Straw-polls to adopt baseline proposals
More information for consensus building

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Introduction and motivation

- Chief Editor reported at July Plenary Meeting (see [1]) that there is no new technical content adopted yet as baseline since D1.1.

- At the ad-hoc meeting on August 3, four straw polls were carried out (see [7]) to measure how the task force is willing to move forward the project by adopting the following baseline proposals:

  - Straw-poll 1: Bit Error Ratio (BER) test mode proposal (see [4])
  - Straw-poll 2: Loopback modes proposal (see [5])
  - Straw-poll 3: BASE-U EEE (Energy Efficient Ethernet) proposal (see [6])
  - Straw-poll 4: 50 Gb/s PCS/PMA proposal (see [2] and [3])

- **Many abstentions were received by arguing that more information is needed**

- **Negative votes were received during the straw polls with no argumentation**

Introduction and motivation

- No questions were pending for each of the baseline proposals at the moment of the straw-polls. For some of the baseline proposals even no questions were received: e.g. EEE proposal

  - **However, many voters abstained arguing that more information is needed.**

- No opposition was received against the proposals of BER test mode, loopback modes and EEE, when they were presented to the TF

  - **However, negative votes were received for BER and EEE proposals.**

- For the 50G PCS/PMA proposal, the TF had several discussions and an additional contribution [3] was presented to give answers to **unasked questions**, because many negative votes were received in the first attempt of adopting 50G PCS/PMA baseline by arguing that more information was needed

- It is not possible to elaborate more about each of the baseline proposals if **no questions** are received from individuals that argue that more information is needed

  - **Which specific information is missed?**

- Negative votes are received without **specific technical arguments** and expressed opposition during contributions

Introduction and motivation

- An email was sent to the reflector on August 5 requesting to participants to send specific questions that could solve abstentions and negative votes

- Based on the received specific questions specific contributions would be elaborated, intended to give answers to all of them

- **Dead-line is September 3**

- Since then, only one question has been received

Received questions

- Q1: Masato Shiino: *"BER, Loopback modes, EEE / LPI Baseline. Please let me check one point in all. Is each Baseline of this contribution limited to 980nm + OM3? Or is it intended for all PMDs currently under discussion?"*

- A1:
  - According to [4], BER test mode is specified as special operation mode of the PCS sublayer.

  - According to [5], line and xMII loopbacks are specified to be implemented in the PCS sublayer. PMD interface level loopback is specified to be implemented near the PMD service interface, completely exercising the PCS and PMA as in normal operation.

  - According to [6], EEE proposal is specified as special signaling (i.e. refresh and wake) produced by the PCS transmit function when PHY TX is in LPI mode or normal operation is signaled to be resumed.

  - All of these proposals are independent of PMD sublayer. No specific optical fiber medium and wavelength is assumed in the specifications.

Straw poll 1: BER test mode proposal

- BER test mode proposal [4] was presented at **July Plenary** meeting

- Compatible with currently adopted 2.5, 5, 10 and 25 Gb/s PCS / PMA baseline and compatible with 50 Gb/s PCS / PMA proposal [2]

- Operating in this test mode, the PCS transmitter generates LBLOCK_T containing two Local Fault sequential ordered sets regardless the link status and ignore the XGMII, 25GMII or 50GMII input

- Any data bit difference with respect LBLOCK_T binary sequence is computed as BER. Any RS code-word containing bit errors is counted as a RS code-word error and calculated in the RS-FEC block error ratio.

- Simple proposal: PCS 64B/65B transmit state diagram remains in TX_INIT state, and PCS 64B/65B receive state diagram in RX_INIT state

- New value is defined for PHD.TX.NEXT.MODE = 1 to indicate BER test mode transmission

- BER test mode is not part of the project's objectives, however this kind of test mode is included in every automotive Ethernet PHY

- All the questions were solved during the presentation, no open items and no opposition were identified

- [4] is the only BER test mode proposal

Straw poll 1: BER test mode proposal

		A	B	C	D	E	
	Answers	**Yes**	**No**	**A: info**	**A: exp**	**A: neutral**	**N/A**
Totals per response		22	1	6	10	6	4
Total of participants		49	49	49	49	49	49
Percentages		44.90 %	2.04 %	12.24 %	20.41 %	12.24 %	8.16 %
Yes / (Yes + No)		95.65 %					
Yes / (Yes + No + A:info)		75.86 %					

- Abstentions because more information is needed:

  - Ichiro Ogura PETRA

  - Richard Pitwon Resolute Photonics

  - Masato Shiino, FURUKAWA

  - Tomohiro Kikuta Adamant Namiki Precision Jewel Co., Ltd.

  - Nozomi Tsuzaki, Independent

  - Hideki Isono Fujitsu Optical Components

- Negative votes:

  - Takeo Masuda [OITDA/PETRA]

- **Which specific information should be added to this proposal?**

- **What are the specific arguments against this proposal?**

Straw poll 2: Loopback modes proposal

- Loopback modes proposal [5] was presented at **July Plenary** meeting

- Compatible with currently adopted 2.5, 5, 10 and 25 Gb/s PCS / PMA baseline and compatible with 50 Gb/s PCS / PMA proposal [2]

- The same three loopback modes were already defined in similar way in IEEE Std 802.3 2018 Clause 115

- Loopback modes are not part of the project's objectives, however loopback modes are commonly used for debugging purposes and checks during ECU boot

- All the questions were solved during the presentation, no open items and no opposition were identified

- [5] is the only loopback modes proposal

Straw poll 2: Loopback modes proposal

		A	B	C	D	E	
	Answers	Yes	No	A: info	A: exp	A: neutral	N/A
Totals per response		24	0	6	8	5	6
Total of participants		49	49	49	49	49	49
Percentages		48.98 %	0.00 %	12.24 %	16.33 %	10.20 %	12.24 %
Yes / (Yes + No)		100.00 %					
Yes / (Yes + No + A:info)		80.00 %					

- Abstentions because more information is needed:

  - Ichiro Ogura PETRA

  - Richard Pitwon Resolute Photonics

  - Masato Shiino, FURUKAWA

  - Takeo Masuda [OITDA/PETRA]

  - Shigeru Kobayashi, AIO Core

  - Hideki Isono Fujitsu Optical Components

- **Which specific information should be added to this proposal?**

Straw poll 3: EEE/LPI proposal

- EEE/LPI proposal [6] was presented at **July Plenary** meeting

- EEE is a project's objective: "Support optional Energy Efficient Ethernet optimized for automotive applications"

- Compatible with currently adopted 2.5, 5, 10 and 25 Gb/s PCS / PMA baseline and compatible with 50 Gb/s PCS / PMA proposal [2]

- Proposal [6] included an introduction about LPI and the two types of LPI supported in IEEE Std 802.3, i.e. deep sleep and fast wake

- A comparison of deep sleep and fast wake modes was provided from functional, power saving, latency and complexity points of view

- EEE proposal of [6] keeps the PHY transmitting signals during LPI to make possible receiver alignment (like fast wake mode)

- EEE proposal of [6] is designed for allowing big power saving in the receiver with very short wake times, which is beneficial for automotive use cases

- Detailed information on LPI signals encoding as well as power saving consideration was provided in order to justify the proposal

- NO questions were asked during the presentation, no open items and no opposition were identified

- [6] is the only EEE/LPI proposal

Straw poll 3: EEE/LPI proposal

		A	B	C	D	E	
	Answers	Yes	No	A: info	A: exp	A: neutral	N/A
Totals per response		29	1	3	5	5	7
Total of participants		50	50	50	50	50	50
Percentages		58.00 %	2.00 %	6.00 %	10.00 %	10.00 %	14.00 %
Yes / (Yes + No)		96.67 %					
Yes / (Yes + No + A:info)		87.88 %					

- Abstentions because more information is needed:

  - Richard Pitwon Resolute Photonics

  - Masato Shiino, FURUKAWA

  - Takeo Masuda [OITDA/PETRA]

- Negative votes:

  - Ichiro Ogura PETRA

- **Which specific information should be added to this proposal?**

- **What are the specific arguments against this proposal?**

Straw poll 4: 50 Gb/s PCS/PMA proposal

- 50 Gb/s PCS/PMA proposal [2] was presented at **May 11th**.

