(Unconfirmed Minutes)
IEEE 802.3 EPON Protocol over Coax (EPoC) PHY Study Group
January 24-25th 2012,
Fairmont Newport Beach, California.
Chair: Howard Frazier
Recording Secretary: Hesham ElBakoury

Tuesday, January 24th, 2012

Meeting was called to order at 9AM PST.

David Law (802.3 Chair) held a confirmation vote for the Study Group Chair
Moved to confirm Howard Frazier as Study Group Chair
Moved: Marek Hajduczenia
Seconded: Mark Laubach
For: 68
Against: 0
Abstain: 0
Motion Passes

Mr. Frazier asked the attendees to introduce themselves and announce their affiliation.
No one from press attended the meeting.

MOTION #1

Approve the agenda.
M: Hugh Barrass
S: Duane Remein
Passed by voice vote without opposition

ADMINISTRATIVE MATTERS

Mr. Frazier asked if anyone wants to change the order of the presentation.
No one wanted to change the order of presentations as shown below along with the expected duration of each presentation.

- John D'Ambrosia – Dell - Introducing the 5 Criteria - 30
- Hugh Barrass and Howard Frazier – Guidelines for project objectives - 30
- Steve Shellhammer – Qualcomm - Questions on EPOC Technical Requirements - 45
- Mark Laubach – Broadcom - A View on Scope, Assumptions, and Needs - 30
- Edwin Mallette - Bright House Networks - Hybrid Fiber Coax, and EPON over Coax - 30
- Mark Laubach & Matt Schmitt - - Evaluation Criteria - 30

- Robert Howald – Motorola - Implications of New RF PHYs and Supporting Architectures for HFC Equipment Vendors - 20
- Boris Brun - Harmonic - HFC: New PHY- coexistence concerns and network limitations – 30
- Peter Wolff - Titan Photonics - Spectrum Proposal for EPoC - 20
- Mark Laubach - Broadcom - A first look at Modeling EPoC on Cable – 40
- Steve Shellhammer - Qualcomm - Project Authorization Request (PAR) Recommendations – 45

Mr. Frazier introduced the Working Group decorum as described in his presentation: http://www.ieee802.org/3/epoc/public/jan12/agenda_0112b.pdf

Mr. Frazier mentioned that the three main goals of the meeting are:

- Review IEEE 802.3 standards process tutorials
- Hear Presentations
- Begin work on PAR, 5 Criteria and Objectives.

Mr. Frazier noted that EPoC reflector is a healthy reflector with More than 140 subscribers.

Mr. Frazier noted that currently no private area is set up yet for the study group. Only members can access this area using a password.

Mr. Frazier went through IEEE 802.3 rules which are based on Robert's Rules of Order.

Mr. Frazier noted that since this is Study Group anyone in the room can vote.

Mr. Frazier made it clear that mutual respect between study group members is very important.

Mr. Frazier explained IEEE Structure.

Mr. Frazier went through important Bylaws and Rules.

Mr. Geoff Thompson read the IEEE-SA patent policy.

Mr. Frazier performed the call for potentially essential patents.

No response was received for the Call for potentially essential patents.

Mr. Frazier noted that the EPoC Study Group meeting is one of several meetings. The function of the Study Group (SG) is to draft a complete PAR, 5 Criteria, and objectives, and to gain approval for them at the WG, LMSC EC, IEEE-SA New Standards Committee (NesCom) and the IEEE Standards Board. The PAR is a contract of sorts between the IEEE 802.3 working group and the standards association.

Mr. Frazier noted that Study Group does not pick solutions, it defines problem and requirements. Once a PAR has been approved, a Task Force will be formed to identify and write a draft standard for a solution.

Mr. Frazier noted that EPoC Study Group will produce an amendment to IEEE 802.3

Mr. Frazier explained the IEEE 802 balloting process.

