IEEE P802.11 Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Proposal of Repetition CCA mechanism | | | | |
| Date: 2021-02-26 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | Email |
| Chong Han | pureLiFi |  |  | chong.han@purelifi.com |
| Nikola Serafimovski |  |  | [nikola.serafimovski@purelifi.com](mailto:nikola.serafimovski@purelifi.com) |
| Stephan Berner |  |  | [stephan.berner@purelifi.com](mailto:stephan.berner@purelifi.com) |
| Mostafa Afgani |  |  | [Mostafa.afgani@purelifi.com](mailto:Mostafa.afgani@purelifi.com) |
| Tamas Weszely |  |  | [Tamas.weszely@purelifi.com](mailto:Tamas.weszely@purelifi.com) |
| Tuncer Baykas | Has University and Hyperion Tech |  |  | [tbaykas@ieee.org](mailto:tbaykas@ieee.org) |
| Murat Uysal | Hyperion Tech |  |  |  |

Abstract

This document proposes the Repetition CCA mechanism in TGbb.

History

R2: update the figure to better illustrate the channel access examples; update the terms according to the changes in subclause 4.3.

R4: update the text with suitable terms, such as ‘transmission’/‘signals’ instead of ‘data’, ‘repetition’ instead of ‘relayed’; and revise the way to introduce the mechanism of packet repetition.

R5: revised language

# 1. Repetition CCA

Due to the nature of LC, the CCA mechanism may not work for non-AP LC STAs. The repetition CCA mechanism could allow the existing CCA mechanism to be used within non-AP LC STAs with the assistance of the LC AP. In general, the LC AP could detect any transmission from any non-AP LC STA as described in 32.3.2.3.5.2 CCA requirements. Then, the LC AP may disseminate the channel occupation information among the non-AP LC STAs within its coverage.

A simple mechanism to achieve this could be a simple amplify and forward retransmission mechanism. When the LC AP detects a transmission from a non-AP LC STA or transmissions from multiple non-AP LC STAs, it may repeat any signal it receivs on the uplink channel, even if it may not be decodable by the non-AP LC STAs. The repetition could be done at the analogue level, i.e., the detected transmission could be forwarded to both the receiver physical layer of the LC AP and analogue amplifying element. The repetition would be a broadcast to all the non-AP LC STAs within its range, so that the non-AP LC STAs may be able to obtain the occupation status of the uplink channel from the retransmitted signal of the LC AP if that signal is decodable. Non-AP LC STAs that successfully detect the retransmitted signal by the LC AP would mark the medium ‘busy’ as currently done in the CCA mechanism.

When the LC AP has a packet to transmit, it could start the transmission of the new packet immediately after the retransmission of the transmission from a non-AP LC STA is completed.

Figure 1 illustrates an example of channel access with the repetition CCA mechanism. The LC AP may retransmit the signals received from non-AP LC STAs on the downlink channel. Other non-AP LC STAs could mark the uplink channel as ‘busy’ in the CCA.indication in order to avoid collisions on the uplink channel. The LC AP could switch from the repetition of received signals to its own queue at the end of the repetition, as shown in the example of Packet 3 and 4’s switch.

**LC AP**

**non-AP LC STA1**

**non-AP LC STA2**

Packet 1

Repetition

Packet 1

Backoff

Repetition CCA Busy

Packet 2

Repetition Packet 3

Repetition CCA Busy

Delay (ns)

Delay (ns)

Delay (ns)

Packet 3

Backoff

Backoff

Backoff

Backoff

Packet 4

Figure 1 An example of channel access with repetition CCA mechanism