Unapproved Minutes
IEEE P802.3bq Channel Model Ad Hoc
June 19th, 2013
Prepared by Pete Cibula and Brad Booth

Meeting Agenda:
1) Roll call - Record attendance, attendees' names and affiliations
2) Reminder of IEEE patent policy: www.ieee802.org/3/patent.html
3) Approve June 5th meeting minutes (unapproved minutes are located here)
4) Review the Channel Modeling Ad hoc charter/scope and deliverables for new participants (included for reference in the following two bullets)
   a) Defining a set of channel models for PHY complexity evaluation, including host channel model
   b) Provide early feedback on key parameters to cabling bodies (Can a parameter be improved? Is a relaxation a cost benefit?)
5) Discuss new business for the June 19th ad hoc meeting as follows:

   a) Open agenda items from June 5th meeting
      i) C. DiMinico - Present his contribution concerning an overview of 802.3 copper modeling and 40GBASE-T PHY channel.
      ii) P. Cibula - Share some of his 10GBASE-T test channel configurations and identify ones he considers irrelevant for 40GBASE-T.

   b) New agenda items for the June 19th meeting
      i) Channel Modeling ad hoc sub-team updates
         (1) M. Grimwood and G. Zimmerman – Update on data collection for MDI and isolation path with discussion.
         (2) B. Booth and P. Cibula - Update on data collection on PCB stackup and noise for 10GBASE-T systems with discussion.
         (3) C. DiMinico and W. Larsen – Update on cabling channel MDI-to-MDI efforts with discussion
      ii) Action Item updates from June 5th meeting
         (1) P. Cibula: Schedule missed presentations as first order of new business (~~Complete - See agenda~~)
         (2) P. Cibula, B. Booth: Present collected data related to PCB stackup and noise at the next ad hoc meeting (scheduled in sub-team updates)
         (3) S. Vaden: Converge on measurement bandwidth and bandwidth steps
         (4) W. Larsen: More work/input required on ILD curve

   c) New contributions with discussion

6) General Discussion and meeting wrap-up
   a) Review action items from the June 19th meeting
   b) Suggestions for future presentations
   c) Next steps/future meetings

The 3rd meeting of the 802.3bq Channel Modeling Ad Hoc was called to order at 8:05 AM Pacific Time.

1) The agenda was reviewed with those in attendance; no modifications were suggested and the agenda was approved without opposition. The agenda stands approved.

2) Participants were asked to email B. Booth or P. Cibula a note confirming their attendance. The attendance record at the bottom of these minutes is a compilation of email confirmations and an online meeting log.

3) P. Cibula reminded everyone of the patent policy. Those not familiar with it were directed to the URL above.

4) There were no modifications suggested to the minutes of the last meeting and the meeting minutes were approved without opposition. The June 19th, 2013 minutes stand approved.

5) P. Cibula briefly reviewed ad hoc charter for new participants.

6) The meeting was then opened to hear open items from the June 5th meeting and updates for the June 19th meeting as follows:

   a) June 5th open item #1: C. DiMinico presented some considerations for the channel IL budget (40GBASE-T PHY-Channel insertion loss). Discussion associated with the contribution included considerations of test points, the fact that 40GBASE-T will be somewhat different from other standards since the channel includes magnetics/isolation component, effects of various PCB material options, and promotion of a common interpretation/understanding of insertion loss. It was also noted that some of the presented material is intended to demonstrate "what we don't want" (for example, short CAT6A cords may/will most likely be unacceptable for 40GBASE-T applications notwithstanding length).

   b) June 5th open item #2: P. Cibula presented some of his 10GBASE-T test channel configurations with some suggestions for 40GBASE-T (Experience with 10GBASE-T Test Channels and Implications for 40GBASE-T). The contribution noted that 10GBASE-T PHY DSP systems respond differently to channel topology and IL/RL characteristics, and suggested that topologies should include "mid-length" configurations that include both transitions between return loss/crosstalk driven (short) and insertion loss driven (long) PHY end states and other regions of interest (similar to the 10GBASE-T power backoff schedule).