Mr. Frazier confirmed that he would like to see healthy relationships with other standards body.
Mr. Frazier noted that in this meeting there are no incoming Liaison letters. However, Mr. Frazier noted that we will see if we will have outgoing letters on Wed.

Mr. Frazier said: Do not use Questions/comments to deliver a counter presentation, instead, as for time to make a presentation of your own.

Mr. Frazier mentioned that he does not expect to conduct votes on any major issues in this meeting.

Break at 10:30
Reconvened at 10:45.

Presentation: Review of the 5 Criteria
Presenter: John D'Ambrosia – Dell
Mr. D'Ambrosia presented the 5 Criteria and provided guidelines to prepare the 5 criteria presentations (one slide per criteria).
Mr. D'Ambrosia noted that the group should Learn it Live it and Love it (LLL) and use 5 criteria of other successful projects as examples. The 5 criteria are:

- Broad Market Potential
- Compatibility
- Distinct Identity
- Technical feasibility
- Economic Feasibility

Mr. D'Ambrosia noted that all 5 criteria MUST be met. They are reviewed and approved (individually) by the working group. They are subject to review and approval by each and every other working group in IEEE 802. They are reviewed and approved by the IEEE 802 executive committee.
Mr. D'Ambrosia noted that 75% approval is required.

Mr. Thompson explained the main IEEE 802 principles:

- Management by no surprises.
- Think in depth
- 3 criteria are intricately related: broad market potential, economic feasibility and technical feasibility.
- 5 criteria must be satisfied **simultaneously.**
- The goal of the group is to create a standard that has successful market.

Mr. Frazier confirmed that WG may provide permission to submit PAR 30 days in advance to EC in the same plenary in which the WG should approve/disapprove the PAR.

Mr. Frazier noted that Straw polls are often used to measure consensus. However, sometimes straw poll may succeed but a similar motion fails.

Presentation: Guidelines for Project Objectives

Presenter: Hugh Barrass – Cisco

These are the key points that Mr. Barrass made in his presentation:

- Objectives represent a distilled set of high-level technical requirements.
- Objectives are created by the study group, approved by the parent working group, and are fulfilled by the task force
- Objectives are consistent with the scope.
- One power point slide for objectives/requirements.
- The hardest part of the work of this group is to develop objectives.
- Objectives are problem statements not solution statements.
- Try to get consensus above 75% if at all possible.

Mr. Frazier encourages EPoG group to write presentations that address themselves to objectives or 5 criteria.

Mr. Frazier requests extremely rigorous technical presentations (substantiated with models, simulations, test results). --- rigor is measured by approval vote of 75% or more.

Presentation: Questions on EPoC Technical Requirements

Presenter: Steve Shellhammer – Qualcomm

- In this presentation Mr. Shellhammer provided a number of questions regarding EPoC technical requirements/objectives. These questions are related to spectrum allocation, what bandwidth and the minimum and maximum spectral efficiency the standard should support, spectrum bandwidth allocation, channel bandwidth, what is the range of cable plant characteristics we should support, what channel models we should use for the coax PHY given the characteristics of the cable plant, the distance between CLT and CNU, and what are the coexistence requirements that the standard should support.
- Mr. Shellhammer proposed that EPoC need to support multiple spectrum plans including, paired spectrum (FDD) and unpaired spectrum (TDD).
- Mr. Shellhammer noted that we should develop one configurable PHY that provides the flexibility to support different spectrum plans for different operators.
- Mr. Paul Nikolich asked how many CNUs can connect to CLT, Mr. Shellhammer said this needs to be determined.
- Mr. Thompson asked does individual subscriber can have different bands? Mr. Shellhammer said may be.
- Mr. Hal Roberts (Calix) noted that the DOCSIS RF channel assumptions were based on the HFC systems where EPoC is going to be deployed. The channel assumptions will have to be reviewed and probably modified as they are old. However they provide a place to start to define EPoC channel models.
- Mr. Michail Tsatsanis from Entropic indicated that we need to address PHY efficiency using frame aggregation to reduce MAC overhead.
- Mr. Matt Schmitt from Cablelabs asked what is the process to address these questions? Mr. Frazier said using presentations which provide proposals for objectives.
- Mr. Chano Gomez from Lantiq asked do we have to use EPON MAC or we just use something that looks like EPON MAC for the outside world ?

