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| Re: | IEEE 802.16-10/0011, "IEEE 802.16 Working Group Letter Ballot#31" <br> Target topic: "IEEE P802.16m/D4, section 16.3.6.5.1". |
| Abstract | The contribution provides the clean up text for SFH |
| Purpose | To be discussed and adopted by TGm for the 802.16m/D5 |
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# Proposed texts to Broadcast Control Information Elements (16.3.6.5.1)

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## 1. Introduction

This contribution provides the cleanup text to clarify the following issues:

- Remedy #1: Modify some parameters in order to reduce the DLRU size for P-SFH.

  Based on current information bits in P-SFH IE, 5 DLRUs are needed. But, some parameters should be reconsidered their size and usage. Specially, It is inefficient to allow concurrent transmission of multiple SPs using 'Scheduling information bitmap'. For the simultaneous transmission, we need to change /modify the TBCC interleaver since the size of any combination of current SPx IEs is larger than 128 bits. Table 1, Table 2 and Table 3 show the bit calculation of SP1, SP2 and SP3, respectively, where total size in Tables does not include the reserved bits and CRC. So, I suggest using the individual indication instead of the bitmap indication.

- Remedy #2: Describe the size of each S-SFH SP IE.

  The size of S-SFH SPx IE is required to determine the DLRU size used for S-SFH transmission. But, it is hard to describe a specific value now because the fields in S-SFH IE are still on going to be specified and some fields are different according to FFT size.

  I suggest specifying the size of each S-SFH SP IE and its upper bound. The maximum size of S-SFH IE when one SP IE is transmitted is up to 120 bits. i.e. the maxium size of each SP is up to 104 bits when 16 bit CRC is used. The following rationales are considered.

  - The SFH uses DLRU which consist 80 data carriers and QPSK with the mother coding rate as 1/4. If the information sizes are multiple of 40 bits, there are no resource losses at view of rate matching.

  - The size of current S-SFH SPx IE is not larger than 90 bits. Table 1, Table 2 and Table 3 show the bit calculation of SP1, SP2 and SP3, respectively, where total size in Tables does not include the reserved bits and CRC. The reserved bit may be less than 8 bits.

  - The complexity can be reduced if the S-SFH IE is up to 128 as like the maximum size of TBCC interleaver because one TBCC block may be considered for S-SFH decoding.

Table 1. S-SFH SP1 IE

| # | Channel | Parameters | 16m BS (Macro) | | |
|---|---------|------------|-----|-----|-----|
| | DRU | fields | 2k | 1k | 512 |
| 1 | SP1 | MSB of superframe number | 8 | 8 | 8 |
| 2 | SP1 | LSBs of 48 bit ABS MAC ID | 12 | 12 | 12 |
| 3 | SP1 | Number of UL ACK/NACK channels per HARQ feedback region | 2 | 2 | 2 |
| 4 | SP1 | Number of DL ACK/NACK channels per HF-A-MAP region | 2 | 2 | 2 |

| # | | Parameters | 2k | 1k | 512 |
|---|---|---|---|---|---|
| 5 | SP1 | Power control channel resource size indicator | 2 | 2 | 2 |
| 6 | SP1 | Primary frequency partition location | 1 | 1 | 1 |
| 7 | SP1 | A-A-MAP MCS selection | 1 | 1 | 1 |
| 8 | SP1 | ABS EIRP | 7 | 7 | 7 |
| 9 | SP1 | Cell bar information | 1 | 1 | 1 |
| 10 | SP1 | UL_N_MAX_ReTx | 1 | 1 | 1 |
| 11 | SP1 | DL_N_MAX_ReTx | 1 | 1 | 1 |
| 12 | SP1 | $T_{UL\_Rx\_Processing}$ | 1 | 1 | 1 |
| 13 | SP1 | $DCAS_{SB0}$ | 5 | 4 | 3 |
| 14 | SP1 | $DCAS_{MB0}$ | 5 | 4 | 3 |
| 15 | SP1 | $DCAS_i$ | 3 | 2 | 1 |
| 16 | SP1 | Frame configuration index | 6 | 6 | 6 |
| 17 | SP1 | WirelessMAN-OFDMA support | 1 | 1 | 1 |
| 18 | SP1 | Allocation periodicity of ranging channel for non-synchronized AMSs | 2 | 2 | 2 |
| 19 | SP1 | Subframe offset of ranging channel | 2 | 2 | 2 |
| 20 | SP1 | Start code information of ranging channel for non-synchronized AMSs | 4 | 4 | 4 |
| 21 | SP1 | Ranging preamble code partition information for non-synchronized AMSs | 4 | 4 | 4 |
| 22 | SP1 | Number of cyclic shifted ranging preamble codes per root index for non-synchronized AMSs | 2 | 2 | 2 |
| 23 | SP1 | Ranging channel formats for non-synchronized AMSs | 1 | 1 | 1 |
| 24 | SP1 | UL sounding | 3 | 3 | 3 |
| 25 | SP1 | $UCAS_{SB0}$ | 5 | 4 | 3 |
| 26 | SP1 | $UCAS_{MB0}$ | 5 | 4 | 3 |
| 27 | SP1 | $UCAS_i$ | 3 | 2 | 1 |
| 28 | SP1 | reserved | TBD | TBD | TBD |
| | | *Total* | 90 | 84 | 78 |

