**IEEE P802.19**

**Wireless Coexistence**

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| Liaison statement to 3GPP TSG-RAN |
| Date: 2015-01-15 |
| Author(s): |
| Name | Company | Address | Phone | Email |
| Alireza Babei | CableLabs | 858 Coal Creek CirLouisville, CO 80027USA | +1-303-661-3405 | a.babaei@cablelabs.com |
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Abstract

This document provides a liaison statement to 3GPP TSG-RAN and provides recommendations regarding the 3GPP draft study item document on Licensed-Assisted Access to Unlicensed Spectrum: 3GPP TR 36.889 v0.1.0 (2014-11).

IEEE 802.19 WIRELESS COEXISTENCE WORKING GROUP (WG)

LIAISON STATEMENT TO 3GPP TSG-RAN

To:

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3GPP is studying fairness between Wi-Fi and LAA networks through simulations. The simulation study is based on 3GPP TR 36.889 v0.1.0. This liaison statement provides recommendation regarding the simulation assumptions. A more detailed PPT document that includes simulation results is available at <https://mentor.ieee.org/802.19/dcn/15/19-15-0007-01-0000-comments-on-laa-evm.ppt>

**Recommendation 1: Incorporate Truncated Exponential Backoff in LBT requirements and simulate its effect.**

3GPP contributions indicate that the majority opinion is tending towards load-based equipment (LBE) listen before talk (LBT) defined in ETSI 301 389 v 1.7.1. Simulation results indicate that Version 1.7.1 of ESTI LBT rules are not sufficient for fair Coexistence of LTE and Wi-Fi and leads to significant performance degradation of Wi-Fi users. The main reason for this performance degradation can be attributed to the fixed linear backoff window for extended CCA procedure in LBE LBT.

**Recommendation 2: For a complete understanding of LAA impact on Wi-Fi, consider a range of load densities in coexistence simulations.**

Section A.1.1 of TR 36.889 lists the parameters for indoor LAA coexistence evaluation. Only 10 LAA UEs or Wi-Fi clients are assumed per unlicensed band carrier. Simulation results indicate that the impact of LAA (using version 1.7.1 of ETSI LBT) on Wi-Fi clients is more evident at high system load particularly when number of nodes is large.

**Recommendation 3: Include VoIP and other traffic types as a mandatory traffic models and evaluate corresponding performance metrics.**

Wi-Fi and LAA have to operate in unlicensed spectrum carrying a variety of traffic types including voice, video, FTP, etc. However, the simulations evaluating the fairness of LAA with Wi-Fi are currently limited to FTP.

**Recommendation 4: Consider 256 QAM, LDPC and RTS/CTS mandatory for simulation.**

256 QAM, LDPC and RTS/CTS are considered optional for simulations. Use of lower order modulation (when SINR is sufficient for 256 QAM) means unnecessarily longer frame duration. Longer frame duration increases the backoff period (and hence delay) and decreases the channel utilization for other Wi-Fi clients. Also, the hidden node behavior of two wireless systems is key to coexistence. RTS/CTS is optional but commonly used in congested environments.