- Mr. Bill Powell (ALU) asked EPON protocols can handle FDD, but how it can handle TDD?
- Mr. Jorge Salinger: asked how many of these questions we need to answer before we can write objectives? Mr. Frazier said we should use Mr. Barrass' presentation as a guide to help develop objectives.

Presentation: A View on Scope, Assumptions, and Needs
Presenter: Mark Laubach – Broadcom

- Mr. Laubach provided a review of EPoC CFI, the scope of the project, the 4 coaxial cable network topologies that we need to study, and the fundamental assumptions behind the development of EPoC coax PHY.
- Mr. Laubach noted the fact that a key function of EPoC Study group is to determine '*Plausibility*' i.e. what can be done given the study group 'sandbox' and assumptions.
- Mr. Laubach presentation calls for additional contributions to address EPoC objectives.
- Mr. Laubach noted that since the primary users of EPoC are Cable Operators, we need to understand the requirements of US and international MSO.
- Mr. Laubach also noted that finding one answer for spectrum allocation is difficult. To support flexibility in spectrum allocation, CNUs should be able to discover their frequencies.
- It is noted that If EPON gets certified at a certain level, EPoC needs to be certified at the same level.
- Mr. Laubach indicated that EPoC standards may be used by other standards organizations like IEEE 802.1, Cablelabs, SCTE, and SARFT.
- Slide #17 shows CNU at the demarcation point between MAN and home LAN. **Mr. Thompson said it is commonly believed that a router is the device that exists between provider and user.** This implies that CNU in this slide may provide a routing function.
- Mr. Salinger (Comcast) noted that MxU support is not an issue for Comcast. In majority of the cases Comcast (and probably all NA operators) build their own networks inside MxU
- Mr. Laubach noted that since IP services will run over EPoC, we need to determine the QoS requirements of these services.
- Mr. Thompson noted that in Slide #19 we should not show media converter since there is no IEEE 802.3 standard for media converter. Mr. Thompson also noted that if we use an ONU and CLT as shown in the top scenario of slide #8, the combined ONU and CLT provide bridging function.
- Mr. Ed Mallette (BHN) indicated that he would like OLT at the head-end to *transparently* manage ONU and CNU using the same EPON protocols. Mr. Laubach asked for contributions on EPoC transparency models.
- Mr. Laubach plans to change the diagram in slide #8 to make it industry standard diagram.

Presentation: Hybrid Fiber Coax and EPON over Coax
Presenter: Edwin Mallette – BHN

- Mr. Mallette presented the need for EPoC and the fact that it must operate over the existing HFC network.
- Mr. Mallette presented BHN HFC network topology configurations and amplification.

    - Mr. Mallette noted that we may need to change or bypass AMPs based on spectrum allocation.
    - Mr. Mallette mentioned that EPoC MUST support Node+3 requirements.
- Mr. Mallette presented two options for spectrum allocations, namely, Low-Split and Mid-Split.
- Mr. Mallette presented two requirements:
    - Business and residential services MUST co-exist on the same EPoC network.
    - EPoC must support Symmetric and Asymmetric services.
        - Mr. Hajduczenia asked what is the ratio of asymmetry?, Mr. Mallette answered 1:8.
- **Mr. Hal Roberts (Calix) noted that using 24MHz channels with 240Mbps per channel is a good start.**
- Mr. Mike Emmendorfer: asked what is the desired data rate upstream and downstream? Mr. Mallette said we start with 1Gbps.
- **Mr. Jeff Finkelstein (Cox) noted that we should make sure that spectrum allocation is flexible enough that it will not hinder our future bandwidth plans**.

