IEEE 802 July 2023

IEEE 802.3 Ethernet WG Closing Plenary
Berlin, Germany
13 July 2023

Joint
IEEE P802.3cw / P802.3df / P802.3dj
Task Force

Closing Report

IEEE P802.3cw Task Force Project information

- **Task Force Organization**
  - **John D'Ambrosia, Chair, IEEE P802.3cw Task Force**
  - **Editorial Team**
    - **Tom Issenhuth – Chief Editor, 400 GbE Optical PHY Clause**
    - **Leon Bruckman - 400 GbE PCS/PMA Clauses**

  - **Task force web and reflector information**
    - **Reflector: http://www.ieee802.org/3/ct/reflector.html**
    - **Home page: http://www.ieee802.org/3/cw/index.html**

  - **Project Documentation –**
    - **PAR : http://www.ieee802.org/3/cw/proj_doc/P802d3cw_PAR.pdf**
    - **CSD: https://mentor.ieee.org/802-ec/dcn/19/ec-19-0219-00-ACSD-p802-3cw.pdf**

    - **Objectives: http://www.ieee802.org/3/cw/proj_doc/3cw_Objectives_190911.pdf**
    - **Timeline: https://www.ieee802.org/3/cw/proj_doc/timeline_3cw_230608.pdf**

  - **Ad Hoc page: http://www.ieee802.org/3/ct/public/adhoc/index.html**

IEEE P802.3df Task Force Project information

- **Organization**
  - **John D'Ambrosia, Chair, IEEE P802.3df Task Force**
  - **Mark Nowell, Vice-Chair, IEEE P802.3df Task Force, Optics Track Chair**
  - **Matt Brown, Chief Editor**
  - **Mark Gustlin, Architecture & Logic Track Chair**
  - **Kent Lusted, Electrical Track Chair, Recording Secretary**

- **Task force web and reflector information:**
  - **Home page: https://www.ieee802.org/3/df/index.html**
  - **Reflector Info - https://www.ieee802.org/3/df/reflector.html**
    - **TF Reflector: stds-802-3-b400g@listserv@ieee.org**
    - **Logic Reflector: stds-802-3-b400g-logic@listserv@ieee.org**
    - **Optical Reflector: stds-802-3-b400g-optx@listserv@ieee.org**
    - **Electrical Reflector: stds-802-3-b400g-elec@listserv@ieee.org**

- **Project Documentation –**
  - **PAR : https://www.ieee802.org/3/df/proj_doc/IEEE_P802.3df_PAR_11122021.pdf**
  - **CSD: https://mentor.ieee.org/802-ec/dcn/21/ec-21-0306-00-ACSD-p802-3df.pdf**
  - **Objectives: https://www.ieee802.org/3/df/proj_doc/objectives_P802d3df_221117.pdf**

- **P802.3df TF meeting information may be found on:**
  - **Public page: https://www.ieee802.org/3/df/public/index.html**
  - **802.3 Calendar: https://www.ieee802.org/3/calendar.html**
  - **Ad hoc Page: https://www.ieee802.org/3/df/public/adhoc/index.html**

IEEE P802.3dj Task Force Project information

- **Organization**
  - **John D'Ambrosia, Chair, IEEE P802.3dj Task Force**
  - **Mark Nowell, Vice-Chair, IEEE P802.3dj Task Force; Chair, Optics Track**
  - **Kent Lusted, Secretary, Chair, Electrical Track**
  - **Matt Brown, IEEE P802.3dj Chief Editor**
  - **Mark Gustlin, Chair, Architecture and Logic Track**

- **Task force web and reflector information:**
  - **Home page: https://www.ieee802.org/3/df/index.html**
  - **Reflector Info - https://www.ieee802.org/3/df/reflector.html**
    - **TF Reflector: stds-802-3-b400g@listserv@ieee.org**
    - **Logic Reflector: stds-802-3-b400g-logic@listserv@ieee.org**
    - **Optical Reflector: stds-802-3-b400g-optx@listserv@ieee.org**
    - **Electrical Reflector: stds-802-3-b400g-elec@listserv@ieee.org**