Table 2. S-SFH SP2 IE

| # | | Parameters | 16m BS | | |
|---|---|---|---|---|---|
| | | fields | 2k | 1k | 512 |
| 1 | SP2 | UL carrier frequency | 6 | 6 | 6 |
| 2 | SP2 | UL bandwidth | 3 | 3 | 3 |
| 3 | SP2 | MSB bytes of 48 bit ABS MAC ID | 36 | 36 | 36 |
| 4 | SP2 | MAC protocol revision | 4 | 4 | 4 |
| 5 | SP2 | *DSAC* | 5 | 4 | 3 |
| 6 | SP2 | *DFPC* | 4 | 3 | 3 |
| 7 | SP2 | *DFPSC* | 3 | 2 | 1 |
| 8 | SP2 | *USAC* | 5 | 4 | 3 |

| 9 | SP2 | *UFPC* | 4 | 3 | 3 |
|---|-----|--------|---|---|---|
| 10 | SP2 | *UFPSC* | 3 | 2 | 1 |
| 11 | SP2 | AMS Transmit Power Limitation Level | 5 | 5 | 5 |
| 12 | SP2 | EIRxPIR,min | 5 | 5 | 5 |
| 13 | SP2 | reserved | TBD | TBD | TBD |
| | | total | 83 | 77 | 73 |

Table 3. S-SFH SP3 IE

| # | Channel | Parameters | |
|---|---------|------------|--|
| | DRU | fields | Bit size |
| 1 | SP3 | Rate of change of S-SFH info | 4 |
| 2 | SP3 | SA-Preamble sequence soft partitioning information | 4 |
| 3 | SP3 | FFR partition resource metrics | 8 |
| 4 | SP3 | IoT correction value for UL power control | 10 |
| 5 | SP3 | Number of Distributed LRUs for UL feedback channel per a UL AAI subframe | 4 |
| 6 | SP3 | # Tx antenna | 2 |
| 7 | SP3 | SP scheduling periodicity information | 4 |
| 8 | SP3 | HO Ranging backoff start | 4 |
| 9 | SP3 | HO Ranging backoff end | 4 |
| 10 | SP3 | Initial ranging backoff start | 4 |
| 11 | SP3 | Initial ranging backoff end | 4 |
| 12 | SP3 | UL BW REQ channel information | 3 |
| 13 | SP3 | Bandwidth request backoff start | 4 |
| 14 | SP3 | Bandwidth request backoff end | 4 |
| 15 | SP3 | fpPowerConfig | 4 |
| 16 | SP3 | Reserved | TBD |
| | | total | 67 |

Removed text

Added text

# 2. References

[1] IEEE P802.16m/D4, *"P802.16m DRAFT Amendment to IEEE Standard for Local and metropolitan area networks Part 16: Air Interface for Broadband Wireless Access Systems",* 2010-02-03

# 3. Proposed Text Changes

*[Remedy#1: Adopt the following modification in page 446, Table 809, section 16.3.6.5.1.1]*

