IEEE 802.3 Sept 2022

IEEE 802.3 Ethernet WG
Interim Meeting
15 Sept 2022

IEEE P802.3df
200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Force
Closing Report

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
- **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_220317.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

Introduction

- Based on rapid progress of 100 Gbps / lane objectives and evaluation of schedule, P802.3df leadership proposed split of project
  - P802.3df (modified PAR)
    - Focus on 100 Gb/s per lane objectives (no new objectives)
  - P802.3dj (new PAR)
    - Focus on > 100 Gb/s per lane objectives (no new objectives)
- Initial discussion May 2022
- Initial proposed project documentation introduced July 2022

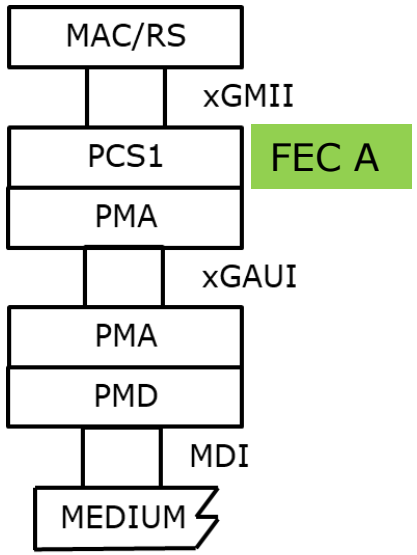
- This report gives update on state of project and proposed project split.

IEEE P802.3df Progress Observations

- IEEE P802.3df architecture that can support multiple PCS / FEC schemes has been adopted
- 100 Gb/s per lane based objectives making rapid progress leveraging:
  - IEEE 802.3bs – 100 Gb/s over single wavelength over 500m SMF
  - IEEE 802.3cu – 100 Gb/s over single wavelength over 2km SMF
  - IEEE P802.3ck – 100 Gb/s over single lane for electrical interfaces (AUIs), electrical backplanes, and twinaxial copper cables
  - IEEE P802.3db – 100 Gb/s over single MMF for 50m and 100m
- 200 Gb/s per lane based objectives
  - Only decision - PAM4 optical modulation for 200 Gb/s per lane 500m and 2km SMF reach objectives
  - No adopted baselines
  - Limited 200 Gb/s electrical channel data submitted
- 800 GbE 10km and 40km objectives
  - No adopted baselines

