Objectives for "First Mile" Gigabit Optics

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Jonathan Thatcher

Jonathan@wwp.com

Recommend 3 New 1000BASE-X PMDs

- **LX-like PMD; > 10 km**
- **Single mode PMD; > 80 km**
- **Single fiber, full duplex PMD; > 10 km**

10 km, 1000BASE-LX-like PMD

- **Standardize what we are all using….**
  - **Current standard LX specified to 5 km**
  - **FC solution: 10 km (running at 1.0625 Gb/s)**
  - **Most shipping: non-standard LX running 10 km**
- **Need to guarantee interoperability**
  - **Various companies' specifications similar; not same**
- **Opportunity to tune this for 1310 nm VCSELs**
  - **Cost reduction**
  - **Reduce risk of limited laser supply**
- **Opportunity to refine specifications according to new link model used in 802.3ae**
- **Make interoperable with 1000BASE-LX at 5 km**

10 km, 1000BASE-LX-like PMD

- **Broad Market Potential**
  - **Well duh; it already dominates LX market**
- **Compatibility with Standard 802.3**
  - **No issue**
- **Distinct Identity**
  - **No issue**
- **Technical Feasibility**
  - **Well duh…**
- **Economic Feasibility**
  - **Need I say it?**

Single Mode, 1550 nm PMD

- Standardize what some of us are already using
  - Market opportunity clearly established
  - 40 km easily achieved; > 80 km demonstrated
  - Want to be functionally compatible with existing LX/SX
- Need to guarantee interoperability
  - Various companies' specifications vary widely
- Use techniques being leveraged by 802.3ae
- Eventual standard may or may not be interoperable with existing, proprietary solutions

Single Mode, 1550 nm PMD

- **Broad Market Potential**
  - **Interoperability will expand existing market**
- **Compatibility with Standard 802.3**
  - **No issue**
- **Distinct Identity**
  - **No issue**
- **Technical Feasibility**
  - **Already proven in proprietary solutions**
- **Economic Feasibility**
  - **Can only improve upon proprietary solutions**

Single Mode, 1550 nm PMD

- **But, is this really a "FIRST MILE" technology?**

- **Absolutely!**
  - **In many instances, "First Mile" aggregation boxes need to connect long distances back to Network Operating Centers**
  - **Natural upgrade to 802.3ae**

Single fiber, single mode PMD

- **Application:**
  - **To be used as alternative to the LX or 10km dual SMF solution**
- **Purpose**
  - **Reduce fiber infrastructure (fiber; connectors; splices)**
- **Example:**
  - **2 wavelength, WWDM at ~1310 nm**
  - **Disadvantage: different wavelength transceivers required at opposite ends**

Single fiber, single mode PMD

- **Broad Market Potential**
  - **Needs to be established (should be easy)**
- **Compatibility with Standard 802.3**
  - **No issue**
- **Distinct Identity**
  - **No issue**
- **Technical Feasibility**
  - **Proven**
- **Economic Feasibility**
  - **For “First Mile” application, will beat LX**

Objectives

- **Provide Physical Layer Specifications for:**
  - **1000BASE-X, 10 km, 1310 nm duplex over dual SMF**
  - **1000BASE-X, 80 km, 1550 nm duplex over dual SMF**
  - **1000BASE-X, 10 km, 1310 nm duplex over single SMF**