(Approved 16 July 2013)
IEEE P802.3bn EPoC PHY Task Force
May 15-17, 2013,
Victoria, BC, Canada
Chair: Mark Laubach
Recording Secretary: Duane Remein

Summary:

The P802.3bn EPOC Task Force met for 3 days in Victoria BC. A total of 30 presentations were reviewed and 23 Technical motions were passed; including 3 baseline proposals, and 5 baseline starting points. A motion was passed to create an initial draft document for presentation in the next meeting (Geneva). A summary of decisions can be viewed at decisions and baseline proposals.

Wednesday 5/15/13

8:10 The Chair called the meeting to order

Motion #1

Motion to approve the minutes from 19-21 March 2013, Orlando
Moved: Victor ~~Hau~~ Hou
Second: Tom ~~Stannic~~ Staniec
Procedural (> 50%)
Motion Passed by Voice without opposition

Motion #2

Motion to approve the amended Agenda for the meeting
Moved: Marek Hajduczenia
Second: Ed Mallette
Procedural (> 50%)
Motion Passed by Voice without opposition

Opening Mark Laubach Broadcom

The Chair noted that IEEE copyright material should not be submitted to the reflector. The following topics were reviewed: Decorum, goals for meeting, Reflector & WEB page, meeting ground rules, and IEEE Structure.

8:20 AM Essential patents

The Chair reviewed the IEEE Patent Policy and made a call for potentially essential patents. No responses were made.

Introductions and declaration of affiliations was held. Information on IMAT Attendance tool and sign-in sheet was announced. No new liaisons or communications were received. It was noted that conference calls are being held for Chinese and Japanese communities.

The Chair noted that several ePolls have been held with very little participation. The ePoll is intended to build consensus and participation is strongly encouraged. A short discussion on use of this tool was held.

There is a movement within the 802.3 Working Group to move the reference point for error performance to the "FEC service interface" and to add a statement regarding Mean Time to False Packet Acceptance (MTTFPA). This is likely to come to the Task Force during the next meeting.

The Chair noted that the Task Force needs to continue the good productivity made during the last meeting.

Opening Report: TDD ad hoc Steve Shellhammer Qualcomm
Summary of TDD ad hoc activities since the last meeting and plans for this meeting.

Opening Report: Channel Model ad hoc Duane Remein Huawei
Summary of Channel Model ad hoc activities since the last meeting and plans for this meeting.

Opening Report: Evaluation and Requirements ad hoc
Steve Shellhammer Qualcomm
Summary of Evaluation and Requirements ad hoc activities since the last meeting and plans for this meeting.

Opening Report: MMP ad hoc Saif Rahman for Jorge Salinger Comcast
Summary of MMP ad hoc activities since the last meeting and plans for this meeting. There was some discussion on what constitutes a Profile and if the FEC should be part of a Profile or not.

Opening Report: PHY-Link ad hoc Mark Laubach for Ed Boyd Broadcom
The Chair was assumed by Steve Shellhammer during this presentation and returned to Mark Laubach at the conclusion. Summary of PHY-Link ad hoc activities since the last meeting and plans for this meeting.

Opening Report: RF Spectrum ad hoc Steve Shellhammer Qualcomm
Summary of RF Spectrum ad hoc activities since the last meeting and plans for this meeting.

EPoC PCS Status Update (Clause 101) Marek Hajduczenia ZTE
Overview of proposed structure for Clause 101 (RS/PCS).

Clause 102 preview Duane Remein Huawei
Preview of Clause 102 draft to help familiarize the Task Force with this material. Editorial comments are welcome.

Baseline proposal for RS for EPoC Marek Hajduczenia ZTE
Proposal for Clause 101 baseline material.

Baseline proposal for RS for Clause 101 Marek Hajduczenia ZTE
Proposal for Clause 101 baseline material section 101.2

Baseline Proposal Addressing Technical Decision #20 (line code for EPoC)
Marek Hajduczenia, Ed Boyd ZTE, Broadcom
Proposal for Clause 101 baseline material for 64/66 encoder/decoder. Also see material in private area.

Baseline Proposal Addressing Technical Decisions #45 and #43 (idle processing…)
Marek Hajduczenia, Andrea Garavaglia ZTE, Qualcomm

Proposal for Clause 101 baseline material on rate adaptation functions. Also see material in private area.

