802.3 High Speed Study Group

Transceiver Interface
"Clay Pigeons*"

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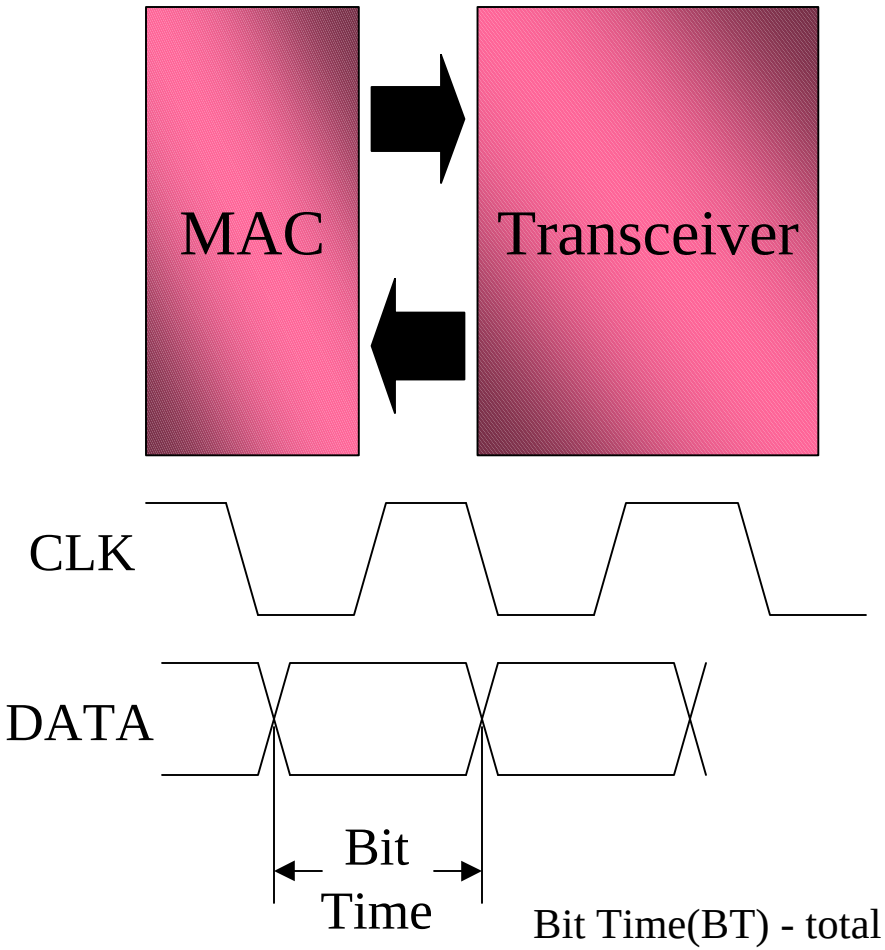
* Ideas worth taking a shot at.

Transceiver Interface
“Clay Pigeons”

- **MAC-Transceiver Interface -** *Pins vs Frequency*
  - ~3.2ns Bit Time approach
  - ~1.6ns Bit Time approach

- **Transceiver - Fiber Module Interface -** WDM or Serial?
  - Fiber Independent Interface (FII)

