IEEE P802.11
Wireless LANs

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| Liaison response to 3GPP R2-141855 |
| Date: 2014-05-13 |
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Abstract

Reply to the liaison from 3GPP RAN R2-141855. Also see 11-14-0519r0.

The 3rd Generation Partnership Project (3GPP) submitted a letter to the IEEE 802.11 Working Group (WG). The letter is documented in 11-14-0519r0. This document contains recommended response text drafted by members of the IEEE 802.11 Task Group mc.

# Summary of the letter from 3GPP

The 3GPP TSG RAN Working Group (WG) 2 created a letter to the IEEE 802.11 WG during the 3GPP TSG-RAN2 Meeting #85bis. The letter reports that “3GPP TSG-RAN WG2 (RAN2) is developing a mechanism for inter-working between 3GPP RATs [Radio Access Technologies] (UMTS and LTE) and WLAN.” To allow for efficient inter-working of IEEE 802.11 WLAN and 3GPP’s radio technologies, the 3GPP RAN WG2 intends to develop mechanisms that provide access network selection and traffic routing. The proposed 3GPP mechanism allows a device to steer traffic from one radio technology to another. The letter highlights that this decision process considers several parameters. Among these parameters, 3GPP TSG RAN WG 2 identified RCPI and RSNI as candidates to observe: “If, for a WLAN AP, the RCPI measured by the terminal is above the RCPI-threshold and/or RSNI measured by the terminal is above the RSNI-threshold (***and other conditions are fulfilled***), the terminal should steer traffic to the WLAN AP.” 3GPP TSG RAN WG2 further emphasizes “[…] that ***other metrics than RSNI and RCPI are also considered in this mechanism*** […]” since the decision making process does not rely on PHY layer based measurements only. Consequently 3GPP TSG RAN WG2 asks the IEEE 802.11 WG about its opinion regarding the usefulness of the RCPI and RSNI values to represent PHY layer conditions.

In their letter, the 3GPP TSG RAN WG2 asks about the applicability of certain measurement functionality in the IEEE Std 802.11. The questions are as follows.

* Question 1: Does IEEE 802.11 WG consider WLAN RCPI a suitable metric of WLAN signal strength such that it can be compared to thresholds as in the above described mechanism?
* Question 2: Does IEEE 802.11 WG consider WLAN RSNI a suitable metric of WLAN signal quality such that it can be compared to thresholds as in the above described mechanism?
* Question 3: Does IEEE 802.11 WG consider any other WLAN signal metric more suitable for the above described mechanism?

# Summary of this reply letter

IEEE 802.11 Task Group mc developed this reply letter for approval by the IEEE 802.11 Working Group. The letter confirms that the measurement values in question are considered suitable for the envisaged use case.

To: 3GPP TSG-RAN WG2 c/o Mattias.a.bergstrom@ericsson.com

Subject: Liaison on WLAN signal measurements for WLAN/3GPP Radio interworking

Date: 2014-05-12

Dear Mattias,

We would like to thank 3GPP TSG-RAN Working Group (WG) 2 for its letter that we received on 2014-04-14. In its letter 3GPP TSG-RAN WG2 asked the IEEE 802.11 WG the following three questions:

1. Does IEEE 802.11 WG consider WLAN RCPI a suitable metric of WLAN signal strength such that it can be compared to thresholds as in the above described mechanism?
2. Does IEEE 802.11 WG consider WLAN RSNI a suitable metric of WLAN signal quality such that it can be compared to thresholds as in the above described mechanism?
3. Does IEEE 802.11 WG consider any other WLAN signal metric more suitable for the above described mechanism?

We answer your questions as follows.

* Regarding Question 1: We consider the RCPI value as defined in IEEE 802.11™-2012 a suitable metric for signal strength and can be used as described in 3GPP TSG RAN WG2’s letter.
* Regarding Question 2: We consider the RSNI value as defined in IEEE 802.11™-2012 a suitable metric for signal quality and can be used as described in 3GPP TSG RAN WG2’s letter.
* Regarding Question 3: IEEE Standard 802.11™-2012 defines additional values that you might deem helpful for the envisaged usage scenario. Among them we highlight the channel load and noise histogram that provide channel usage statistics. These statistics can be helpful to identify busy channels complementing RCPI and RSNI measurements. Also Received Signal Strength Indicator (RSSI) measurement methods that mitigate against the effects of short-term channel fading might support the decision making process, however there are no accuracy requirements specified for RSSI. Please note that frequency channel bandwidth, number of spatial streams, and other values also impact user experience.

Please note that there is no explicit accuracy requirement for RSNI, but RSNI is defined by the ratio of the received signal power (RCPI - ANPI) to the noise plus interference power (ANPI). Both, ANPI and RCPI, have accuracy requirements of ±5 dB.

Sincerely,

Adrian Stephens
IEEE 802.11 Working Group Chair

**References:**