Presentation: Evaluation Criteria
Presenter: Matt Schmitt – Cablelabs

- The presentation is essentially a Call for future contribution.
- Mr. Schmitt described hard and soft criteria to evaluate and select proposals. These criteria are primarily based on EPoC CFI and the requirements from operators around the globe.
    - Mr. Nikolich: we need input from Cablelabs and operators.
    - Mr. Frazier indicated that we may need a crash course on DOCSIS requirements.
    - Mr. Frazier also indicated that anyone can come up with a presentation on operator requirements.
- Mr. Schmitt **noted that he knows of some who are willing to deploy EPoC now if it is available.**

Presentation: Implications of New RF PHYs and Supporting Architectures for HFC Equipment Suppliers
Presenter: Robert Howald – Motorola Mobility

- The objective of the presentation is two-fold:
    - address the need for a perspective of suppliers for cable systems, and
    - make sure that the group understands the limitations of current equipment and architectures.
- There has been some discussion on whether we should develop one CPE device that supports any spectrum range (i.e. 1GHz, 2GHz, … etc).
- Mr. Eugene Dai (Cox) prefers to have one device.
- Mr. John Dickinson (BHN) prefers to develop CPE for 1GHz which can be tuned to frequencies in that range, and the later we can develop CPE devices for 2GHz range. The 2GHz CPE should be backward compatible and co-exist with the 1GHz device and share the same spectrum.
- Mr. Salinger (Comcast) and Mr. John Chapman (Cisco) agreed with Mr. Dickinson.

- Mr. Salinger (Comcast) noted that the new EPoC CPE devices should coexist with existing DOCSIS devices.

Meeting was adjourned at 5:30PM PST.

Wednesday, January 25th, 2012

Meeting was called to order at 9AM PST.

Mr. Frazier explained the process of obtaining voting rights in the IEEE 802.3 Working Group:

- Attend 2 out of 4 plenaries.
- In each plenary attend (and sign in) at least 3 days,
- Request membership in the 3rd plenary. In the opening or closing plenary of IEEE 802.3 you can request to be a voter when you see you name in the list of potential voters.
- It is allowed to substitute an interim meeting for one plenary.

Because the EPoC Study group (SG) meeting is collocated with task force meetings during the IEEE 802.3 interim, attendance in the SG counts for voting membership.

Mr. Frazier noted that in SG everyone can vote.

Presentation: HFC: New PHY coexistence concerns and network limitations
Presenter: Boris Brun – Harmonic Inc

The objective of Mr. Brun's presentation is two-fold:

- Review of HFC network architecture and its problems and weak points.
- Emphasize the importance of coexistence with legacy signals - the new PHY MUST NOT cause any damage to existing environment, therefore, we should provide a smooth introduction of new signal into the "old" HFC.

There was no discussion on Mr. Brun's presentation.

Presentation: Spectrum Proposal for EPoC
Presenter: Peter Wolff – Titan Photonics

Mr. Wolff presented proposal for spectrum allocations to cover the following cases:

- 1G DS and << 1G US.
- 1G DS and 1G US.
- 10G DS and 1 G US.
- 10G DS and 10G US.

The following considerations were discussed during the meeting:

- Mr. Dickinson (BHN), Mr. Salinger (Comcast) and Mr. Kevin Noll (TWC) emphasized that 1Gbps is enough initially for both residential and business, therefore, we can stay at 1GHz, and if someone needs 10Gbps we can use fiber all the way.
- Operators prefer to stay beyond 1GHz with 1Gbps DS and .5 Gbps US.
- Main application for 10G is business services (e.g. hospitals) and MDUs.
- Mr. Dickinson and Mr. Salinger say the main driver for EPoC is residential services since business will be challenge over coax.
- Mr. Wolf's presentation assumes that we must have exactly the 10G EPON bandwidth on the Coax. Mr. Roberts (Calix) said that we can have 10G on the PON but we can deliver 1G to 10 CLTs and each one can use 150MHz to deliver 1Gbps. In this case the combined rates of the 10 CLTs subtended from one OLT could still match the EPON PHY rate of 10G.
- Mr. Salinger (Comcast) noted that we can't put passive taps above 1.75 GHz.
- Mr. Salinger (Comcast) does not like the proposed spectrum allocations for the 1G DS/1G US and 10G DS/1G US.

