IEEE P802.3bp (RTPGE) PHY Task Force
Channel Definitions Ad Hoc Report

Dallas, Texas
November 2013

Ad hoc – co-chairs
Chris DiMinico –
MC Communications
Mehmet Tazebay –
Broadcom

Channel Definitions Ad Hoc

- Ad Hoc charted to develop channel definitions
- Initial meeting IEEE Interim May 2012
- Communications via RTPGE reflector
- Follow-on meetings and conference calls to develop consensus on baseline Link Segment specifications

802.3bp Link Segment (automotive)

- Define the performance characteristics of an automotive link segment and a PHY to support point-to-point operation over this link segment with less than three twisted pairs supporting up to four inline connectors using balanced copper cabling for at least 15m for the automotive link segment.

•***APPROVED 802.3 WG (November 15, 2012)***

Affirmation of 1-pair

Motion

Move that:

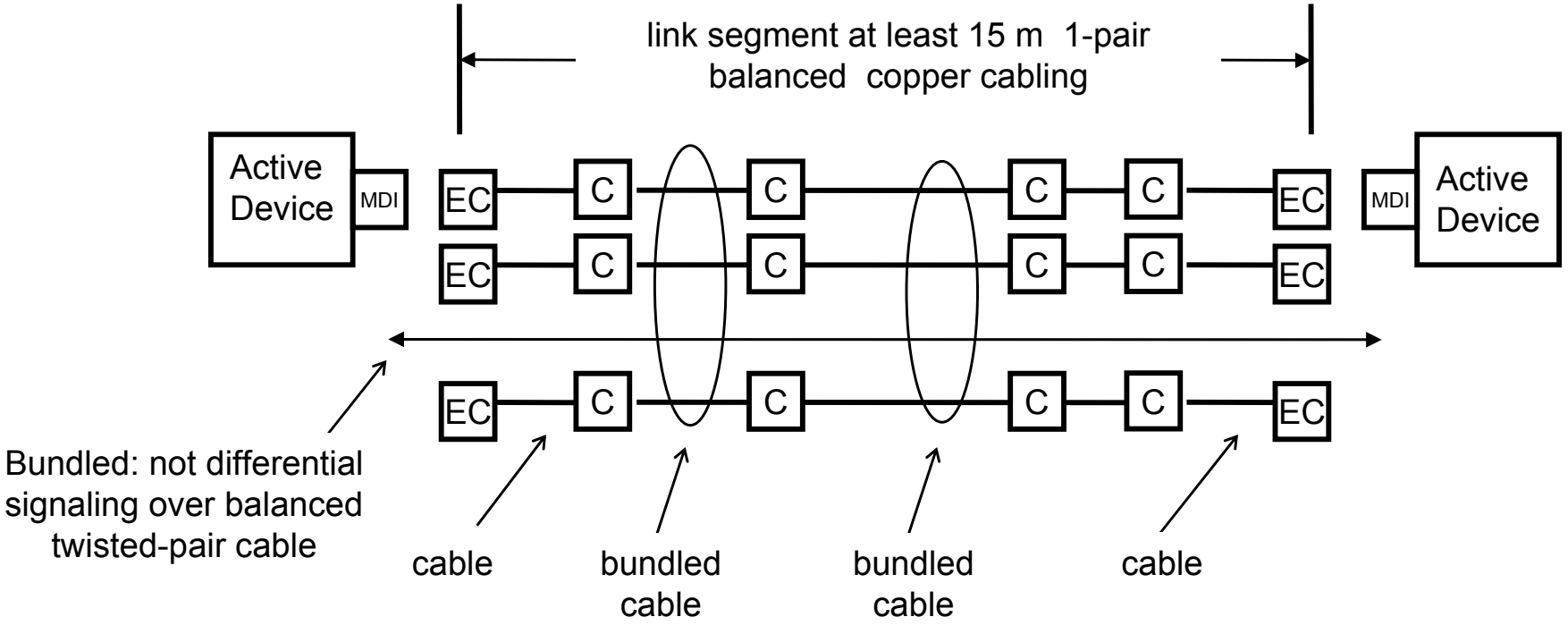
The IEEE P802.3bp Task Force affirms a 1-pair PHY Solution at 15m.

