# 400GBASE-SR8 MDI Choices

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IEEE P802.3cm

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# Purpose and Approach

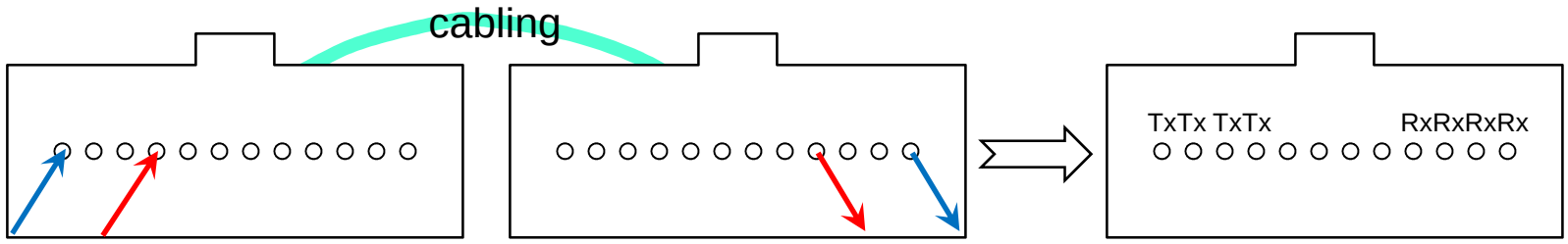
- Purpose
  - To present choices for SR8 MDI lane assignments to allow informed selection
- Approach
  - Review structured cabling connectivity
  - Present three types of MDI assignments
  - Examine pros and cons
  - Foster discussion

# Structured Cabling Connectivity

- ANSI/TIA-568.3-D (2016)
  - Defines structured cabling polarity methods and components for duplex and parallel channels
  - Illustrates
    - duplex, multi-duplex array, 1-row array, 2-row array
  - Allows
    - other than 12-wide array cabling, e.g. 16-wide

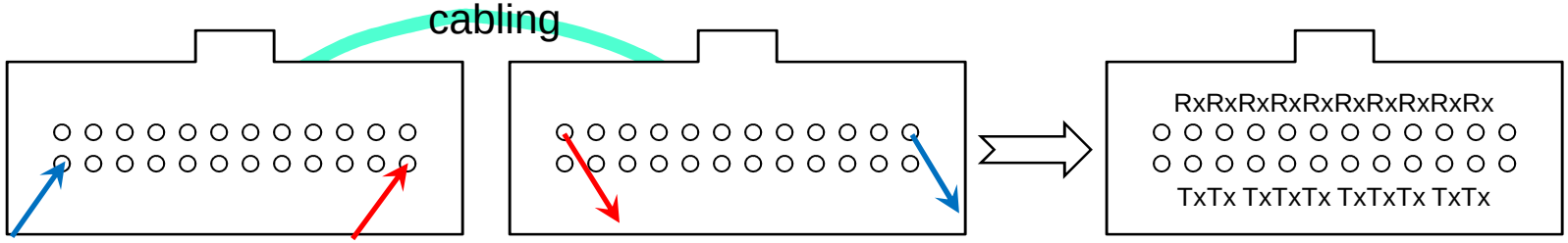
# How Array Polarity Works

- TIA-568 describes three methods: A, B, C.  ISO & CENELEC one.
  - All produce the same signal routing with different sets of components
  - Key application examples:




For 1-row applications, methods deliver lateral signal transposition (Tx to Rx)

Supports 40G/100G/200G-SR4
200G/400G-DR4, 100G-SR2




For 2-row applications, methods deliver lateral and row transposition (Tx to Rx)

Supports 100G-SR10,
400G-SR16

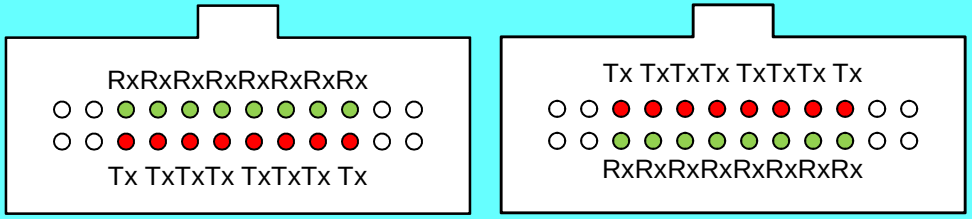
These signal routing conventions support all standard parallel applications