Break at 9:55AM PST.
Reconvened at 10:10AM PST.

Presentation: A First Look at Modeling EPoC on Cable
Presenter: Mark Laubach – Broadcom

- Mr. Laubach presented an informal analysis model to determine the *plausible* "up-to" rate in both downstream and upstream for different HFC plant characteristics and spectrum allocations.
- Mr. Laubach noted that *plausibility* is obtained by having at least 75% approval vote.
- The objective of the informal study that Mr. Laubach presented is to answer the following questions:
  - Can EPoC deliver 1Gbps symmetric EPON MAC data rate over common types of all passive drop cable up to 300m, assuming the following cable operator provisioning:
    - EPoC downstream 850 MHz to 1000 MHz
    - EPoC upstream 1150 MHz to 1300 MHz
    - Fully loaded mix of analog TV and digital programming
    - EPoC TX electrical outputs "similar" to DOCSIS
  - What general impact do Taps and Splitters have on losses?
- Mr. Laubach noted that the example in the presentation is a contrived example (almost ideal situation). He challenges the group to build real models to help reach consensus on objectives.
- Mr. Juan Montojo-Bennassar (Qualcomm) noted that coding gains should be taken into consideration in the analysis.
- **Mr. Dickinson (BHN) would like to study spectrum allocation of 1100Mhz and below.**
- Mr. Laubach indicated that we need to study the implications of using Taps and splitters on using spectrum above 1GHz.
- Mr. Laubach indicated that we need to develop 1 PHY that supports 1Gbps and up-to 10Gbps. The PHY is configurable to support available spectrum allocations, and different rates based on spectral efficiency and bandwidth.

- Mr. Frazier noted that we are studying up-to 10Gbps in each direction to determine its feasibility
- Mr. Frazier asked for contribution to support up-to 10Gbps. He emphasized that collaboration for presentations for March plenary meeting is great idea.
- **Mr. Valentin Ossman (PMC-Sierra) asked for solution that support up-to 10Gbps**.
- **Mr. Barrass (Cisco) indicated that we should support 1Gbps, and upto 10Gbps. We should also support lower than 1Gbps as permitted by the media.**
- Mr. Thompson said if we need to change MAC we need to look at it now. Mr. Frazier said in VDSL we use the same MAC on any PHY regardless of the speed of the PHY
- Mr. Salinger (Comcast) said Comcast is not going to change cable plants to support 10Gbps**.**
- Mr. Laubach asked where we put EPoC in the spectrum**?**
- Mr. Mike Emmendorfer (ARRIS) noted that in order to take into account all sort of losses we may need more than the 150Mhz bandwidth that Mark presented.
- Mr. Laubach indicated that we need to look at relative cost of transmitter power as one of the factors for DS (and US) spectrum allocation.
- **Mr. Dickinson (BHN) and Mr. Dai (Cox) want jitter and delay to be the same or close as possible to what we have in EPON.**
- Mr. Laubach indicated that we need to study TDD example**.**

Break for lunch at 12:05PM PST.
Reconvened at 1:30PM PST.

