IEEE 802
Local and Metropolitan Area Network Standards Committee

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SUBJECT: Liaison Statement Regarding Coexistence of Licensed Assisted Access (LAA) and IEEE 802

DATE: XX February 2015

Dear Dino,

It is IEEE 802's goal to establish commonly understood levels of acceptable interference and performance degradation for LAA and IEEE 802.11 networks operating in the same unlicensed channel.

We understand that 3GPP TSG-RAN is studying fairness between IEEE 802.11 and LAA networks using simulations. The simulation studies are based on 3GPP TR 36.889 v0.1.0.

This liaison statement from IEEE 802 provides a number of recommendations regarding assumptions used in the 3GPP simulations. A more detailed PPT document that includes discussion of these recommendations is available at https://mentor.ieee.org/802.19/dcn/15/19-15-0007-03-0000-comments-on-laa-evm.ppt.

Recommendation 1: Evaluate an alternative to the fixed back-off mechanism in LBT simulations

3GPP contributions indicate that the majority opinion is tending towards the use of load-based equipment (LBE) listen before talk (LBT) defined in ETSI EN 301 893 v1.7.1. Multiple simulation results (based on each individual IEEE 802.11 and LAA node being a contender) presented to ETSI BRAN indicate that v1.7.1 rules are insufficient for fairness between LTE and IEEE 802.11 networks and lead to significant performance degradation for IEEE 802.11 users. These presentations attributed this performance degradation to the fixed linear back-off window for the extended CCA procedure in v1.7.1.

Recommendation 2: For a complete understanding of LAA impact on IEEE 802.11 networks, 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 IEEE 802.11 clients are assumed per unlicensed band carrier. Simulation results indicate that the impact

of LAA (using ETSI 301 893 v1.7.1) on IEEE 802.11 clients is more evident at high system load, particularly when the number of nodes is large.

Recommendation 3: Consider VoIP and other traffic types as mandatory traffic models and evaluate corresponding performance metrics

IEEE 802.11 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 IEEE 802.11 networks (using the user perceived throughput and latency metrics) are currently limited to FTP.

Recommendation 4: Consider 256 QAM, LDPC and RTS/CTS as mandatory in simulation

256 QAM, LDPC and RTS/CTS are considered optional for simulations. The use of lower order modulation (when SINR is sufficient for 256 QAM) means unnecessarily long frame durations. Longer frame duration increases the back-off period (and hence delay) and decreases the channel utilization for other IEEE 802.11 clients. Also, the hidden node behavior of two wireless systems is key to coexistence. RTS/CTS is optional but commonly used in congested environments.

The next meeting of IEEE 802 will take place on March 9th - 13th, 2015 in Berlin, Germany.

Regards,

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