

BER Monitor

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March 2008

BER Monitor Function (PCS Receiver)

1. Monitors link for “high BER” condition over a time window of particular duration (eg. 125us)
2. Upon detect of “high BER” condition in the link:
 - 64b/66b decoder receive state is reset
 - protects the receiver from instability resulting from transient episodes of high errors (eg. temporary physical connectivity problem) even if sync is restored
 - *Hi_ber* MDIO flag is raised
3. “Hi_ber” condition is cleared after a 125 us window in which BER is “normal”
 - 64b66b decoder operation is restored
 - MDIO flag is cleared
4. Function is present in 10GBASE-R and other 10G specs
5. Straw Poll in Portland favored adding the function to 10GEAPON

BER Monitor for 10GEPON

1. BER Monitor function is present only in the ONU
2. Not needed in the OLT:
 - If synchronization is lost, then the burst is lost (there is no resync)
 - Don't want to retain hi-ber condition across bursts
3. Which BER to monitor?
 - Simplest to look at the raw BER as indicated by Sync Header errors
 - Counting uncorrectable FEC codewords ends up being less reliable
 - For BER significantly worse than 10^{-3} , the accuracy of such a BER estimate will depend on the implementation of the FEC decoder
4. Threshold for “hi_ber” condition
 1. Since *hi_ber* will shut off ONU data reception, threshold BER must be a value that is not seen under “normal” operation
 - Obviously this varies from deployment to deployment
 2. But if the value is too high then the function won't do anything
 3. Consequently: for BER Monitor to be useful, the Sync Header error threshold and window interval should be MDIO parameters (manageable eg. Via OAM)

State Diagram Considerations

1. BER monitor process operates parallel to the ONU synchronizer process (just like in 10G point-to-point)
2. No modifications to 66b Decoder Receive state diagram

BER Monitor State Diagram