Presentation: Project Authorization Request (PAR) Recommendations.
Presenter: Steve Shellhammer – Qualcomm

- Mr. Shellhammer noted that EPoC project is to specify an amendment to IEEE 802.3.
- Mr. Shellhammer provided recommendations for different sections of the PAR (e.g. title, scope, purpose, .. etc).
- Mr. Shellhammer recommended that the scope of the project should include support for both TDD and FDD, and MPCP extensions to support the RF PHY operation over coaxial cable.
    - Mr. Shellhammer explained that MPCP needs to change to support multiple CNU transmissions at the same time using different frequencies.
    - Mr. Powell (ALU) noted that if two CNUs send traffic at the same time, then CLT needs to handle the problem of buffering traffic received from these CNUs.
    - Mr. Duane Remein (Huawei) questioned whether simultaneous transmissions of CNUs will reduce traffic latency.
    - Mr. Thompson asked how an Ethernet MAC which is single threaded can handle simultaneous transmissions of CNUs?
    - Mr. Hajduczenia (ZTE): IEEE 802.3 will not likely accept MPCP extensions.
    - Mr. Thompson asked why we need to change MPCP if EPoC is supposed to focus on specifying a new PHY ?
    - Mr. Ossman (PMC-Sierra) said we are supposed to work only on a new coax PHY.
    - Mr. Dai (Cox): are these MPCP changes for TDD or FDD?. He noted that for TDD we may need to change MPCP and other stuff.

- Mr. Ed Boyd (Broadcom) indicated that changing MPCP to support 3 dimensions: time, frequency, TDD/FDD is complex and EPON does not support such changes.
- Mr. Shellhammer (Qualcomm) noted that MPCP changes may also be needed to control data rate, modulation and coding scheme.
  - Mr. Hajduczenia indicated that there are other ways (e.g. using OAM) to do the same thing.
  - Mr. Shellhammer agreed that using OAM in this case is acceptable.
- Mr. Frazier emphasized the fact that EPoC will NOT change Ethernet MAC sub-layer which is defined in Annex 4A. However, EPoC is allowed to change MPCP sub-layer, and OAM sub-layer as long as backward compatibility is maintained.

- Mr. Barrass (Cisco) noted that we need to get agreement from WG in whatever we want to do in EPoC.

Mr. Frazier stated that Mr. Kevin Noll said that he had some answers for us. Mr. Frazier said we discourage presentations being offered at the last minute. Mr. Frazier asked if anyone objected to having Mr. Noll present. No objection was offered..

Presentation: A High Level Perspective on EPoC Requirements
Presenter: Kevin Noll – TWC

The main points in Mr. Noll's presentation are summarized below:

- Market urgency: not 10 years – more like 2 years.
- Business applications today
- Coax fill gap where fiber is not available.
- Spectral placement: Design for uncertainty. Be flexible with spectrum.
- Mr. Noll asked the group to give MSO some proposal on what the group thinks MSO have to do, and MSO will get back with answer if it is feasible or not. Similarly MSO know what they want but do not know if it is feasible.
- Regarding speed/capacity, Mr. Noll noted that it should be greater than DOCSIS/QAM256 at the same spectral width.
- **OLT should schedule the transmission of CNUs. OLT should be the one place for management and control.**
  - **Mr. Dickinson agreed that this is required especially for DPoE.**
- We want to go digital from head-end to CNUs.
  - We need to discuss using digital transmission only – no analog.
- DOCSIS and EPoC live together.
- Main driver for EPoC is using Ethernet not just the need for higher speed.

Break at 15:30PM PST.
Reconvened at 15:45 PM PST.

No objections from EPoC group to let Mr. Jorge Salinger (Comcast) to comment and provide reflections on the topics covered by Kevin's presentation.

The key points in Mr. Salinger's presentation are:

