2.5G/5G Rates: Technical

- 10GBASE-T PCS/PMA

- Allows reuse of much of 10GBASE-T (Clause 55)
- Integer clock divider used to support 2.5/5G data rates



Why 2.5G/5G Rates - Cost

- Re-use system reference clock as 1G/10GBASE-T, other rates may result in more complex clock distribution when supporting 1G/10G as well new rates
- No Gear-Box and rate adaptation FIFO required - other rates such as 2.4G/4.8G may require complex rate adaptation
- Why Two Rates:
 - 2.5G : Low Cost WiFi AP's and Switches
 - 100M/1G and 2.5G (Low End AP/Switches)
 - Package cost: Wire-bond instead of flip-chip BGA
 - Silicon die area can be optimized
 - Low Power – low clock frequency
 - 5G: For High-End AP's and BW scalable switches from 100M to 10G

Why 2.5G/5G Rates - Summary

- Technical Feasibility – Simple and re-uses current 10GBASE-T technology
- Scalability
 - Bandwidth: Allows low and medium/high end AP/Switch
 - Low Power for Low End AP/Switch
 - Cost – Allows lower cost option for low end AP/switch

Thank you.

