IEEE P802.11
Wireless LANs

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| Proposal on Simulation Scenario Document for 11ax PAR verification(doc) |
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Abstract

This submission proposes text for simulation scenario document

## Common Parameters for all simulation Scenarios

*Add following table after MAC parameters*

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| **OFDMA parameters** |
| Resource Unit Configuration | 20 MHz BSS* 26 tone RU\* 9
* 52 tone RU \* 4 + 26 tone RU
* 106 tone RU \* 2 + 26 tone RU
* 242 tone RU

80 MHz BSS* 26 tone RU\* 37
* 52 tone RU \* 16 + 26 tone RU \* 5
* 106 tone RU \* 8 + 26 tone RU \* 5
* 242 tone RU \* 4 + 26 tone RU
* 484 tone RU \* 2 + 26 tone RU
* 996 tone RU
 |
| Symbol length | 14.4 usec |
| Guard Interval | 1.6 usec |
| Trigger frame length | 28 bytes + 5 bytes\* number of User Info + padding(0~3)e.g.) 4 User info: 28 + 20 + 0 = 48 bytes 9 User info: 28 + 45 + 3 = 76 bytes |
| MCS of Trigger frame | MCS 0 (BPSK, 1/2) |
| Multi-STA BlockAck frame length | 22 bytes + 12 bytes \* number of User  |
| MCS of M-BA | MCS 0 (BPSK, 1/2) |
| RTS/CTS Threshold | No MU-RTS/CTS |

*Add following subchapter*

**1 - 1: Simplified Residential Scenario**

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| **Topology** |
| **Figure x - Residential building layout** |
| **Parameter** | **Value** |
| Environment description | Multi-floor building* 1 floor, 3 m height
* 2x10 apartments in each floor
* Apartment size:10m x 10m x 3m
 |
| APs location | In each apartment, place AP in center of xy-locations at z = 1.5 m above the floor level of the apartment. |
| AP Type | All 11ax AP or all 11ac AP5GHz band only  |
| STAs location | In each apartment, place STAs in random xy-locations (uniform distribution) at z = 1.5m above the floor level of the apartment |
| Number of STA and STAs type | All 11ax STA or all 11ac STANumber of STA: 4 ~ 205GHz band only  |
| Channel ModelAnd Penetration Losses | Fading modelTGac channel model D NLOS for all the links. |
| Pathloss modelPL(d) = 40.05 + 20\*log10(fc/2.4) + 20\*log10(min(d,5)) + (d>5) \* 35\*log10(d/5) + 18.3\*F^((F+2)/(F+1)-0.46) + 5\*W* d = max(3D distance [m], 1)
* fc = frequency [GHz]
* F = number of floors traversed
* W = number of walls traversed in x-direction plus number of walls traversed in y-direction
 |
| ShadowingLog-normal with 5 dB standard deviation, iid across all links |
|  |
| **PHY parameters** |
| MCS | [use MCS7 for all data transmissions] and[use MCS0 for all control transmissions]  |
| GI | Short |
| AP #of TX antennas  | All HEW APs with [2] or all with 4 |
| AP #of RX antennas  | All HEW APs with [2] or all with 4 |
| STA #of TX antennas | All HEW STAs with [1] or all with 2 |
| STA #of RX antennas | All HEW STAs with [1] or all with 2 |
|  |
| **MAC parameters** |
| Access protocol parameters  | [EDCA with default parameters according to traffic class] |
| Center frequency, BSS BW and primary channels | Operating channel: 5GHz: 3 80MHz non-overlapping channels |
| Aggregation  | [A-MPDU / 64 MPDU aggregation size / BA window size, No A-MSDU, with immediate BA] |
| Max # of retries  | Max retries: 10 |
| RTS/CTS Threshold | No RTS/CTS or RTS/CTS |
| Association | X% of STAs in an apartment are associated to the AP in the apartment; 100-X% of the STAs are not associated[X=100] |
| Management | Each AP is independently managed |

**Traffic model**

* Traffic Type: CBR (Constant Bit Rate)
* Traffic Rate: 0 ~ full buffer
* Traffic Direction: DL only, UL only, DL/UL mixed
* Access Category: VO, VI, BE