- **Project Documentation –**
  - **PAR : https://www.ieee802.org/3/dj/projdoc/P802d3dj_PAR.pdf**
  - **CSD: https://mentor.ieee.org/802-ec/dcn/22/ec-22-0256-00-ACSD-p802-3dj.pdf**
  - **Objectives: https://www.ieee802.org/3/dj/projdoc/objectives_P802d3dj_230518.pdf**
  - **Adopted Timeline: https://www.ieee802.org/3/dj/projdoc/timeline_3dj_230116.pdf**
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Activities This Week

- IEEE P802.3cw
  - Approved liaison to OIF regarding EVM

- IEEE P802.3df

  - Addressed all comments submitted against D2.1

  - 100% Approval Rate, no unsatisfied comments

  - Motion – "Move that the IEEE P802.3df Task Force generate Draft 3.0 from D2.1 and the closed comments"
    - Approved by unanimous consent!

  - Motion – "Move that the Task Force re-affirm the CSD responses in https://mentor.ieee.org/802-ec/dcn/21/ec-21-0306-01-ACSD-p802-3df.pdf and request approval to progress the IEEE P802.3df draft to IEEE Standards Association ballot"
    - Approved by unanimous consent!

IEEE P802.3dj Task Force

Overall we made significant progress with 15 Straw Polls and 14 Motions taken

Overall summary:

- Optical: Clear direction identified for interest in supporting (1) Inner code FEC Bypass (2) use of BCH FEC for Coherent LR1 (10km) PMD (3) use of CD_Q methodology for SMF channel to be used for optical baselines
- Electrical: adopted DER_0 budget for all AUI interfaces in a PHY, CR die to die loss budget,

- Logic: Adopted convolution interleaver, 4 code-word interleave for 200GbE / 400 GbE, adopted logic layers / fec for 10km single wavelength PMD, inner fec for 1.6 TbE, stateless encoding 200 / 400 GbE (aligns with 800 GbE / 1.6 TbE)

- Approved liaison to OIF regarding 800LR

TF Motions and Straw Polls - Optical

- **Straw Poll # 11 (FEC Bypass)**
  - I would support adopting the direction of adding an option to support only RS544 FEC (aka Bypass Inner FEC) for the single wavelength 500m and 2km optical PMDs with the mechanism to enable it remaining TBD **Results (all): Y: 69 , N: 15 , A: 15**
- **Straw Poll # 12 (Coherent)**
  - I would support adopting the following as baselines for 800G-LR1 and 800G-ER1:
    - LR1 Logic baseline: kota_3dj_01a_2307.pdf
    - LR1 Optics baseline: maniloff_3dj_01_2307.pdf (slides 7-9)
    - ER1 Logic baseline: nicholl_3dj_02a_2307.pdf
    - ER1 Optics Baseline: williams_3dj_01a_2305.pdf (slides 7-10)
  - **Results (all): Y: 50 , N: 29 , A: 27**
  - **Results (802.3 voters): Y: 40, N: 26, A: 19**
- **Motion #4 (FEC Bypass)**
  - Move to adopt the direction of adding an option to support only RS544 FEC (aka Bypass Inner FEC) for the single wavelength 500m and 2km optical PMDs with the mechanism to enable it remaining TBD.
    Result: passed by unanimous consent.
- **Straw Poll #13 (Coherent 10km BCH)**
  - I would support adoption of BCH FEC as defined in kota_3dj_01a_2307.pdf slides 6-18 as the baseline FEC specification for the single wavelength 10 km 800Gb/s optical PMD.
  - **Result (all): Y: 66,   N: 19,   A: 35**
  - **Result (802.3 voters)   Y: 62,   N: 17 A: 20**

