Comments on the TG1 Specification

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Motivation

- ■ **TG3 Systems will function in a more hostile channel environment as compared to TG1:**
  - ❑ **Co-channel interference**
  - ❑ **Multipath**

Implication: The protocol should be robust enough to recover from transient error conditions, as well as flexible enough to control a variety of link parameters in response to longer term channel variations

- ■ **TG3 Systems will see a different mix of traffic types as compared to TG1**
  - ❑ **TCP traffic will dominate, as opposed to TDM**
  - ❑ **Support large number of relatively low bit rate bursty sources**

Implication: The protocol should be able to efficiently handle a wide mix of packet sizes. It should have the ability to efficiently allocate BW to short bursts of data, in addition to longer term flows.
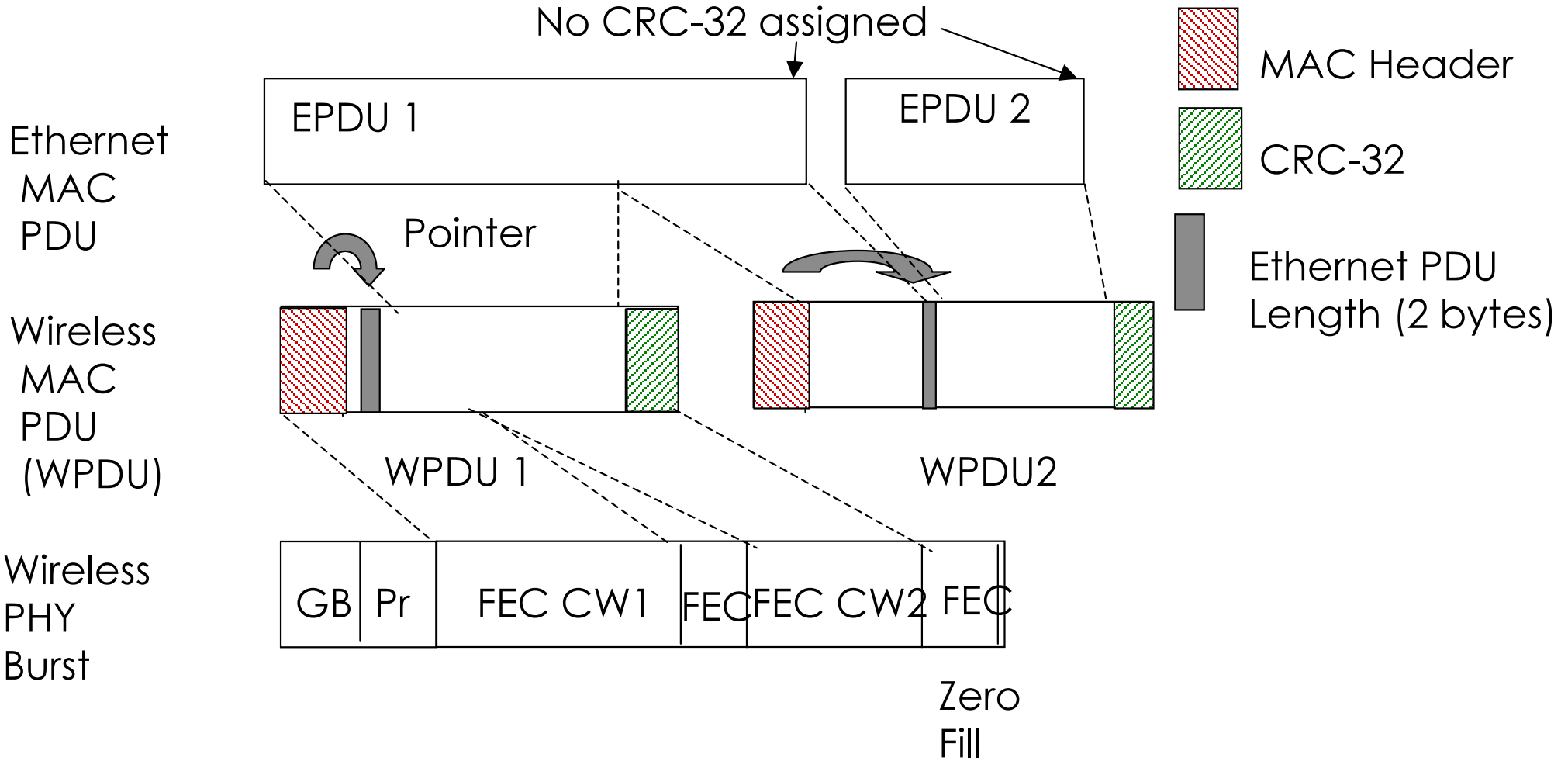
MAC Packet Encapsulation

- ■ **Shortcomings of current TG1 design:**
  - ❑ **Does not support concatenation efficiently. Essential to the efficient operation of the TCP protocol**
  - ❑ **Does not have a large enough Piggyback request field to be able to efficiently handle short bursts of data**
- ■ **Suggestion:**
  - ❑ **A simple pointer based encapsulation scheme, that supports both concatenation and fragmentation**
  - ❑ **Increase the Piggyback request field size to 2 bytes**

MAC Packet Encapsulation (cont)

No CRC-32 assigned

MAC Header

EPDU 1

EPDU 2

CRC-32

Ethernet
MAC
PDU

Pointer

Ethernet PDU
Length (2 bytes)

Wireless
MAC
PDU
(WPDU)

WPDU 1

WPDU2

Wireless
PHY
Burst

| GB | Pr | FEC CW1 | FEC | FEC CW2 | FEC |

Zero
Fill

ARQ

- **Absolutely essential for reliable operation of TG3 systems**
- **Requirements:**
    - ❑ **Should be available in both directions, uplink and downlink**
    - ❑ **Should not consume too much overhead**
    - ❑ **Should be flexible:**
        - ◆ **Should not constrain the flow BW**
        - ◆ **Should allow the MAC packet parameters to vary between re-transmissions**
- **Should be robust**

Link Parameter Control

- The current TG1 specification allows dynamic control of the Modulation and FEC values.

- In order to provide for more powerful Link Parameter Control, the protocol should allow the BS to modify a wider set of parameters, some of which can be vendor proprietary

- This feature can serve as a differentiator between vendors

- Requires the addition of a 2 byte field to Uplink/Downlink MAP Data IEs