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

August 19th, 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

4) New business for the August 19th ad hoc meeting as follows:
   a) Comments from the Chief Editor
   b) Discussion of "Next Steps and Discussion Points" from Larry Cohen's August 12th ENUCA contribution "CMNR Test for 2.5G/5GBASE-T" (cohen_CMNR_Test_for_2.5G-5GBase-T_20150812.pdf)
   c) Contribution from Larry Cohen on "Cable RF Ingress Measurement in an Anechoic Chamber"

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

The 11th meeting of the P802.3bq Receiver Common-Mode Noise Rejection (Rx CMNR) Ad Hoc was called to order at 9:35 AM Pacific Daylight 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 meeting agenda was reviewed with those in attendance. The P802.3bq Chief Editor, George Zimmerman, requested time to share some perspectives and suggestions for the ad hoc based on the state of the draft. The updated agenda was accepted without opposition.

4) New business:

   a) Chief Editor's comments - The ad hoc chair prefaced the Editor's comments by reminding participants of the ad hoc's focus as we move through commenting on D2.2 as follows:
      - To identify, review and resolve any outstanding specific technical details associated with Annex 113A.
      - To assure that 802.3bz and 802.3bq track each other in Annex113A.

- To review and discuss any comments received against P802.3bq D2.2, Clause 113.5.4.3 Rejection of External EM Fields and P802.3bq D2.2, Annex 113A. This includes any changes to Annex 113A for P802.3bz which, per the Editor's Note in P802.3bz_D1.0, have been commented to 802.3bq.

The Chief Editor then shared several perspectives with the ad hoc, summarized as follows:

- Perspective on the ad hoc's progress to date - Starting with the Rx CMNR specification in Clause 55 (which is somewhat vague when compared to Clause 40), the ad hoc clarified the specification for Clause 113 and created a re-useable informative annex to provide guidance to implementers.
- Perspective on the relevant text – Note that informative annexes are informative, and the goal is to develop text that fosters repeatability across implementations of defined tests. Informative text doesn't necessarily demand the rigor associated with normative text. We should strive to achieve a result that is at least the level of Annex 40B – while the text is not perfect, it works, it allows implementers to make a useful test, and is generally accepted as a "good" description and definition of a Rx CMNR test.
- Perspective on P802.3bq - We are at the point where we need to nail things down in the upcoming September Interim P802.3bq and P802.3bz meetings. Converging on the text soon is "really, really important" as delays in these Subclauses and Annexes have the potential to delay both standards.
- Perspective on work going forward – There are some ongoing technical discussions associated with the need for separate verification/calibration procedures for different cable types. It is strongly suggested that these – and any other changes - are addressed in small, focused ("surgical") edits vs. wholesale changes to the current text.

The Chief Editor closed his comments by encourage ongoing discussion of specific technical details on the reflector.

Participants briefly discussed some aspects of the test, seeking clarification as to the target of the test - PHY or system. It was noted that the Rx CMNR requirement is a test of the network port in a system, and is essentially an equipment test encompassing the PHY, PCB traces and routing, ICM or magnetics and jack, connectors and cabling.

b) Participants then addressed "Next Steps and Discussion Points" as a continuation of the previous week's P802.3bz ENUCA ad hoc. The discussion was kicked off by the ad hoc chair, who shared "A few thoughts on Clause P802.3bz D1.0, 126.5.4.3". Key points of the discussion include:
   - Participants agreed that a Rx CMNR specification and test should be added to P802.3bz, in line with the P802.3bz Task Force consensus at the July meeting.
   - Participants discussed the proposed frequency range of 80 MHz to 1000 MHz with a suggestion to modify the starting frequency to 30 MHz.
     (1) A brief discussion of extending the lower limit to 1 MHz as defined in Clause 40.6.1.3.3 concluded that this lower limit was selected to align with the Clause 40.7 link segment vs. any corresponding immunity standards. A 1MHz lower limit has the disadvantage of not aligning with receiver common-mode specifications for other MultiGBASE-T PHYs.

(2) The 30MHz lower limit aligns with the upper boundary of conducted emissions testing (FCC Part 15, EN55022) while the 80MHz lower limit aligns with the transition between IEC61000-4-6 conducted immunity (150 kHz to 80 MHz) and IEC61000-4-3 radiated immunity (80 MHz to 1000 MHz).

- The proposed +13dBm power level was observed to be in line with cable RF ingress measurements presented later in the meeting.
- The suggestions for including a minimum number of points and minimum dwell times were believed to be good starting points for Rx CMNR tests.
- Other discussion points were briefly reviewed, including
  (1) How to manage the observed common-mode coupling nulls (which may be unique to individual cable clamps)
  (2) Adding envelope rise/fall time control
  (3) Measuring injected signal distortion (potentially using a directional coupler and spectrum analyzer), and
  (4) Accommodating non-shielded vs. shielded cable types (type-specific terminations and potentially different common-mode limits)

  The discussion ended with general comments on test equipment capabilities, the injected common-mode signal, and the fact that the resulting differential-mode noise signal depends on the balance of the signal path elements (cable, connector, magnetics, PCB, and PHY receiver).

  Interested participants were encouraged to develop specific comments and associated text for further discussion on the [802.3_NGBASET] reflector.

c) Participants heard a contribution on "Cable RF Ingress Measurement in an Anechoic Chamber (Larry Cohen, Aquantia).
   - Abstract: The contribution presents considerations for a Rx CMNR common-mode ingress target level based upon measured common-mode and differential RF ingress levels at an MDI port termination on link segment cabling from a controlled external RF field in an anechoic chamber.
   - Discussion:
     (1) A modification is proposed to the common-mode ingress target described in Annex 113A. The proposed target models the roll-off above 250MHz in common-mode ingress levels observed in chamber measurements of various cabling types.
     (2) Further discussion of the Summary, Discussion Points and Next Steps on Slide 16 of the contribution will be continued using the reflector and in future meetings.

5) Meeting wrap-up - The next P802.3bq Rx CMNR ad hoc meeting is scheduled for September 2nd, 2015 at 9:30 AM Pacific Daylight Time. As we move closer to the upcoming September Interim meeting, discussions will intentionally overlap and carry over into the P802.3bz ENUCA ad hoc meeting.

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

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

Name	Employer	Affiliation (if different)
Jim Bauer	Marvell	
Theo Brillhart	Fluke Networks	
Geoffrey Chacon	HP	
Pete Cibula	Intel	
Larry Cohen	Aquantia	
Chris DiMinico	MC Communications	
German Feyh	Broadcom	
Mike Good	Berk-Tek	
Yong Kim	Broadcom	
Brett McClellan	Marvell	
Bryan Moffitt	CommScope	
Rick Rabinovich	ALE	
Victor Renteria	Bel/TRP	
Hossein Sedarat	Aquantia	
Dieter Schicketanz	University of Reutlingen	
Thuyen Dinh	Pulse	
Paul Vanderlaan	Berk-Tek	
Peter Wu	Marvell	
George Zimmerman	CME Consulting	Aquantia, Commscope