MAC - Transceiver Interface

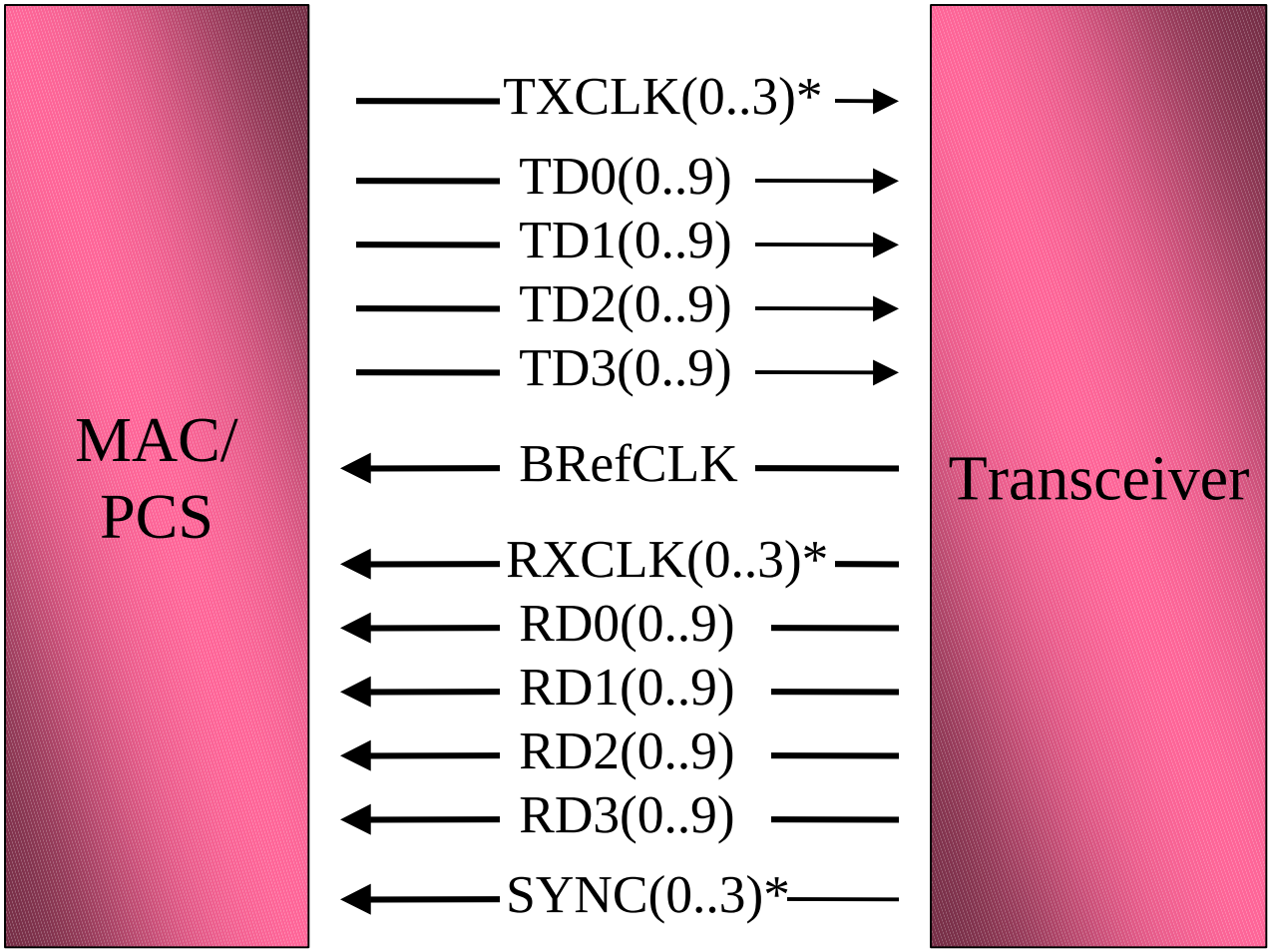


Issue: Pins vs Frequency

- 802.3z - 8.0ns bit time (BT)
- ~3.2ns BT:
  - Requires 71-84 pins
  - TTL switching
- ~1.6ns BT
  - Requires 43-48 pins
  - Requires small signal switching (non-TTL) RAMBUS type tech.