Baseline Proposal for technical decision #44

Andrea Garavaglia, Marek Hajduczenia Qualcomm, ZTE

Proposal for Clause 102 baseline material covering rate adaptation. Also see material in private area.

11:45 AM Recessed for lunch

1:10 PM Reconvene, The Chair was assumed by Steve Shellhammer.

Downstream Continuous Pilot Proposal Christian Pietsch, et al Qualcomm et al

This presentation (given by Leo Montreuil) provided additional details on option 2 of the downstream pilot proposal given in Orlando. Specific details on Pilot positioning was given. It was noted that additional pilots not covered in this presentation are intended to border the exclusion bands.

Framing for EPoC Continuous Downstream

Marek Hajduczenia, et al ZTE et al

This presentation discussed alignment of 64b/65b data vectors with FEC codewords. It was proposed that the FEC codewords be identified via a pointer in the PLC. There was some discussion about imbedding the pointer in the data stream rather than putting this in the PLC.

Burst Markers in EPoC Syed Rahman Huawei

This presentation suggested a burst markers scheme based on power detection. Essentially the marker sequence includes nulled carriers; this provides better detection than a typical correlation mechanism.

2:35 PM TDD sub-Task Force convened

Local Grant Identification for EPOC TDD Andrea Garavaglia Qualcomm

This presentation provided an improved method for generating the Local GATE for TDD downstream.

EPoC TDD – Data Detector and Downstream PCS Considerations

Andrea Garavaglia, Patrick Stupar Qualcomm

This presentation described how a data detector function could work in the TDD downstream. Also see material in private area.

4:07PM TDD sub-Task Force adjourned, Mark Laubach resumed chair

The chair summarized the day's work.

- A motion is expected to initiate the draft (action Duane Remein).
- There was a statement that parties interested in PCS/PMA and PMA/PMD interfaces should get together informally; Bill Keasler will organize this effort.
- A motion is expected on 64b/66b encoder/decoder (wording of the proposed motion was refined).
- Interested parties on FEC soft/hard output with respect to line coding should discuss this topic.
- Several motions are expected on Idle Insertion proposals discussed.
- Several straw polls are expected on downstream framing.
- A straw poll is expected on Local GATE identification.

Motion #3(tabled by Motion #4)

Move to:

- Adopt hajduczenia_3bn_04_3bn_0513.pdf (content of subclauses 101.3.2.2 and 101.3.3.6) as baseline for draft for 64b/66b encoder and decoder processes, respectively.
- Sync header truncation (in Tx direction) before the encoder and expansion (in the Rx direction) after the decoder.

Moved: Marek Hajduczenia
Second: Eugene Dai

Motion #4

Move to table motion #3
Moved: Victor Hou
Second: Tom Staniec
For: 14
Against: 9
Abstain: 4
Procedural (> 50%)
Motion Passed

4:45 PM PHY-Link ad hoc convened, Steve Shellhammer assumed Chair

Downstream PLC Baseline Proposal Mark Laubach, Ed Boyd Broadcom

This presentation summarized much of the work done in the PHY-Link ad hoc since the last meeting and included a motion to accept this work as baseline.

4:00 PM Mark Laubach resumed the Chair

EPOC Upstream PHY Link Channel and Channel Probing

Christian Pietsch for Ed Boyd et al Broadcom, et al.

This presentation (given by Christian Pietsch) discussed the upstream PHY-Link briefly and included a deeper discussion of upstream channel probing.

5:45 PM The Task Force recessed for the day.

Thursday 5/16/13

8:05 AM The Task Force reconvened.

Details on Downstream PLC for TDD mode Christian Pietsch for Nicola Varanese Qualcomm

This presentation (given by Christian Pietsch) discussed the PHY-Link and TDD mode.

The Task Force further discussed the proposed motion regarding “Use boyd_3bn_02_0513.pdf slides 2-8 …” (see Motion #13)

8:45 AM PHY-Link ad hoc work concluded

Details on Upstream Pilots and Resource Block Configuration for EPoC
Christian Pietsch, Avi Kliger Broadcom, Qualcomm
The presentation followed up on one given in Orlando and discussed details of upstream pilots and resource blocks.