TF Motions and Straw Polls - Optical

- **Motion#5 (Coherent 10km BCH)**
  - Move to adopt BCH FEC as defined in kota_3dj_01a_2307.pdf slides 6-18 as the baseline FEC specification for the single wavelength 10 km 800Gb/s optical PMD.
  - **Result (all): Y: 66,   N: 19,   A: 35**
  - **Result (802.3 voters)   Y: 62,   N: 17 A: 20**
- **Straw Poll #15 (O-Band for 10km coherent)**
  - I would support adoption of the O band optical parameters as defined in maniloff_3dj_01_2307.pdf slides 7-9 as the baseline optical specification for the single wavelength 10 km 800Gb/s optical PMD
  - **Results (all):   Y: 44, N: 12   , NMI: 30   , A: 30**
- **Straw Poll #16 (O-Band for 10km coherent)**
  - I support the use of the CD_Q methodology (with values TBD) as described in johnson_3dj_01a_2307 and liu_3dj_01_2307 to specify chromatic dispersion (CD) for initial baseline specifications for 200G per lane PAM4 PMDs
    - A: Yes
    - B: No, wait for more accurate CD_Q values from ITU-T
    - C: No, continue to use traditional worst case CD values
    - D: Abstain
  - **Results (all):   Y: 44, N: 12   , NMI: 30   , A: 30**

TF Motions and Straw Polls - Electrical

- **Straw Poll #1 (Rx FFE in COM)**
  - I would support the direction of the RXFFE changes to Annex 93A (COM) in mellitz_3dj_01a_2307 slides 6, 7, and 8. **Result Y: 61, N: 0, NMI: 7,   A: 19**
- **Straw Poll #4 (CR Insertion Loss Target)**
  - I would support a die-to-die insertion loss <= 40 dB at 53.125 GHz for the 200G/lane CR PHYs
  - **Result Y: Y: 58, N: 0 , NMI: 7 , A: 25**
- **Straw Poll #5 (Clause 73 AutoNeg)**
  - I would support adopting the Cl 73 changes in lusted_3dj_06a_2307 slides 7-15
  - **Results: Y: 62, N: 0, NMI: 4, A: 28**
- **Straw Poll #8 (Common AUI DER_0 target)**
  - I would support defining only one DER0 value of 2.67e-5 (equivalent to measured BER of 4e-5 with precoding ON) as the total allocation for AUIs within a PHY (BER division between C2C and C2M as well as the measurement method to be determined later). **Results: Y: 62, N: 0, NMI: 4, A: 28**
- **Straw Poll #9 (Rx FFE for AUI)**
  - I would support the direction of a RXFFE based reference RX to the 200G/lane AUI C2M and AUI C2C
    Results: Y: 61, N: 0, NMI: 10,   A: 26

TF Motions and Straw Polls - Electrical

- **Straw Poll #10 (AUI C2M Insertion Loss Target)**
  - I believe the maximum IL (die-die) target for 200G per lane AUI C2M should be:
    A. 32 dB
    B. 36 dB
    C. NMI
    D. abstain
  - **Results (all): A: 29, B: 18,   C: 21 , D: 33**
  - **Results (802.3 voters) A: 26 B: 16   C: 16, D: 22**
- **Motion #6 (Common AUI DER_0 target)**
  - Move to adopt one DER0 value of 2.67e-5 (equivalent to measured BER of 4e-5 with precoding ON) as the total allocation for 200Gbps/lane AUIs within a PHY (BER division between C2C and C2M as well as the measurement method to be determined later)
  - **Result: passed by unanimous consent**
- **Motion #7 (CR Budget)**
  - Move to adopt a die-to-die insertion loss <= 40 dB at 53.125 GHz for 200GBASE-CR1, 400GBASE-CR2, 800GBASE-CR4 and 1.6TBASE-CR8 PHYs **Result: passed by unanimous consent**

TF Motions and Straw Polls - Logic

- **Straw Poll #2 (Stateless PCS)**
  - I support specifying stateless 64b/66b encode and decode, as defined in 802.3df D2.1 172.2.4.1.2 and 172.2.5.9.2, as an option in Clause 119 for all 200G/lane PHY/PMDs **Result Y: 66, N: 1, A: 27**
- **Straw Poll #3 (4x RS Codewords)**
  - I would support the proposal of 4x RS codewords interleaving for 200 GbE and 400 GbE using 200G/lane AUIs or PMDs, as shown in slides 4-6 and 10 of he_3dj_02a_2307 and with full deskew on 100G/lane input AUI lanes. **Results Y: 57, N: 8, A: 33**
- **Straw Poll #6 (1.6 TbE Inner FEC)**
  - I support adopting the same inner FEC architecture used for 200GbE/400GbE/800GbE for 1.6TbE SMF optical PMDs (500m/2km). **Results Y: 68 , N: 0 , A: 21**
- **Straw Poll #7 (Inner FEC self-sync)**
  - I would support the direction of using self-sync technique for inner FEC as described in page 6 of he_3dj_03a_2307. **Results Y: 60,   N: 1,   NMI: 4, A: 25**
- **Motion #8 (Stateless PCS)**
  - Move to adopt stateless 64b/66b encode and decode, as defined in opsasnick_3dj_01a_2307.pdf slides 7 and 8, as an option for 200GbE and 400GbE for all 200G/lane PHY/PMDs
  - **Result: passed by unanimous consent**