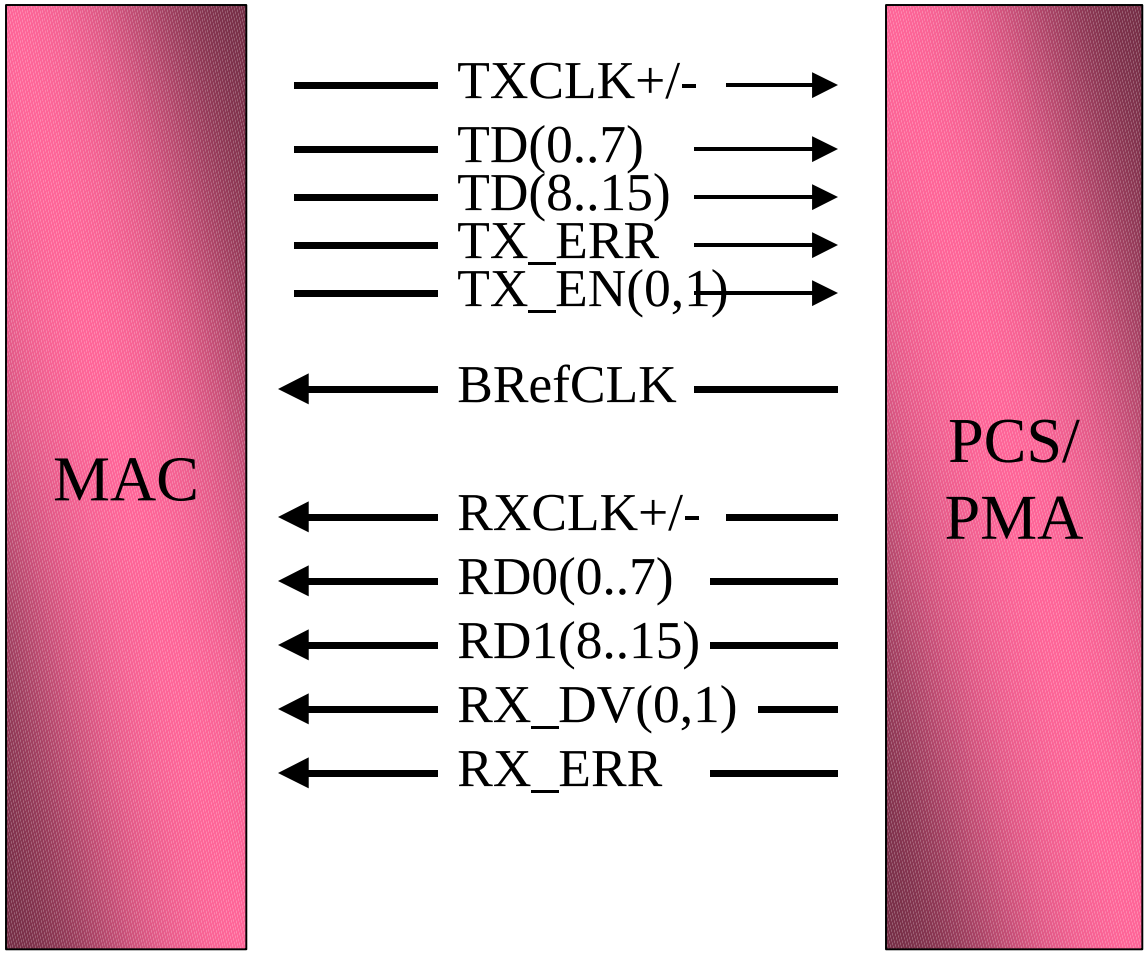
Bit Time(BT) - total time to transfer data across the interface.

MAC-Transceiver Interface ~3.2ns BT Example



* Minimum of 1 required

MAC-Transceiver Interface
~1.6ns BT Example



MAC-Transceiver Interface

~3.2ns BT

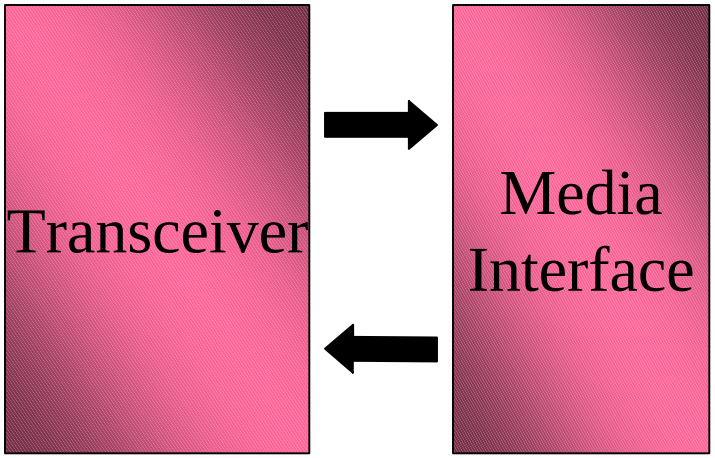
- Easier transition from 1GbE for MAC Asics.
- I/O timing budget is manageable.
- Standard TTL switching technology (156Mhz toggle rate assuming 8b/10b encoding).
- Requires ~3x pins if 1GbE interface.

