IEEE P802.11
Wireless LANs

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| HEW SG Simulation Scenarios [Example Template] |
| Date: September 16, 2013 |
| Authors and Contributors |
| Name | Company | Address | Phone | Email |
| Simone Merlin | Qualcomm | 5775 Morehouse DrSan Diego, CA |  | smerlin@qti.qualcomm.com |
| Gwen Barriac | Qualcomm |  |  |  |
| Hemanth Sampath | Qualcomm |  |  |  |

# Revisions

|  |  |  |
| --- | --- | --- |
| **Revision** | **Comments** | **Date** |
| *R0* | Initial draft template | Aug 28th |
| *R1* |  | Sept 15th |
| *R2* | Made it consistent with document 1000r2 | Sept 16th |
|  |  |  |

# Introduction

This document defines simulation scenarios to be used for

* Evaluation of perfrormance of fetures proposed in HEW
* Generation of reults for simulators calibratton purpose.

Each scenario is defiend by specifying

* Topology: AP/STAs positions, P2P STAs pair positions, obstructions , layout, propagation model
* Traffic model
	+ STA - AP traffic
	+ P2P traffic (tethering, Soft-APs, TDLS)
	+ ‘Idle’ devices (generating management traffic such as probes/beacons)
* List of PHY, MAC, Management parameters
	+ We may want to fix the value of some parameters to limit the degrees of freedom, and for calibration
	+ Optionally, some STAs may use legacy (11n/ac) operation parameters, if required to prove effectiveness of selected HEW solutions
* An interfering scenario (its performance optioally tracked)
	+ Not managed or managed by a different entity than the one of the main scenario
	+ Defined by its own Topology, Traffic model and parameters

Per each of above items, the scenario description defines a detailed list of parameters and corresponding values.

Values included in curly brackets {} are mandatory and shall be adopted for any simulation.

Values included in square brackets [] are default values and can be used as reference for calibration

* They shall be used for generating results for calibration purposes
* They may be changed for simulations for performance evaluation; in case theya are changed, the simulation results shall be accompained by a list of the paramters and the corresponding values used in the simulation.

**Scenarios summary**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Scenario Name** | **Topology** | **Management** | **Channel Model** | **Homogeneity** | **~Traffic Model** |
| **1** | Residential | A - Apartment bldg. e.g. ~10m x 10m apts in a multi-floor bldg~10s of STAs/AP, P2P pairs | Unmanaged | Indoor | Flat | Home |
| **2** | Enterprise | B - Dense small BSSs with clusterse.g. ~10-20m inter AP distance,  ~100s of STAs/AP, P2P pairs | Managed | Indoor | Flat | Enterprise  |
| **3** | Indoor Small BSS Hotspot | C - Dense small BSSs, uniforme.g. ~10-20m inter AP distance ~100s of STAs/AP, P2P pairs |
| Mobile  |
| **4** | Outdoor Large BSS Hotspot | D - Large BSSs, uniforme.g. 100-200m inter AP distance ~100s of STAs/AP, P2P pairs | Managed | Outdoor | Flat | Mobile |
| **4a** | Outdoor Large BSS Hotspot+ Residential | D+A | Managed + Unmanaged | Hierarchical | Mobile + Home |

1. **Residential Scenario [Example Template]**

The Residential scenario consists of one apartment building with multiple apartments; Multiple STAs and one AP are located inside each apartment; STAs within an apartment are associated with the AP in the same apartment. APs are independently operated. The traffic model is derived from the Home profile.

*Add picture [TBD]*

|  |  |
| --- | --- |
| **Parameter** | **Value** |
|  |
| **Topology** |
| Topology Description (A)(AP/STAs positions, P2P STAs pair positions, obstructions , layout, propagation model) | 1 Apartment building* Number of floors {N}
* Floors hight: {3 m}
* Apartments in each floor {2xN}
* Apartment size:{10m x 10m x 3m}

{1 AP per room, randomly located inside the room}{N STAs per AP, randomly located inside the room; optional indication of which STAs are ‘legacy’}{M pairs of STAs, each pair randomly located in the apartment, with STAs Xm apart} |
| Channel Model | {Indoor, TBD} |
| Penetration Losses | Apartment-to-apartment wall penetration {XdB @ 2.4GHz, YdB at 5GHz}External wall penetration {XdB @ 2.4GHz, YdB at 5GHz} |
|  |
| **PHY paramters** |
|  |  |
| BW:  | [up to X MHz] |
| MCS: | [BCC up to MCS X] |
| GI:  | [long] |
| Data Premble:  | [11ac] |
| STA TX power  | [Xdbm/Antenna] |
| AP TX Power  | [Ydbm/Antenna] |
| AP #of TX antennas  | {N} |
| AP #of RX antennas  | {N} |
| STA #of TX antennas | {N}  |
| STA #of RX antennas | {N}  |
|  |
| **MAC paramters** |
|  |  |
| Acess protocol parameters:  | [EDCA with default EDCA Parameters set] |
| Primary channels  | [all BSSs on same primary channel] |
| Aggregation:  | [A-MPDU / max aggregation size / BA window size, No A-MSDU, with immediate BA] |
| Max # of retries  | [10] |
| RTS/CTS  | [off] |
| Rate adaptation method  | [genie, TBD in Evaluation Methodology] |
|  |  |
| Association | Each STA associated with the AP in same apartment |