TF Motions and Straw Polls - Logic

- **Motion#9 (1.6 TbE Inner FEC)**
  - Move to adopt the same inner FEC architecture used for 200GbE/400GbE/800GbE for 1.6TbE SMF optical PMDs (500m/2km) **Result: passed by unanimous consent.**
- **Motion#10 (4x RS Codewords)**
  - Move to adopt the 4x RS codewords interleaving for 200GbE and 400 GbE using 200G/lane AUIs or PMDs, as shown in slides 4-6 and 10 of he_3dj_02a_2307 along with deskew (alignment) to codeword boundaries for 100G/lane input lanes. **Results: passed by unanimous consent.**
- **Motion #11 (Inner FEC Convolutional Interleaver)**
  - Move to adopt the FEC_I sublayer architecture with 200G throughput convolutional interleaver as shown in slides 6-11 of he_3dj_01_2307 for 200G/400G/800G/1.6TbE.
  - **Results: passed by unanimous consent.**
- **Motion #12 (Inner FEC self-sync)**
  - Motion to adopt using the self-sync technique for inner FEC as described on page 6 of he_3dj_03b_2307, with exact policy for determining lock TBD. **Results Y: 60, N: 1, NMI: 4, A: 25**

WG Motion

Move that the IEEE 802.3 Working Group approve
- IEEE_802d3_to_OIF_3dj_2307_draft_redacted.pdf
- IEEE_802d3_to_OIF_3cw_2307_draft_redacted.pdf

- with editorial license granted to the Chair (or his appointed agent) as a liaison communication from the IEEE 802.3 Working Group to OIF.

▪ Technical (>=75%)
▪ M: D'Ambrosia
▪ S: Lusted
▪ Results: Y:x   N:x   A:x

WG MOTION

Move that the IEEE 802.3 Working Group re-affirm the CSD responses in https://mentor.ieee.org/802-ec/dcn/21/ec-21-0306-01-ACSD-p802-3df.pdf and request approval to progress the IEEE P802.3df draft to IEEE Standards Association ballot.

- ▣ **Technical (>=75%)**
- ▣ **M: D'Ambrosia**
- ▣ **S: Nowell**
- ▣ **Results: Y:x   N:x   A:x**

Future Meetings
IEEE P802.3cw: https://www.ieee802.org/3/cw/public/index.html
IEEE P802.3df: https://www.ieee802.org/3/df/public/index.html
IEEE P802.3dj: https://www.ieee802.org/3/dj/public/index.html

- Joint IEEE P802.3dj TF Electronic Interim
  - 20 July 2023

- IEEE P802.3cw Comment Consideration (2nd WG Recirculation)
  - 27 July 2023

- Joint IEEE P802.3cw / .3df / .3dj TF Sept 2023 Interim
  - Week of Sept 11 – 14, 2023
  - Campinas, Brazil

- Joint IEEE P802.3cw / .3df / .3dj TF Nov 2023 Plenary
  - Week of Nov 13 – 16, 2023
  - Hawaiian Village
  - Oahu, Hawaii, USA

- Any additional meetings will be announced, as appropriate.

Future Ad hoc Meetings

- **IEEE P802.3dj Electrical Ad hoc**

  - **17 Aug 2023**

  - **31 Aug 2023**

- **IEEE P802.3dj Logic / Optic Ad hoc**

  - **15 Aug 2023**

  - **29 Aug 2023**

THANK YOU!