

CLAUSE 46 AND 49 TIMESTAMP PROPOSAL FOR UPSTREAM EPoC



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- **Many recent discussions on upstream 1D to 2D frame mapping and timing has observed that an upstream CNU frame timestamp will be needed to de-jitter frames at the CLT receiver.**
 - This presentation does not re-overview all the jitter issues
- **This presentation updates and proposes the approach for adding timestamps into frame encoding was used as part of an example in [laubach_3bn_02_1113.pdf](#) (page 22-27).**
 - Impact Clause 46 and Clause 49
 - CNU 64B/66B encoding processing
 - CLT 64B/66B decoding processing
- **Balanced 802.3 layer architecture maintained**

- In table 46-3 for TXD and TXC, changing a reserved value of “FC” for use as Start, with timestamp.
- In table 46-4 for RXD and RXC, changing a reserved value of “FC” for use as Start, with timestamp.

The above is simply to reserve the value of “FC” for use in Clause 49.

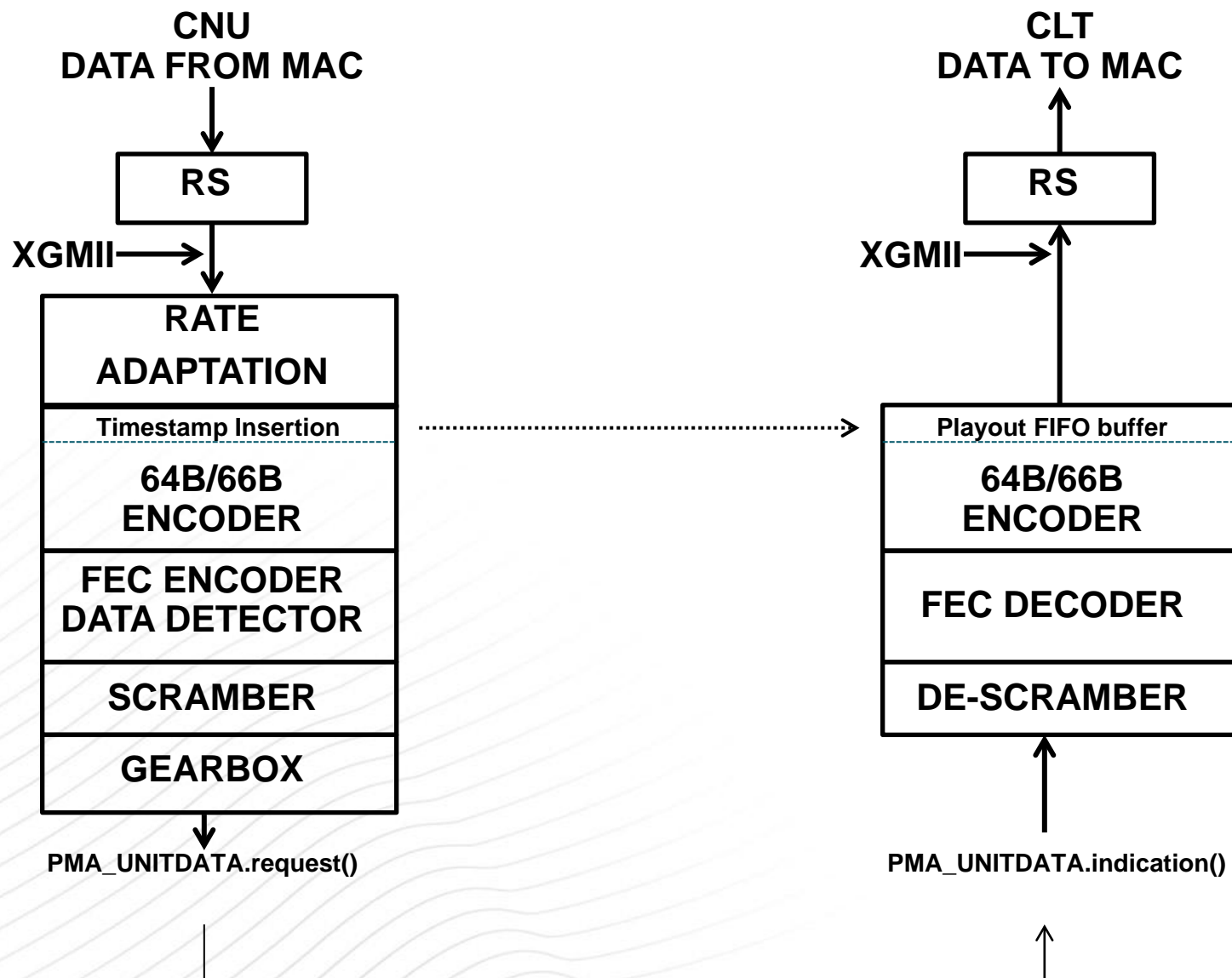
- **In Figure 49-7, add new Control block format for 0xfc**
 - $Q_0Q_1Q_2Q_3D_0D_1D_2$
 - Where Q code is an octet, four octets for a timestamp
 - Intent is for 64b/66b line encoding to signal that for a Start, data is preceded by a 32-bit timestamp.
- **Table 49-1, add new row**
 - “start with timestamp”, /S+/, 0xfc, Start followed by 32-bit timestamp value
- **Add new section 49.2.4.12:**
 - 49.2.4.12 Start with timestamp (/S+/
For EPoC PHY use (Clause 101). In the CNU transmitter (upstream), upon receiving a valid start control character (/S/) as per Section 49.2.4.8 at the beginning of an upstream burst, the EPoC 64B/66B encoder will change the block type value from 0xfb to 0xfc, insert the timestamp value in octets $Q_0Q_1Q_2Q_3$ and construct the block payload as per Figure 49-7. In the CLT receiver, if a block type value of 0xfc (/S+) is received, the EPoC 64B/66B decoder will treat this as equivalent to 0xfb, change the value to 0xfb (/S/), and will not include the timestamp octets in the decoded MAC frame.

- Draft text changes in [laubach_3bn_07_0914.pdf](#) (PDF)

- **In the CNU: upon receiving the start of a new burst across the XGMII from the CNU MAC, the start of the first frame /S/ will be converted to an /S+/, and a 32-bit timestamp will be inserted and encoded as part of 64B/66B (65B). In a concatenated burst containing more than one frame, only the first frame /S/ needs to be converted to an /S+/,**
 - The timestamp is taken directly from the PHY Link timestamp mechanism which is maintained and transmitted by the CLT
 - Note: the relation of downstream MPCP time to the PHY Link timestamp is up to the CLT vendor

- **In the CLT: upon 64B/66B decoding from a CNU, any received /S+/ adds the following processing:**
 - The 32-bit timestamp is removed before the frame
 - The /S+/ is converted to an /S/ before passing the frame to the XGMII
 - The 32-bit timestamp is used in a playout FIFO frame buffer to precisely time transmission to the XGMII
 - Playout buffer specifics are up to the CLT vendor
 - Subsequent frames in an upstream burst simply follow the “timed” frame

EPoC – BALANCED ARCHITECTURE



Move to:

Adopt into the Clause 46 and Clause 49 changes as per laubach_3bn_07_0914.pdf. Instruct the editors to include text that corresponds to Page 5 and 6 of laubach_3bn_06_0914.pdf in the next draft.

Thank you