   c) Channel Modeling ad hoc sub-team updates
      i) MDI and isolation path (M. Grimwood and G. Zimmerman) – MDI information is being collected and noted that some magnetics characterization data provided by T. Dinh could be shared in this meeting.
      ii) PCB stackup and noise for 10GBASE-T systems (B. Booth and P. Cibula) - System PCB channel models used to support 10GBASE-T server designs have been identified and work is under way to make those available to the channel modeling ad-hoc. Other systems implementors were encouraged to support this effort and share their experiences.
      iii) MDI-to-MDI cabling channel (C. DiMinico and W. Larsen) – The subteam met on June 7th, reviewed cabling contributions from the June 5th channel modeling ad hoc, reviewed a new contribution from C. DiMinico (40GBASE-T Cabling channel MDI-to-MDI)and reviewed the

cabling topologies selected for modeling. Please check with Chris and Wayne for further information on MDI-to-MDI cabling channel activities.

d) Action Item Update (Action Item #3) - S. Vaden. An update on port nomenclature and port mapping (Port Nomenclature) as well as a reference for the touchstone file format (Touchstone File Format Reference) was presented to the ad hoc. Attendees continued discussing port mapping and conventions, and new discussion concerned some logistics of transferring model and measurement files, and defining a single-wire to differential port mapping convention.

    i) **Action item (C. DiMinico, M. Grimwood, W. Larsen, and S. Vaden): Develop a single-wire to differential port mapping convention for use in touchstone modeling/measurement data transfer.**

e) Action Item Update (Action Item #4) – W. Larsen. Wayne requested clarification on the action, leading the ad hoc to clarify the "More work/input required on ILD curve" action assigned to W. Larsen as an action to all AR subteams. Contributions addressing this topic and its importance to future 40GBASE-T PHYs are encouraged for future ad hoc meetings or for the upcoming IEEE 802.3 Plenary.

    i) **Action item (All ad hoc subteams): Consider ILD affects in future modeling efforts.**

f) T. Dinh reviewed some early data on magnetics components over an extended frequency range, including transformer and common-mode choke and discrete NEXT characteristics, data, and touchstone s4p files. The initial, limited results show that extended frequency range magnetics are feasible. Discussions around the results identified future work that could include integrating components with MDI connectors, evaluating Open Circuit Inductance, and possible compensation techniques.

7) The meeting concluded with a review of the meeting action Items as follows:
  a) C. DiMinico: Update contribution with ?
  b) P. Cibula: Work to get 10GBASE-T system PCB channel modeling and measurements into an ad-hoc friendly, shareable format. Solicit PCB modeling and measurement inputs from other system implementors.
  c) C. DiMinico, M. Grimwood, W. Larsen, and S. Vaden): Develop a single-wire to differential port mapping convention for use in touchstone modeling/measurement data transfer.
  d) All ad hoc subteams): Consider ILD affects in future modeling efforts.

8) The next meeting was scheduled for Wednesday, July 3rd 2013 at 8:00AM PDT.

The 802.3bq Channel Modeling Ad Hoc meeting was adjourned without opposition at 10:10 AM Pacific Daylight Time.

Meeting Attendance

Name	Employer	Affiliation (if different)
Alan Flatman	LAN Technologies	
Anna An	Foxconn	
Bernie Hammond	TE Connectivity	
Beth Kochuparambil	Cisco	

Brad Booth	Dell	
Chris DiMinico	MC Communications	Panduit
Dave Chalupsky	Intel	
Dave Jeskey	Sentinel Connector Systems	
Frank Straka	Panduit	
George Zimmerman	CME	
Harry Forbes	Nexans	
Harshang ??	??	
Jason Chou	Foxconn	
Jerry Chiang	Foxconn	
Martin Rossbach	Nexans	
Mike Good	Berk-Tek	
Mike Grimwood	Broadcom	
Ron Nordin	Panduit	
Rich Mellitz	Intel	
Peter Cibula	Intel	
Peter Wu	Marvell	
Sam Sambasivan	AT&T	
Shadi AbuGhazaleh	Hubbell	
Sterling Vaden	OCC	
Thuyen Dinh	Pulse	
Wayne Larsen	Commscope	
Yakov Belopololsky	Bel Stewart	