

# P802.3cy Lane Swap Information Reporting

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# P802.3cy OAM background

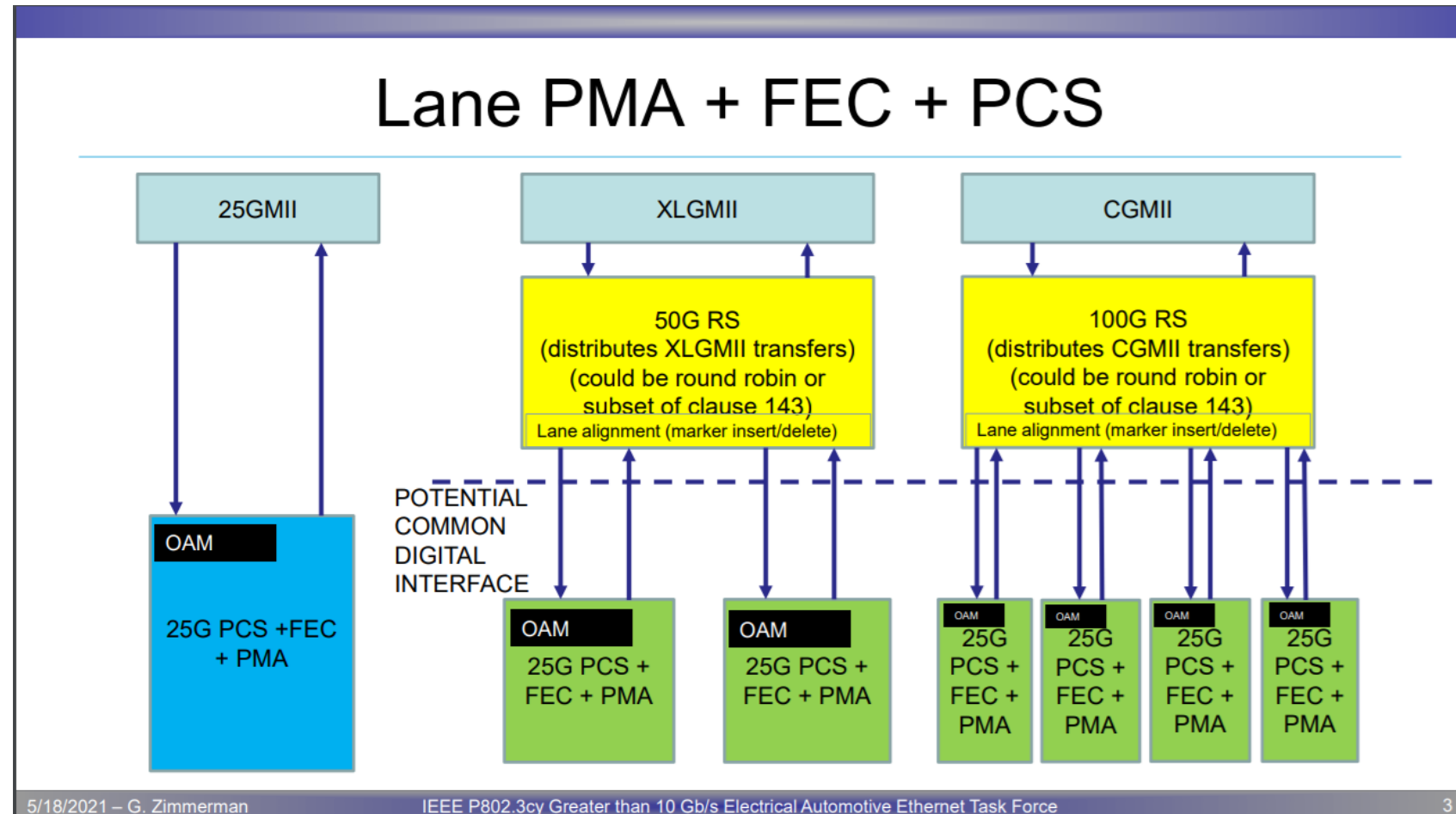
- March 30<sup>th</sup> Motion
- [https://www.ieee802.org/3/cy/public/30mar21/motions\\_3cy\\_01\\_033021.pdf](https://www.ieee802.org/3/cy/public/30mar21/motions_3cy_01_033021.pdf)
- Presentation
- [https://www.ieee802.org/3/cy/public/adhoc/wienckowski\\_3cy\\_01a\\_03\\_15\\_21.pdf](https://www.ieee802.org/3/cy/public/adhoc/wienckowski_3cy_01a_03_15_21.pdf)

## Motion #2

- Move that: 802.3cy specify an OAM similar to the MultiGBASE-T1 OAM, leaving issues of what needs to change (based on the laning method chosen and multi-lane operation) open for future proposals.
- M: Natalie Wienckowski
- S: Haysam Kadry
- Technical (>75%)
- Motion Passed by unanimous consent

# P802.3cy Laning background

- [https://www.ieee802.org/3/cy/public/adhoc/zimmerman\\_3cy\\_01\\_05\\_18\\_21.pdf](https://www.ieee802.org/3/cy/public/adhoc/zimmerman_3cy_01_05_18_21.pdf)