~1.6ns BT

- Requires small signal buffer technology (312.5Mhz toggle rate assuming 8b/10b encoding).
- I/O timing budget will require greater board design expertise.
- Requires ~2x pins of 1Gb interface.

~3.2ns BT offers faster time to market but,
~1.6ns BT appears more cost effective

Transceiver - Media Interface



Issue:

Which Media Interface?

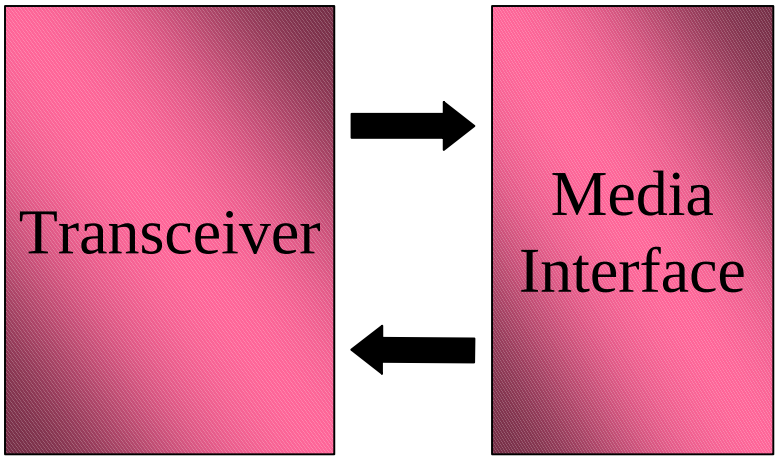
Wavelength Division Multiplexing: (WDM)

- Allows use of existing multi-mode fiber.
- Distance is limited to LAN and Risers.

Serial:

- Allows much greater distances
- Requires installation of single mode fiber.

Transceiver - Media Interface



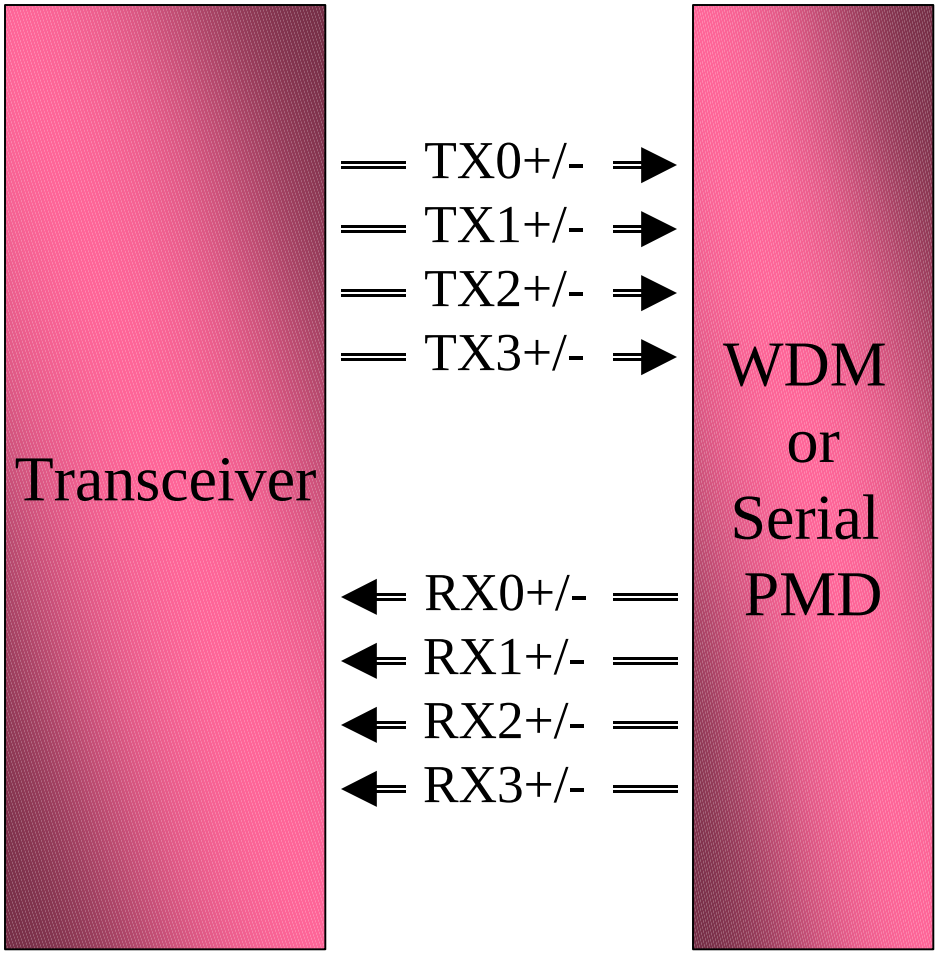
Proposal:

Define a **Fiber Independent Interface** (FII) that would support WDM, Serial or MAS.

Benefit

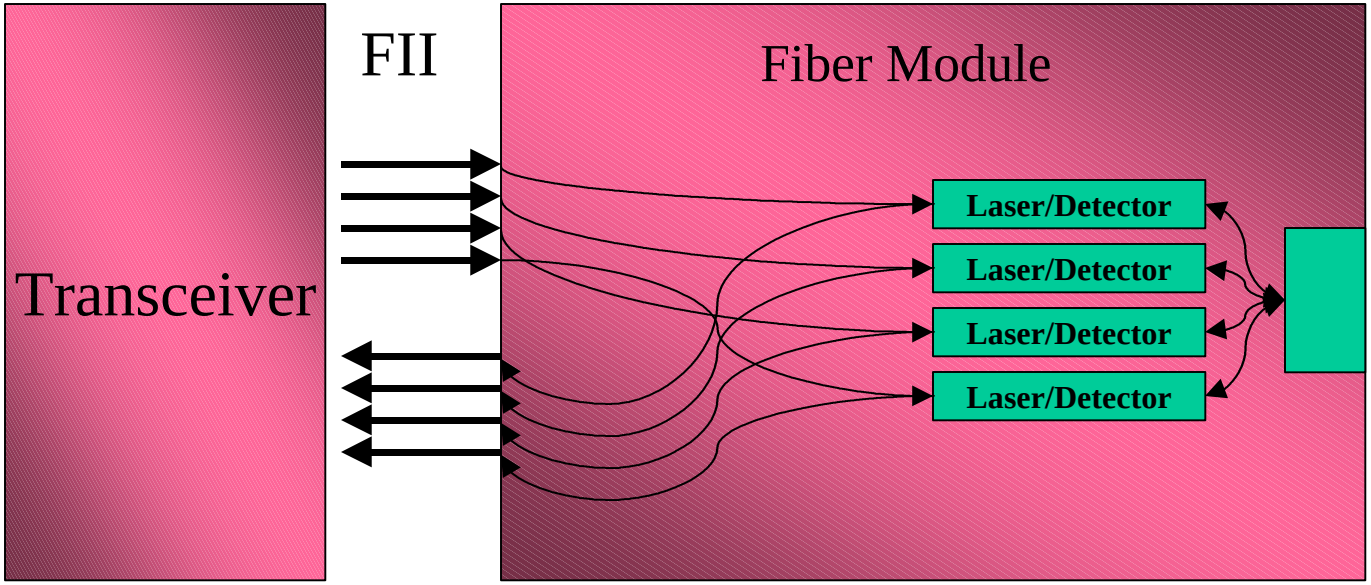
- Reduces cost to support both implementations
  - does not burden LAN with WAN costs.
- Allows more system design flexibility
  - common system solution for LAN and WAN
- Allows for future ASIC integration of transceiver.

