IEEE 802.11 Coexistence SC

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| Proposed LS to 3GPP RAN1 related to *blocking energy* | | |
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Abstract

*This document contains a draft liaison to 3GPP RAN1 (cc’ed to ETSI BRAN) related to blocking energy.*

## Proposed LS to 3GPP RAN1

TO:

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CC:

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SUBJECT: **Blocking energy/reservation signals[[1]](#footnote-1)**

DATE: 20 September 2019

Dear Wanshi,

As far back as 2015, the potential transmission of *blocking energy* (also known as *reservation signals)* to maintain control of a channel until an LAA device is ready to transmit on a slot boundary has been contentious within 3GPP RAN1, IEEE 802.11 WG and ETSI BRAN.

After a long period of debate in the various forums, there was no consensus on the importance of the *reservation signals* issue for coexistence, although it does appear there was consensus that reducing the use of *reservation signals* was a worthwhile goal. In a Liaison Statement to IEEE 802.11 WG some years ago, 3GPP RAN1 committed to investigating defining new starting positions in LAA to reduce the length of any *reservation signals*. We understand that no new starting positions were ultimately added in LAA.

IEEE 802.11 WG would like to inform 3GPP RAN1 that a presentation at the Coexistence Workshop held in Vienna, Austria in July 2019, highlighted a new perspective on the use of *reservation signals*. The presentation was:

* [3-10](http://grouper.ieee.org/groups/802/11/Workshops/2019-July-Coex/wireless_collision_detection.pptx): *Collision Detection for Fair LAA/Wi-Fi Coexistence* (IITP RAS)

Interestingly, the post-Workshop *Issues Survey* indicated the topic of *blocking energy/reservation signals* was considered to be an important coexistence issue by 30% of respondents to the survey. The survey indicated a significant increase (from 10% to 30%) in interest in this issue compared to a pre-workshop survey conducted by the Wireless Broadband Alliance (see [3-1](http://grouper.ieee.org/groups/802/11/Workshops/2019-July-Coex/IEEE%20Workshop%20Tiago%20Rodrigues%20WBA%20v003.pptx)). This increase could possibly be ascribed to be a result of the noted presentation at the workshop.

The IITP RAS presentation makes an important new observation about the adverse effects of *reservation signals*. It observes that the use of a *reservation signal* by a system breaks underlying principles of LBT sharing whereby a collision at the start of a transmission normally results in a backoff. In particular, the use of a *reservation signal* by a system allows it to completely ignore any collision at the start of the transmission with a Wi-Fi system if the Wi-Fi transmission is short, eg a short data transmission or an RTS. The Wi-Fi system will detect the collision with the *reservation signal* and double its CW, whereas the system sending a *reservation signal* will probably successfully transmit its data and reset its CW.

The IITP RAS presentation goes on to suggest a novel mechanism for a system making use of a *reservation signal*  before a data transmission to detect any collision and subsequently stop transmission while doubling its CW. This is appropriate behaviour when a collision occurs. 3GPP RAN1 could certainly chose to incorporate this mechanism into the LAA and NR-U specifications. However, it could also choose to mitigate any need for such a mechanism by reducing the need for *reservation signals* in the first place.

IEEE 802.11 WG understands that the NR-U specification is making some progress in this regard by increasing the number of potential starting positions. However, we also understand that NR-U devices are not required to support the additional starting positions. In this case, the *reservation signal* problem will still exist. Is our understanding correct?

Given the new observations highlighting the adverse effects of *reservation signals* on coexistence, IEEE 802.11 WG request that 3GPP RAN1 either adopt a mechanism like that suggested in the IITP RAS presentation for both LAA and NR-U or adopt mandatory methods to significantly reduce the need for the transmission of *reservation signals* in the first place. This is particularly important for NR-U systems because they are more likely to be deployed in locations requiring good coexistence with co-located Wi-Fi systems.

We look forward to your response to this Liaison Statement as part of an invigorated collaboration on coexistence issues between IEEE 802.11 WG and 3GPP RAN1 deriving from the success of the Coexistence Workshop.

Regards,

/s/

Dorothy Stanley ([dstanley@ieee.org](mailto:dstanley@ieee.org)) Chair of IEEE 802.11 WG

1. This document represents the views of the IEEE 802.11 Working Group, and does not necessarily represent a position of the IEEE, the IEEE Standards Association, or IEEE 802. [↑](#footnote-ref-1)