|  |
| --- |
| **Traffic model (Per each apartment) - TBD** |
| **#** | **Source/Sink** | **Name** | **Traffic definition** | **Flow specific paramters**  | **AC** |
| **Dowlink** |
| D1 | AP/STA1 | 4k Video | T1 |  | VI |
| D2 | AP/STA2 | Local file transwer | T3 |  | BE |
| D3 | AP/STA3 | … |  |  |  |
| … | … |  |  |  |  |
| DN | AP/STAN |  |  |  |  |
| **Uplink** |
| U1 | STA1/AP |  |  |  |  |
| U2 | STA2/AP |  |  |  |  |
| U3 | STA3/AP |  |  |  |  |
| … | … |  |  |  |  |
| UN | STAN/AP |  |  |  |  |
| **P2P** |
| P1 | STA1/AP |  |  |  |  |
| P2 | STA2/AP |  |  |  |  |
| P3 | STA3/AP |  |  |  |  |
| … | … |  |  |  |  |
| PN | STAN/AP |  |  |  |  |
|  **Idle Management** |
| M1 | AP1 | Beacon  | TX |  |  |
| M2 | STA2 | Probe Req. | TY |  |  |
| M3 | STA3 |  |  |  |  |
| … | … |  |  |  |  |
| MN | STAN |  |  |  |  |

### Interfering Scenario

None

# 2a – Enterprise

# 2b- Indoor Hotspot

# 2c- Outdoor Hotspot

# 3a- Outdoor Large BSS + Residential

# 3b- Outdoor Large BSS + Outdoor Hotspot

**Annex 1 - Reference traffic profiles [Exmaple template]**

**T1 - Local file transfer**

* Add description
* Mandatory settings
	+ E.g. TCP model paramters
* Optional paramters settings that may be specified per traffic flow in the scenario
	+ E.g. Offered rate in Mbps or full buffer

**T2 - Lightly compressed video**

Add description

Mandatory paramters settings

Optional paramters settings

**T3 - Internet streaming video/audio (e.g. Youtube)**

Add description

Mandatory settings

Optional paramters settings

**T4 …**

**Annex 2 - Templates**

|  |  |
| --- | --- |
| **Parameter** | **Value** |
|  |
| **Topology** |
| Topology Description (A)(AP/STAs positions, P2P STAs pair positions, obstructions , layout, propagation model) |  |
| Channel Model |  |
| Penetration Losses |  |
|  |
| **PHY paramters** |
|  |  |
| BW:  |  |
| MCS: |  |
| GI:  |  |
| Data Premble:  |  |
| STA TX power  |  |
| AP TX Power  |  |
| AP #of TX antennas  |  |
| AP #of RX antennas  |  |
| STA #of TX antennas |  |
| STA #of RX antennas |  |
|  |
| **MAC paramters** |
|  |  |
| Acess protocol parameters:  |  |
| Primary channels  |  |
| Aggregation:  |  |
| Max # of retries  |  |
| RTS/CTS  |  |
| Rate adaptation method  |  |
|  |  |
| Association |  |

**Traffic model**

|  |
| --- |
| **Traffic model (Per each apartment) - TBD** |
| **#** | **Source/Sink** | **Name** | **Traffic definition** | **Flow specific paramters**  | **AC** |
| **Dowlink** |
| D1 | AP/STA1 | 4k Video | T1 |  | VI |
| D2 | AP/STA2 | Local file transwer | T3 |  | BE |
| D3 | AP/STA3 | … |  |  |  |
| … | … |  |  |  |  |
| DN | AP/STAN |  |  |  |  |
| **Uplink** |
| U1 | STA1/AP |  |  |  |  |
| U2 | STA2/AP |  |  |  |  |
| U3 | STA3/AP |  |  |  |  |
| … | … |  |  |  |  |
| UN | STAN/AP |  |  |  |  |
| **P2P** |
| P1 | STA1/AP |  |  |  |  |
| P2 | STA2/AP |  |  |  |  |
| P3 | STA3/AP |  |  |  |  |
| … | … |  |  |  |  |
| PN | STAN/AP |  |  |  |  |
|  **Idle Management** |
| M1 | AP1 | Beacon  | TX |  |  |
| M2 | STA2 | Probe Req. | TY |  |  |
| M3 | STA3 |  |  |  |  |
| … | … |  |  |  |  |
| MN | STAN |  |  |  |  |