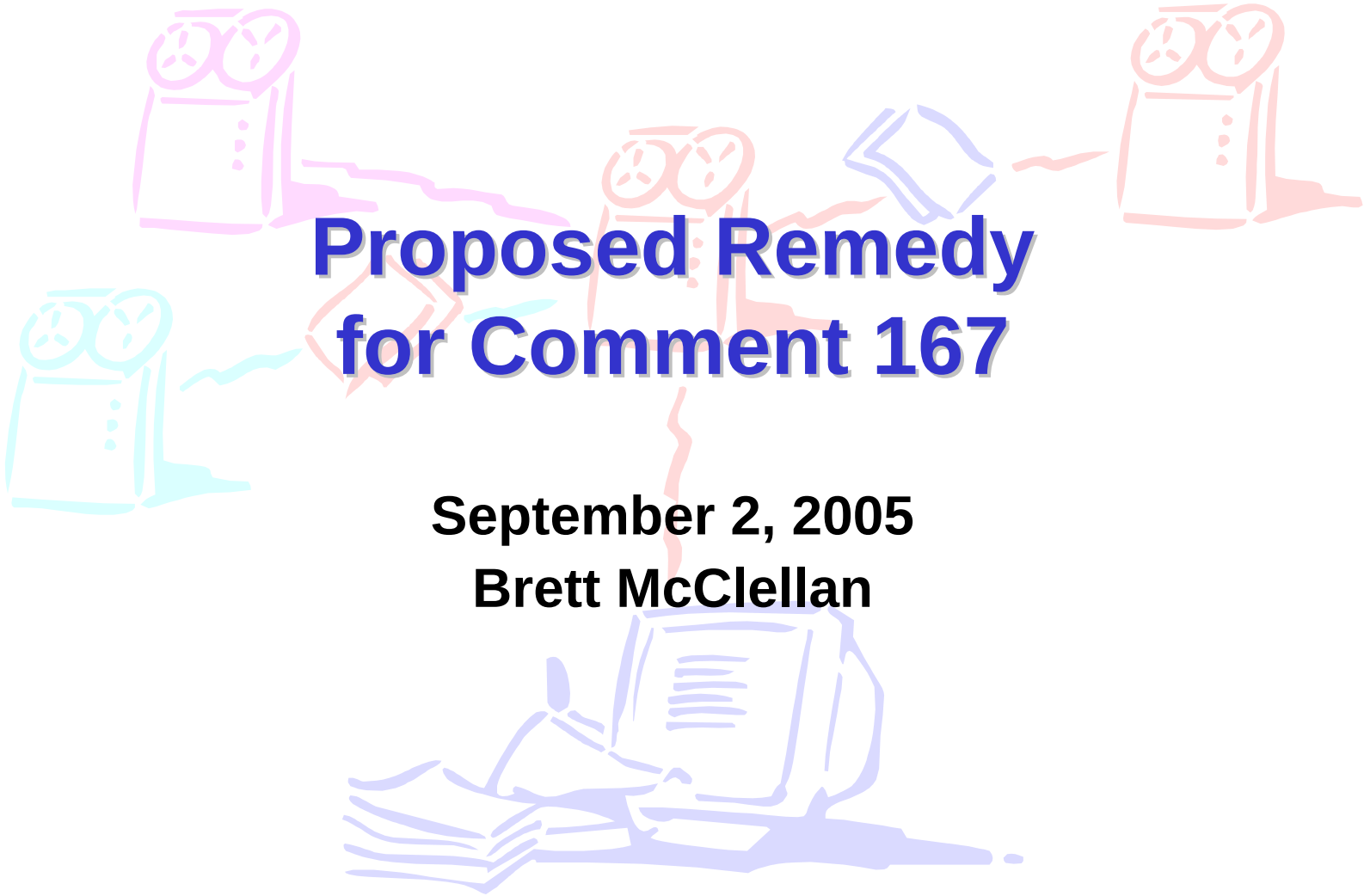


Proposed Remedy for Comment 167

September 2, 2005

Brett McClellan

Link Status

- PMA_LINK.indication (link_status)
  - defined in 55.2.1.2.1 (came from Clause 40)
  - Status indicator to Auto-Negotiation (Clause 28)
- Generated in PMA by Link Monitor state machine
- Used only by Clause 28
  - Arbitration State Diagram
  - During initial startup: link_status = FAIL
  - Successful startup: link_status = OK
    - -> prevents Autoneg from starting over
  - During retrain: link_status = OK
    - -> prevents Autoneg from starting over
  - Failed retrain: link_status = FAIL
    - -> restart Autoneg

Link Fault Signaling

- Clause 46 Reconciliation Sublayer (RS) and XGMII
  - 46.3.4 Link fault signaling
    - Upon recognition of a fault condition a PHY sublayer indicates Local Fault status on the data path. When this Local Fault status reaches an RS, the RS stops sending MAC data, and continuously generates a Remote Fault status on the transmit data path (possibly truncating a MAC frame being transmitted). When Remote Fault status is received by an RS, the RS stops sending MAC data, and continuously generates Idle control characters. **When the RS no longer receives fault status messages, it returns to normal operation, sending MAC data.**
  - The local RS will only send MAC data when the remote RS is ready, ie. no faults in the remote RX path, and there are no faults in the local RX path.

PCS RX State Machine

- 55.3.5 page 109 Figure 55-16
- RX State Machine from Clause 49
- RX_INIT state
  - Send LF on the RX path
  - While: pcs_reset + hi_lfer + !block_lock
  - In other words:
    - send LF's to the RS until we receive good LDPC frames
- After good frames received
  - ie. while !pcs_reset + !hi_lfer + block_lock
  - Pass data transmitted by remote PHY
    - LF, RF, IDLE, or MAC data

PCS_Test vs PCS_Data

- PCS_Test
  - Both PHY's simultaneously enter PCS_Test, begin sending LDPC frames / DSQ128, and wait for 1ms
  - If PCS_status = OK, go to PCS_Data
- PCS_Data
  - Continue sending LDPC frames / DSQ128
  - If minwait_timer_done * loc_rcvr_status = NOT_OK then start retraining.
- Strict reading of the draft allows MAC data to be sent during PCS_Test
  - In PCS_Test after enough good LDPC frames have been received: hi_lfer <= false
    - RX data changes from LF to received data
    - If the RS receives no faults, MAC data is sent

Data Holdoff

- If it is desired to hold off MAC data until the PCS_Data state then we need the following
  - A new variable in the PCS RX State Machine to hold the PCS in the RX_INIT state until PCS_Data
    - pcs_reset + hi_lfer + !block_lock + !pcs_data
  - A defined primitive from the PMA to the PCS to pass this variable from the PHY Control to the PCS.
    - PMA_PCSDATA.indication (pcs_data)
      - TRUE PHY Control is in the PCS_Data state
      - FALSE PHY Control is not in the PCS_Data state