EEE baseline proposal for 802.3cd

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Supporters

802.3cd Objectives

- Support optional Energy-Efficient Ethernet operation

Clause 78 – Energy Efficient Ethernet

- Provides mechanism to allow links to enter a lower power state to conserve energy. Traffic transmission is halted during this time.

- Two types of operation
  - Fast Wake
    - EEE mode for all PHYs that have EEE defined (except 10G-KR/CR)
    - Doesn't stop data transmission
    - Wake time is roughly 340ns
  - Deep Sleep
    - EEE mode for Copper PHYs only
    - Stops data transmission for periods of time
    - Wake time is roughly 5500ns

Baseline Proposal

- Only add Fast-Wake EEE support for all 802.3cd PHY types
  - Set wake time to be the same as 40/100G

Why no Deep Sleep?

- Deployment usage
  - How many systems use the feature?
  - If it's a feature no-one uses why spend time/effort defining it?
- Wake time requirements
  - What is the system wake time requirement to be used?
  - What is the PHY wake time requirement for "significant" power savings?
  - Do the system and PHY wake times align such that power-savings is "substantial"? (ie. 2us wake provides 1% savings, while 200us 50%)
- Deep sleep circuitry support
  - Rapid Alignment Marker logic costs area and power. Which does diminish the PMA/PMD power savings. Is it still net positive?
  - Complicates the standard quite a bit (FW only require LPI encode/ decode)

Conclusion

- Add Fast-wake at this time
  - Easy to define and implement and provides a tool for savings to be made.
- Do NOT add Deep sleep at this time
  - Adds a lot of work for unknown usage
  - PHYs maybe lower-power by not supporting the sleep functions (no need for fast-power-on circuitry)

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