including INCITS T11 10GFC 1200-Mx-SN4P-I and HIPPI-6400

# Some MDI Lane Assignment Choices

without lane numbers

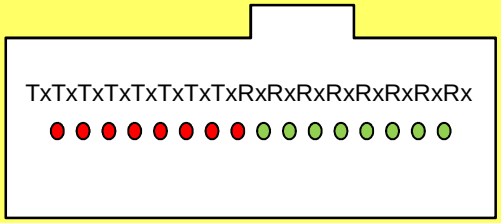
## 1) Tx row + Rx row, 24f MPO




Rx over Tx
like SR10 opt. A

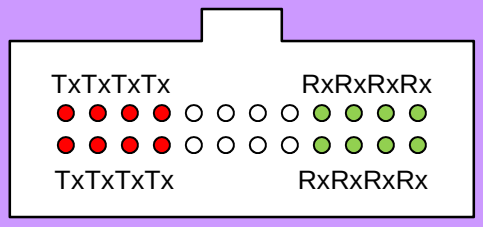
Tx over Rx
like SR16

## 2) Single row MPO-16




Tx then Rx
like QSFP-DD

## 3) “Dual DR4” 24f MPO




Tx, blank, Rx
like QSFP-DD

# Pros n Cons of 1), 2), 3)

## 1) Tx row + Rx row

- Pros
  - Familiar from SR10, 16
  - CXP and CDFP MSAs
  - Compatible w standard cabling if without lane numbers of MSAs
  - Monolithic source and detector w low interference
- Cons
  - SR10, SR16 not popular
  - Cabling polarity more complex w two rows
  - More difficult connector termination

## 2) Single-row MPO16

- Pros
  - Compatible w standard cabling polarity
  - Easier connector termination
  - Monolithic source and detector
  - In QSFP-DD MSA
  - Proposed by Google at outset
- Cons
  - New MDI construct
  - MPO16 small base
  - More difficult interference mitigation between Tx and Rx

## 3) “Dual DR4” 24f MPO

- Pros
  - In QSFP-DD MSA
  - Compatible w standard cabling polarity if without lane numbers of MSA
  - Dual engine construct good for DR4 SiP
- Cons
  - New MDI construct
  - 24f MPO small base
  - Cabling polarity more complex w two rows
  - More difficult connector termination
  - Dual Tx and Rx suboptimal for MM which has traditionally used choice 1)

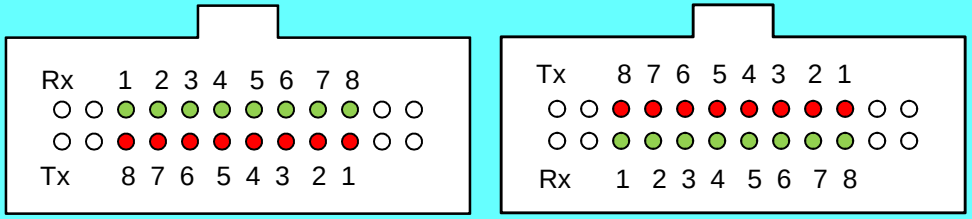
Thank You.

Questions?

