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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>** |
| Title | **128 and 256 FFT Sizes for OFDMA PHY** |
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| Re: | Working Group Review of P802.16e/D2 |
| Abstract | |
| Purpose | To propose enhancements to the OFDMA PHY in P802.16e/D2 draft for better performance in narrow channel bandwidths. |
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Scalable OFDMA PHY Expansion

## *1 Introduction*

In this contribution we propose enhancements to the WirelessMAN OFDMA PHY, so that it can perform more optimally in narrow channel bandwidths of smaller than 5 MHz while keeping the sub-carrier spacing fixed in line with the concept of Scalable OFDMA option in P802.16e/D2. The following are some of the parameters that are required to meet the requirements from service providers. The contribution covers expansion of Scalable FFT size set to include 128 FFT size for DL FUSC and PUSC sub-channelization and UL sub-channelization formats.

## 2 Proposed Text Changes

***[Add the following tables in section 8.4.6.1.2 after Table 272c and rename Tables 272d-f to 272e-g]***

**Table 272d— 128-FFT OFDMA downlink carrier allocations**

| Parameter | Value | Comments |
|---|---|---|
| Number of DC Subcarriers | 1 | Index 64 |
| Number of Guard Subcarriers, Left | 11 | |
| Number of Guard Subcarriers, Right | 11 | |
| Number of Used Subcarriers (Nused) | 106 | Number of all subcarriers used within a symbol, including all possible allocated pilots and the DC carrier. |
| Pilots | | |
| VariableSet #0 | 2 | 0,24, 48, 72,96 |
| VariableSet #1 | 2 | 12,36,60,84 |
| ConstantSet #0 | 1 | N/A |
| ConstantSet #1 | 1 | N/A |
| Number of data subcarriers | 96 | |
| Number of data subcarriers per subchannel | 48 | |
| Number of Subchannels | 2 | |
| PermutationBase | | 1,0 |

***[Add the following tables in section 8.4.6.1.2 after renamed Table 272g as suggested above]***

**Table 272j— 128-FFT OFDMA downlink carrier allocations - PUSC**

| Parameter | Value | Comments |
|---|---|---|
| Number of DC Subcarriers | 1 | index 64 |
| Number of Guard Subcarriers, Left | 21 | |
| Number of Guard Subcarriers, Right | 22 | |
| Number of Used Subcarriers (Nused) including all possible allocated pilots and the DC carrier. | 85 | Number of all subcarriers used within a symbol |
| Renumbering sequence | 2, 3, 1, 5, 0, 4 | used to renumber clusters before allocation to subchannels: |
| Number of carriers per cluster | 14 | Number of all subcarriers used within a symbol |
| Number of clusters | 6 | |
| Number of carries per subchannel | 48 | |
| Number of subchannels | 3 | |

*[Add the following tables after Table 247b]*

**Table 247c—128-FFT OFDMA uplink subcarrier allocations**

| Parameter | Value | Comments |
|---|---|---|
| Number of DC Subcarriers | 1 | index 64 |
| Number of Guard Subcarriers, Left | 15 | |
| Number of Guard Subcarriers, Right | 16 | |
| Number of Used Subcarriers (Nused) including all possible allocated pilots and the DC carrier. | 97 | Number of all subcarriers used within a symbol |
| PermutationBase0 | 2,0,3,1 | used to allocate tiles to subchannels |
| Number of carriers per tile | 4 | Number of all subcarriers used within a tile |
| Number of tiles | 24 | |
| Number of tiles per subchannel | 6 | |
| Number of subchannels | 4 | |

# References

[1] IEEE P802.16-REVe/D2-2004 Amendment for Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Band.