Point to Point Fiber
Five Criteria

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Point to Point Fiber - Intro

- Presentation purpose:
  - Show that the Point-to-Point Fiber Objectives passed in Hilton Head meet the 5 criteria mandated by 802.3.
- Specific objectives supported by this presentation:
  - Support subscriber access network topologies: point-to-point on optical fiber.
  - Associated PHY: 1000BASE-X long distance over single SMF.
- Proposed modification to the objective:
  - “>=10Km” in place of “long distance”
- An example PHY which would meet these objectives is:
  - “1000BASE-LX2”: 1Gbps over 10Km of single SMF at 1310nm using two lambdas.

Broad Market Potential

- US and worldwide broadband markets growing
  - High speed US access subscribers growing from 7M in 2000 to 41M in 2005
    - Frazier, 11/00,1/01:
      - http://grouper.ieee.org/groups/802/3/efm/public/nov00/frazier_1_1100.pdf
      - http://grouper.ieee.org/groups/802/3/efm/public/jan01/par_1_01_2001.pdf
  - Worldwide subscribers of 150M in 2005
    - Frazier, 11/00, 1/01
  - US and Europe market potential estimated at 200M households
    - Vaananen, 1/01
      - http://grouper.ieee.org/groups/802/3/efm/public/jan01/vaananen_1_01_2001.pdf

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Broad Market Potential (con't)

- Number of MAN/WAN broadband (>10Mbps) building terminations expected to exceed 2M by 2005 (Gartner 2/01)
  - Average data rate/building expected to grow from 10Mbps (2001) to greater than 250Mbps (2005)
  - Ethernet penetration is expected to grow from 1% (2001) to greater than 20% (2005)
- Fiber-To-The-Home is expected to grow rapidly during the next decade (Electronicast)
  - 5M FTTH subscribers in 2005, 22M in 2009

Broad Market Potential (con't)

- High level of support for this objective
  - Objective passed in March (84-4-13)
  - Support from multiple equipment/transceiver vendors

Compatibility

- MAC layer should remain unchanged.
- Point to point fiber should be able to use the existing media independent interface and reconciliation sublayer.
- The Point-Point fiber PHY should leverage the existing 1000BASE-X PCS/PMA.

Distinct Identity

- No 802.3 PHY standard optimized for wire-line access
- Gigabit Ethernet PHYs are not optimized for subscriber access applications
  - 5km 1000BASE-LX is not long enough
  - No single fiber SMF point-to-point PHY

Technical Feasibility

- Deployment of LX Gigabit Ethernet today
- Widespread deployment of extended reach GbE today
  - 10Km vs. the 5Km specified by the standard
- Physical layer devices are well understood and widely available.
- Availability of optical components (WDM) indicate single fiber feasible
- Extended temperature optics will address reliability concerns in the access space

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Economic Feasibility

- New well funded service providers broadening the market
  - Several using standard GbE LX optics
  - Increased volume will help drive down transceiver costs
- Access market requirements unlikely to significantly affect PMD economics
  - OAM&P effects are minimal
- Single fiber solutions will further reduce deployment costs
  - Should more than offset added cost of optical mux/demux