OAM Proposal Draft

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IEEE802.3ch AdHoc

What OAM is

- Layer 1 communication
- A method for a PHY to share its status with its Link partner
- Available when the MAC and other upper layers are not available

What OAM is NOT

- Available when the LINK is down
- Available when the link segment is faulted
- A method to share upper layer status between ECUs

OAM Bit usage

- Define standard usage of OAM bits

- No "RAM" associated with OAM

- OAM is not configurable

- OAM data is stored in a predefined register

- OAM is not divided across multiple message frames

- Use Parity bit(s) to fault check OAM

- Backward compatibility to Clause 97 is not maintained
  - 2.5GBASE-T1 PHY capable of 1000BASE-T1 communication when 1000BASE-T1 does not implement OAM (or implements Multi-Gig OAM, if possible)

OAM Frame Proposal

D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
P2	P1	RSVD	Status<2>	Status<1>	Status<0>	Ping RX	Ping TX	SNR<1>	SNR<0>
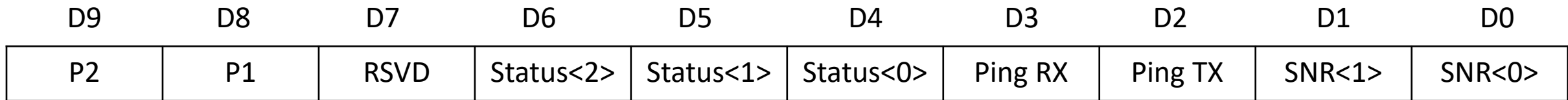
Parity: P1 and P2 set based on the values of D0 – D7

P1 = D0 $\oplus$ D1 $\oplus$ D2 $\oplus$ D4   (Equations need to be optimized)
P2 = ¬ (D3 $\oplus$ D5 $\oplus$ D6 $\oplus$ D7)

RSVD: Not currently used, always transmit as 0

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P2	P1	RSVD	Status<2>	Status<1>	Status<0>	Ping RX	Ping TX	SNR<1>	SNR<0>

Status<1,0>: This status provides information on potential issues within the ECU that may impact the PHY/Frame performance. Only one status can be reported at a time. 00 is the highest priority status and 11 is the lowest priority status.   The status, except for 11, shall be reported until the Link Partner changes the value of Ping TX at which time when the highest current latched status shall be reported.

- 000: Status Invalid
- 001: 1 or more PHY power supplies are near (within 10%) of the specified minimum or maximum
- 010: No messages from MAC
- 011: Transmission lines swapped
- 100:
- 101:
- 110:
- 111: All is good

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P2	P1	RSVD	Status<2>	Status<1>	Status<0>	Ping RX	Ping TX	SNR<1>	SNR<0>

Ping Rx - This bit is set by the PHY to the same value as the Ping TX bit received from the link partner.
Ping TX - This bit is set by the PHY to for the link partner to echo on Ping RX.

SNR<1,0>: This status is set by the PHY to indicate the status of the receiver. The definitions of good, marginal, when to request idles, and when to request retrain are implementation dependent.
— 00: PHY link is failing and will drop link and relink within 2 ms to 4 ms after the end of the current 2.5G/5G/10GBASE-T1 OAM frame
— 01: LPI refresh is insufficient to maintain PHY SNR. Request link partner to exit LPI and send idles (used only when EEE is enabled)
— 10: PHY SNR is marginal
— 11: PHY SNR is good

Both: Same definition as Clause 97 and same bit positions.