Coax Resource Allocation & Tone Reordering Duane Remein Huawei
This presentation suggested a type of frequency interleaving so as to achieve a level capacity channel making 1D to 2D GATE translation easier. Feedback was mostly positive.

Upstream Ranging Proposal (Part 1) Leo Montreuil for Avi Kliger et al Broadcom et al
This presentation suggested a ranging process with several steps. The intent is to limit the time/capacity required for the ranging process.

Wideband Probing (Part 2) Leo Montreuil for Avi Kliger et al Broadcom et al
This presentation builds on "Upstream Ranging Proposal (Part 1)" and addresses ongoing maintenance of ranging and OFDM synchronization using pilots.

Simulation results for Upstream probing in EPoC
Syed Rahman Huawei
This presentation suggested a probing mechanism that allows probing multiple CNUs simultaneously.

EPoC Upstream FEC Efficiency Rich Prodan, Ed Boyd Broadcom
This presentation discussed FEC and its relation to upstream bursts. It suggested that several FEC codewords of varying lengths be used within a burst to minimize foreshortening and optimize efficiency.

EPOC Upstream FEC Code Auto-Detection Hesham ElBakoury Huawei
This presentation, like "EPoC Upstream FEC Efficiency", concluded that using multiple FEC sizes in a single burst has significant advantages. It also proposed a method to detect the FEC codeword size at the receiver.

12:07 PM Recessed for Lunch

1:35 PM Reconvene, RF Spectrum ad hoc, Steve Shellhammer presiding

Two Classes of Downstream Frequency Band
Keiji Tanaka, Naoki Agata KDDI
This presentation provided some concerns and needs of the Japanese community on RF Spectrum. The Japanese MSOs have a strong desire to use RF Spectrum up to 2.6 GHz.

Straw Poll #1

Definition
Exclusion Sub-band: a set of k adjacent subcarriers indexed [m, m+1, … m+k-1], which are configured via MDIO to have zero amplitude.
Do you support the above as a working definition of "Exclusion sub-band"?
Yes: 28
No: 0

Straw Poll #2

Define three different types of exclusions:
- Individual exclusion subcarriers
- Internal exclusion sub-bands
- Band edge exclusion sub-bands

Do you support the above working definitions of exclusion types?

Yes:	23
No:	7

Tom Kolze volunteered to bring information on individual exclusion subcarriers to the Task Force, either via the RF Spectrum ad hoc or to the next Task Force meeting.

Straw Poll #3

Downstream Exclusion sub-bands question:
Do you support the following statement?
- Shall support 2 downstream band edge exclusion sub-bands, in a single 192 MHz OFDM Channel, in the transmitted signal.

Yes:	27
No:	0

Straw Poll #4 (this straw poll number was skipped)

Straw Poll #5

Downstream Exclusion sub-bands question:
Do you support the following statement?
The standard shall support a maximum number of internal exclusion sub-bands, in a single 192 MHz OFDM Channel in the transmitted signal?

Yes:	22
No:	5

3:10 PM RF Spectrum ad hoc adjourned, Mark Laubach resumed the Task Force chair.

Downstream FEC Rich Prodan (et al.) Broadcom (et al.)

This joint presentation discussed use cases of FEC for both low and high bands. It suggested that eight FEC codes be allocated into 4 groups with 3-4 FEC codes in each group for combinations of US/DS, low/high band and passive/active plant (DS low band Active and US high band not addressed).

Motions & Straw Polls

Motion #5

Move to accept the prodan_3bn_01_0513.pdf as the starting point for EPoC FEC.
Moved: Jorge Salinger
Second: Ed Mallette
For: 32
Against: 0
Abstain: 0
Technical (≥ 75%)
Motion Passed

Motion #6

Moved to take Motion #3 off the table
Moved: Mark Laubach
Second: Duane Remein
Procedural (> 50%)
Motion Passed by Voice without opposition

Motion #3

Move to:

- Adopt hajduczenia_3bn_04_3bn_0513.pdf (content of subclauses 101.3.2.2 and 101.3.3.6) as baseline for draft for 64b/66b encoder and decoder processes, respectively.
- Sync header truncation (in Tx direction) before the encoder and expansion (in the Rx direction) after the decoder.

