10000BASE-X PMD Solutions

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Goal of presentation

- **Recommend reduction** of the number of PMD technologies
  - Serial and WWDM
- **Justify the inclusion** of 5 PMD types for consideration at the July plenary

The Winning Route to Consensus

- 850 nm Serial
- 850 nm WWDM
- 1310 nm Serial
- 1310 nm WWDM
- 1550 nm Serial

Rationale

- The 5 PMD implementation meets all 802.3ae PMD objectives developed in Albuquerque
  - Provides the lowest cost solutions
  - Flexible and adaptive to market needs
  - Supported by complete set of specifications
  - Best opportunity for 75% support
  - 1000BASE-X has 5 PMD types today

Comparison of PMD Technologies

			Maximum Link length			
Technology	λ	Rel. Cost	62.5um Fiber (160/500) MHz*km	50um Fiber (500/500) MHz*km	50um Fiber (2000/500) MHz*km	SMF
Serial	1550nm	5X	NA	NA	NA	40km
	1300nm	1.8X	86m	86m	86m	10km
	850nm	X	28m	86m	300m	NA
WWDM	1300nm	3X	300m	300m	300m	10km
	850nm	1.5X	100m	300m	550m	NA

- 100m over installed MMF
- 300m over MMF
- 2km over SMF
- 10km over SMF
- 40km over SMF

Justification for Serial

- Proven low cost technology over time
- Electrical (Si) cost curves historically drop by factors of 10s, optics by factors of 1s
- Needed to support scalability

Justification for WWDM

- Could prove cost effective sooner
- Can support longer distances at a given speed
- Needed to support scalability

850nm Justification

- Lowest cost solution in marketplace today
- Operation on MMF
- Volume leader
- Proven performance
- Proven reliability
- Sound familiar??? 850nm was almost excluded from 1000BASE-X

1310nm Justification

- High performance SMF operation
- Can operate on MMF
- Proven performance
- Proven reliability

1550nm Justification

- Provides extended performance on SMF operation
- Meets 40km objective

The Installed Base Argument

- We should include solutions that support the installed base but not exclude those that do not
- History shows that customers will deploy new media if it makes sense
- Short reach applications are not heavily populated with fiber today, but will be at 10GB
- The backbone is an easy upgrade

Conclusions

- A 5 PMD Standard is the winning route
- Meets all 802.3ae objectives
  - ABQ objective was to reduce PMD types to 7 by end of July plenary
  - All of these solutions have proven performance, cost effectiveness and reliability
  - No reason to exclude any of these solutions at this point; to do so is not fair to ourselves or our customers