

Joint ITU-T/IEEE Workshop on Next Generation Optical Access Systems

Physical Layer Requirements for Next Generation Optical Access

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Highlights - “Introduction to 10G EPON PMDs”

- 10G EPON PMDs are defined for
 - Three classes of ODN: 20, 24, and 29dB
 - Asymmetric 10/1 and symmetric 10G
- PMD specs carefully chosen to be
 - Cost effective
 - Compatible with deployed ODNs
 - Compatible with existing PON systems
- TDMA coexistence concept
 - 10G EPON upstream at 1270nm

Highlights – “Physical layer requirements for smooth migration...”

- PON is successful FTTH method
- Growing demand will drive network upgrades
- Several upgrades methods are possible
 - Side-by-side OLTs
 - Replacement with backward-compatible OLT
- Optical interconnection of OLTs an issue that can drive wavelength choice and power budget
- O-band suitable for TDMA coexistence at 10G rates
 - Commonality with 10G EPON design

Highlights - “Enhancing PON capabilities using the wavelength domain”

- Current deployed ODN and equipment have spectral limitations
- WDM could be used for several purposes
 - Adding capacity (e.g., overlaid GPONs)
 - Saving feeder fiber
 - Enabling better amplified PON concepts
 - Replacing power splitting PON with wavelength routing PON
- However, WDM technology presents significant cost challenges
 - Colorless ONU transmitters
 - Wavelength filters
 - Optical layer supervision

Conclusions / Recommendations

- 10G EPON PMD standard is fully featured and well on its way to completion
- Upgrading existing PON is critical, with two major techniques possible
 - Side-by-side OLTs using WDM
 - Replacement OLT using TDMA
- WDM extended NG-PON offers many capabilities, but presents cost challenges
 - Technical innovations are needed to make them more practical