Unapproved Meeting Minutes
IEEE P802.3bq Rx CMNR Ad Hoc

January 21st, 2015
Prepared by Pete Cibula

Meeting Agenda:

1) Roll call - Record attendance, attendees' names and affiliations

2) Reminder of IEEE patent policy: www.ieee802.org/3/patent.html

3) Housekeeping:
   a) Review & approve meeting agenda.
      - Add new contribution from Bryan Moffitt (CommScope) that examines the 802.3-2012 Annex 40B Cable Clamp.

4) New business for the January 21st ad hoc meeting as follows:
   a) Discussion of Text for 40GBASE-T Common-Mode Noise Rejection (Pete Cibula, Intel Corporation)
   b) Examination of 802.3-2012 Annex 40B Cable Clamp (Bryan Moffitt, CommScope)

5) General Discussion and meeting wrap-up
   a) Next steps/future meetings

The 5th meeting of the P802.3bq Receiver Common-Mode Noise Rejection (Rx CMNR) Ad Hoc was called to order at 9:37 AM Pacific Standard Time.

1) Participants were asked to register their attendance by email; responses are reproduced in the attendance record at the end of these minutes.

2) Participants were reminded of the IEEE's patent policy. All in attendance acknowledged the policy; as a reference, anyone not familiar with said policy is directed to the URL above.

3) Houskeeping & general updates:

   a) The agenda was reviewed with those in attendance and attendees were notified that a new contribution had been received and would be added to the agenda. The updated was accepted without opposition.

4) New business:
   a) Participants reviewed a contribution, "Discussion of Text for 40GBASE-T Common-Mode Noise Rejection" (Pete Cibula, Intel Corporation), that was prepared as a follow-up to some aspects of the Rx CMNR specification discussed in the January 13th, 2015 P802.3bq Task Force meeting.
      - The contribution reviewed some specifics of standards language as outlined in the 2014 IEEE-SA Standards Style Manual and then examined the text in Subclause 55.5.4.3 within that context in an effort to clarify various elements of the subclause.

- Building on this clarification, text developed from a hybrid of subclause 40.6.1.3.3 and subclause 55.5.4.3 was presented as a strawman for consideration. The text is intended to provide guidance regarding the purpose and intent of the subclause with sufficient detail to help implementers evaluate the performance of a system incorporating 40GBASE-T technology to common-mode impairments.

Major points of the discussion are summarized below:

- Who/what is a port manufacturer? (General agreement that this is a system implementer).
- Concern about continued confusion if the operational requirements are left open (No resolution at this time; examples of regulatory test operational requirements are included in the discussion presentation).
- Discussion about the appropriateness of the clamp for coupling impairments into the device under test (Now under investigation in the ad hoc).
- Participants were encouraged to review the text and potential paths forward and to identify any areas where they can contribute to the work of the ad hoc.

b) A new contribution, Examination of 802.3-2012 Annex 40B Cable Clamp (Bryan Moffitt, CommScope) was reviewed with ad hoc participants. The contribution examined several electrical characteristics of the Annex 40B cable clamp and its suitability for common-mode noise rejection testing of 40GBASE-T.

- Cable clamp performance was evaluated in terms of both noise induced onto the cable shield (Cat8 cabling) and common-mode and differential-mode noise induced on the cable pairs (Cat6A and Cat8 cabling).
- The presenter noted that the shield, while typically viewed as a ground connection, is actually a unique conductor in shielded cabling systems and is a key factor in determining EMC performance. Shield transmission characteristics and the response of the shield when driven by the cable clamp showed that additional ferrite chokes may be required to minimize induced noise backscattering to a link partner system.
- Measurements of induced common-mode and differential-mode noise, performed using a 0 dB reference power level sourced by the VNA used in the setup, showed differences in both common-mode and differential-mode noise levels between unshielded and shielded cable types. Induced noise power (both modes) on the shielded type was significantly lower over the measurement range.
- A preliminary conclusion is that the cable clamp may not be suitable for injecting common-mode noise into shielded cable pairs.

Major points of the discussion are summarized below.

- It was noted that this investigation is specific to noise coupled into the cable and does not include interconnect (including shield terminations), magnetics, or circuit board effects.
- Participants suggested that the purpose of the test appears to have evolved over time - the primary concern for 1000BASE-T was common-mode noise, while the corresponding differential-mode noise became more significant for 10GBASE-T. Either, both or some new impairment (possibly interaction between the two modes) may be more of a concern with shielded cabling and interconnect systems.

- Discussion concluded with an observation that the clamp test may still be useful, but more work is needed to understand what it's really telling us, especially in the context of shielded cable and interconnects.

5) Meeting wrap-up - The next meeting was scheduled for February 4th, 2015 at 9:30 AM Pacific Standard Time.

The P802.3bq Rx CMNR Ad Hoc meeting was adjourned at 11:01 AM Pacific Standard Time.

Meeting Attendance (From e-mail acknowledgements and on-line participant list)

Name	Employer	Affiliation (if different)
Jim Bauer	Marvell	
Brian Buckmeier	Bel Stewart Connector	
Dave Chalupsky	Intel	
Pete Cibula	Intel	
Chris DiMinico	MC Communications	
German Feyh	Broadcom	
Mike Good	Berk-Tek	
Brett McClellan	Marvell	
Bryan Moffitt	CommScope	
Victor Renteria	BelFuse/TRP	
Dieter Schicketanz	University of Science, Reutlingen	
Steve Sedio	Foxconn	
Tom Souvignier	Broadcom	
Ron Tellas	Panduit	
Paul Vanderlaan	Nexans	
Peter Wu	Marvell	