Unconfirmed Meeting Minutes:
Meeting of the IEEE P802.3dg Long-Reach Single Pair Ethernet TF

May13, 2024 Hybrid Interim meeting
Prepared by Bob Voss
All times in EDT

IEEE P802.3dg Task Force meeting was convened at 5/13/2024 1:18PM by the chair, George Zimmerman.

The meeting was held in person and electronically.

Attendance is listed in Appendix A.

All presentations referenced in these minutes are located on the Task Force Public web page:
https://www.ieee802.org/3/dg/public/May_2024/index.htm

The Chair displayed and proceeded to review the agenda in
https://www.ieee802.org/3/dg/public/May_2024/agenda_3dg_01a_20240513.pdf

The agenda was approved at 1:21PM by unanimous consent.

Bob Voss continues as recording secretary for the task force.

The minutes from 28Feb2024 and 11Mar2024 TF meetings were approved at 1:22PM EDT by unanimous consent.

Members of the Press, at 1:23PM EDT the chair asked for any press members to identify themselves. None heard.

Attendance, the Chair advised the group that the attendance would be taken from Webex and IMAT.

At 1:24PM EDT, the Chair resumed review of the agenda deck, including the following items – a review of the participation policy, a review of the IEEE copyright policy, a review of the IEEE policy on dominance, and a review of the IEEE Standards process. There were no questions.

Mr. Thompson asked a question of clarification, asking if “direction from all other entities” included IEEE. The chair confirmed that yes, this is true.

IEEE Patent Policy, The Chair read aloud the patent slides.
The call for patents was made at 1:32PM EDT and **none** responded.

The Chair resumed review of the agenda deck material after the call for patents.

At 1:32PM, the chair reviewed the IEEE SA Copyright policy, participant behavior, individual process, fair and equitable consideration,

The chair said there are no liaisons or communications for the task force to consider at this time.

Presentations and Discussion:
At 1:44PM EDT, the Chair moved on to the presentations.

Presentation: IEEE 802.3dg 100BASE-T1L: Downshift – part 2
(Presented by Peter Jones, Cisco Systems)

- https://www.ieee802.org/3/dg/public/May_2024/jones_3dg_01_050924.pdf
- Presentation started at 1:46PM EDT.
- Starting at 1:54PM EDT, questions were asked and answered.

Presentation: Partial Response with Bonded Running Disparity
(Presented by Brian Murray, Analog Devices)

- https://www.ieee802.org/3/dg/public/May_2024/curran_3dg_01_05132024.pdf
- Presentation started at 2:23PM EDT.
- Starting at 2:25PM EDT, questions were asked and answered.

Meeting break at 3:18PM EDT; meeting resumed at 3:37PM EDT.

- Questions for Mr. Murray's presentation resumed after break.

Presentation: IEEE P802.3dg 100BASE-T1L PHY PAM-3 8B6T Partial Response with Bounded Running Time Disparity Time Domain Simulations
(Presented by Brian Murray, Analog Devices)

- https://www.ieee802.org/3/dg/public/May_2024/Murray_3dg_01_05132024.pdf
- Presentation started at 4:08PM EDT.
- At 4:25PM EDT, the chair made an announcement regarding IMAT registration for PM2 session.
- Starting at 4:26PM EDT, questions were asked and answered.

Presentation: Proposal for PCS Transmit Using 8B6T Line Code, Data Code groups, Idle Code groups
(Presented by Brian Murray, Analog Devices)

- https://www.ieee802.org/3/dg/public/May_2024/curran_3dg_02_05132024.pdf
- Presentation started at 4:39PM EDT.
- Starting at 4:49PM EDT, questions were asked and answered.

Presentation: Further Consideration on 100BASE-T1L PHY
(Presented by Tingtin Zhang, Huawei Technologies)

- https://www.ieee802.org/3/dg/public/May_2024/Tingting_3dg_14_05_2024.pdf
- Presentation started at 5:15PM EDT.
- Starting at 5:26PM EDT, questions were asked and answered.

Presentations concluded for the day at 5:40PM EDT.

The chair opened the floor for discussion of PHY proposals**,** time limited to 10 minutes**.**

The chair cautioned that we are way behind our adopted timeline therefore we cannot put off decisions indefinitely.

Meeting recessed by chair at 6:02PM EDT, will resume at 8:00AM EDT on 14Mar2024.

At 14May2024, 8:01AM EDT, the chair called the meeting back to order and reviewed the meeting agenda deck.

The chair asked Members of the Press attending the meeting to identify themselves at 8:02AM EDT. None heard.

