Gaps in D. 0.9 for EEE

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Contributors, reviewers and supporters

- Your name here

Agenda

- From Baseline…
- Tx_mode signaling
- Rx_mode signaling
- Questions…

Signaling tx_mode across CAUI

- **A mechanism must be defined to signal the tx_mode parameter across the CAUI from the PCS to the PMA/PMD**

Signaling rx_mode across CAUI

- **A mechanism must be defined to signal the rx_mode parameter (or the state of the received signal) across the CAUI from the PMA/PMD to the PCS**

FEC – Needs to be defined

- Dependent upon choice of FEC baseline…
- RAM alignment to the FEC frame
- Start of FEC block relative to restoration of normal AMs
- Any special behavior of FEC for EEE

PMA/PMD – transmit functions

- An integrated PMA can use tx_mode parameters directly
- Signaling across CAUI to be defined

- Based on tx_mode – PMA/PMD transmission changes
  - DATA/SLEEP/WAKE – normal behavior;
  - ALERT - send alert signal;
  - FW – send PMA-specific pattern (TBD);
  - QUIET – disable Tx
  - Requirements for PMA/PMD signaling depend on chosen line code (etc.)

PMA/PMD – receive functions

- Infer rx_mode from incoming signal:
  - Receiving normal AMs, or RAMs = DATA/SLEEP/WAKE
  - Receiving no signal = QUIET; alert signal = ALERT; specific signaling = FW
- An integrated PMA can signal receive state to PCS directly
- Otherwise, code for signaling across CAUI - TBD

Hugh's suggestions

- The remainder of this presentation consists of Hugh's proposals for filling the gaps
  - This has NOT been extensively reviewed or discussed
  - It is intended as a starting point for discussions

- Comments against D. 0.9 will be required

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Signaling tx_mode across CAUI

- Use specific codes within the Rapid Alignment Markers
  - CD fields currently used for countdown
  - Used to synchronize the start of normal alignment markers
- Variable count_down is defined & scrambled to produce CD field
- According to tx_mode state, set different values for count_down

PCS – alignment marker insertion

- **Clause 82.2.7**
- **Define RAM as shown before – count_down definition:**

tx_mode	Down_count
DATA	(normal AM operation)
SLEEP	count_down = 135
QUIET	count_down = 154
RF_ALERT	count_down = 173
ALERT	count_down = 183
FW	count_down = 192
RF_WAKE	count_down = dc_start *
WAKE	count_down = dc_start *

When tx_mode transitions to WAKE, count_down is set to dc_start ; count_down then decrements until it reaches zero, after which normal AMs are sent starting 16383 blocks after the terminal RAM

dc_start = 38 (std); 3 (FW)

CD/!CD field in RAM communicates tx_mode to other sublayers across CAUI

NB: PMA/PMD does not transmit RAMs to LP during QUIET/ALERT/FW states

Pros & Cons

- No change to datapath structure
  - Simple to implement in PCS
  - Signaling carries across to LP for most states
- Only 1 PCS lane sufficient to decode
- Layer violation – requires detached PMA to decode 66 blocks
- Problem for 2 x CAUI implementation
  - If 1st CAUI shut down, PMA must insert for 2nd CAUI

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- From Baseline …
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- Rx_mode signaling etc.
- Questions…

Signaling rx_mode across CAUI

- Incoming RAMs are left intact (when received)
  - All states other than QUIET, ALERT, RF_ALERT, & FW
  - Needs 3 new signals (QUIET, ALERT/RF_ALERT, FW)
- Use fixed pattern, easy to detect & distinguish
- QUIET & FW states are persistent => needs “safe” pattern; ALERT is transitory

Solution, Pros & Cons

- ALERT – use the same PMA structure as Tx alert
  - (if identical for different PMDs)
- QUIET & FW, use PRBS test mode – same for both
  - PCS must understand which one was expected

- + No extra h/w in PMA – re-uses alert & test mode logic
- - Needs careful thought regarding latency/delays

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