IEEE P802.11
Wireless LANs

|  |
| --- |
| EHT-LTF field using secure EHT-LTF  |
| Date: 2023-07-10 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Christian Berger | NXP | 350 Holger Way, San Jose, CA |  | christian.berger@nxp.com |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This submission proposes amendment text to add description of using secure EHT-LTF in the EHT PHY section, changes are relative to Draft P802.11be\_D3.0 and partially based on IEEE802.11az-2022

Revisions:

1. Changes made during presentation
2. Clarify order of segments in frequency, rename segment to subblock

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 TGbk Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

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

**The text preceded by “Discussion” is not part of the adopted changes.**

**Discussion:**

Add subclause describing secure EHT-LTF to EHT PHY similar to additions to HE PY in IEEE802.11az-2022.

1. ***TGbk Editor: Insert the following subclause at the end of the 36.3.X2 EHT TB Ranging NDP:***
2. 36.3.X3 EHT-LTF field using secure EHT-LTF
3. 36.3.X3.1 Introduction
4. 36.3.X3.2 Generation of a randomized secure LTF sequence
5. The secure LTF sequence is constructed using pseudorandom 64-QAM modulation. Pseudorandom octets defined in [11.21.6.4.5.4](#H11o21o6o4o5o4) (Overview of secure LTF octet stream generation) are used in the construction of the pseudorandom 64-QAM values.
6. The first seven pseudorandom octets ($Octet\_{0}$-$Octet\_{6}$) in the secure NDP are used for per stream phase rotations see [27.3.18b.3](#H27o3o18bo3) (Pseudorandom and deterministic per spatial stream phase rotations). Starting with $Octet\_{7},$ these pseudorandom octets are used for construction of pseudorandom 64-QAM values in the secure LTF sequences.
	* + - 1. 36.3.X3.2.1 Randomized LTF sequence for the 320 MHz secure NDP

This subclause describes the mapping of pseudorandom octets to the nonzero entries of the 320 MHz secure 2x EHT-LTF sequence, and then the construction of the 64-QAM values for each nonzero entry of the secure LTF sequence.

The construction of the 320 MHz secure LTF sequence uses a segment parser to divide the pseudorandom octets between the four sequences for each of the 80 MHz subblocks. The subblocks are enumerated first to last starting at the lowest frequencies to the highest. Figure 36-G (Segment parser distributing pseudorandom octets to the sequences for each of the four 80 MHz subblocks in the 320 MHz secure LTF) illustrates the segment parser distribution of pseudorandom octets between the sequences for each of the 80 MHz subblocks.



1. Figure 36-G—Segment parser distributing pseudorandom octets to the sequences for each of the four 80 MHz subblocks in the 320 MHz secure LTF.

The indices of the nonzero entries of each 80 MHz subblock’s secure 2x EHT-LTF sequence are given in Equation (36-39).

There are up to sixty four secure LTF sequences in an NDP. For notational convenience we indicate the LTF sequence number with the integer $n$, which is an integer between one and sixty four. Since each secure LTF sequence is used to generate each of the LTF symbols,$ n$ also indicates the LTF symbol number. Table 36-A (Pseudorandom octet index for each nonzero subcarrier index in the $n$-th quadruplet of 80 MHz subblocks) provides the pseudorandom octet index for each nonzero subcarrier index for the $n$-th quadruplet of 80 MHz subblocks.

1. Table 36-A—Pseudorandom octet index for each nonzero subcarrier index in the n-th quadruplet of 80 MHz segments

|  |  |  |
| --- | --- | --- |
| **80 MHz subblocks** | **Secure EHT-LTF tone index** | **Pseudorandom octet index** |
| First | -500 | $$7 + \left(n-1\right)×1992$$ |
| Second | -500 | $$8 + \left(n-1\right)×1992$$ |
| Third | -500 | $$9 + \left(n-1\right)×1992$$ |
| Fourth | -500 | $$10 + \left(n-1\right)×1992$$ |
| First | -498 | $$11 + \left(n-1\right)×1992$$ |
| Second | -498 | $$12 + \left(n-1\right)×1992$$ |
| $$\vdots $$ | $$\vdots $$ | $$\vdots $$ |
| First | -4 | $$999 + \left(n-1\right)×1992$$ |
| Second | -4 | $$1000 + \left(n-1\right)×1992$$ |
| Third | -4 | $$1001 + \left(n-1\right)×1992$$ |
| Fourth | -4 | $$1002 + \left(n-1\right)×1992$$ |
| First | 4 | $$1003 + \left(n-1\right)×1992$$ |
| Second | 4 | $$1004 + \left(n-1\right)×1992$$ |
| Third | 4 | $$1005 + \left(n-1\right)×1992$$ |
| Fourth | 4 | $$1006 + \left(n-1\right)×1992$$ |
| $$\vdots $$ | $$\vdots $$ | $$\vdots $$ |
| Third | 498 | $$1993 + \left(n-1\right)×1992$$ |
| Fourth | 498 | $$1994 + \left(n-1\right)×1992$$ |
| First | 500 | $$1995 + \left(n-1\right)×1992$$ |
| Second | 500 | $$1996 + \left(n-1\right)×1992$$ |
| Third | 500 | $$1997+ \left(n-1\right)×1992$$ |
| Fourth | 500 | $$1998 + \left(n-1\right)×1992$$ |

All entries in the 320 MHz secure LTF sequence other than the entries with indices defined in Equation (TBD) shall be set to 0.

The six least significant bits ($B\_{0},B\_{1},B\_{2},B\_{3},B\_{4},B\_{5}$) of an octet are used in the construction of the 64-QAM value, as specified in Table 17-15 (64-QAM Encoding Table).