Supporting Materials for comment #67

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September, 2017

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Draft 2.0 comment #176

Cl **135F** *SC* **135F.3.2.1** *P* **357** *L* **28** # 176

Slavick, Jeff — Broadcom Limited

Comment Type **T** *Comment Status* **R** *<late>*

For the precoding request function, the PMA needs to know when the update is complete. To best accomplish this task, the configuration of the Precoder state should be managed entirely by management processes (which is how TxEq is done). MDIO registers 1.600-1.603 provide the precoder control over each end of the link. When the request flag in 1.604 is asserted, 1.605 and 1.606 are used indicate the desired setting, but changing that setting in 1.600-1.603 should be done via management. Once the requested status and configurations align, the request flag is lowered. Clarification is needed to specify that this is how the operation should be done.

SuggestedRemedy

Change 135F.3.2.1 to be:

135F.3.2.1 Precoder request (optional)

The precoder request is an optional capability for a 50GAUI-1 C2C or 100GAUI-2 C2C receiver. If implemented, it shall operate as described in this subclause.

The precoder request is generated for each input (Tx and Rx) on each lane (0 and 1). The variables that control the precoding request are specific for each input and lane.

A 50GAUI-1 C2C or 100GAUI-2 C2C input may generate a request to change the precoder state on a given interface and lane by setting the variables request_precoder_tx_in_i or request_precoder_rx_in_i (where i is 0 to 1) to indicate the desired precoder setting per lane and interface. A precoder request from a 50GAUI-1 C2C or 100GAUI-2 C2C receiver is generated in an implementation specific manner. A 50GAUI-1 C2C or 100GAUI-2 C2C receiver that does not implement precoder request always sets request_precoder_tx_in_i, request_precoder_rx_in_i, request_precoder_tx_in_flag, and request_precoder_rx_in_flag to 0.

When a 50GAUI-1 C2C or 100GAUI-2 C2C supports precoder request and a request_precoder_tx_in_i differs from it's precoder_tx_in_en_i the request_precoder_tx_in_flag is set to 1. When a 50GAUI-1 C2C or 100GAUI-2 C2C supports precoder request and a request_precoder_rx_in_i differs from it's precoder_rx_in_en_i the request_precoder_rx_in_flag is set to 1. When request_precoder_tx_in_flag is 1, the request is fulfilled by setting the precoder_rx_out_en_i of the remote transmitter and the precoder_tx_in_en_i of the local receiver to the state of the request_precoder_tx_in_i. When request_precoder_rx_in_flag is 1, the request is fulfilled by setting the precoder_tx_out_en_i of the remote transmitter and the precoder_rx_in_en_i of the local receiver to the state of the request_precoder_rx_in_i.

If a Clause 45 MDIO is implemented, the variables request_precoder_rx_in_flag and request_precoder_tx_in_flag are accessible through register 1.604 (see 45.2.1.116l), variables request_precoder_rx_in_i are accessible through register 1.605 (see 45.2.1.116m), variables request_precoder_tx_in_i are accessible through register 1.606 (see 45.2.1.116n), variables precoder_tx_in_en_i are accessible through registers 1.603 (see 45.2.1.116k), variables precoder_rx_in_en_i are accessible through registers 1.601 (see 45.2.1.116i), variables precoder_tx_out_en_i are accessible through registers 1.600 (see 45.2.1.116h), and variables precoder_rx_out_en_i are accessible through registers 1.602 (see 45.2.1.116j).

Response *Response Status* **C**

REJECT.

[Editor's note: This comment was received after the Working Group ballot closed.]

There is no consensus to implement the suggested remedy at this time.

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Comment #67

Cl **135F** *SC* **135F.3.2.1** *P* **365** *L* **49** # 67

Slavick, Jeff — Broadcom Limited

Comment Type **TR** *Comment Status* **D**

Comment #176 from D2.0 was rejected stating insufficient consensus. How about if we do this similarly to how Cl 83D describes the transmit eq process.