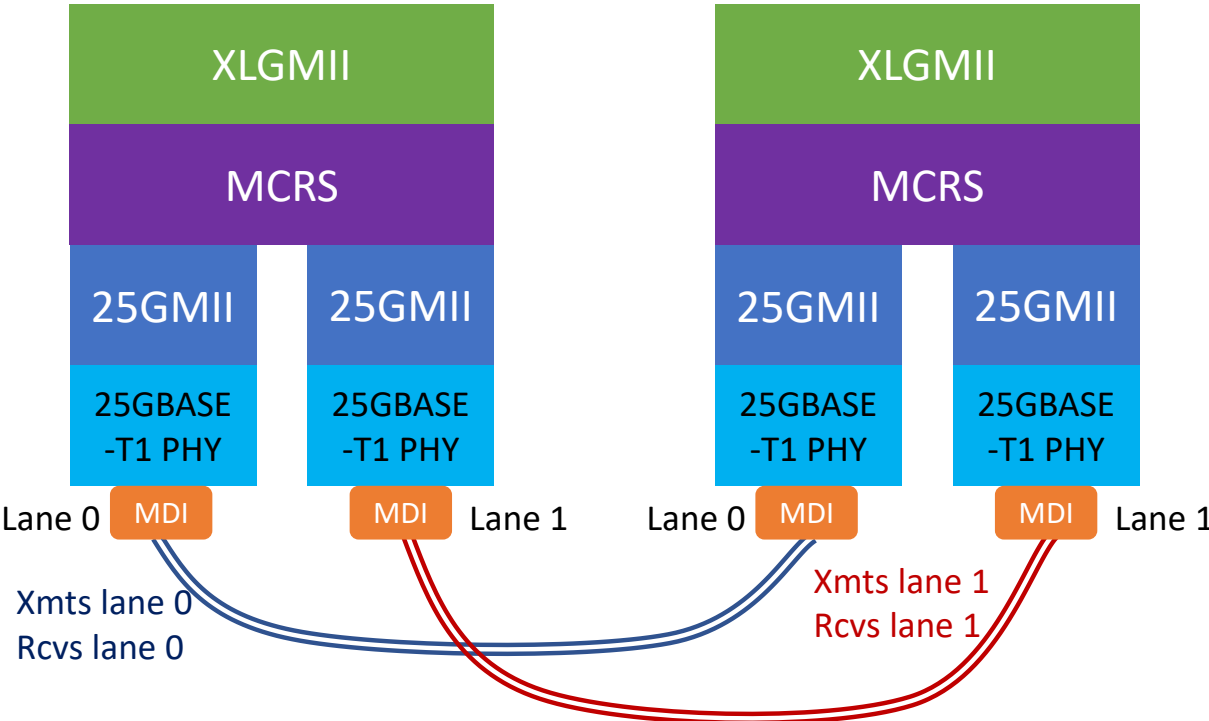
# OAM Straw Polls

- A number of [straw polls](#) were held on May 25, 2021.
- Summary of preferences
  - Behavior if any pair is swapped with another pair - Compensate for swapped pairs to allow communication and report the fault
  - Correct for swap of any two, three, or four pair
  - PHY health (149.3.9.2.5) should be – Per Lane
  - Power supply warning should be – Per Lane
  - Internal temp warning should be – Tie Per Lane/Per Link
  - Degraded link segment should be – Per Lane
  - What would you want reported in the OAM for polarity inversion? – Individual lane status (polarity inversion (y/n) for each pair)
  - REC should be – Per Lane

