IEEE P802.11  
Wireless LANs

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| HEW SG Simulation Scenarios  [Example Template] | | | | |
| Date: September 16, 2013 | | | | |
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# Revisions

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| --- | --- | --- |
| **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 clusters  e.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, uniform  e.g. ~10-20m inter AP distance  ~100s of STAs/AP, P2P pairs |
| Mobile |
| **4** | Outdoor Large BSS Hotspot | D - Large BSSs, uniform  e.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 |  |  |  |  |