Moved: Marek Hajduczenia
Second: Eugene Dai
For: 29
Against: 0
Abstain: 3
Technical (≥ 75%)
Motion Passed

Motion #7

Move to: Adopt hajduczenia_3bn_01_3bn_0513.pdf (content of subclauses 101.3.2.1 and 101.3.3.7) as baseline for draft for Tx Idle Deletion and Rx Idle Insertion functions, respectively.
Moved: Marek Hajduczenia
Second: Andrea Garavaglia
For: 29
Against: 0
Abstain: 3
Technical (≥ 75%)
Motion Passed

Motion #8

Move to: Adopt garaevaglia_3bn_02a_0513.pdf (content of sub-clause 102.2.2) as baseline for the draft for Tx Idle Insertion at MPCP Multiple Control Multiplexer.
Moved: Andrea Garavaglia
Second: Marek Hajduczenia
For: 24
Against: 0
Abstain: 5
Technical (≥ 75%)
Motion Passed

Straw Poll #6

I support the Upstream probing including the ability to use scattered pilots as described in rahman_syed_3bn_02[a]_0513 slides 2 & 6.]
Yes: 12
No: 4
Abstain: 5
Too soon to decide: 10

[Chair's note: original straw poll text referenced rev 02b which was incorrect. The only rev posted and available is rev 02a. Confirmed with author on 5/30/13]

Straw Poll #7

Which of the following approaches do you prefer from "Local Grant Identification for EPOC TDD" garavaglia_3bn_04_0513
Solution 1 (new MAC control address)
Solution 2 (adding a new primitive for local grant):
Solution 3 (extending existing primitive to include local grant):
Solution 1: 0
Solution 2: 18
Solution 3: 1
Abstain: 10

Motion #9 (tabled by Motion #10)

Move that in the EPoC continuous downstream a 65 bit vector (shortened 64b/66b encoded vector) shall not be split across FEC codewords.
Moved: Marek Hajduczenia
Second: Jorge Salinger

Motion #10

Move to table Motion #9
Moved: Tom Kolze
Second: Victor Hou
For: 12
Against: 7
Abstain: 8
Procedural (> 50%)
Motion Passed

Motion #11

Move that in the EPoC Continuous downstream PHY, the PLC shall transmit (either in all or some PLC frames) a pointer in bits to identify the start of the first complete FEC codeword in the following PLC frame.
Moved: Marek Hajduczenia
Second: Eugene Dai
For: 29
Against: 0
Abstain: 1
Technical (≥ 75%)
Motion Passed

Motion #12

Move to: Adopt garaqvaglia_3bn_05_0513.pdf (content of sub-clause 102.3.5) for the method for Local Grant Identification for EPOC TDD.
Moved: Andrea Garavaglia
Second: Duane Remein
For: 18
Against: 0
Abstain: 11
Technical (≥ 75%)
Motion Passed

Motion #13

Use boyd_3bn_02_0513.pdf slides 2-8 as starting point for the development of the PHY Link baseline (use of multiple RF Channels is for further study).
Moved: Saifur Rahman
Second: Bill Powell
For: 31
Against: 0
Abstain: 0
Technical (≥ 75%)
Motion Passed

Motion #14

Move to adopt the Channel model parameter lists and topology illustrations shown in howald_3bn_02_0313.pdf slides 7-20 as exemplar channel conditions for the associated topologies (Node+6, Node+3 with digital distribution, Node+3 with analog distribution, and Node+0< 1GHz).
Moved: Duane Remein
Second: John Ulm
For: 27
Against: 0
Abstain: 2
Technical (≥ 75%)
Motion Passed

Motion #15

Move to define Exclusion Sub-band as a set of k adjacent subcarriers indexed [m, m+1, … m+k-1], which are configured to have zero amplitude.
Moved: Steve Shellhammer
Second: Duane Remein
For: 22
Against: 2
Abstain: 2
Technical (≥ 75%)
Motion Passed

Motion #16

"Move to define two different types of exclusion sub-bands:
- Internal exclusion sub-bands
- Band edge exclusion sub-bands
to define two different types of individual exclusion subcarriers:
- individual exclusion subcarriers which have zero amplitude
- exclusion subcarriers which are pilots"
Moved: Tom Kolze
Second: Ravi Rajagopal
For: 20
Against: 2
Abstain: 5
Technical (≥ 75%)
Motion Passed

Motion #17

Call the question motion 16
Moved: Duane Remein
Second: Jorge Salinger
Procedural (> 50%)
Motion Passed by Voice without opposition

Motion #18

Move that the standard will support 2 separate downstream band-edge exclusion sub-bands, in a single 192 MHz OFDM Channel, in the transmitted signal.