Fiber Independent Interface (FII)



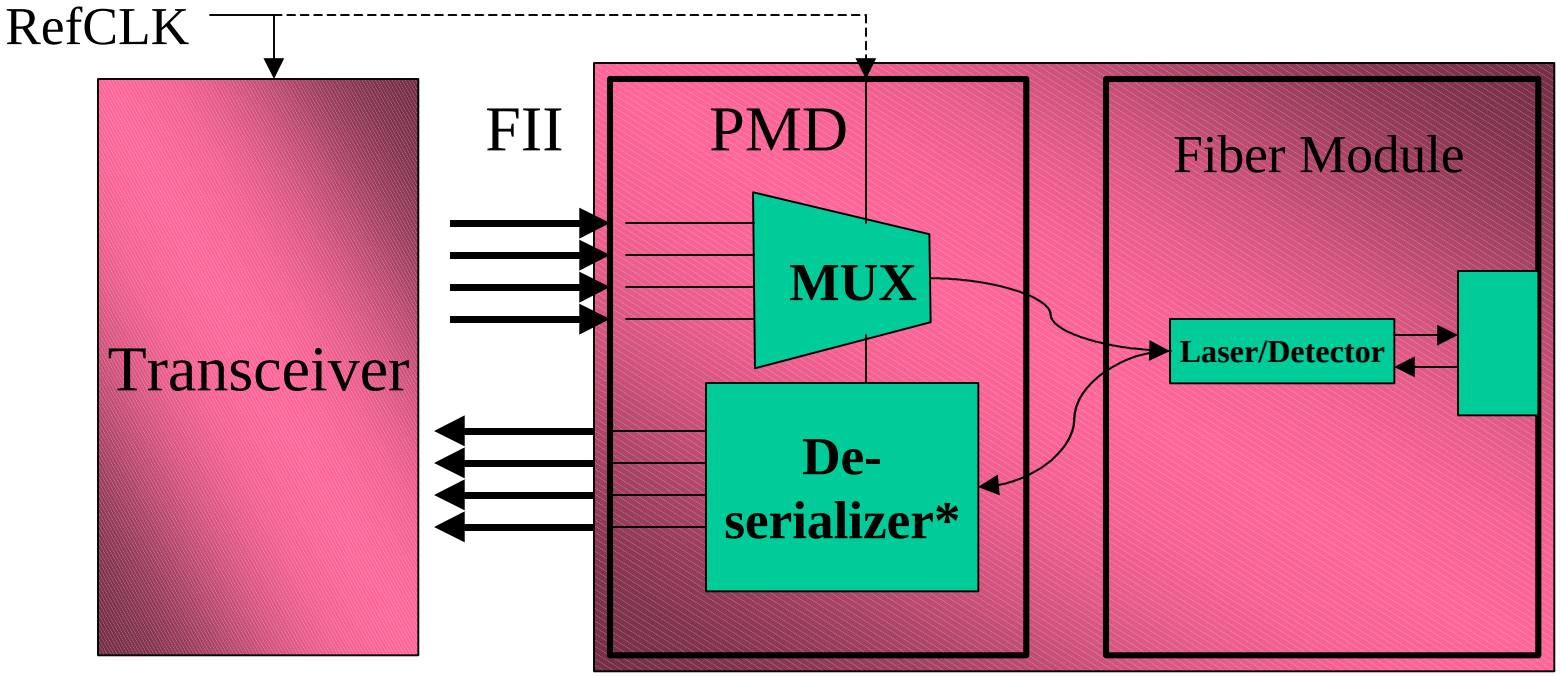
- Transceiver transmits the encoded data across four synchronous channels.
- Transceiver receives the encoded and synchronizes the data to be sent to the MAC.
- Each channel is transmitted and received differentially to/from the media interface device at 3.125Gbps (assuming 8b/10b).

Transceiver- WDM Module Interface



- FII is the direct interface to WDM Fiber Module

Transceiver - Serial Module Interface



- Separate PMD is required for Serialization/De-serialization
- Jitter requirements for long haul communications can be handled in the PMD.

