OAM Work Item #3
Periodic Reporting of BER

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Problem

- **EFM OAM needs the ability to report the quality of the link**

- **Link Quality is more than link_status=TRUE/FALSE**

- **Includes tracking of error counters over regular intervals**

- **Allows monitoring of link BER, which helps SPs determine when a link is deteriorating**

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Information Flow

- OLT monitors link quality in both directions

- OLT management monitors local counter value for up-link quality

- ONU management responds with local counter value for down-link quality to OLT management when queried

- Leave the definition of "deteriorating link" to implementation

Existing Error Counters

- **MAC has aFrameCheckSequenceErrors (30.3.1.1.6)**

- **PHY has aSymbolErrorDuringCarrier (30.3.2.1.5)**

- **MAU has aFalseCarriers (30.5.1.1.10)**

- **All can be counted at the MAC**

Coding Violation Counters

- **1000BASE-X**

  Define a new 8B/10B coding violation counter that increments for all INVALID code-groups based on the running disparity rules and Tables 36-1 & 36-2. 16-bit counter supports a BER of 5×10^{-4} without reaching a max value in 1 sec

  FEC counter?

- **100BASE-X**

  Define a new 4B/5B coding violation counter that increments for all INVALID code-groups, other than /H/, as defined in Table 24-1. 16-bit counter supports a BER of 2.6×10^{-3} without reaching a max value in 1 sec

Counter Comparisons

- **Existing Counters**

  + Counters exist

  - Poor approximation of link quality due to necessity of data traffic or simply due to low increment rate

  Are they good enough?

- **New Counters**

  - Counters don't exist

  - When they exist, they will be on the PHY side of the MDIO

  + Good approximation of link quality, regardless of packet count

  Is sync maintained if BER is so high that the counter rolls over in a polling interval? Is a larger counter or one that freezes at max better for longer polling intervals or more accurate BER?

Counter Access
1000BASE-X & 100BASE-X

- **Use MDIO Register address 13 to reflect the PCS Coding Violation counters**

- **Need new MAU attribute: aPCSCodingViolation(?) - Trust David Law to provide appropriate text.**

New PHY Counters

- **Expecting all new PHYs to completely specify any new counters required**

  This includes all the copper counters

  It also includes any counter duplication required by EPON, especially if that duplication is required in the PHY (e.g. FEC counter per ONU)