Timing in PHY startup (D2.1 Comment #169)

IEEE P802.3ch Multigig Automotive Ethernet PHY Task Force
Ad Hoc

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Comment 169

CI **149**   SC **149.4.2.4.10**   P **147**   L **35**   # 169

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Comment Type   **T**   Comment Status **X**   *late*

To ensure interoperability during the training phase, certain timing allocations between Master, Slave and other steps of training must be observed. We propose to the text of 802.3bz for interoperability and just scale the timing of 10G mode and deduct the timing for PCS_TEST that is set by min_wait_timer.

SuggestedRemedy

tModify FIgure 149_33 as attached and Include the associated Table 145.15 in section 149.4.2.4.10 page 147, line 35 to read as follows

MASTER	SLAVE	MAX REQUIRED TIME
Traning	Silent	40.00 msec
Training	Training	57.02 msec
PCS Test	PCS Test	0.98 msec
TOTAL		98.00 msec

Proposed Response   Response Status **O**

Timing the startup

- PHY control must complete in no more than 97 msec or risk being terminated by the link_fail_inhibit_timer
  - 97 msec, Max = 98 msec (see 98.5.2)
- No timers control times in:
  - SILENT
  - TRAINING
  - COUNTDOWN/TX_SWITCH
- Experience from 10GBASE-T showed different designers made different assumptions of the time distribution
  - Discovered after initial publication, so it was a recommendation, not a requirement
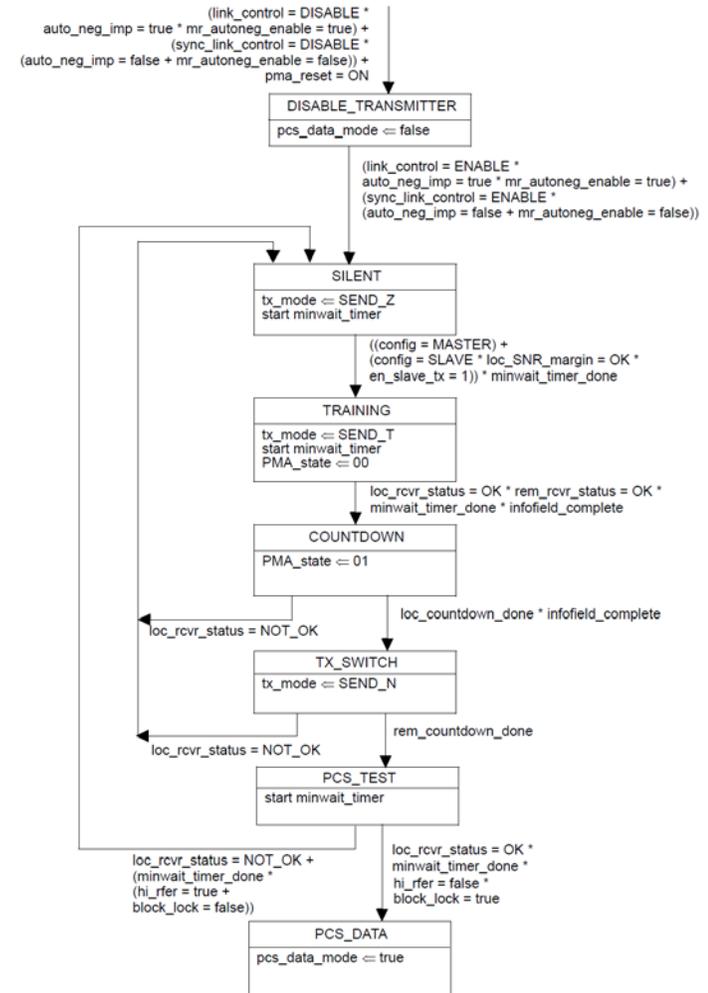

Figure 149–33—PHY Control state diagram

Approaches to the problem

- Modify state diagram: Add timers to push on to the next state
    - This makes us define the behavior in the over-time case which isn't supposed to happen: EXTRA WORK & UNINTENDED CONSEQUENCES!
- Add a statement "a compliant phy shall spend no more than X msec in state Y" into state diagram text
    - Such statements get lost and are unusual in 802.3 style
- Add a table for timing, similar to 2.5G/5G/10GBASE-T, but REQUIRED.

Suggested response

Insert new final paragraph to 149.4.2.4.10 Startup sequence (Page 147 line 35): "The startup timing shall comply with Table 145-15."

Insert new table 145-15 at end of 149.4.2.4.10

Table 145-15: Maximum time spent in startup states (See Figure 149-33)

MASTER	Maximum time (msec)	SLAVE
SILENT plus (TRAINING state AND en_slave_tx = 0)	40	SILENT
TRAINING state AND en_slave_tx = 1)	54.439	TRAINING
COUNTDOWN plus TX_SWITCH	0.384 / S	COUNTDOWN plus TX_SWITCH
PCS TEST	1.025	PCS TEST
Total (for reference only)	95.464 + 0.384/S	Total (for reference only)

THANK YOU!

Consensus
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