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
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MAC Packet Encapsulation (cont)

Ethernet MAC PDU

Wireless MAC PDU (WPDU)

Wireless PHY Burst

EPDU 1

No CRC-32 assigned

EPDU 2

MAC Header

CRC-32

Ethernet PDU Length (2 bytes)

WPDU 1

WPDU 2

GB Pr FEC CW1 FEC CW2 FEC

Zero Fill

Pointer
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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
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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.