SuggestedRemedy

Add the following with editorial license (including adding a diagram similar to Figure 83D-5).

135F.x Example usage of the optional transmitter precoder request
135F.x.1 Overview
If implemented, transmitter precoder request from a 50GAUI-1 C2C or 100GAUI-2 C2C receiver may be used to set the precoder configuration for each lane within the link as requested by the receiver. An example of a possible precoder configuration process using the transmitter precoder request is provided in this subclass.

In this example, two components, A and B, are connected by a C2C link, such that A is closest to the PCS and B is closest to the PMD. Clause 45 MDIO is implemented by both components, with component A at device address 11 and component B at device address 10. Transmitter precoder request is implemented by either component A, component B, or both. One Station Management (STA) controls both components.

135F.x.2 Configuring precoder setting in the transmit direction
1) For each lane
1a) Read precoder_tx_out_enable_i from component A.
1b) Write precoder_rx_in_enable_i of component B with the read value.
2) Read request_precoder_tx_in_flag from component B
2a) If the flag is a one, then for each lane
2aa) Read request_precoder_tx_in_i from component B
2ab) Write precoder_rx_in_enable_i of component B and precoder_tx_out_enable_i from component A with the read value.
2ac) Go to step 2

135F.x.3 Configuring precoder setting in the receive direction
1) For each lane
1a) Read precoder_rx_out_enable_i from component B.
1b) Write precoder_tx_in_enable_i of component A with the read value.
2) Read request_precoder_rx_in_flag from component A
2a) If the flag is a one, then for each lane
2aa) Read request_precoder_rx_in_i from component A
2ab) Write precoder_tx_in_enable_i of component A and precoder_rx_out_enable_i from component B with the read value.
2ac) Go to step 2

Proposed solutions

- D2.0
  - Proposed defining in 135F how the request process is done.
- D2.1
  - Proposes an example in 135F on how the request process could be done.

- D2.1 proposal follows along the lines of how 83D was done for the transmitter equalization feedback process.

135.5.7.2 and 135F.3.2.1

- 135.5.7.2 defines the registers for:
  - Configuring the precoder state for each side of the physical link
    - Transmitter and Receiver need to both be configured to same state
  - Registers 1.600 -> 1.603
- 135F.3.2.1 defines the registers for:
  - Receiver's desire to change the precoder configuration
  - Receiver's desired precoder state for each lane
  - Registers 1.604 -> 1.606

Proposed new sub-clause

135F.x Example usage of the optional transmitter precoder request

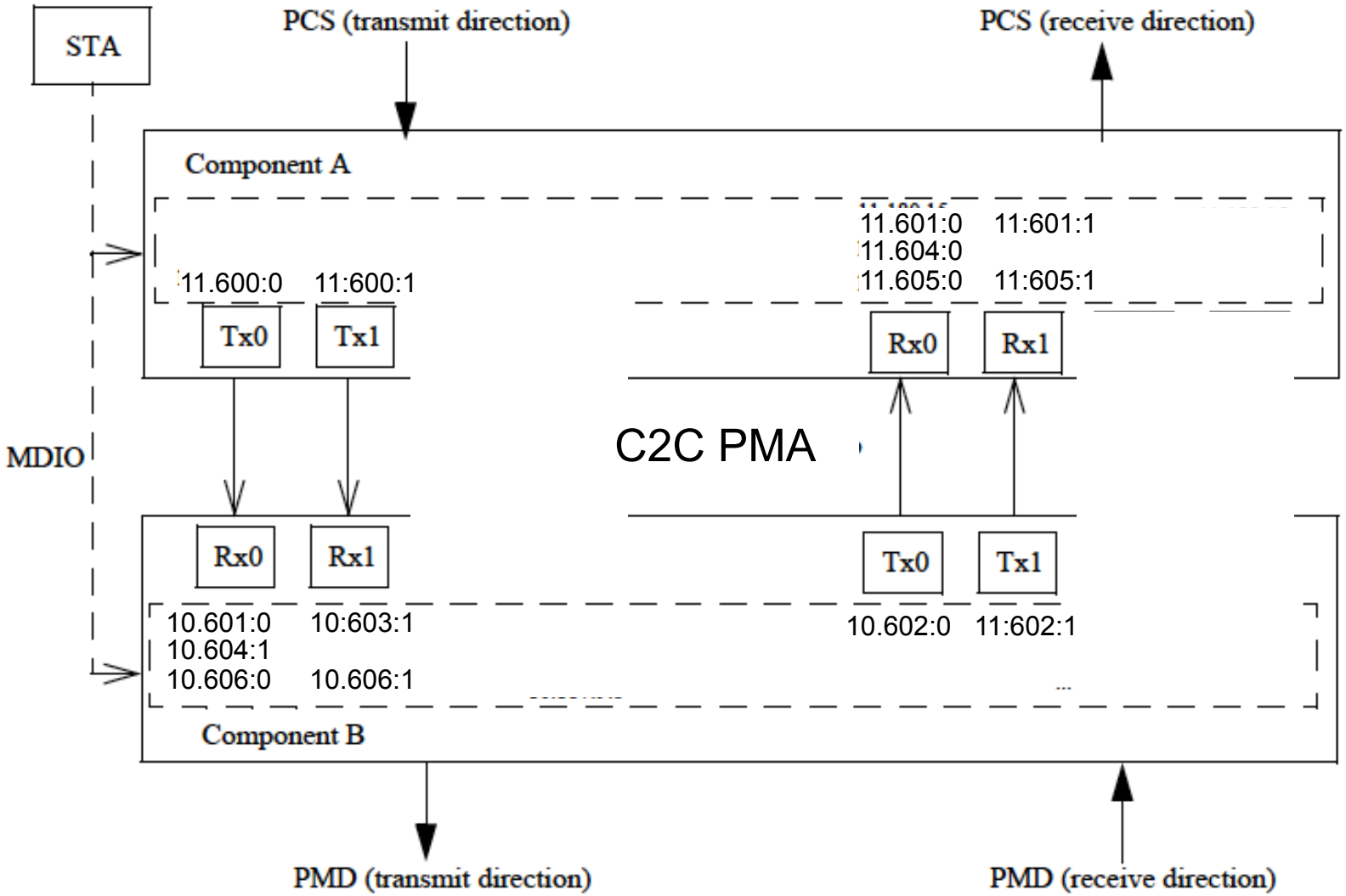
135F.x.1 Overview

If implemented, transmitter precoder request from a 50GAUI-1 C2C or 100GAUI-2 C2C receiver may be used to set the precoder configuration for each lane within the link as requested by the receiver. An example of a possible precoder configuration process using the transmitter precoder request is provided in this subclass.

In this example, two components, A and B, are connected by a C2C link, such that A is closest to the PCS and B is closest to the PMD. Clause 45 MDIO is implemented by both components, with component A at device address 11 and component B at device address 10. Transmitter precoder request is implemented by either component A, component B, or both. One Station Management (STA) controls both components.

Figure 135F–x depicts the components of the chip-to-chip link and the registers used during the procedure.

Figure 83D-5 modified for 135F



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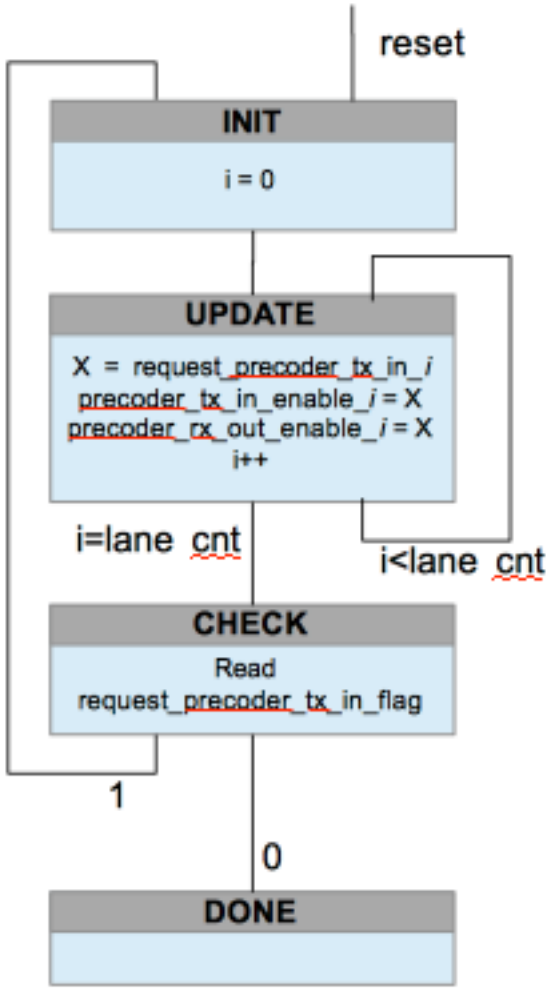
- 135F.x.2 Configuring precoder setting in the transmit direction
  a) For each lane in the link
     1) Read the request_precoder_tx_in_i from component B.
     2) Set both precoder_tx_in_enable_i of component B and precoder_rx_out_enable_i of component A to the read value.
  b) If request_precoder_tx_in_flag of component B is 1 then go to step a)



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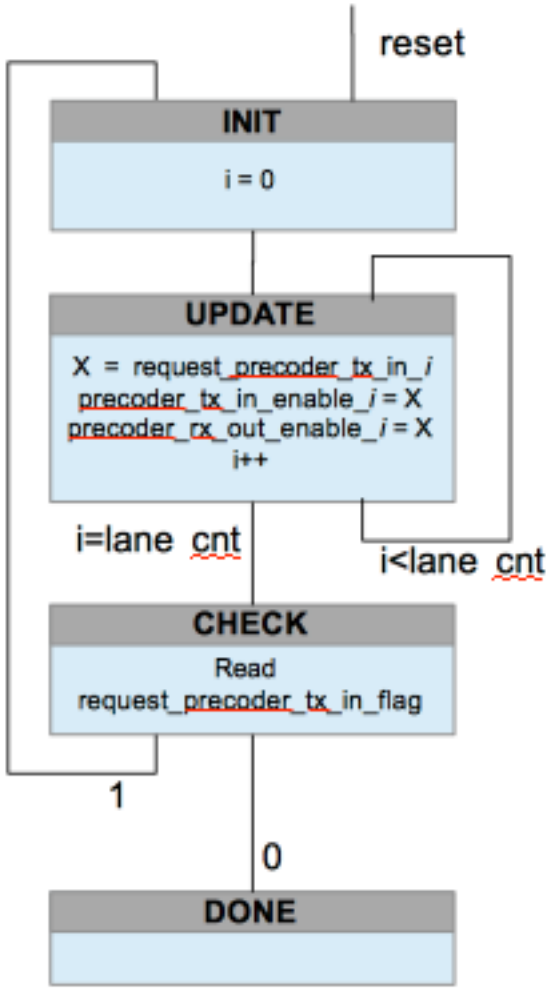
- 135F.x.2 Configuring precoder setting in the receive direction
  - a) For each lane in the link
    - 1) Read the request_precoder_rx_in_i from component A.
    - 2) Set both precoder_rx_in_enable_i of component A and precoder_tx_out_enable_i of component B to the read value.
  - b) If request_precoder_rx_in_flag of compenent A is 1 then go to step a)



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Conclusion

- Add an informative example section for how to execute the precoder request into 135F.
  - New sub-section is based upon how transmitter equalization feedback was done in 83D.
- Use the previous 4 slides to provide the content for the new sub-clause.

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