* May require a header in the data stream for alignment

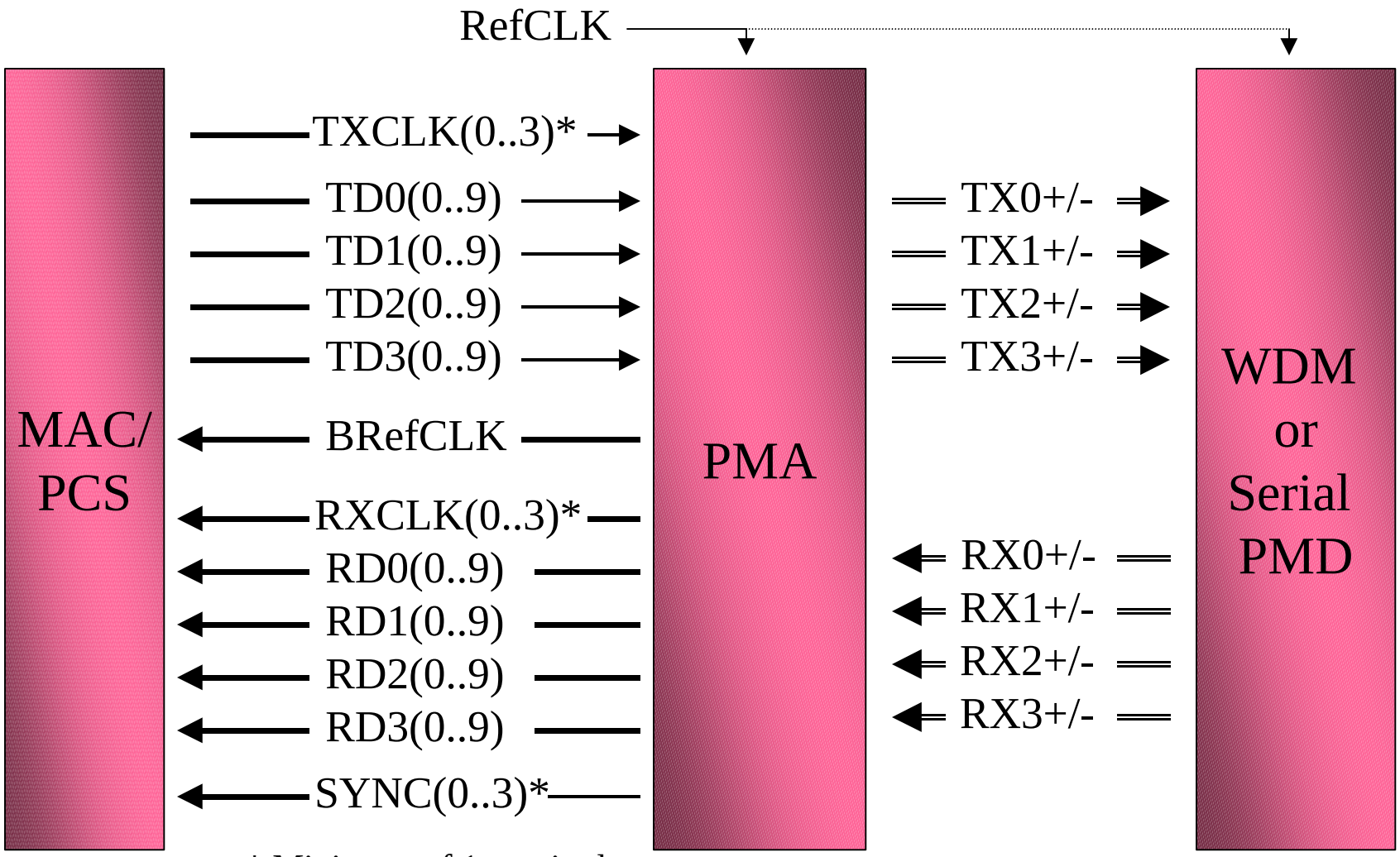
Transceiver Interface "Clay Pigeons"

Summary

- **MAC-Transceiver interface**
  - ~3.2ns or ~1.6ns BT interface are both viable.
  - Decision should be made based on time to market.

- **Transceiver - Fiber Module Interface**
  - Fiber Independent Interface (FII) offers a way to cost effectively support both LAN and WAN applications.

HSSG Transceiver



* Minimum of 1 required