- Comcast is still formulating its strategy.
- Mr. Doug Jones and Mr. Salinger sometimes have different opinions [Mr. Frazier reminded the group that we are individuals in IEEE 802, not company representatives.]
- Mr. Salinger is familiar with IEEE 802 processes since he participated in IEEE 802.14.
- Enormous differences in idiosyncrasies between how IEEE operates and how Comcast is used to operate regarding specifications and standards.
- Comcast spends enough time to spec the products Comcast buys. Comcast convenes working groups with equipment and silicon suppliers to develop specifications, but unlike the IEEE process these are driven and managed by Comcast based on its own goals and needs. Comcast also participates in multi-MSO efforts led by CableLabs in which CableLabs staff proceeds in a similar way.
- Mr. Salinger asked why MAC is untouchable? He noted that if we need to change it we change it.
- We are deploying DOCSIS successfully. We need more DOCSIS. We plan to deploy IP video using DOCSIS.
- Over time we will need additional DOCSIS capacity.
- DOCSIS is a viable alternative to EPoC.
- One alternative for EPoC is different MAC & PHY for DOCSIS.
- Market/Urgency:
    - 2 years seems too short. Perhaps at least 3 years is better.
    - Comcast initial goal is business applications, not residential.
- Comcast is using very expensive CPUs and equipment at the head end and Lots of fiber to support metro Ethernet services.
- Comcast is deploying EPON & DPoE for commercial customers since Comcast can provide better service using EPON.
- Comcast is deploying metro Ethernet services for residential services.
- In 65% of the cases the spectrum ends at 750, especially in places where we have more subscribers.
- Comcast is aggressively reclaiming analog spectrum; we should be done in 2 years.
- We need to find the most cost effective spectral placement to get 1Gbps.
- Comcast will hold conference calls to describe how Comcast HFC network works.
- Cable plants are moving things, for example, we move channels based on programmer's input.
- EPoC bit rates should be > 1024QAM. We should implement 12bit per HZ to get effective MAC throughput of 10bits per HZ.
- Comcast uses Node+6. Comcast does not have a plan to be smaller than N+3.
- Comcast continues to segment the network to get to N+0.
- EPoC makes sense where we plan to deploy EPON extensively.

Future Meetings:

March 2012 Plenary

- Waikoloa, HI

- March 12-15, 2012.

May 2012 Interim

- Venue T.B.D (probably somewhere east of Missisipi River).
- Week of May 14th.
- Conflict with cable conference – but we cannot move it.

July Plenary is in San Diego
September interim meeting is in Geneva
November plenary is in San Antonio.

Mr. Frazier indicated that if anyone is interested in hosting a meeting, he should contact Mr. Frazier or Mr. Steve Carlson.

Straw-polls

I will attend the March plenary
Yes: 28
I probably will attend the March Plenary
Yes: 10
I probably will not attend the March Plenary
Yes: 15
I will not attend the March Plenary
Yes: 2
I will attend the May Interim
Yes: 28
I probably will attend the May Interim
Yes: 19
I probably will not attend the May Interim
Yes: 6
I will not attend the May Interim
Yes: 0

To test the temperature of the room Mr. Frazier suggested having straw poll on two objectives.

He noted that we are not bound to this objective. If you have better wording to the objective do that in March.

The first objective is related to EPoC PHY. No rates are defined in this objective. Two proposals were made for this objective:

1. **Define a PHY for operating the EPON protocol over coaxial distribution Networks**
2. **Define a PHY for operating the EPON protocol over coaxial Distribution Network, and is protocol and timing compatible with an IEEE 802.3 EPON OLT.**

Mr. Frazier confirmed that this objective does not preclude changing MPCP

Straw-polls

40 support proposal #1
1 supports proposal #2.
4 support both proposals.
9 do not support anyone of the two proposals**.**

Mr. Salinger does not agree with this objective. He suggests taking out EPON.

The 2nd objective is related to network topology.

Mr. Frazier proposed the following text for this objective:

- Support the following network topology:
  - **Passive, "NODE + 0" (single span)**
  - **NODE + N where N <= 5 (multi span, amplified).**
  - **Hybrid Fiber/Coax:**
  - **MxU (Multiple dwelling/tenant units) -- unstructured wiring with unspecified # of AMPs.**
- Mr. Salinger suggests changing the objective to focus only on two topologies:
  - **Passive, "NODE + 0" (single span)**
  - **NODE + N where N <= 5 (multi span, amplified).**

No straw-poll was taken for this objective.