# Backup Slides

# If used, what example lane numbers work with structured cabling?

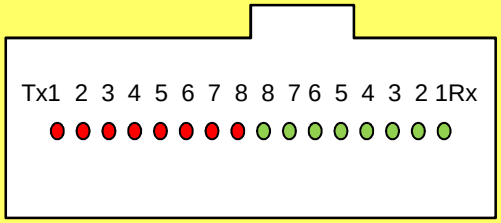
## 1) Tx row + Rx row, 24f MPO




Rx over Tx
like SR10 opt. A

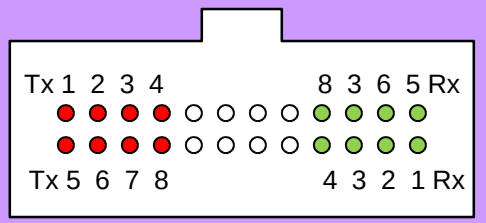
Tx over Rx
like SR16

## 2) Single row MPO-16



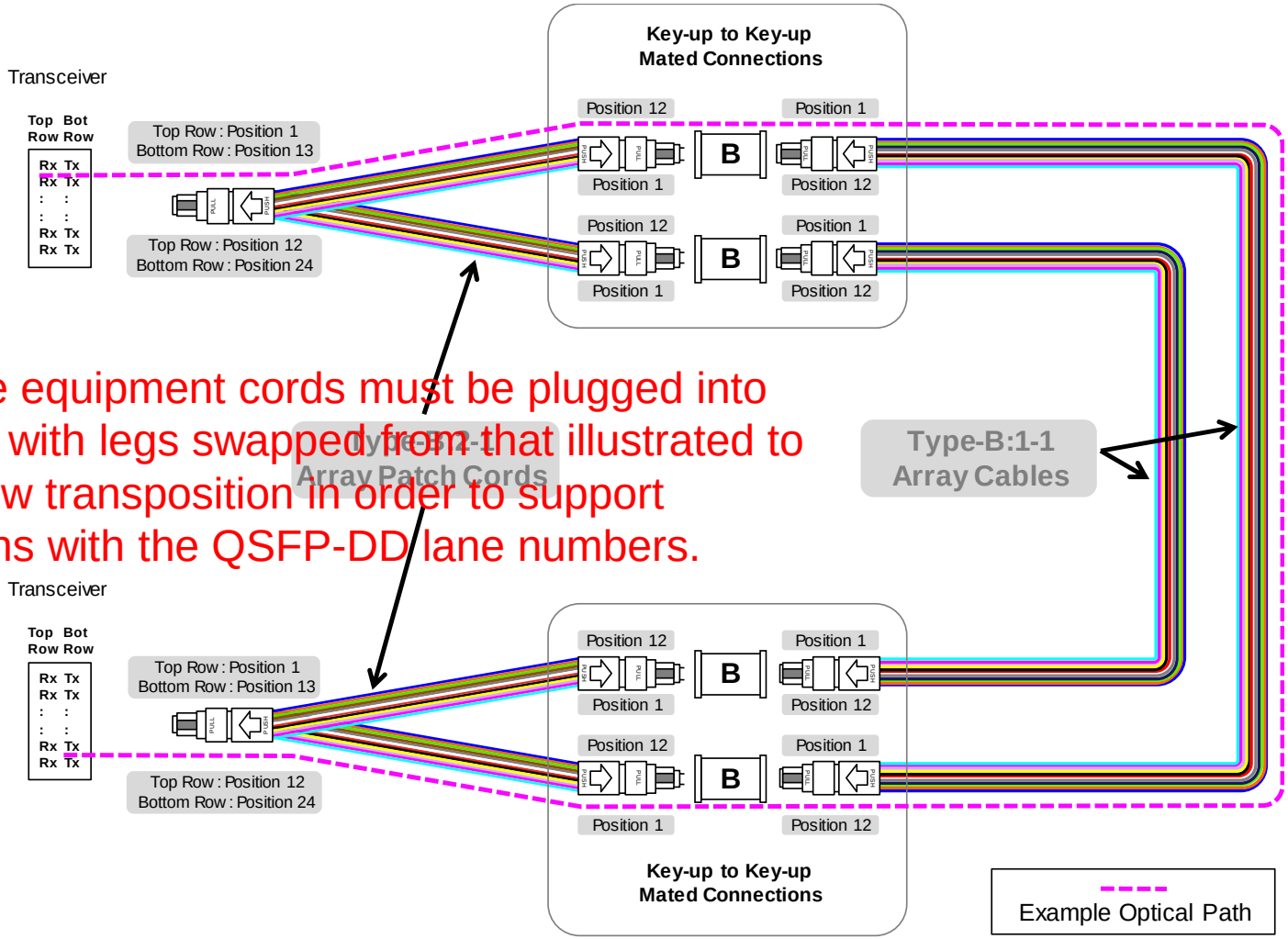

Tx then Rx
like QSFP-DD

## 3) “Dual DR4” 24f MPO




Tx, blank, Rx
like QSFP-DD

# What's the lane number issue with 3) ?




One of the equipment cords must be plugged into 12f trunks with legs swapped from that illustrated to remove row transposition in order to support applications with the QSFP-DD lane numbers.

Connectivity Method B Supporting Parallel Signals
for 1-plug x 2-row Applications over 12f MPO trunks