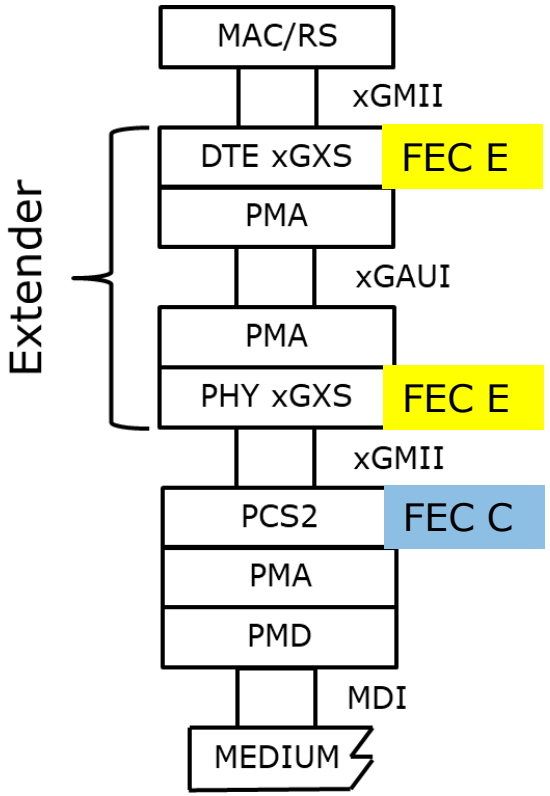
Overall P802.3f Architecture

Option #1



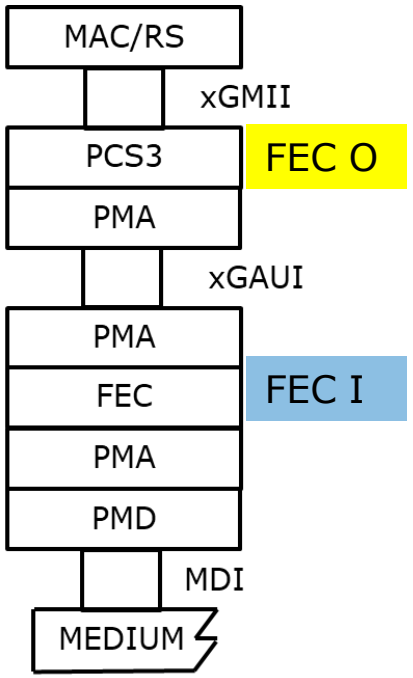
End-to-end

Option #2



Segmented

Option #3



Concatenated

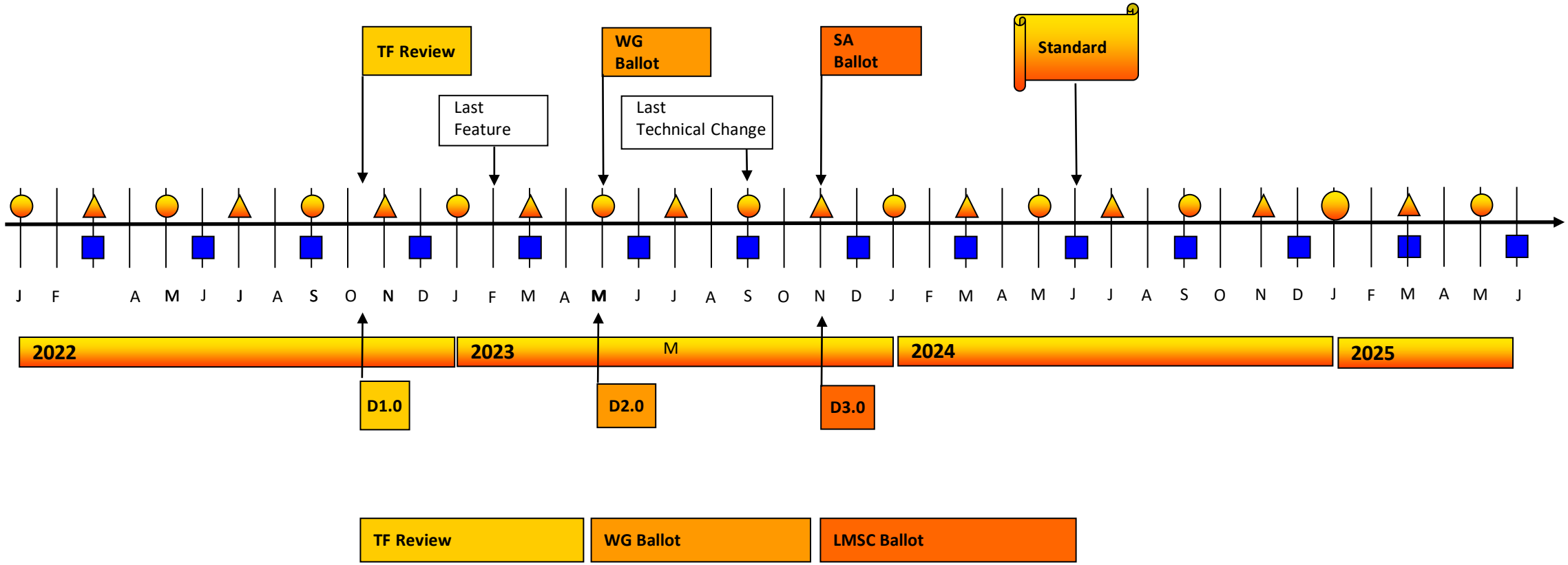
- Applicable to all Ethernet rates being addressed in P802.3df
- FEC codes may or may not be reused in different options
- FEC Schemes for each physical layer specification TBD
- Extender used with encoding and / or FEC changes. Multiple instances possible.