**4 – 1: Simplified Outdoor Large BSS Scenario**

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| --- | --- |
| **Parameter** | **Value** |
|  |
| **Topology (A)** |
| **Figure 9x – BSSs layout** |
| Environment description | Outdoor street deploymentBSS layout configurationDefine a 7 hexagonal grid as in Figure 9xWith ICD = 130m h=sqrt(R2-R2/4)/2 |
| Wrap-around (radio-distance based) | Not used |
| APs location | Place APs on the center of each hexagonAntenna height 10 m. |
| AP Type | All 11ax AP or all 11ac AP |
| STAs location | .STA antenna height 1.5 m.STAs are placed randomly (uniform distribution) in each cellMinimum distance from AP: 15 mMaximum distance from AP: 55 m |
| Number of STA and STAs type | All 11ax STA or all 11ac STANumber of STA: 15 ~ 502,4 GHz band or 5GHz band  |
| Channel Model | UMiThe following equations from ITU-UMi model [4] are to be used for computing the path loss for each drop in an outdoor scenarioLOS Links $$PL\_{ITU-LOS}(d(m) < d\_{BP})=22.0log\_{10}d +28+20log\_{10}f\_{c}(GHz)$$$$PL\_{ITU-LOS}\left(d\left(m\right)>d\_{BP}\right)=40log\_{10}(d>d\_{BP})+7.8 -18log\_{10}\left(h\_{BS}^{'}\right)-18log\_{10}\left(h\_{MS}^{'}\right)+2log\_{10}f\_{c}(GHz)$$ where the effective antenna height parameters are given by $h\_{BS}^{'}=h\_{BS}-1.0$ and $h\_{MS}^{'}=h\_{MS}-1.0$ and $d\_{BP}=\frac{4h\_{BS}^{'}h\_{MS}^{'}f\left(Hz\right)}{c(=3×10^{8})}$NLOS Links$$PL\_{ITU-NLOS}\left(d(m)\right)=36.7log\_{10}(d)+22.7+26.0log\_{10}f\_{c}(GHz)$$Modify height parameters as follows depending on the link* + $h\_{MS}$ = 1.5m for the STA; $h\_{BS}$ = 10m for AP in the AP🡨🡪 STA links
	+ $h\_{MS}=h\_{BS}$ = 1.5m for STA🡨🡪 STA links
	+ $h\_{MS}=h\_{BS}=10$m for AP 🡨🡪 AP links

In the above equations, the variable d is defined as:d = max(3D-distance [m], 1) |
| Penetration Losses | None |
|  |
| **PHY parameters** |
| MCS | Not fixed |
| GI | Long |
| AP #of TX antennas  | All APs with [2] or all APs with 4 |
| AP #of RX antennas  | All APs with [2] or all APs with 4 |
| STA #of TX antennas | All STAs with [1] or all STAs with 2 |
| STA #of RX antennas | All STAs with [1] or all STAs with 2 |
|  |
| **MAC parameters** |
| Access protocol parameters  | [EDCA with default EDCA Parameters set] |
| Center frequency, BW and primary channels  | Frequency reuse 1 is used. 5GHzall BSSs are using the same 80MHz channel[Same Primary channel]2.4GHzAll BSSs are 20MHz BSS on same channel |
| Aggregation  | [A-MPDU / max aggregation size / BA window size, No A-MSDU, with immediate BA] |
| Max # of retries  | 10 |
| RTS/CTS Threshold | no RTS/CTS or RTS/CTS |
| Association | X% of STAs are associated with the strongest AP, Y% of STAs are associated with the second-strongest AP, and Z% of STAs are associated with the third-strongest AP. Z% of STAs are not associated. Detailed distribution to be decided.[X=100, Y=0,Z=0] |
| Management | It is allowed to assume that all APs belong to the same management entity |

**Traffic model**

* Traffic Type: CBR (Constant Bit Rate)
* Traffic Rate: 0 ~ full buffer
* Traffic Direction: DL only, UL only, DL/UL mixed
* Access Category: VO, VI, BE