Task Force Decorum, Goals for the Meeting, Interim Meeting fees reminder, Ground Rules, Attendance, Patent Slides.

At **8:07AM EDT**, the chair gave the Call for Patents. No responses in the room or online.

The chair resumed the agenda deck after the Call for Patents.

Presentation: Communications interference from Motor PWM variants with hybrid cables
(Presented by Michal Brychata, Analog Devices, Inc.)
Mr. Brandt, co-author, joined the meeting remotely and offered to answer questions as required.

- https://www.ieee802.org/3/dg/public/May_2024/Brychta_3dg_01_0524.pdf
- Presentation started at 8:14AM EDT.
- Starting at 8:41AM EDT, questions were asked and answered.

8:55AM EDT, the chair called an IMAT break, gave the session code, and confirmed TF members could register.

Presentation: Motor PWM coupling on 100m hybrid cables (in context of 100BASE-T1L)(rev.a)
(Presented by Michal Brychata, Analog Devices, Inc.)

- https://www.ieee802.org/3/dg/public/May_2024/Brychta_3dg_02a_0524.pdf
- Presentation started at 8:56AM EDT.
- Starting at 9:14AM EDT, questions were asked and answered.

Presentation: Mixed Crosstalk Measurements in Near-Far Test Case
(Presented by Francois Beauregard, Belden)

- https://www.ieee802.org/3/dg/public/May_2024/Beauregard_3dg_05092024.02.pdf
- Presentation started at 9:28AM EDT.
- Starting at 9:41AM EDT, questions were asked and answered.

Mr. Zimmerman asked Mr. Beauregard if he would be amenable to chairing a focused ad hoc to research the issues exposed in his presentation. Mr. Beauregard stated that he is amenable.

Meeting break at 10:05AM EDT; meeting resumed at 10:27AM EDT.

The chair asked the group if there was any objection to hearing a late presentation from Mr. Lo. No objection heard.

Presentation: PHY Parameter Decisions Toward Closure
(Presented by William Lo, Axonne)

- https://www.ieee802.org/3/dg/public/May_2024/Lo_3dg_01_051424.pdf
- Presentation started at 10:32AM EDT.
- Starting at 10:45AM EDT, questions were asked and answered.

At **10:45AM EDT**, Mr. Lo offered several straw polls related to his presentation.

Straw Poll #1

I support adding sequence ordered set to MII.

Y = 10 + 6 = 16
N = 1
A = 7 + 3 = 10

Straw Poll #2

I support at least one PHY variant with forward error correction.

Y = 11 + 9 = 20
N = 1
A = 2 + 2 = 4

Straw Poll #3

I support FEC burst protection of at least 150ns for one PHY variant.

Y = 10 + 8 = 18
N = 0
A = 3 + 4 = 7

Straw Poll #4

I support low latency requirement not to exceed 1.5us.

Y = 21
N = 0
A = 5

Straw Poll #5

I can accept the bit stream being different between full burst protection PHY variant vs low latency PHY variant.

Y = 7 + 3 = 10
N = 1
A = 5 + 7 = 12

Straw Poll #6

(This one applies only if #5 is Yes) Chicago Rules:
To better optimize low latency operation, I can support:

a) Same baud rate, same PAM for both full burst protection and low latency = 11 + 9 = 20
b) Same PAM, but fast baud rate for full burst protection and slower baud rate for low latency = 8 + 2 = 10
c) Same baud rate, but PAM4 for full burst protection and PAM3 for low latency = 0

Motion #1

Move that the TF select PAM3 as the modulation for the IEEE 802.3dg PHY

M = Brian Murray
S = Bob Voss

Y = 18
N = 0
A = 2

Technical (>/= 75%)
Motion passes

Motion #2

Move that 802.3dg add the capability to support sequence ordered sets to the MII signaling.

M = Tim Baggett
S = Brian Murray

Technical (>/= 75%)
Motion passes without objection

Motion #3

Move that 802.3dg support sequence at least one PHY variant with FEC.

M = Yan Zhuang
S = Tingting Zhang

Y = 8
N = 7
A = 10

Technical (>/= 75%)
Motion fails.

Presentations and discussion concluded at 12:10PM EDT.

<u>Discussion of Revised Timeline/Proposed Direction (from March 2024)</u>

- Proponents commit to the group to bring full proposals – including justification for noise models & link segments used to the group PRIOR TO the May 2024 interim, for decision at the May interim.
- Models/Proposals should include:
    - Link segment models & rationale.
    - Noise models for crosstalk AND impulse noise & rationale
    - Line code (constellation), baud rate, FEC, and framing overhead.
    - Performance metrics and simulation results

<u>Discussion of future meetings</u>

- Ad Hocs. if required, Wednesday 7-9AM PDT, opportunities on 29May, 12Jun, 26Jun.
    - The chair suggests that we have at least one ad hoc on or about 12Jun.
    - Other ad hocs on the other two opportune days are possible with one week notice.

