IEEE P802.11
Wireless LANs

|  |
| --- |
| Segment Parser |
| Date: 2020-09-10 |
| Author(s): |
| Name | Affiliation | Address | Phone | Email |
| Jianhan Liu | Mediatek |  |  | Jianhan.liu@mediatek.com |
| Shengquan Hu | Mediatek |  |  | Shengquan.hu@mediatek.com |
| Dandan Liang | Huawei |  |  | Dandan.liang@huawei.com |

Abstract:

This document contains draft text of the following motions in [1]:

111(#SP061107, SP#2, SP#3), 115 (SP#70)

**34.3.11.xx Segment Parser**

For a 20MHz, 40MHz, 80MHz, 160MHz, 80+80MHz and 320MHz transmission with a 26, 52, 106, 242, 484, 996 tone RU, and (26+52), (26+106), (242+484) tone MRU, the segment parser is bypassed and the output bits are as specified in Equation (34x1).

$y\_{k,l,u}= x\_{k,}$ (Equation 34-x1)

Where

$$x\_{k} is bit k of a block of N\_{CBPSS} bits, k=0 to N\_{CBPSS,u}-1$$

$l is the frequency subblock index and l=0 $for a 26, 52, 106, 242, 484, 996tone RU, and (26+52), (26+106), (242+484)tone MRU

$$y\_{k,l} is bit k of the frequency subblock l$$

$$u=0, 1, …, N\_{user}-1$$

For a 160/80+80 MHz and 320/160+160 MHz transmission with a 2×996,(484+996), ((242+484)+996), (484+2x996), (3x996), (484+3x996) and (4x996) tone RU/MRU, the output bits of each stream parser are first divided into blocks of $ \sum\_{}^{}\_{}$$\sum\_{l=0}^{L-1}N\_{cbpss,l,u}$bits The segment parser bit distribution sequence starts from the lowest frequency location to the highest frequency. The parameter of proportional ratio ($m\_{i}$) is defined in Table 34-t1 for each MRU.

**Table 34-t1 Proportional Round Robin Segment Parser Parameters**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MRU** | **RU Order(low to high frequency)** | **Nsd\_total** | **Proportional Ratio*(m0:m1:m2:m3)*** | **leftover bits(on RU996)** |
| **484+996** | 484+996 | 1448 | *1s:2s* | *44\*Nbpscs* |
| 996+484 | 1448 | *2s:1s* | *44\*Nbpscs* |
| **(242+484)+996** | (242+484)+996 | 1682 | *3s:4s* | *44\*Nbpscs* |
| 996+(242+484) | 1682 | *4s:3s* | *44\*Nbpscs* |
| **484+2x996** | 484+996+996 | 2428 | *1s:2s:2s* | *44\*Nbpscs* |
| 996+484+996 | 2428 | *2s:1s:2s* | *44\*Nbpscs* |
| 996+996+484 | 2428 | *2s:2s:1s* | *44\*Nbpscs* |
| **484+3x996** | 484+996+996+996 | 3408 | *1s:2s:2s:2s* | *44\*Nbpscs* |
| 996+484+996+996 | 3408 | *2s:1s:2s:2s* | *44\*Nbpscs* |
| 996+996+484+996 | 3408 | *2s:2s:1s:2s* | *44\*Nbpscs* |
| 996+996+996+484 | 3408 | *2s:2s:2s:1s* | *44\*Nbpscs* |
| **2x996** | 996+996 | 1960 | *1s:1s* | 0 |
| **3x996** | 996+996+996 | 2940 | *1s:1s:1s* | 0 |
| **4x996** | 996+996+996+996 | 3920 | *1s:1s:1s:1s* | 0 |

In the Table 34-t1

$$s=max⁡(1, \frac{N\_{bpscs,u}}{2})$$

Then, each block further performs the proportial round robsin segment parser as shown in Equation (34-x2).

