IEEE P802.11
Wireless LANs

|  |
| --- |
| TGbb:MAC Evaluation Simulation Method |
| Date: 2019-06-11 |
| Author(s): |
| Name | Affiliation | Address | Phone | Email |
| Chong Han  | pureLiFi |  |  | chong.han@purelifi.com  |
| Nikola Serafimofski | pureLiFi |  |  | nikola.serafimovski@purelifi.com  |
| Tamas Weszely | pureLiFi |  |  | tamas.weszely@purelifi.com |

Abstract

This document defines methodologies for the evaluation of MAC proposals in the TGbb.

1. **MAC proposal evaluation method**

The following presents the steps to be taken in the MAC evaluation simulations.

1. **PHY/MAC parameter setting**
	1. follow guidance for each use case in doc.11-18/1423r8
2. **Topology setting**
	1. confirm the initial positions of STAs and APs in each simulation
3. **Mobility model**
	1. allow STAs to move within the scenario
4. **Traffic model**
	1. Arrival rate, packet size, source/receiver
5. Link budget for current topology
	1. **Model Frontends response F(f)**

A frontend response to be used for the simulation has been already defined by HHI in the doc.11-18/1574r4. Note: this is noise-less model.

* 1. **Model Noise response N(f)**
		1. Model noise response of exemplary frontends (TBD)
	2. **Calculate Pathloss G(f)**

Current positions are needed based on the mobility model.

* + 1. Model frequency-selective path gain (ray tracing for 10000 random positions)
		2. Model LOS pathloss at 1m distance
		3. Model NLOS 1st reflection pathloss at 1m distance
		4. Model NLOS multiple reflections pathloss at 1m distance
	1. **Calculate SNR**

Depends on settings in 2.

* + 1. For single link at each STA/BSS
		2. For multilink at each STA/BSS

?? MIMO. Optional calculation.

1. **Estimate the achievable rate**

Based on the doc. 11-19/0916r1 or others?

* 1. Bit-interleaved coded modulation (BICM), use L2S interface MIESM
1. **Select appropriate PHY mode**
	1. Select appropriate PHY mode which allows a given PER
2. **Model random packet loss**
	1. Need packet loss against **SNR(or ?)** for each PHY mode curves (this can come from 802.11ax PHY simulations)
3. **Measure 5 KPIs as defined in doc.11-19/0848r2**
	1. Measure Per-STA throughput

Use the theoretical maximum(=capacity) or the achievable rate estimated in step 6?

* 1. Measure Per-BSS throughput
	2. Measure Packet loss
	3. Measure Transmission latency
	4. Measure End-to-end latency
1. **Repeat** steps 5.3 to 9 for each transmission, unless the sender and receiver pair remain the same that could be regarded as static within the short period of transmission
2. **Summarise results measured in step 9**