.

- July 2024 802 Plenary – Montreal, Quebec, Canada – 15Jul to 19Jul2024
    - In Person with remote access
    - Registration Fee required, see https://web.cvent.com/event/64f6931c-b20d-44af-a54e-4830fa2f7097/summary
    - Early Registration Fee ends 17May2024.
    - Note: Saturday, 13Jul before the plenary meeting is a joint ITU-T SG15 / IEEE 802 Workshop

Mr Zimmerman is chartering an ad hoc, led by Francois Beauregard, to explore issues raised in Mr. Beauregard's presentation with the goal of coming back to the TF with direction by July meeting or sooner.

Having exhausted the agenda, a motion to adjourn was offered:

M = Michal Brychta
S = Geoff Thompson

The meeting was adjourned at **12:15PM EDT**.

Appendix A: IEEE P802.3dg Long-Reach Single Pair Ethernet Task Force Attendance

Last Name	First Name	Employer	Affiliation
Arroyo	Hector		Analog Devices Inc.
Baggett	Tim	Microchip Technology, Inc.	Microchip Technology, Inc.
Beauregard	Francois	Belden Canada ULC	Belden
Boyer	Rich	Aptiv - Signal and Power Solutions	Aptiv Signal and Power Solutions
Brandt	David	Rockwell Automation	Rockwell Automation
Brychta	Michal	Analog Devices Inc.	Analog Devices Inc.
Diminico	Christopher	M C Communications, LLC	Panduit Corp.
Fritsche	Matthias	HARTING Technologie Gruppe	HARTING Electronics GmbH
Gauthier	Claude	NXP Semiconductors	NXP Semiconductors
Graber	Steffen	Pepperl+Fuchs SE	Pepperl+Fuchs SE
Hajduczenia	Marek	Charter Communications	Charter Communications
Jones	Chad	Cisco Systems, Inc.	Cisco Systems, Inc.
Jones	Peter	Cisco Systems, Inc.	Cisco Systems, Inc.
Jonsson	Ragnar	Marvell Semiconductor, Inc.	Marvell
Lackner	Hans	QoSCom GmbH	QoSCom GmbH
Lewis	Jon	Dell Technologies	Dell Technologies
Liu	Qing		Fast Photonics
Lo	William	Axonne, Inc.	Axonne Inc.
Lou	Wei		Broadcom Corporation
Lyon	Chris	Amphenol Corporation	Amphenol Corporation
Maguire	Valerie	Copperopolis	Copperopolis, affiliated with CME Consulting
Matheus	Kirsten	BMW Group	BMW Group
Mcclellan	Brett	Marvell Semiconductor, Inc.	Marvell Semiconductor, Inc.
Murray	Brian	Analog Devices Inc.	Analog Devices
Paul	Michael	Analog Devices Inc.	Analog Devices
Pischl	Neven	Broadcom Corporation	Broadcom Corporation
Potterf	Jason	Cisco Systems, Inc.	Cisco Systems, Inc.
Razavi	Alireza	Marvell	Marvell
Regev	Alon	Keysight Technologies	Keysight Technologies
Schreiner	Stephan	Rosenberger Hochfrequenztechnik GmbH & Co. KG	Rosenberger
Sharma	Rohit		Molex Incorporated
Strohmeier	Heiko	Robert Bosch GmbH	Robert Bosch GmbH
Sun	jingcong		Motorcomm Electronic Technology Co
Thompson	Geoffrey	GraCaSI S.A.	INDEPENDENT
Tran	Ky-Anh	Aeonsemi Inc	Aeonsemi Inc
Vanderlaan	Paul	UL LLC	UL Solutions
Voss	Robert	Panduit Corp.	Panduit Corp.
Withey	James	Fluke Corporation	Fluke Corporation
Wu	Peter	Marvell Semiconductor, Inc.	Marvell Semiconductor, Inc.
Xu	Dayin	Rockwell Automation	Rockwell Automation
Zerna	Conrad	Aviva Links Inc	Aviva Links Inc
Zhang	Tingting	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd
Zhuang	Yan	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd
Zimmerman	George	CME Consulting, Inc.	CME Consulting/ADI, APL Group, Cisco, Marvell, OnSemi, SenTekSe LLC, Sony