802.3bz Layers – Auto-negotiation Proposal

(Revised from April 14th, 2015 ad hoc call
Option 2 as the proposal based on .3bq direction.
Decouples .3bz from .3bq but still coordinated)

Thank you for ALL of your FEEDBACK!

Yong Kim (ybkim at broadcom com), presenting
Tooraj Esmailian (ToorajE at broadcom com),
Brad Booth (BrBooth at microsoft com)

802.3BZ AUTO-NEGOTIATION PROPOSAL (based on the "Option 2")

in

http://www.ieee802.org/3/NGEBASET/public/archadhoc/Kim_AutoNegotiation_v2_2015_4_14c.pdf

Based on 802.3bq (early) indication to stay in Message Code 9.

Acting on "IF .3bq does not want to move, THEN …

CL 28 .3bz AN Objectives & A Proposal

Objectives

- 802.3bq and 802.3bz to be coordinated, i.e. 2.5G/5G/25G/40G.
- Got (early) .3bq Feedback – 802.3bq to stay in MC9, so acting on that preference,
- Define 2.5G/5G BASE-T PHY related AN bits in new MC.

Proposal

- Define a new message code 12 for 2.5G/5G ("Option 2")
- Design such a way that modern RJ-45 MDI PHYs only need to <u>support Base Page plus XNP MC12 (new) – optimize and help reduce AN duration.</u>
    - Does <u>NOT relieve PHY's support of </u>other message codes (true, and has been true).
- Design such a way to recognize the following modern optimizations.
    - 10M/100M/1G to extend to support 10M/100M/1G/2.5G
    - 1G/10G to extend (down) support for 1G/2.5G/5G/10G
    - Superset of the above two ranges – <u>does it fit? - YES! </u>w/ spare bits.
    - No ability assignment for 1G HDX, no need to replicate.
- Master/Slave related fields are replicated (as done in MC8 and MC9).
- 3 spare bits, or 1 bit, left, if .3bz adopts "repeat train capability".

Auto-Negotiation (CL28) – .3bz Proposal

BASE

D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15
S0	S1	S2	S3	S4	A0	A1	A2	A3	A4	A5	A6	XNP	RF	Ack	NP

Selector S<4:0>
00001 == IEEE 802.3

Technology Ability <6:0>
A0=10 HDX, A1= 10 FDX
A2= 100 TX, HDX A3= 100 TX FDX
A4=100BASE-T4

A5 = Pause Ability
A6= Asym. Pause

RF = Remote Fault
Ack = Acknowledge
NP = Next Page, XNP =Exten. NP

Next Page

D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15
M0	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	T	Ack2	MP	Ack	NP

Message Code<10:0>
8: 9: 10GBASET/1000BASET msg code, Ext NP
10: EEE msg, 11: OUI: Tagged msg,
12: 100M/1G/2.5G/5G/10G   13 ..2047: reserved

Ack2 = NP ability
T=Toggle from
previous NP msg.

NP = New Page
Ack = Acknowledge
MP – Message Code=1 or
unformatted=0

Ext NP W1

D16	D17	D18	D19	D20	D21	D22	D23	D24	D25	D26	D27	D28	D29	D30	D31
U0	U1	U2	U3	U4	U5	U6	U7	U8	U9	U10	U11 M/S Man Conf EN.	U12 M/S Conf Val Mstr.	U13 Mul Port	U14 1G FDX	U15 ~~1G HDX~~

U<10:0> Master-Slave seed bits

Ext NP W2

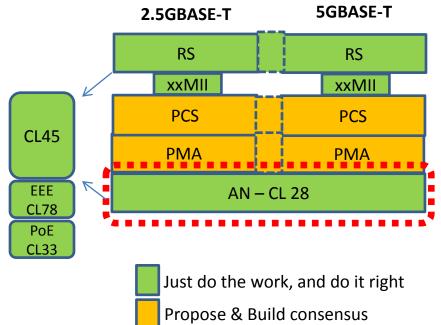| D32	D33	D34	D35	D36	D37	D38	D39	D40	D41	D42	D43	D44	D45	D46	D47
U16 10G	U17 (10G) LD Lp Time	U18 (10G) Short Reach	U19 (10G) Fast retrn	U20 (10G) LD train Rst rq	U21 2.5G	U22 100T X EEE	U23 1G EEE	U24 10G EEE	U25 2.5G EEE	U26 2.5G Fast retrn	U27 5G	U28 5G EEE	U29 5G Fast retrn	U30	U31

Summary

- CL 28 auto-negotiation changes are [still] straight forward.
  - Defined MC12 and assign extended next page assignments (new)
  - Supports all modern PHYs between 10M ~ 10G, with some spare bits, and NO need to use BOTH MC9 and MC12.

- Next Steps
  - Consider this proposal for adoption in 802.3bz TF.

  Note: Feedbacks, objections, support,…, all welcome toward May Interim.

Thank you!