  - No questions were received for clarification and/or discussion
  - Straw poll, with potential motion, was announced for **May 18th**

- [2] proposes a complete baseline of 50 Gb/s PCS/PMA based on PAM4 modulation format consistent with currently adopted PCS/PMA sublayers for rates of 25 Gb/s and below

- At **May 11th**, [10] presented the first link budget analysis for 50 Gb/s

- At **May 11th**, [8] demonstrated that 50 Gb/s is feasible in extreme temperatures (-40°C through 125°C) using PAM4 modulation scheme, even using a 850nm VCSEL not designed for that aim, when the proper transmitter (TX FFE) and receiver (DFE) are implemented and current density is limited for reliability

- At **May 18th**, [9] demonstrated that 50 Gb/s PAM4 is even more feasible using 980nm VCSEL, without TX FFE, reduced complexity RX, and without current density limits in high temperature due to superior VCSEL reliability (see [11])

Straw poll 4: 50 Gb/s PCS/PMA proposal

- At **May 18th** a straw poll was conducted to measure the support level by TF. A summary of the PCS/PMA proposal was provided. No questions were received for clarification and/or discussion

  - Straw poll passed with 92.6%, 25/(25 + 2). The motion failed with 58.8%, 10/(10 + 7)

- At **May 25th**, [3] provided answers to unasked questions intended to give argumentation to support the 50 Gb/s PAM4 baseline proposal attending to several considerations: digital and AMS complexities, clock jitter, RIN, PLL, TIA, lab equipment, HW reuse among several rates

- At **August 3rd**, [7] presented a complete link budget proposal for 50, 25, 10, 5, and 2.5 Gb/s including allocation for modal noise and implementation penalties

- No open items were identified before straw poll of August 3rd

- [2] is the only 50 Gb/s PCS/PMA baseline proposal

Straw poll 4: 50 Gb/s PCS/PMA proposal

		A	B	C	D	E	
	Answers	Yes	No	A: info	A: exp	A: neutral	N/A
Totals per response		21	3	10	4	7	5
Total of participants		50	50	50	50	50	50
Percentages		42.00 %	6.00 %	20.00 %	8.00 %	14.00 %	10.00 %
Yes / (Yes + No)		87.50 %					
Yes / (Yes + No + A:info)		61.76 %					

- Abstentions because more information is needed:

  - Richard Pitwon Resolute Photonics

  - Michikazu Aono - Yazaki

  - Masato Shiino, FURUKAWA

  - Yasuhiro Hyakutake, Adamant Namiki Precision Jewel

  - Nobuyasu Araki YAZAKI

  - Tomohiro Kikuta Adamant Namiki Precision Jewel Co., Ltd.

  - Manabu Kagami - NITech

  - Taiji Kondo, MegaChips

  - Hideki Isono Fujitsu Optical Components

  - Takehiro Hayashi HAT Lab - independent

- Negative votes:

  - Takeo Masuda [OITDA/PETRA]

  - Shigeru Kobayashi, AIO Core

  - Hideki Goto Toyota

- **Which specific information should be added to this proposal?**

- **What are the specific arguments against this proposal?**

References

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- [2] R. Pérez-Aranda, "50GBASE-AU baseline proposal," May 2021, [Online], Available: https://www.ieee802.org/3/cz/public/11_may_2021/perezaranda_3cz_03_110521_50Gbps_pcs_pma.pdf

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Thank you