Report from serial ad hoc

Piers Dawe

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Issues over last two months

- Test methods
  - Jitter (Test patterns)
  - Dispersion penalty
- Noise contributors
  - Effect of very low extinction ratio
  - RIN value
  - Interferometric noise
- Polarization Mode Dispersion
  - Analysis by equalization ad hoc
  - Extra detail added to link model
- Update to link model reflects Nov. changes
- Not addressed: Management & control

Test methods

- Jitter
  - Test patterns

  Report by Bill Reysen
- Dispersion penalty

  Presentation by Peter Öhlen describes a test procedure

Noise contributors 1 of 2

- Effect of very low extinction ratio
  - Could cause additional noise through several mechanisms
  - Transmitter builders wouldn't want to go there anyway
  - Teleconference agreed to impose a minimum, proposed at 3 dB
- RIN value
  - Noted that 1550nm's -140dB/Hz appears very stringent for little benefit
  - Presentation by Peter Öhlen proposes relaxing this

Noise contributors 2 of 2

- Interferometric noise
  - Involves two or more reflections separated by not much optical loss
  - Exacerbated by low extinction ratio
  - May be associated with:
    - single mode lasers e.g. DFBs
    - single mode fibre
    - high electrical bandwidth
  - Could affect 1300 nm serial
  - Presentation by Krister Fröjdh
  - Not a show-stopper

Polarization Mode Dispersion

- Analysis by equalization ad hoc
  - Mostly sorted out at Tampa in November
  - Equalization report by Oscar Agazzi
- DGDmax (the “worst case”)
  - DGDmax >> typical PMD
  - For DGDmax at 40 km, 19 ps chosen
  - Extra formula added to link model
- Penalty appears <0.5dB
- Need to choose DGDmax for 10km

Extra formula added to link model

- Simple linear formula:

  Effective BW1= 10^6*Ltarget/(3*DGDmax)

  (MHz.km) (km) (ps)

  Effective BW2 = Effective BW1/L

  (MHz) (MHz.km) (km)

- Basic idea, BW = 1/(3.Delta_t), was known to the 802.3z community
- Notice two quantities with identical names but different units.

Update to link model

- Reflects changes voted in November
  - Proposal for 850 nm,
  - OMA definition of transmit power,
  - RIN and RIN(OMA) are distinguished,
  - MPN k now shown as k(OMA)
  - Worst extinction ratio is calculated,
  - 1550 nm powers raised by 2 dB,
  - A Polarization Mode Dispersion formula
- The new features can be overridden

Conclusions

- Some issues raised
- Some issues nearly closed
- Major outstanding issues
  - Jitter test method
    - Some progress, difficult issues
    - Test patterns span the sublayers, spec numbers don't?
  - Management & control of the sublayers
    - No progress, no familiarity or common understanding of the issues
    - Spans the layers in a big way