MOTION #2

Hold a teleconference meeting in 30 days
Moved: Jorge Salinger
Seconded: Kevin Noll

Mr. Carlson noted that usually we hold conference calls to resolve ballot comments, and not during the study group phase of a project.

Motion was withdrawn by the mover and seconder.

Towards the end of EPoC meeting there has been discussion on the impact of using EPON TDMA scheduling over coax.

- Mr. Montojo-Bennassar (Qualcomm) expressed the fact that using TDMA will waste bandwidth when OFDM is used over coax.
- Mr. Roberts (Calix) presented 'back of the envelope' calculations that he said showed a pure TDMA using OFDM over coax would cause the minimum data granularity to be large (i.e. multiple kilobytes) and suggested the use of OFDMA on the coax as is used in WiMAX and LTE would solve that problem.

- Mr. Thompson suggested to have an ad-hoc to study TDMA in RF domain.
- Mr. Frazier indicated that there is no need for an ad-hoc, and anyone can come in with presentations to address this issue.

Meeting was adjourned at 6:25PM PST.

List of attendees

Last name	First name	Affiliation
Abaye	Ali	Broadcom
Allard	Michel	Cogeco Cable
Baran	Dave	Aurora Networks
Barr	David	Entropic Communications
Barrass	Hugh	Cisco
Bliss	Will	Broadcom
Boyd	Ed	Broadcom
Brophy	Tim	Cisco
Brown	Kevin	Broadcom
Brown	Alan	Aurora Networks
Brun	Boris	Harmonic
Chapman	John	Cisco
Chen	Charlie	Titan Photonics
Chou	Joseph	Realtek Semiconductor
Dai	Eugene	Cox
Darling	Mike	Shaw Cable
Diab	Wael	Broadcom
Dickinson	John	Bright House Networks
ElBakoury	Hesham	Huawei
Eleniak	Shane	Commscope
Emmendorfer	Michael	ARRIS
Fang	Liming	Huawei
Finkelstein	Jeff	Cox
Frazier	Howard	Broadcom
Gomez	Chano	LANTIQ
Hajduczenia	Marek	ZTE Corp
Hanna	Charaf	ST Microelectronics
Hart	George	Rogers Communications
Hou	Victor	Broadcom
Howald	Robert	Motorola Mobility

Jain	Rajeev	Qualcomm
Jin	Liang	Broadlogic
Joetten	Christoph	Qualcomm
Jones	Nevin	ZTE Corp
Jones	Doug	Comcast
Kaplan	Chuck	Ciena
Kinnard	Brian	Commscope
Kumar	Satish	Intel
Lamb	Lowell	Broadcom
Laubach	Mark	Broadcom
Liu	Alex	Qualcomm
Liu	Eric	Titan Photonics
Mallette	Edwin	Bright House Networks
Montojo	Juan	Qualcomm
Mueller	Joseph	Entropic Communications
Nikolich	Paul	802 Chair/YASBBV
Nishihara	Susumu	NTT
Noll	Kevin	Time Warner Cable
Ossman	Valy	PMC-Sierra
Parnaby	Gavin	Broadcom
Peske	Richard	Broadlogic
Pietsch	Christian	Qualcomm
Powell	Bill	Alcatel-Lucent
Remein	Duane	Huawei
Roberts	Hal	CALIX
Salinger	Jorge	Comcast
Sanders	Russell	Ciena
Schmittt	Matt	CableLabs
Shariff	Masood	Comscope
Shellhammer	Steve	Qualcomm
Sun	Chen-Kuo	Titan Photonics
Suzuki	Ken-Ich	NTT
Thompson	Geoff	GraCaSI
Tsatsanis	Mickail	Entropic Communications
Vieira	Amarilos	Motorola Mobility
Vogel	Mark	Commscope
Warner	Edward	Entropic Communications
Wolff	Peter	Titan Photonics
Zang	Maggie	ZTE Corp
Zhang	James	Qualcomm
Zou	Hanli	Broadcom