Reviewing Path Forward for IEEE P802.3ct

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Joint IEEE P802.3cn / IEEE P802.3ct Task Force Ad hoc
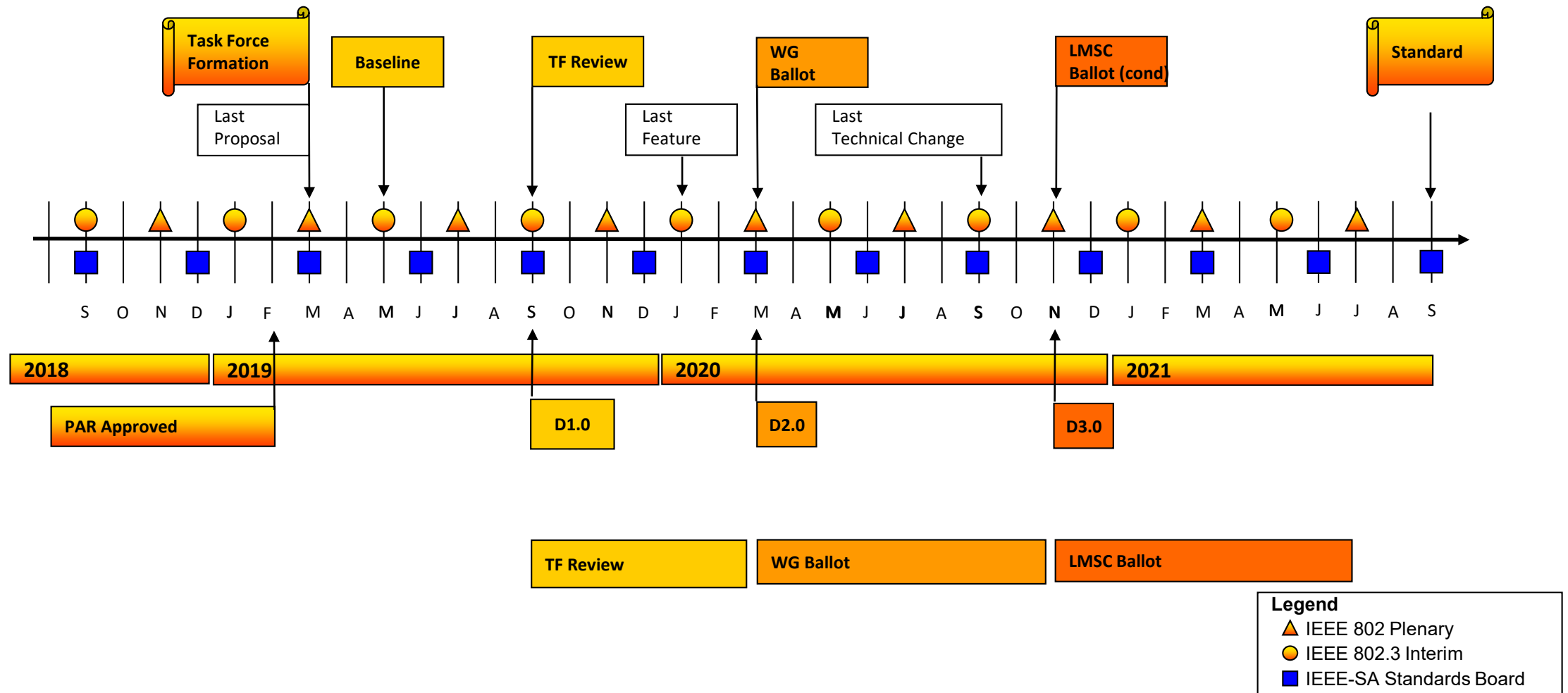Meeting, April 4, 2019

Introduction

- This presentation reviews status of IEEE P802.3ct project and associated needed baselines

The Role of the Chair

- Per the IEEE 802.3 Ethernet WG Operations Manual
  (http://www.ieee802.org/3/rules/P802_3_rules.pdf)
  - The operation of the TF has to be balanced between democratic procedures that reflect the desires of the TF members and the TF Chair's responsibility to produce a draft standard, recommended practice, or guideline in a reasonable amount of time for review and approval by the WG. Robert's Rules of Order shall be used in combination with these operating rules to achieve this balance.
  - The full responsibilities of the chair are specified in 3.4.3 Task Force Chair's Responsibilities.
- Reminder - individual standards activities within the WG are, at the discretion of the WG, carried out by Task Forces (TF) operating under, and reporting to, the WG.

