# **CDR Based Extended Reach**

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## Agenda



- Benefits of CDR based extension
- Architectures
- Potential Reaches
- Next Steps

## Benefits of CDR Based Extension



- CDRs enable additional budget for optics and channel
  - Enables longer reach

## CDRs do not impact bits (transparent)

- Fully compatible with 10.3125G bit rate, full rate MAC
- Very low latency (measured in ps)

## CDRs help with crosstalk

- In transmit direction, crosstalk from host & connector is eliminated
- In receive direction, reset of jitter budget allows for robust performance in the presence of connector and host crosstalk

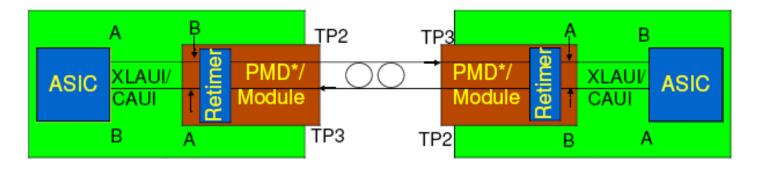
## CDR based optical interface already proven in 802.3ae

- SR, LR, ER, Cu....
- Enables Pluggable Module interface which is Media Independent
  - Performance, link budget determined within the module
  - Allows for future proof module / system architecture as additional PMDs arise
- Integration with module components (laser driver, limiting amplifier) results in low cost, low power solution

#### Architectures

## CDR contained within the module

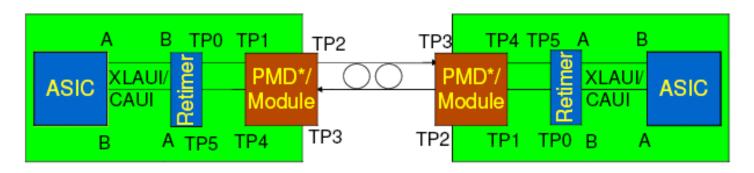
- XLAUI / CAUI used as interface to host
- Module supports MMF, SMF, Cu
- CDR on linecard



Retimer = CDR

Retimer = CDR

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#### Potential Reaches & Next Steps

## • 10GBASE-S: 300m over OM3

## Other input from John Petrilla

- CDR on both Tx and Rx OM3 204m
- CDR on both Tx and Rx OM4 248m
  - "Assuming Tx, Rx and link parameters close to those in my latest example (I've been doing some exploration to find an optimal combination of Tx and Rx attributes so some have been traded off with others. The overall results should not change that much.), no signal degradation between the CDR and pluggable module and the following CDR characteristics: Jitter Tolerance: TJ = 0.75 UI, DJ = 0.40 UI Jitter Generation: TJ = 0.20 UI, DJ = 0.05 UI"

#### Next Steps

- Develop proposal for CDR based extended reach

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