Summary Progress

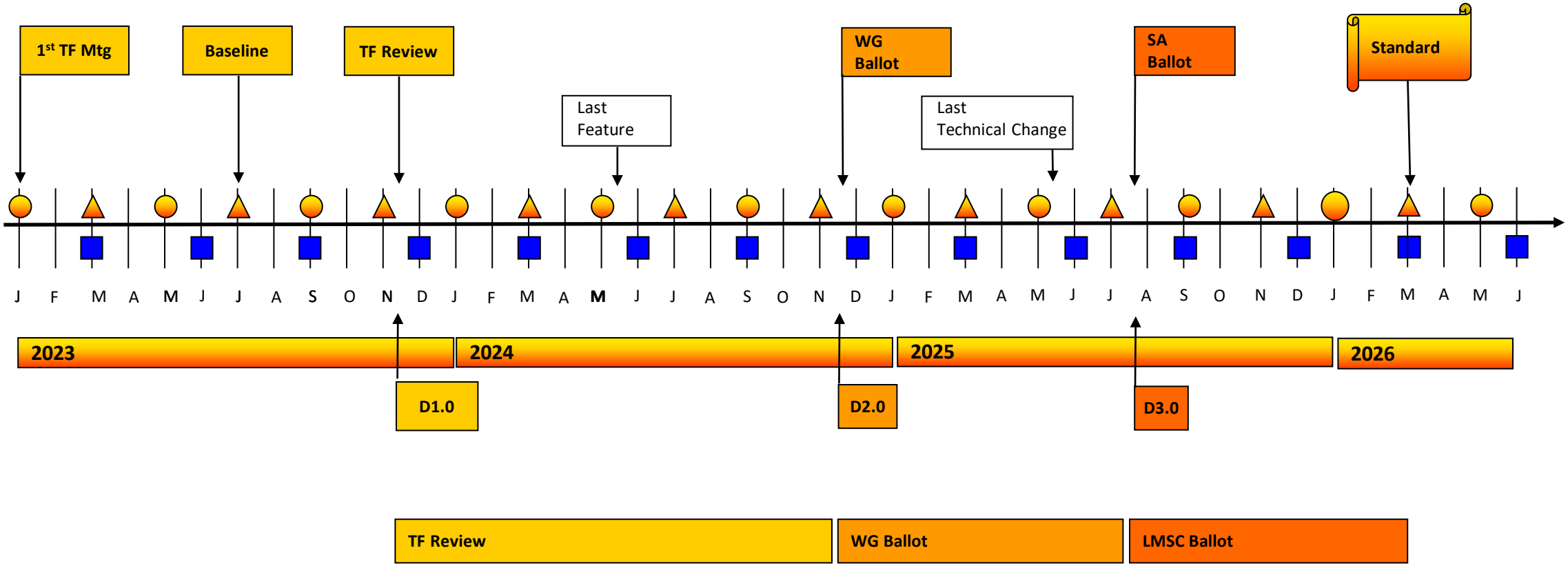
Ethernet Rate	Assumed Signaling Rate	AUI	BP	Cu Cable	MMF 50m	MMF 100m	SMF 500m	SMF 2km	SMF 10km	SMF 40km
200 Gb/s	200 Gb/s	1 lane 200GAUI-1		1 pair 200GBASE-CR1			1 pair 200GBASE-DR1	1 pair 200GBASE-FR1		
400 Gb/s	100 Gb/s							4 pair 400GBASE-DR4-2		
	200 Gb/s	2 lanes 400GAUI-2		2 pairs 400GBASE-CR2			2 Pair 200GBASE-DR2			
800 Gb/s	100 Gb/s	8 lanes 800GAUI-8	8 lanes 800GBASE-KR8	8 pairs 800GBASE-CR8	8 pairs 800GBASE-VR8	8 pairs 800GBASE-SR8	8 pairs 800GBASE-DR8	8 pairs 800GBASE-DR8-2		
	200 Gb/s	4 lanes 800GAUI-4		4 pairs 800GBASE-CR4			4 pairs 800GBASE-DR4	1. 4 pairs 800GBASE-DR4-2 2. 4 λ's 800GBASE-FR4		
	TBD								Over single SMF in each direction TBD	Over single SMF in each direction TBD
1.6 Tb/s	100 Gb/s	16 lanes 1.6TAUI-16								
	200 Gb/s	8 lanes 1.6TAUI-8		8 pairs 1.6TBASE-CR8			8 pairs 1.6TBASE-DR8	8 pairs 1.6TBASE-DR8-2		

Adopted baselines

Proposed IEEE P802.3df Timeline



Potential IEEE P802.3dj Timeline



Note – Project and timeline will need to be adopted, monitored, and adapted, based on progress, by future P802.3dj Task Force.

Legend
- IEEE 802 Plenary
- IEEE 802.3 Interim
- IEEE-SA Standards Board

Sept 2022 Status

- Task force reviewed all project documentation
- **Project documentation related motions approved by Unanimous Consent**
  - Move that the IEEE P802.3df Task Force develop:
    - A modification of the IEEE P802.3df PAR to address “Media Access Control Parameters for 800 Gb/s and Physical Layers and Management Parameters for 400 Gb/s and 800 Gb/s Operation”
    - A new IEEE P802.3dj PAR to address “Media Access Control Parameters for 1.6 Tb/s and, Physical Layers and Management Parameters for 200 Gb/s, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s Operation.”
  - Move to adopt:
    - The objectives stated on Slide #6 of dambrosia_3df_02_2209 for the modified IEEE P802.3df Project
    - The objectives stated on Slides #6 –7 of dambrosia_3df_05_2209 for the IEEE P802.3dj Project
- Other Technical Details
  - Adoption of link training baseline for 800GBASE-CR8 and 800GBASE-KR8 PMDs adopted by unanimous consent
  - PCS (& FEC) / PMA for 100 Gb/s per lane anticipated to be addressed @ Oct 2022 series
- Other project progress – IEEE P802.3df Editorial Team preparing D0.3 contribution.

Proposed Project Documentation Packages*

- **Modified IEEE P802.3df Project**
  - **Proposed Modified Objectives – dambrosia_3df_02_2209.pdf**
  - **Proposed Modified PAR Response – dambrosia_3df_03a_2209.pdf**
  - **Proposed Modified CSD Response – dambrosia_3df_04a_2209.pdf**
- **New IEEE P802.3dj Project**
  - **Proposed Objectives – dambrosia_3df_05_2209.pdf**
  - **Proposed PAR Response – dambrosia_3df_06a_2209.pdf**
  - **Proposed CSD Response – dambrosia_3df_07b_2209.pdf**

*** All project documentation has been reviewed by P802.3df TF**
Objectives for both project adopted
PARs / CSDs will be considered on 9/27 (Oct 2022 Series)

Next Steps

- Approval of proposed PARs and CSDs planned for 27 Sept 2022 (Oct 2022 Series)
- Plan to submit for consideration at Nov 2022 Plenary

THANK YOU!