Moved: Saifur Rahman
Second: Tom Kolze
For: 26
Against: 0
Abstain: 2
Technical (≥ 75%)
Motion Passed

Straw Poll #8

The minimum width of an internal exclusion sub-band is 1 MHz.

Yes: 26
No: 1
Too Early: 3

Motion# #19

Move that the minimum width of a downstream internal exclusion sub-band is 1 MHz.

Moved: Bill Powell
Second: Saifur Rahman
For: 24
Against: 2
Abstain: 1
Technical (≥ 75%)
Motion Passed

Straw Poll #9

The standard shall support 6 internal exclusion sub-bands, in a single 192 MHz OFDM channel, in the transmitted signal.

Yes: 14
No: 6
Too early to decide: 7

Straw Poll #10

The standard shall support a fixed integer number of ~~integer~~ internal exclusion sub-bands, in a single 192 MHz OFDM channel, in the transmitted signal.

Yes: 23
No: 0
Too early to decide: 3

Motion #20

Move that the standard shall support a fixed integer number of ~~integer~~ internal exclusion sub-bands, in a single 192 MHz OFDM channel, in the transmitted signal.

Moved: Leo Montreuil
Second: Eugene Dai
For: 26
Against: 1
Abstain: 1
Technical (≥ 75%)
Motion Passed

Motion #21

Move to take motion #9 off the table

Moved: Tom Kolze
Second: Tom Staneic
For: 24
Against: 3
Abstain: no count
Procedural (> 50%)
Motion Passed

Motion 9

Move that in the EPoC continuous downstream a 65 bit vector (shortened 64b/66b encoded vector) shall not be split across FEC codewords.

Moved: Marek Hajduczenia
Second: Jorge Salinger
For: 25
Against: 0
Abstain: 1
Technical (≥ 75%)
Motion Passed

Motion #22

Presentation "kliger_3bn_02_0513.pdf" shall be adopted as a refinement of the proposal on continual pilots contained in "pietsch_3bn_01_0313.pdf", which was adopted as a starting point towards a baseline proposal for the downstream pilot structure.

Moved: Christian Pietsch
Second: Ravi Rajagopal
For: 24
Against: 0
Abstain: 4
Technical (≥ 75%)
Motion Passed

Motion #23

Move to recess until 8:00 AM
Moved: Victor Hou
Second: Duane Remein
For: 20
Against: 9
Abstain: no count
Procedural (> 50%)
Motion Passed

Motion #24

Adopt presentation "pietsch_3bn_01_0513.pdf" as a refinement of the original presentation "kliger_3bn_01_0313.pdf". "pietsch_3bn_01_0513.pdf" is the a new starting point towards a baseline proposal for the resource block configuration and upstream pilot structure.
Moved: Christian Pietsch
Second: Ravi Rajagopal
For: 20
Against: 0
Abstain: 1
Technical (≥75%)
Motion Passed

7:35 PM the task force recessed for the day

Friday 5/17/13

8:15 AM the Task Force reconvened

Motion #25

The downstream PLC shall be placed such that there is at least 3 MHz of contiguous spectrum on either side of the center of the PLC.
Moved: Christian Pietsch
Second: Leo Montreuil
For: 22
Against: 0
Abstain: 0
Technical (≥ 75%)
Motion Passed

Motion #26

The cyclic prefix duration is configurable and is independently chosen for the downstream transmission and the upstream transmission. The allowed values for the downstream and the recommended values for the upstream are listed in the tables. (Reference: pietsch_3bn_02_0313.pdf slide 2)

Moved: Christian Pietsch
Second: Saifur Rahman
For: 23
Against: 0
Abstain: 1
Technical (≥ 75%)
Motion Passed

Motion #27

Each CNU shall configure transmit pre-equalization based on feedback from the CLT. (Reference: montreuil_01_0512.pdf and kliger_01a_0912.pdf)

Moved: Christian Pietsch
Second: Leo Montreuil
For: 25
Against: 0
Abstain: 0
Technical (≥ 75%)
Motion Passed

Motion #28

Move to adopt kliger_3bn_01_0513.pdf as the starting point for developing a baseline proposal for upstream ranging for EPoC.

