IEEE P802.11
Wireless LANs

|  |
| --- |
| Proposed Spec Text change on PHY Padding |
| Date: 2018-05-08 |
| Author(s): |
| Name | Affiliation | Address | Phone | Email |
| Tianyu Wu | Samsung |  |  | Tianyu.wu@samusng.com |
| Hongyuan Zhang | Marvell |  |  |  |
| Ron Porat | Broadcom |  |  |  |

Abstract

This submission proposes spec text change related to PHY padding bits in 28.3.10.8.4 and 28.3.11.8.

Revisions:

* Rev 0: Initial version of the document.

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGax Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

# Discussions:

In 11ax D2.2 subclause 28.3.10.8.4 pp447 ln5, the spec reads:

“Padding bits are appended right after the tail bits corresponding to the last User Block field in each HE-SIG-B content channel to round up to the next multiple of number of data bits per HE-SIG-B symbol, as described in 17.3.5.4 (Pad bits (PAD)).”

In REVmd 1.0, 17.3.5.4, the spec says:

“The appended bits (“pad bits”) are set to 0 and are subsequently scrambled with the rest of the bits in the

DATA field.”

Sub clause 17.3.5.4 defines padding bits for data part but the padding in 28.3.10.8.4 is for HE-SIG-B. The HE-SIG-B bits will not be scrambled. Also, the equations in 17.3.5.4 can not be used for HE-SIG-B padding bits. Moreover, without scrambling, all 0 padding may not be a good choice to achieve low PAPR. Similar to PE, there is no need to specify the value of these HE-SIG-B padding bits.

***TGax Editor: Please change 11ax D2.3 P471Ln4 as shown below.***

Padding bits are appended immediately after(#12714) the tail bits corresponding to the last User Block field in each HE-SIG-B content channel to round up to the next multiple of number of data bits per HE-SIG-B symbol. ~~, as described in 17.3.5.4 (Pad bits (PAD)).~~ These padding bits may be set to any value.

# Discussions:

In 11ax D2.2 subclause 28.3.11.8 pp486 ln13, the spec reads:

“When DCM is used with BPSK modulation in a 106-tone RU or a 242-tone RU with *NSS* = 1, after the 2×*NDBPS* coded bits in each OFDM symbol, 1 padding bit is added before the bits are interleaved.”

This 1 bit DCM padding is already counted in NCBPS which is used to calculate number of post-FEC padding bits and used in stream parser and segment parser sub clauses before interleaver. If this padding bit is added at interleaver, then all these earlier sub clauses should use NCBPS-1 instead of NCBPS for the special case of DCM MCS0 Nss1 on 106/242 tone RU.

*Note: NCBPS is defined as NSD × NBPSCS. For DCM MCS0 Nss1 on 106/242 tone RU, NCBPS is odd number. To avoid 1 information bit (2 coded bits) be split to 2 OFDM symbols, 1 post-FEC padding bit is added for each symbol. So for these special DCM cases, there will be NDBPS*×*NSD coded information bits and 1 padding bit on each symbol.*

To avoid this problem, we propose to move this 1 bit padding from interleaver sub clause to 28.3.11.5.1 Binary convolutional coding and puncturing. Also clarify that this padding bit is not FEC coded and is inserted after the FEC coding procedure in the data path. The value of the padding bit is not specified.

***TGax Editor: Please make the following change in D2.3 P511Ln5 as shown below.***

The BCC interleaver operation is specified in 21.3.10.8 (BCC interleaver). ~~When DCM is used with BPSK modulation in a 106-tone RU or a 242-tone RU with~~ *~~NSS~~* ~~= 1, after the 2×~~*~~NDBPS~~* ~~coded bits in each OFDM symbol, 1 padding bit is added before the bits are interleaved.~~

***TGax Editor: Please add the following text in red to D2.3 P505Ln2 as shown below.***

**28.3.11.5.1 Binary convolutional coding and puncturing**

The information bits and pre-FEC padding bits of user *u* are encoded by a rate *R* = 1/2(#11431) convolu-tional encoder defined in 17.3.5.6 (Convolutional encoder). After encoding, the encoded data is punctured by the method defined in 17.3.5.6 (Convolutional encoder) (except for rate 5/6), to achieve the rate selected by the modulation and coding scheme. In the case that rate 5/6 coding is selected, the puncturing scheme will be the same as described in 19.3.11.6 (Binary convolutional coding and puncturing)(#13391, #14182).

When DCM is used with BPSK modulation in a 106-tone or 242-tone RU with NSS = 1, after every 2×NDBPS coded bits, one padding bit is added. This padding bit may be set to any value.