$y\_{k,l}= x\_{m}$(Equation 34-x2)

$m=\left(\sum\_{l=0}^{L-1}m\_{l}\right)\*\left⌊\frac{k}{m\_{l}}\right⌋+\sum\_{i=0}^{l-1}m\_{i}+ \left(k mod m\_{l}\right) $

where

$$k=0,1,…, (N\_{cbpss,l}-n\_{l}\*44\*N\_{bpscs,l}-1)$$

$$x\_{m} is bit m of a block \sum\_{l=0}^{L-1}N\_{cbpss,l} bits and m=0,1, …, \sum\_{l=0}^{L-1}N\_{cbpss,l}-1$$

$m\_{l} is the proportinal ratio defined in Table $34-t1

$l is the frequency subblock index, l=0,1,2, …, $*L-1*

$L$is the number of frequency subblocks. *L=2* for (484+996), ((242+484) +996), 2x996 tone MRU; *L=3* for (484+2x996) and (3x996) tone MRU; *L=4* for (484+3x996) and (4x996) tone MRU

$$y\_{k,l,u} is bit k of frequency subblock (or RU in 80MHz segment) l $$

$n\_{l} n\_{l}=1 for subblock l with nonzero leftover bits$*,* $n\_{l}=0 otherwise$

$$u=0, 1, …, N\_{user}-1$$

$\sum\_{}^{}\_{}$ = 0 for subblock *l*=0, which is equivalent to $\_{}$

For the MRU with the number of the leftover bits in Table 34-t1 is not equal to 0, then proportial round robin parser will continue processing the leftover bits as Equation (34-x3):

$$m=\left(\sum\_{l=0}^{L-1}m\_{l}\right)\*\left⌊\frac{N\_{cbpss,l\_{0}}}{m\_{l\_{0}}}\right⌋+\left(\sum\_{l=0,l\ne l\_{0}}^{L-1}m\_{l}\right)\*\left⌊\frac{k^{'}}{m\_{l}}\right⌋+\sum\_{i=0,i\ne l\_{0}}^{l-1}m\_{i}+ \left(k mod m\_{l}\right)$$

(Equation 34-x3)

Where

$$k=(N\_{cbpss,l}-n\_{l}\*44\*N\_{bpscs,l}),…, N\_{cbpss,l}-1$$

$$k^{'}=k-(N\_{cbpss,l}-n\_{l}\*44\*N\_{bpscs,l})$$

$$l\_{0} is the subblock index with n\_{l\_{0}}=0 (i.e.the subblock without leftover bits)$$

The illustration of Proportional Round Robin Parser with Leftover Bits Processing is shown in figure 34-f1.



**Figure 34-f1 Illustration of Proportional Round Robin Parser with Leftover Bits Processing**

The illustration of segment parser for (484+996) tone MRU and ((242+484) +996) tone MRU are shown in figure 34-f2 and 34-f3 respectively.



**Figure 34-f2 Illustration of Segment Parser for (484+996) tone MRU**



**Figure 34-f3 Illustration of Segment Parser for ((242+484) +996) tone MRU**

Apended Motions:

802.11be uses 80 MHz segment parser with proportional round robin scheme.

[Motion 111, #SP061107, [9], [28], and [29]]

802.11be uses 80 MHz segment parser with the following parameters for the proportional round robin scheme:

|  |  |  |  |
| --- | --- | --- | --- |
| **RU Aggregation** | **Nsd\_total** | **Proportional Ratio (m1:m2:m3:m4)** | **Leftover bits (per symbol)** |
| 484+996 | 1448 | 1s:2s | 44\*Nbpscs on ru996 |
| 484+2\*996 | 2428 | 1s:2s:2s | 44\*Nbpscs on ru996 |
| 484+3\*996 | 3408 | 1s:2s:2s:2s | 44\*Nbpscs on ru996 |
| 2\*996 | 1960 | 1s:1s | 0 |
| 3\*996 | 2940 | 1s:1s:1s | 0 |
| 4\*996 | 3920 | 1s:1s:1s:1s | 0 |

where $s=max\left(1, \frac{N\_{BPSCS}}{2}\right) $

[Motion 111, #SP2, [9] and [30]]

The same proportional round robin is applied to leftover bits

* The same ratios are used in the entire segment parsing process except the ratios of those already filled segment becomes 0.

Leftover bits

To 1st RU

To 2nd RU

*Figure 5 – Proportional round robin parser*

[Motion 111, #SP3, [9] and [30]]

802.11be uses 80 MHz segment parser with the following parameters for (242+484)+996:

|  |  |  |  |
| --- | --- | --- | --- |
| **RU Aggregation** | **Nsd\_total** | **Proportional Ratio (m1:m2:m3:m4)** | **Leftover bits (per symbol)** |
| (242+484)+996 | 1682 | 3s:4s | 44\*Nbpscs on RU996 |

where $s=max\left(1, \frac{N\_{BPSCS}}{2}\right)$

[Motion 115, #SP70, [7] and [31]]

**References:**

[1]. 112005664400becompendiumofstrawpollsandpotentialchangestothespecificationframeworkdocument, Edward Au.