

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

## **Session 5: Interplay between optical access technologies and solutions**

**Objective: Review the current status, future trends, and  
economic aspects of key components of NG-OAS systems**

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# **Highlights: *Optical component technology review and future trends***

## ***David Li (Ligent Photonics)***

- Traditional Xcvr technologies may be approaching their limits
- Key challenges at 10G:
  - High Tx power
  - High Rx sensitivity
  - Price
- Dream device: 2-chip optical Xcvr
  - Will reduce cost and improve performance
  - Not available soon
- New solutions will likely be needed (WDM?) beyond 10G

# **Highlights: *Overview of mass-market silicon development economics***

## **Denis Beaudoin (Texas Instruments)**

- Estimated development cost for 10G PON silicon is \$17M-\$20M per standard
- There are development and device costs to develop and maintain multiple standard silicon
- There is a development cost and a volume impact to develop two different devices
- History tells us that the turning point is reached when a single standard is adopted

# Highlights: *1 Gbit/s P-P Ethernet OAN enhancement*

**Makoto Kadowaki (NEC)**

- Existing optical P-P specifications are not sufficient for access systems
  - Optical Interface: A larger channel insertion loss specification is needed
  - OAM: Specifications for system management are needed
  - Silent Start Function
  - Power Saving Function
- Work proceeding in ITU-T Q2/SG15
- Active liaison between ITU-T and IEEE on this topic

# Conclusions

- Current PON architecture (broadcast downstream, TDMA upstream) should work at 10G. WDM may be needed for higher speeds.
- The economic impact of multiple standards on suppliers is negative and significant
- Volume drives low cost
- Transport is not enough for P-P – manageability is key
  - Physical layer (silent start, power savings, etc.)
  - System layer

# Recommendations

- The PON community needs a comprehensive cost / benefit analysis comparing
  - Multiple, independent NG PON standards (current situation)
    - Benefit: Precise matching of features to requirements for every market segment
    - Costs: Higher costs, possible performance impact, market delay
    - ...
  - One NG PON standard (convergence)
    - Benefit: Low cost, high volume, rapid time to market
    - Costs: Possible change in network architecture, etc.
    - ...
  - “Coexisting/cooperating” multiple NG PON standards
    - Benefit: Partial cost reduction (depends on extent of commonality)
    - Costs: Possible change in network architecture, etc.
    - ...