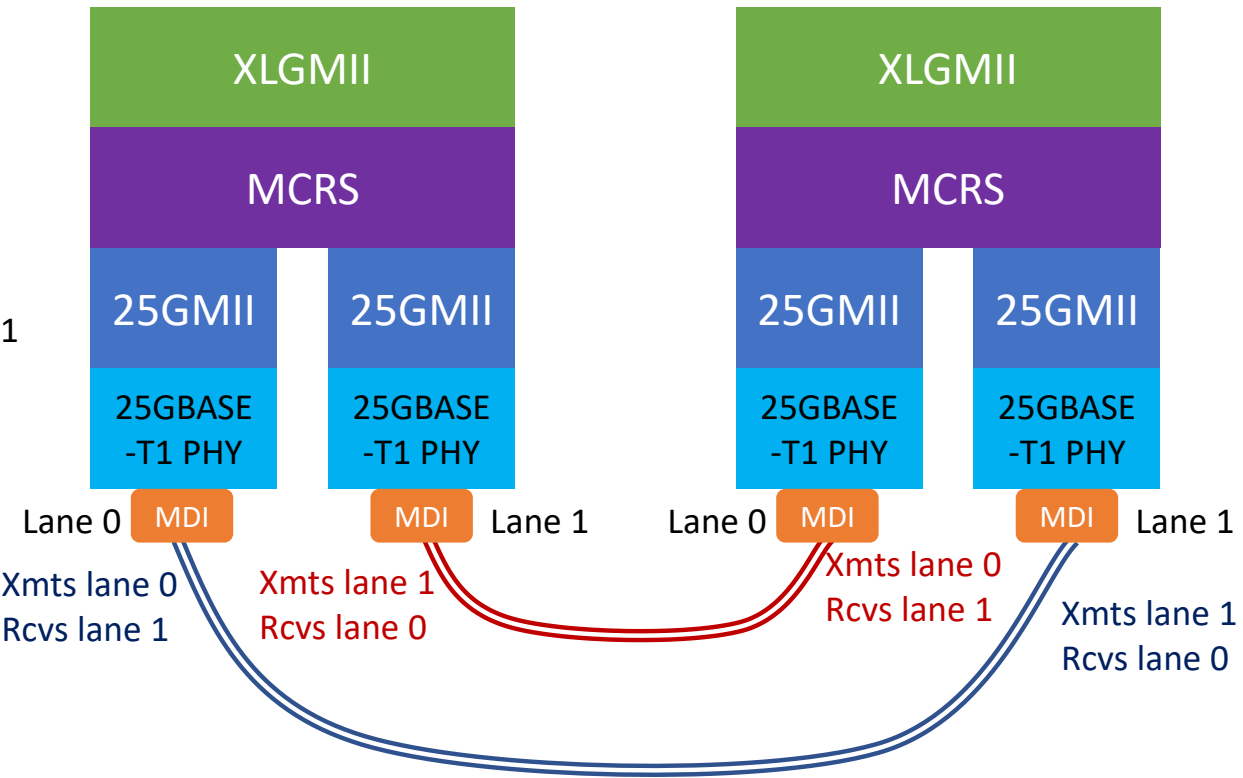
# What does this mean for OAM

- IEEE Std 802.3ch™ OAM can be used as-is for each lane with minor additions
- Additional information needed for Pair swap detection and correction
  - Number of lanes (1, 2, or 4)
  - Which pair number each lane is (1, 2, 3, or 4)
  - This may be part of OAM or other options shown on the following slides

# Lane Swap Depiction: 50GBASE-T2



Lane swap is corrected in the MCRS before passing to the XLGMII, Clause 143.  
 Just need to report to application so the mis-build can be made known.



100GBASE-T4 is similar, with more opportunities to swap the pairs.

The data received on each pair will include an Envelope Header which will indicate which "lane" the data was sent on, Clause 143.

# Option 1 for reporting Pair Swap Info

- Transmit lane # and Receive lane # are in the Envelope Headers for transmit and receive messages
- This information is placed in the Envelope Header by the MCRS
- As long as at least one Ethernet Frame is sent prior to entering EEE in either direction, the PHY can store the Transmit lane # and Receive lane # in a PHY register for reading by the application, NOTE: These may not be defined in Clause 45 but may be left up to the implementer.
- This can be used to determine if the pairs, e.g. cables, are swapped or not
- No additional data needs to be sent as part of OAM

# Option 2 for reporting Pair Swap Info

## – 10 bit FEC symbol

	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Symbol 10	Tx pair # <1> <del>Reserved</del>	1	Status valid	Power supply warning	Internal temp warning	No MAC messages warning	Degraded link segment	Polarity inversion	Clear REC	REC cleared
Symbol 11	Tx pair # <0> <del>Reserved</del>	1	Vendor-specific field <7:0>							
Symbol 12	Rx pair # <1> <del>Reserved</del>	1	REC<7:0>							
Symbol 13	Rx pair # <0> <del>Reserved</del>	1	REC<15:8>							

**Figure 149B–1—MultiGBASE-T1 OAM status**



# Option 3 for reporting Pair Swap Info

## – Infofield

- The Infofield is sent during PMA training during link up
- The pairs will not change position during a link up session; therefore, the information can be exchanged here instead of continuously
- There are reserved bits in the Infofield
- Octet 7 is the “Message” field which is sent during TRAINING and COUNTDOWN
- Bits <3:0> are reserved for both the MASTER and SLAVE message field

**Table 149–10—Infofield message field valid MASTER settings**

PMA_state<7:6>	loc_rcvr_status	en_slave_tx	<u>pair_usage reserved</u>	<u>pair_usage reserved</u>	<u>pair_usage reserved</u>	<u>pair_usage reserved</u>
00	0	0	Tx pair # <1>	Tx pair # <0>	Rx pair # <1>	Rx pair # <0>
00	0	1	Tx pair # <1>	Tx pair # <0>	Rx pair # <1>	Rx pair # <0>
00	1	1	Tx pair # <1>	Tx pair # <0>	Rx pair # <1>	Rx pair # <0>
01	1	1	Tx pair # <1>	Tx pair # <0>	Rx pair # <1>	Rx pair # <0>

# Questions?



# Straw Poll

- Which option do you prefer for reporting the pair swap info?
  - Option 1, use Envelope Header information
  - Option 2, use reserved D9 bits in MultiGBASE-T1 OAM symbols
  - Option 3, use reserved bits <3:0> in message field for both LEADER (MASTER) and FOLLOWER (SLAVE)
  - All options are okay