- M: Matheus, K.
- S: Diab, W.

- Y: 32 N: 0 A: 7

Source: http://www.ieee802.org/3/bp/public/may13/tezebay_3bp_02_0513.pdf

802.3bp Link Segment (automotive)



The IEEE 802.3 nomenclature is bracketed to identify relationship to the IEEE 802.3 definitions.

Length objective [EC] to [EC] at least15 m
Number of inline connectors [C] = 4

C = inline connector

EC = connection to equipment

MDI = Active electronics connector [Medium dependent interface (MDI)]

Link segment transmission parameters

Link segment transmission and coupling parameters

- Insertion loss
- Return loss
- Alien Crosstalk
  - PSANEXT, PSAACRF
- Common to differential conversion loss (SDC12/SDC21)

•Insertion loss

•Amended Motion #2 - Move that The IEEE P802.3bp Task Force affirms the proposed
•Baseline IL Channel Performance for link segment insertion to establish the absolute
•value across the frequency range through 600MHz. (herman_3bp_01_0913.pdf)
•Technical 75%
•Vote
•Y: 25 N: 0 A: 4
•MOTION: Passes

$$IL = .4927\sqrt{f} + 0.0023f + (0.0639 / \sqrt{f}) + 0.08\sqrt{f} + 0.018\sqrt{f}$$

where

f := frequency_in_MHz

Link segment transmission parameters

- Alien Crosstalk -PSANEXT, PSAACRF

Motion #8 - Move that The IEEE P802.3bp Task Force affirms the proposed Baseline PSANEXT (in slide 11 in herman_3bp_01_0913.pdf) and PSAACRF (in slide 13 in herman_3bp_01_0913.pdf) for link segment specification over frequency range 1MHz - 600MHz. (alien crosstalk configuration in http://www.ieee802.org/3/bp/public/jul13/moffitt_3bp_01_0713.pdf)
M: Todd Herman S: Xiaofeng Wang
Technical 75%
Vote
Y: 18 N: 1 A: 10
MOTION: Passes

PSANEXT

from 1 to 100 MHz

$$PSANEXT := 60 - 10\cdot\log\left(\frac{f}{100}\right)$$

from 100 to 500 MHz

$$PSANEXT := 60 - 15\cdot\log\left(\frac{f}{100}\right) - 6\cdot\left[\frac{(f-100)}{400}\right]$$

PSAACRF

$$PSAACRF := -20\cdot\log\left(10^{\frac{-10\cdot\log\left(\frac{15}{100}\right)+38.2-20\cdot\log\left(\frac{f}{100}\right)}{-20}} + 4\cdot 10^{\frac{67-20\cdot\log\left(\frac{f}{100}\right)}{-20}}\right)$$

where

$f := frequency\_in\_MHz$

Link segment transmission parameters

- No objections during October 31 ad hoc conference call to include return loss specification

Return Loss

Frequency range	Requirement
1-10 MHz	19 dB
10-40 MHz	24-5log(f) dB
40-130 MHz	16 dB
130-400 MHz	37-10log(f) dB
400-600 MHz	11 dB

Slide 2: Herman_02_1023_RTPGEReturnLossProposalfor1-PairEthernet.pdf

Link segment transmission parameters

- Please see EMC ad hoc report for status of mode conversion proposal.

- Mode conversion proposal as of October 31 Channel definitions ad hoc

-50_{dB}	$10 < f_{MHz} < 80$
$[\,5 \log_n (f_{MHz}) - 72\,]_{dB}$	$80 < f_{MHz} < 600$

Summary

- Baseline Link segment transmission and coupling parameters accepted by Task Force motions
  - Insertion loss
  - Alien Crosstalk
  - –PSANEXT, PSAACRF

- Baseline Link segment transmission parameter proposal from Channel Definitions ad hoc to be considered by Task Force
  - Return loss

- Baseline Link segment transmission parameter proposal from EMC ad hoc to be considered
  - Common to differential conversion loss (SDC12/SDC21)

Motion

Move that The IEEE P802.3bp Task Force affirms the proposed RL specifications for the automotive link segment in herman_3bp_01_1113.pdf for inclusion in 802.3bp baseline specification.

Technical 75%

Vote

Y: N: A:

MOTION: