Capability Exchanges via InfoField

Austin, TX, USA

February 9, 2014

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Issues with D1.2

- In Draft Text D1.2, the EEE capability exchange is only defined when Auto-Negotiation is enabled.
- The optional OAM capability also need to be exchanged.
- For PHY not supporting Auto-Negotiation, an alternative approach to exchange capabilities is required.
- The best approach is to utilize the InfoField messages.
  - Define capability bits in MSG24 in the TRAINING state
  - If autoneg is enabled, the InfoField capability bits must be consistent.
  - Exchange 7-bits in the same message

Modified Figure 97-14

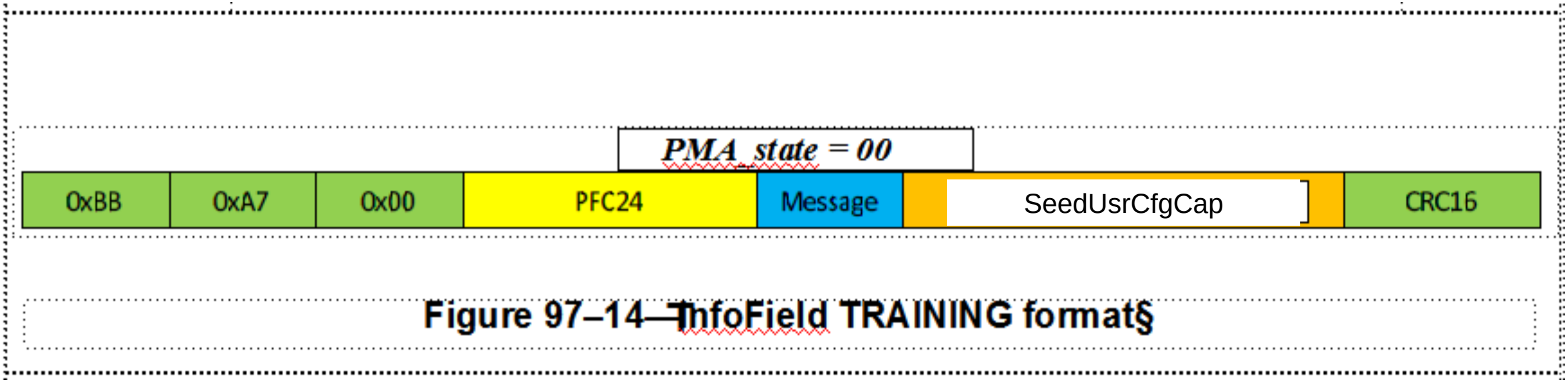

Figure 97–14—InfoField TRAINING format§

Modified Subclause 97.4.2.5.5

97.4.2.5.5 PHY Capability Bits, User Configurable Register, and Data Mode Scrambler Seed

When PMA_state<7:6>=00, [Oct8<7:0>, Oct9<7:0>, Oct10<7:0>] contains the two PHY capability bits (Cap), the user configurable register bits, and the 15-bit data mode scrambler seed (Seed). Each octet is sent LSB first.

The format of PHY capability bits is Oct9<7>=EEEen and Oct10<0>=OAMen, indicating EEE and OAM capability enable respectively. The PHY shall indicate the support of optional capabilities by setting the corresponding capability bits to 1. Otherwise it shall set the capability bit to 0 to indicate no support for the optional capability.

The data mode scrambler seed contains bits S14 (sent first) to S0 (sent last) to indicate the initial state of data mode transmit scrambler of the local device upon reaching the data switch partial frame count. The state of the scrambler in Figure 97–7 shall be S14:S0 at the first bit of the first RS FEC frame when DataSwPFC24 = 0, see 97.4.2.5.6. The format of Seed is Oct8<7:0> = S<7:14> and Oct9<6:0> = S<0:6>. Seed S<14:0> shall not be all zeros.

The remaining 7-bit Oct10<7:1> shall be user configurable register. See Subclause 97.4.2.5.10 for details.

Modified Subclause 97.4.2.5.9

Upon entering the TRAINING state, the minwait_timer is started and the PHY Control forces transmission into the training mode by asserting tx_mode=SEND_T, which includes the transmission of InfoFields. The PHY Control also sets PMA_state = 00 and sends the PHY capability bits, the user configurable register bits, and the Seed value used by the local device for data mode scrambler initialization, see 97.4.2.5.5.

The optional EEE capability shall be enabled only if both PHY set the capability bit EEEen=1. The optional OAM capability shall be enabled only if both PHY set the capability bit OAMen=1.

Remove EEE enable message in Clause 98

- Since EEE capability is already exchanged in InfoField, remove EEE capability related messages in Clause 98, e.g., bit A3 in Table 98B-1, etc.

Add User Configurable Register

- Add in new section 97.2.4.5.10 PHY Control Registers

Training Registers			
1.TBD10.15:11	Reserved	Set to 0s	RO
1.TBD10.10:4	User Field	7 bit user defined field to send to the link partner	R/W
1.TBD10.3	OAM Ability	1 = PHY has OAM ability 0 = PHY does not have OAM ability	RO
1.TBD10.2	EEE Ability	1 = PHY has EEE ability 0 = PHY does not have EEE ability	RO
1.TBD10.1	OAM Advertisement	1 = OAM ability advertised to link partner 0 = OAM ability not advertsied to link partner	R/W
1.TBD10.0	EEE Advertisement	1 = EEE ability advertised to link partner 0 = EEE Ability not advertsied to link partner	R/W

Add User Configurable Register (cont.)

Link Partner Training Registers			
1.TBD11.15:11	Reserved	Set to 0s	RO
1.TBD11.10:4	Link Partner User Field	7 bit user defined field received from the link partner	RO
1.TBD11.3:2	Reserved	Set to 0s	RO
1.TBD11.1	Link Partner OAM Advertisement	1 = Link partner has OAM ability 0 = Link partner does not have OAM ability	RO
1.TBD11.0	Link Partner EEE Advertisement	1 = Link partner has EEE ability 0 = Link partner does not have EEE ability	RO

Conclusion

- Draft D1.2 does not allow EEE and OAM capability exchanges for PHY operating in forced mode.
- Propose to utilize the existing InfoField messages outlined in this presentation.

Motion

- Adopt the proposed changes on slide #4 to #9 in presentation “tu_3bp_01a_0215.pdf” to allow capability exchanges for PHY w/o optional Auto-Negotiation.