IEEE P802.11
Wireless LANs

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| HEW SG Simulation Scenarios [Example Template] |
| Date: August 28, 2013 |
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# Revisions

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| --- | --- | --- |
| **Revision** | **Comments** | **Date** |
| *R0* | Initial draft template | Aug 28th |

#

# 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, 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
* An interfering scenario (its performance may not be 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) | Un Managed | Indoor | Flat | Home |
| **2a** | Enterprise | B(Dense small BSSs) | Managed | Indoor | Flat | Enterprise  |
| **2b** | Indoor Hotspot | Mobile  |
| **2c** | Outdoor Hotspot | Outdoor | Mobile |
| **3a** | Outdoor Large BSS | C(Large BSSs) | Managed | Outdoor | Flat | Mobile |
| **3b** | Outdoor Large BSS+ Residential | C+A | Managed | Hierarchical | Mobile + Home  |
| **3c** | Outdoor Large BSS+ Outdoor Hotspot | C+B | Managed | Hierarchical | Mobile |

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 (A)** |
| Environment description | 1 Apartment building* Number of floors {N}
* Floors hight: {3 m}
* Apartments in each floor {2xN}
* Apartment size:{10m x 10m x 3m}
 |
| APs location | {1 per room, randomly located inside the room} |
| STAs location | {N per AP, randomly located inside the room} |
| 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** | **Transport Protocol** | **Average rate [Mbps]** | **MSDU size [B]** | **Max. Delay [ms]** | **Max. PLR** | **PKT arrival distribution** | **AC** |
| **Dowlink** |
| D1 | AP/STA1 | 4k Video | … |  |  |  |  |  |  |
| D2 | AP/STA2 | Broswing | … |  |  |  |  |  |  |
| 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  |  |  | X Bytes |  |  | 1/Xms |  |
| M2 | STA2 | Probe Req. |  |  | X Bytes |  |  | 1/Xs |  |
| M3 | STA3 |  |  |  |  |  |  |  |  |
| … | … |  |  |  |  |  |  |  |  |
| MN | STAN |  |  |  |  |  |  |  |  |

|  |
| --- |
| **Traffic model (Per each apartment) - TBD** |
| **#** | **Source/Sink** | **Transport Protocol** | **Average rate [Mbps]** | **MSDU size [B]** | **Max. Delay [ms]** | **Max. PLR** | **PKT arrival distribution** | **AC** |
| **Dowlink** |
| D1 | AP/STA1 |  |  |  |  |  |  |  |
| D2 | AP/STA2 |  |  |  |  |  |  |  |
| 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 | STA1 |  |  |  |  |  |  |  |
| M2 | STA2 |  |  |  |  |  |  |  |
| 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

**Appendix**

**Reference traffic profiles**

**Home**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Direction** | **Transport Protocol** | **Average rate [Mbps]** | **MSDU size [B]** | **Max. Delay [ms]** | **Max. PLR** | **PKT arrival distribution** | **AC** |
| 4K Video | DL |  |  |  |  |  |  |  |
| Broswing |  |  |  |  |  |  |  |  |
| … |  |  |  |  |  |  |  |  |
| … |  |  |  |  |  |  |  |  |
| … |  |  |  |  |  |  |  |  |

**Enterprise**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Direction** | **Transport Protocol** | **Average rate [Mbps]** | **MSDU size [B]** | **Max. Delay [ms]** | **Max. PLR** | **PKT arrival distribution** | **AC** |
|  FTP | UL |  |  |  |  |  |  |  |
| Wireless display | P2P |  |  |  |  |  |  |  |
| … |  |  |  |  |  |  |  |  |
| … |  |  |  |  |  |  |  |  |
| … |  |  |  |  |  |  |  |  |

**Mobile**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Direction** | **Transport Protocol** | **Average rate [Mbps]** | **MSDU size [B]** | **Max. Delay [ms]** | **Max. PLR** | **PKT arrival distribution** | **AC** |
| Broswing  | DL |  |  |  |  |  |  |  |
| HD video | DL |  |  |  |  |  |  |  |
| … |  |  |  |  |  |  |  |  |
| … |  |  |  |  |  |  |  |  |
| … |  |  |  |  |  |  |  |  |

**Templates**

|  |  |
| --- | --- |
| **Parameter** | **Value** |
|  |
| **Topology (A)** |
| Environment description |  |
| APs location |  |
| STAs location |  |
| 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  |  |
|  |  |
| Beacon interval |  |
| Beacon size  |  |
| Probe request interval |  |
| Probe request size |  |
| Probe respose size |  |
| Association |  |

|  |
| --- |
| **Traffic model** |
| **#** | **Source/Sink** | **Name** | **Transport Protocol** | **Average rate [Mbps]** | **MSDU size [B]** | **Max. Delay [ms]** | **Max. PLR** | **PKT arrival distribution** | **AC** |
| **Dowlink** |
| D1 | AP/STA1 |  |  |  |  |  |  |  |  |
| D2 | AP/STA2 |  |  |  |  |  |  |  |  |
| 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 | STA1 |  |  |  |  |  |  |  |  |
| M2 | STA2 |  |  |  |  |  |  |  |  |
| M3 | STA3 |  |  |  |  |  |  |  |  |
| … | … |  |  |  |  |  |  |  |  |
| MN | STAN |  |  |  |  |  |  |  |  |