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Title	Transmission Convergence Sublayer to the OFDM PHY	
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Re:	This is a contribution to IEEE 802.16-REVd.	
Abstract	This contribution describes the proposed changes to add the Transmission Convergence sublayer to the OFDM PHY in 802.16REVd.	
Purpose	To provide a quick recovery of decoding process at the receiver side in case one or more FEC codeword get corrupted.	
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Transmission Convergence Sublayer for the OFDM PHY

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1. Introduction

This document proposes to introduce the Transmission Convergence Sublayer (TCS) to the OFDM PHY, in order to quickly recover the MAC PDU decoding from the cases of receiving one or multiple uncorrectable FEC codewords.

The Transmission Convergence sublayer is specified in the current 802.16 standard, i.e., IEEE P802.16-REVd/D3-2004, but it only applies to the WirelessMAN-SC PHY.

2. References

[16REVd/D3] IEEE P802.16-REVd/D3-2004

3. Rationale

The Transmission Convergence Sublayer (TCS) specifies how to fit the MAC PDUs into the PHY FEC codewords. For a given PHY burst, the TCS PDU has a fixed size that is the codeword size of the burst.

The TCS PDU format is illustrated on page 298, Figure 136, in [16REVd/D3], which is also shown as follows:

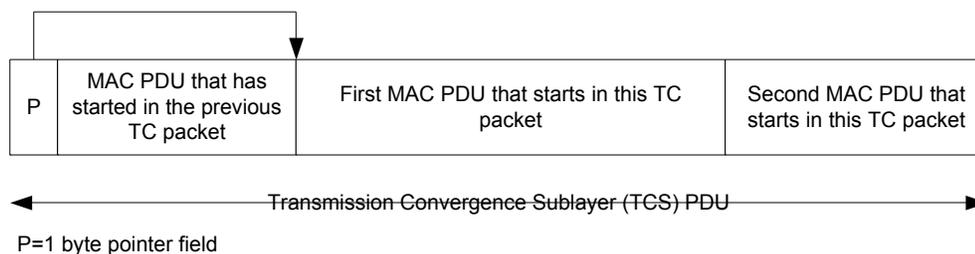


Figure 1. TCS PDU Format

A TCS PDU consists of a pointer field called P and the data from its upper layer, i.e., the MAC. The pointer field identifies the byte number in the packet which indicates either the beginning of the first MAC PDU to start in the packet or the beginning of any stuff bytes that precede the next MAC PDU. For reference, the first byte in the packet is referred to as byte number 1. If no MAC PDU or stuff bytes begin in the CS packet, then the pointer byte is set to 0. When no data is available to transmit, a `stuff_byte` pattern having a value (0xFF) shall be used within the payload to fill any gaps between the IEEE Std 802.16 MAC PDUs. This value is chosen as an unused value for the first byte of the IEEE Std 802.16 MAC PDU, which is designed to never have this value.

The TC sublayer enables a quick recovery from receiving one or multiple uncorrectable codeword, at the cost of using one byte per FEC codeword as the pointer field. Such a quick recovery reduces lost MAC PDUs and reduces ARQ retransmissions.

The TC sublayer shall be applied to both uplink and downlink.

4. Proposed Changes

The following changes are required in [16REVd/D3] to reflect the above proposal:

1) Page 422, line 36, insert the follow text

8.3.4 Transmission Convergence (TC) Sublayer

The transmission Convergence sublayer as described in section 8.1.4.3 shall be applied to the OFDM PHY systems for both uplink and downlink operations.

2) Page 422, line 37, change the section number from “8.3.4” to “8.3.5”, also change all subsequent section numbers.