PHY Initiated Departure From LPI

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4 November 2014

Contributors

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Motivation

- A change in environment to an extreme operating point can stress the receiver during symmetrical LPI mode
- The receiver can recover if the LP transmitter transitions to Normal mode for a finite period
- The 10G EEE standard has no mechanism to tell the transmitter to leave LPI mode at the PHY level without involving higher layers

Solution

- Propose we use a back channel method to tell the LP transmitter to leave LPI mode temporarily
- The higher layers will be oblivious to this action
- Propose the last 128 symbols of Refresh be reserved for sending messages during LPI
- Convey these messages employing the same mechanism used to generate InfoFields as shown in Figure 98–15
- The message format should be general purpose allowing for expansion

R5

R0	R1	R2	R3	R4		LIF
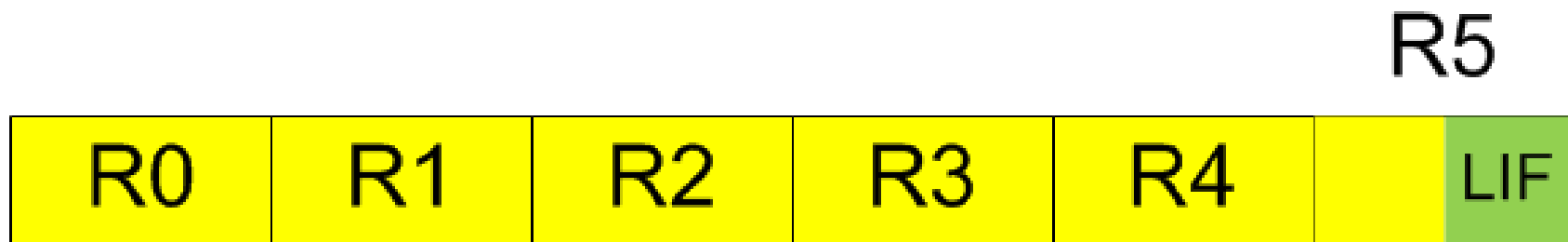
LPI InfoField Position

- Only during A Refresh
- Same position as in training frames
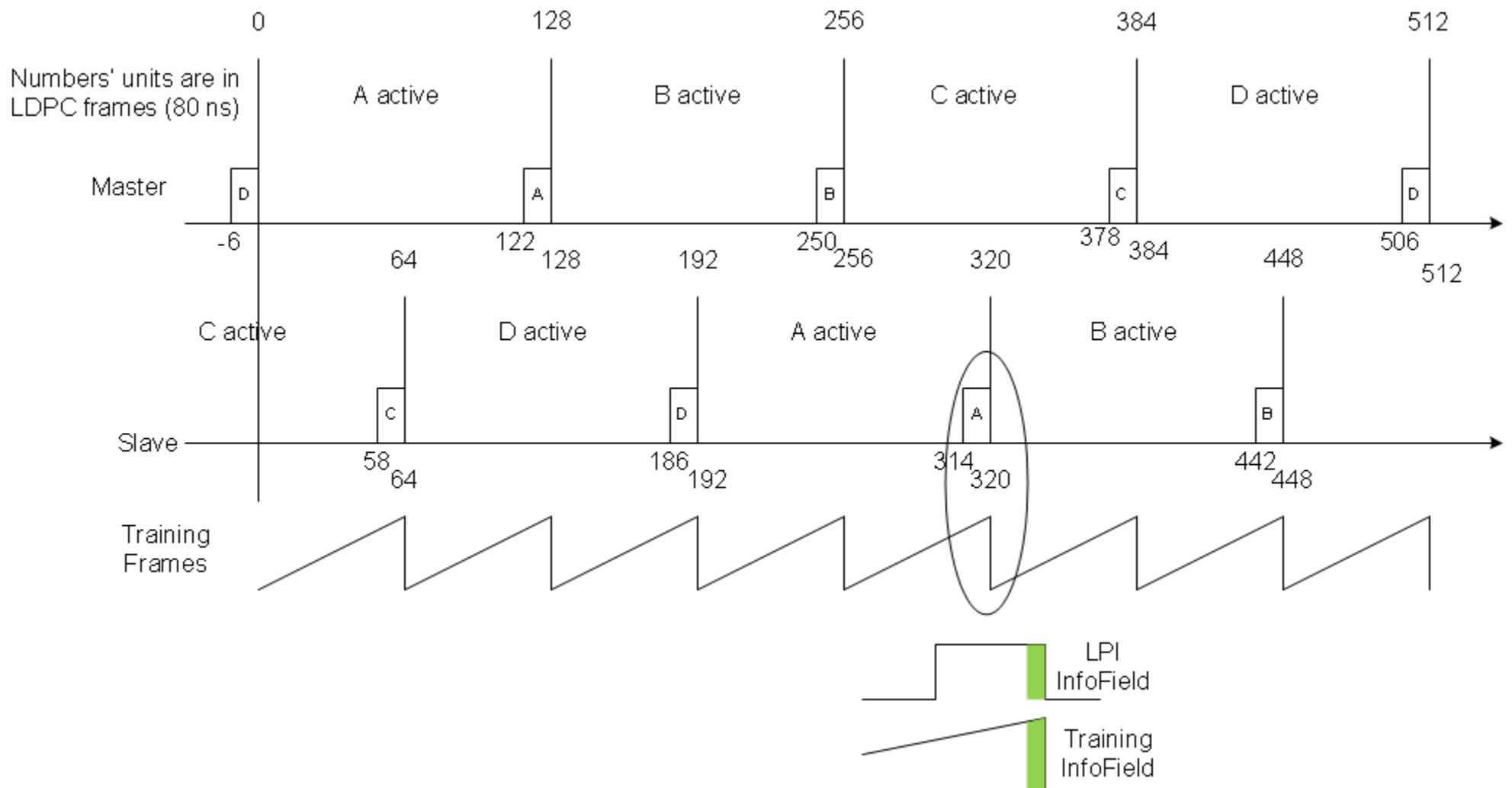
LPI InfoField Format

- Use InfoField coefficient exchange format as template
- Reuse training frame InfoField encode/decode modules

Start of Frame Delimiter 0xBBA70000	3 Transmitter Settings	Msg Field	S N R	Coef. Exch.	Coefficient Field	CRC16
4 octets	3 octets	1 octet	4 bits	1.5 octets	4 octets	2 octets

Start of Frame Delimiter 0xBBA70000	3 Transmitter Settings	LPI Field	U nit s	LPI Data	CRC16
4 octets	3 octets	1 octet	4 bits	5.5 octets	2 octets

LPI InfoField content

- LPI Field (8 bits)
  - 0: no message
  - 1: LP leave LPI mode
  - 2-255: Reserved
- Units (4 bits) (LPI Field = 1)
  - 0: microseconds
  - 1: milliseconds
  - 2: seconds
  - 3: minutes
- If LPI Field > 1 then Units an be used for something else
- Example
  - LPI Field = 1, Units = 3, LPI Data = 10 => Normal mode for 10 minutes
- Granularity if needed

Length of time out of LPI

- Limit to:
  - 32 minutes
  - LPI Data = $2^{16} - 1$

Proposals

- Adopt "LPI InfoField" proposal

- Let one of the LPI InfoField messages instruct the LP transmitter to leave LPI mode for a specified length of time