IEEE P802.3ct Adopted Timeline

Task Force Formation

Baseline

TF Review

WG Ballot

LMSC Ballot (cond)

Standard

Last Proposal

Last Feature

Last Technical Change

S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S

2018 2019 2020 2021

PAR Approved

D1.0

D2.0

D3.0

TF Review

WG Ballot

LMSC Ballot

Legend
- △ IEEE 802 Plenary
- ● IEEE 802.3 Interim
- ■ IEEE-SA Standards Board

Adopted Objectives

- **Support full-duplex operation only**
- **Preserve the Ethernet frame format utilizing the Ethernet MAC**
- **Preserve minimum and maximum FrameSize of current Ethernet standard**
- **Provide appropriate support for OTN**

100 Gb/s Ethernet

- **Support a MAC data rate of 100 Gb/s**
- **Support a BER of better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent) for 100 Gb/s**
- **Provide a physical layer specification supporting 100 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system.**

400 Gb/s Ethernet

- **Support a MAC data rate of 400 Gb/s**
- **Support a BER of better than or equal to 10^{-13} at the MAC/PLS service interface (or the frame loss ratio equivalent) for 400 Gb/s**
- **Provide a physical layer specification supporting 400 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system.**

Per stassar_3cn_02a_1118

High Level Decisions

- What is the reference model for the link?
    - Purely 80 km? Is it using the same model as in OIF for 400ZR?
    - Loss assumption? 0.25 dB/km? Amplified and unamplified?
- Number of channels and spacing?
    - 40 Channels? 75 GHz or 100GHz or both?
    - C-band, L-band or both?
- What is the modulation format?
    - DP-DQPSK for 100G? DP-16QAM for 400G?
- What are the frame assumptions?
    - 400G – Same as OIF? 400ZR frame, GMP, CFEC, 20ppm?
    - 100G – Similar choices to 400G? FEC?
- Then before being able to take decisions on OSNR values, we need to agree on a metric to specify the quality of the transmitter.

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Status - High Level Decisions

	100GbE	400 GbE
Channel Model	stassar_3ct_01_0319	stassar_3ct_01_0319
# of Channels	?	?
Channel Spacing	100 GHz	100 GHz
Modulation Format	DP-DQPSK	DP-16QAM
Frame Assumption	Same as OTN uses for 100G-DP-DQPSK	400GBASE-ZR PCS/PMA
FEC	Staircase (ITU-T G.709.2)	CFEC
Tx Metric	schmitt_3ct_01_0319 or stassar_3ct_01_0319	lyubomirsky_3ct_01_0319 or stassar_3ct_01_0319
AUI Attachment	Inverse RS-FEC Sublayer	400G XS

of Channels

	Start Channel	End Channel	Y / N / Need more info / Abstain
Mar Strawpoll #1	**191.3 THz**	**196.1 THz**	**12 / 1 / 17 / 5**
Mar Strawpoll #2	**191.5 THz**	**196.1 THz**	**11 / 0 / 10 / 9**

individuals who needed more information on Strawpoll #1 were asked for input on what they were looking for -

- **What are cost factors for deploying around end frequencies?**
- **This is new territory for Ethernet, and some basis for the Task Force decision should be provided.**
- **Per TF 4/4 Ad hoc Conversation – what is the application need?**

Specification for Device Interoperability

- Traditionally, a PHY name in Ethernet has defined the characteristics, including the wavelength.
  - 100GBASE-ZR -100 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system
  - 400GBASE-ZR -400 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system

- For DWDM links these are the three key characteristics that need to match:
  - Transmit Frequency
  - Rx Oscillator Frequency
  - Ports on Mux (i.e. link wavelength)

- How will the specification be written so that users know which parts interoperate?
  - 48 PHY names is possible, but ugly!
  - For example, the ITU-T has an application code (similar to an Ethernet PHY name) and a frequency (transmit and Rx Oscillator Frequency) – which also indicates the link wavelength
  - We need to resolve before ending Task Force Review

Thanks to Pete Anslow

Steps Forward to Keep P802.3ct on Schedule

- At May meeting -
  - Adopt Channel Model for 100 GbE and 400 GbE
  - Define Start / End Channel
  - Define Tx metrix for 100 GbE and 400 GbE