**Table 809 - P-SFH IE format**

| Syntax | Size (bit) | Notes |
|---|---|---|
| **P-SFH IE format () {** | | |
| LSB of Superframe number | 4 | Part of superframe number |
| S-SFH change count | 4 | Indicates the value of S-SFH change count associated with the S-SFH SPx IE(s) transmitted in this superframe |
| ~~S-SFH Size~~ S-SFH size extension | ~~4~~ 2 | ~~The units of LRU~~ |
| ~~S-SFH n~~Number of Repetitions for S-SFH ($N_{Rep, S-SFH}$) | 2 | Indicate ~~the transmission format (~~ the number of repetitions~~)~~ used for S-SFH transmission. 0b00: reserved 0b01: 6 0b10: 3 0b11: 1 |
| S-SFH Scheduling information ~~bitmat~~ | ~~3~~ 2 | ~~0b000: no S-SFH~~ ~~If 1st bit = 1, S-SFH includes SP1 otherwise no SP1~~ ~~If 2nd bit = 1, S-SFH includes SP2 otherwise no SP2~~ ~~If 3rd bit = 1, S-SFH includes SP3 otherwise no SP3~~ Indicates which S-SFH SPx IE is included in S-SFH at this superframe 0b00: S-SFH SP1 IE 0b01: S-SFH SP2 IE 0b10: S-SFH SP3 IE 0b11: no S-SFH |
| S-SFH SP change bitmap | 3 | Indicates the change of S-SFH SPx IE(s) associated with the S-SFH change count. If bit#0 (LSB) = 1, change in S-SFH SP1 IE. Otherwise no change in SP1 IE. If bit#1 = 1, change in S-SFH SP2 IE. Otherwise no change in SP2 IE. If bit#2 (MSB) = 1, change in S-SFH SP3 IE. Otherwise no change in SP3 IE. ~~If in S-SFH SP1 IE is changed, then bit#0 (LSB) is toggled. Otherwise no change in SP1.~~ ~~If in S-SFH SP2 IE is changed, then bit#1 is toggled. Otherwise no change in SP2.~~ ~~If in S-SFH SP3 IE is changed, then bit#2 (MSB) is toggled. Otherwise no change in SP3.~~ |
| Start super-frame offset where new S-SFH information is used | 2 | |
| Reserved | ~~3~~ 2 | The reserved bits are for future extension. |
| **}** | | |

-------------------------------------------------------- End of remedy #1 -------------------------------------------------------------

*[Remedy#2: Adopt the following modification in page 447, Table 810, section 16.3.6.5.1.2]*

**Table 810 – S-SFH IE format**

| Syntax | Size (bit) | Notes |
|---|---|---|
| S-SFH IE format () { | | |
| ~~If (1st bit of S-SFH Scheduling information bitmap == 1) {~~ If (S-SFH Scheduling information ==0b00) { | | |
| S-SFH SP1 IE () | | Includes S-SFH SP1 IE in Table 811. The size of S-SFH SP1 IE is dependent of FFT size. A is up to 104 For 512 FFT, Size$_{SP1}$ = A-12 bits For 1024 FFT, Size$_{SP1}$ = A- 6 bits For 2048 FFT, Size$_{SP1}$ = A bits |
| } | | |
| ~~if (2nd bit of S-SFH Scheduling information bitmap == 1) {~~ else if (S-SFH Scheduling information ==0b01) { | | |
| S-SFH SP2 IE () | | Includes S-SFH SP2 IE in Table 812. The size of S-SFH SP2 IE IE is dependent of FFT size. B is up to 104 For 512 FFT, Size$_{SP2}$ = B-10 bits For 1024 FFT, Size$_{SP2}$ = B-6 bits For 2048 FFT, Size$_{SP2}$ = B bits |
| } | | |
| ~~if (3rd bit of S-SFH Scheduling information bitmap == 1) {~~ else if (S-SFH Scheduling information ==0b10) { | | |
| S-SFH SP3 IE () | | Includes S-SFH SP3 IE in Table 813. The size of S-SFH SP2 IE IE Size$_{SP3}$ is C bits. C is up to 104 |
| } | | |
| } | | |

-------------------------------------------------------- End of remedy #2 -------------------------------------------------------------------------