PMD & MDIO

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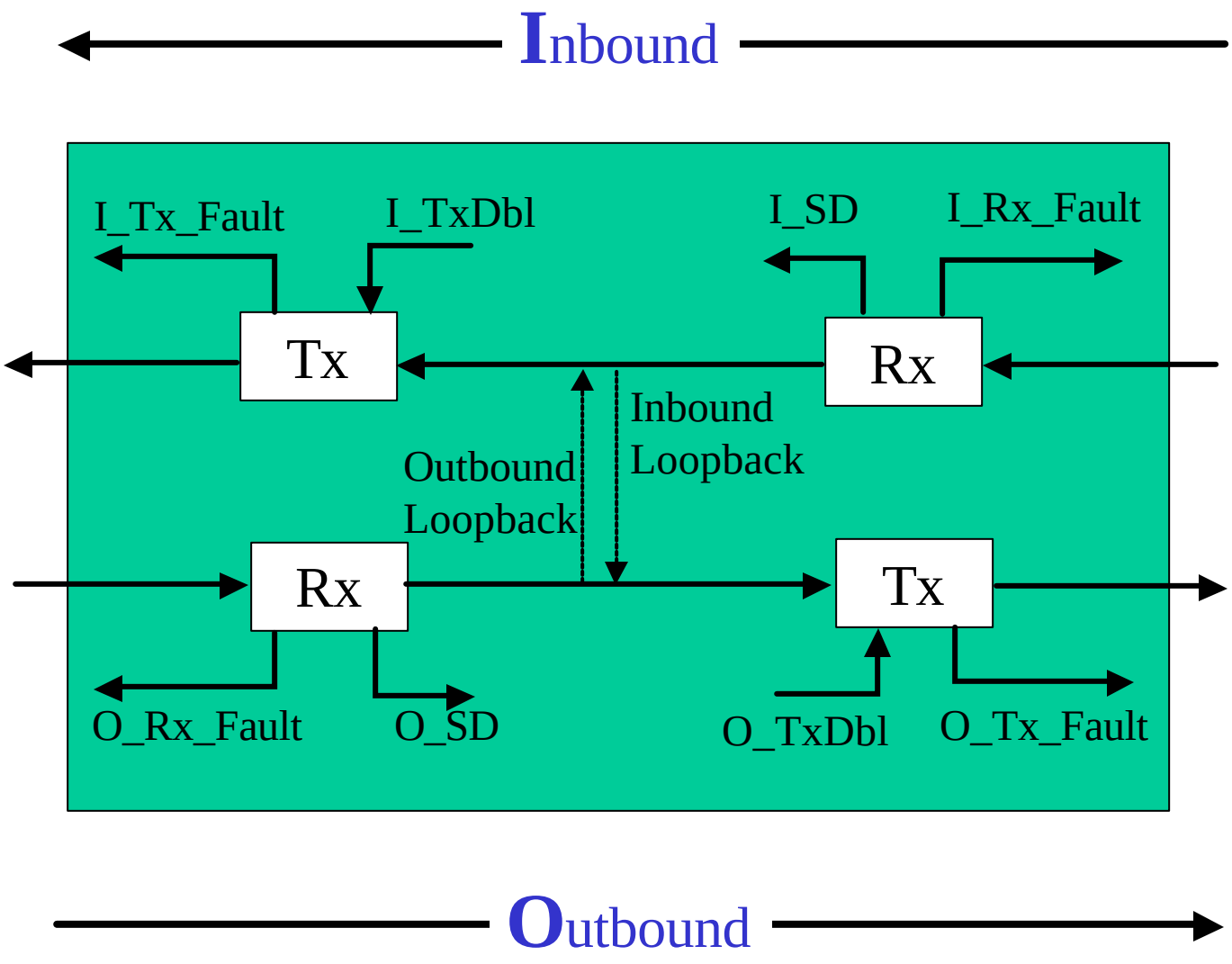
Agenda

- **Block Diagram**
- **Signal Definitions (functions)**
  - Required VS Opional
  - Loopback
  - Fault
  - Transmit Disable
  - Signal Detect
- **Supporting Lamdas**
- **Capabilities**
- **Motion**
  - Mandatory Functions
  - Options

Block Diagram



Required Signals

I_SD

I_TxDbl

Optional Signals

Inbound Loopback

Outbound Loopback

I_Tx_Fault

I_Rx_Fault

O_Tx_Fault

O_Rx_Fault

O_SD

O_TxDbl

- Required if O_SD or O_Xx_Fault supported

Signal Definitions -- Loopback

Inbound *AND* Outbound Loopback:

- O_Tx <- I_Rx
- I_Tx <- O_Rx

Inbound Loopback:

- O_Tx <- I_Rx
- I_Tx <- I_Rx

Outbound Loopback:

- I_Tx <- O_Rx
- O_Tx <- O_Rx

Signal Definitions -- Fault

I_Tx_Fault; I_Rx_Fault; O_Tx_Fault; O_Rx_Fault

Divided at loopback boundary

If no loopback, use Tx_Fault(s) only

- …there is no differentiation between Tx and Rx functional blocks

Signal Definitions – Tx_Dbl

I_Tx_Dbl; O_Tx_Dbl

Options:

- Turn off driver (e.g. laser off)
- Hold Tx (electric driver only) to constant logic state
- Activate an independent data qualification signal (Link Fault) between layers in parallel with data

Activated by:

- Register bit
- Fault indication in appropriate path
- Signal detect in appropriate path (this could be the loopback path)

Signal Definitions – SD

How implemented (not specified):

- **Average optical power (DC)**
- **Biased input (electrical Rx)**
- **Peak to peak detector (AC)**
- **Input Link Fault signal**
  - Not the way people are used to thinking about this, but this is defines the essence of the current proposals

Supporting Lamdas

Required:

- **O_TxDbl$_N$ per Lamda (for debug, test and qualification)**
- **I_SD = I_SD$_0$ AND I_SD$_1$ … I_SD$_N$**

Optional (but recommended):

- **I_SD$_N$ (helps to debug link)**

Not done per Lamda:

- **Loopback; Fault**
- **I_TxDbl**

Reserve bits in MDIO for future capability

- **16X16 recommended**
- **O_TxDbl by N and I_SD by N**
- **? What about O_SD?**

Capabilities

MDIO Register bits to indicate functional capabilities

- **Inbound Loopback**
- **Outbound Loopback**
- **I_Tx_Fault**
- **I_Rx_Fault**
- **O_Tx_Fault**
- **O_Rx_Fault**
- **O_SD**
- **O_TxDbl**
- **I_SD_0 … I_SD_N (one bit)**
- **Reserve space for future capabilities**

Note

Other functions and features may require additional bits in MDIO. Input needed by Jan, 2001 meeting

- PLL lock
- Temperature
- Input power
- Etc.

Motion

Adopt MDIO features in Thatcher… in principle.

- **Have clause 52 and 54 editors write into draft 2.0.**
- **Authorize David Law to define the bit allocations.**