Moved: Leo Montreuil
Second: Ravi Rajagopal
For: 24
Against: 0
Abstain: 0
Technical (≥ 75%)
Motion Passed

Motion #29

Move to adopt montreuil_3bn_01a_0513.pdf as the starting point for developing a baseline proposal for upstream channel probing sequence for EPoC.

Moved: Leo Montreuil
Second: Ravi Rajagopal
For: 25
Against: 0
Abstain: 0
Technical (≥ 75%)
Motion Passed

Motion #30

Move that any downstream continuous pilots bounding exclusion sub-bands are in addition to the continuous pilots specified by kliger_3bn_02_0513.pdf (i.e., continuous pilots bounding exclusion sub-bands are not counted as part of the required number of pilots on slide 5 of the aforementioned document).

Moved: Ravi Rajagopal
Second: Christian Pietsch
For: 22
Against: 0
Abstain: 1
Technical (≥ 75%)
Motion Passed

Motion #31

Move that the P802.3bn Task Force authorizes the editors to create a Draft version 0.1 of the EPoC standard for presentation at the July meeting. Draft to include all baseline material to date.

Moved: Duane Remein
Second: Eugene Dai
For: 26
Against: 0
Abstain: 0
Technical (≥ 75%)
Motion Passed

Closing

The Chair reviewed the list of Consensus Challenged Items. Several items were added to the list and target topics for the July meeting were identified.

Future meetings

July 15th Geneva
Sept 2nd York
Nov Dallas
The chair surveyed the group on July & meeting attendance

The Chair adjourned the meeting without opposition after the agenda was exhausted.

Meeting Attendance

The following represents the meeting attendance as initialed in the attendance binder that was passed around the meeting each day. 36 individuals indicated their attendance for this meeting.

Lastname	Firstname	Employer (Affiliation)	Wed	Thu	Fri
Allard	Michel	Cogeco Cable	X	X	X
Arunarthi	Venkat	Cortina Systems	X	X	X
Brophy	Tim	Cisco	X	X	X
Chang	Xin	Huawei		X	
Coldren	Rex	Alcatel-Lucent	X	X	
Dai	Eugene	Cox	X	X	X
Darling	Mike	Shaw Cable	X	X	X
ElBakoury	Hesham	Huawei	X	X	X
Garavaglia	Andrea	Qualcomm	X	X	X
Hajduczenia	Marek	ZTE Corp	X	X	X
Hou	Victor	Broadcom	X	X	X
Keasler	Bill	Ikanos Communications	X	X	
Ko	Dylan	Qualcomm	X	X	X
Kolze	Tom	Broadcom	X	X	X
Laubach	Mark	Broadcom	X	X	X
Lessard	Andre	Commscope	X	X	X
Mallette	Edwin	Bright House Networks	X	X	
Montreuil	Leo	Broadcom	X	X	X
Peters	Michael	Sumitomo	X	X	X
Pietsch	Christian	Qualcomm	X	X	X
Powell	Bill	Alcatel-Lucent	X	X	X
Prodan	Rich	Broadcom	X	X	X
Rahman	Saifur	Comcast	X	X	X
Rahman	Syed	Huawei	X	X	X
Rajagopal	Ravikiran	Broadcom	X	X	X

Lastname	Firstname	Employer (Affiliation)	Wed	Thu	Fri
Remein	Duane	Huawei	X	X	X
Salinger	Jorge	Comcast	X	X	X
Schmitt	Matt	CableLabs	X	X	X
Shan	Peijun	Acacia Communications	X		
Shellhammer	Steve	Qualcomm	X	X	X
Shen	BZ	Broadcom	X	X	X
Staniec	Thomas	Cohere Networks	X	X	X
Tanaka	Keiji	KDDI	X	X	X
Ulm	John	ARRIS	X	X	X
Wang	Allen	Huawei	X		
Yanbin	Sun	Huawei	X	X	X