IEEE P802.11
Wireless LANs

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| Minutes of the May 2021 meetings of the IEEE 802.11 Coexistence Standing Committee |
| Date: 2021-05-31 |
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Abstract

This document contains the minutes of the May 2021 meetings of the IEEE 802.11 Coexistence Standing Committee.

1. At 2021-05-12T22:03+02:00 the chair calls the meeting of the IEEE 802.11 Coexistence Standing Committee (SC) to order. Andrew Myles acts as chair of the SC. Guido R. Hiertz acts as recording secretary.
	1. The chair presents 11-21/613r4. At this time, 11-21/613r4 is identical to 11-21/613r3. 11-21/613r4 will contain any modifications to 11-21/613r3 that may arise out of this meeting.
	2. At 2021-05-12T22:08+02:00 the chair asks for approval of proposed agenda as presented on page 11 of 11-21/613r4. Nobody objects to the proposed agenda.
2. The chair continues from page 12. At 2021-05-12T22:11+02:00 the chair asks if there is any objection against approving the following motion
	1. “The IEEE 802 Coex SC approves 11-21-0624-00 as the minutes of its virtual meeting in March 2021”
	2. Nobody objects to approving this motion by unanimous consent
3. The chair continues from page 18. At 2021-05-12T22:14+02:00 an attendee makes a comment.
	1. Comment: The current draft 6 GHz HS (EN 303 687) requires only an ED scheme. However, the HS does not preclude to use PD below the ED threshold. And regarding EN 301 893, it is generally understood that 802.11be is using ED at −72 dBm but also formalizing that 802.11ax may use −62 dBm/−82 dBm. The presumption is that in the future, all technologies use the same common ED threshold.
	2. Comment: You are completely right.
4. At 2021-05-12T22:17+02:00 the chair continues from page 20. At 2021-05-12T22:18+02:00 Alecsander Eitan presents 11-21/796r0. At 2021-05-12T22:56+02:00 Alecsander ends his presentation.
	1. Comment: Are you planning to further inform us in this SC?
	2. Comment: Yes
	3. Comment: We may also send an LS to this 60 GHz group.
	4. Comment: There are public ex-parte documents at FCC.
5. At 2021-05-12T23:01+02:00 the chair continues from page 23 of 11-21/613r4. At 2021-05-12T23:06+02:00 an attendee comments on page 26.
	1. Comment: Are these the number of operators or the number of deployments?
	2. Comment: It’s the number of operators.
	3. Comment: We have done measurements with customers. None of them we may share. We might be able to share in the future.
6. At 2021-05-12T23:07+02:00 the chair arrives on page 37. At 2021-05-12T23:15+02:00 Stuart Thomas presents 11-21/814. Stuart ends his presenation at 2021-05-12T23:26+02:00.
	1. Comment: Did you consider 160 MHz and 320 MHz channels?
	2. Comment: No.
	3. Comment: Will you do in the future?
7. At 2021-05-12T23:27+02:00 Menzo Wentink presents 11-21/832.
	1. Comment: On slide 4, your assumptions are not correct. You cannot achieve this duty cycle with Bluetooth.
	2. Comment: I received that feedback but could not change my simulations anymore. But it doesn’t make a difference anyway. My simulations for 20 % duty cycle show this.
8. At 2021-05-12T23:48+02:00 Menzo concludes his presentation. Attendees further discuss the presentation.
	1. Comment: Is the low Wi-Fi throughput because of corrupt packets or because Wi-Fi defers?
	2. Comment: It’s both.
	3. Comment: Are you using a fixed MCS?
	4. Comment: The MCSs in use are between 6 to 9.
	5. Comment: Even at low MCS you see issues?
	6. Comment: Yes.
	7. Comment: You are showing that Wi-Fi shares well with another Wi-Fi network. Wi-Fi and BT sharing seems to work poorly, however. Because of the ECC/CEPT decision we need to have some sharing in 6 GHz. What could work?
	8. Comment: LBT needs to be added to NB FH. ECC/CEPT require an adequate sharing mechanism. It seems that Bluetooth is not providing this w/o LBT.
	9. Comment: Stuart Thomas, what are your reactions to this presentation?
	10. Comment: There are differences between the assumptions. In our measurement results we saw lower DC values. With higher DC we saw degradation. We have a gap here.
	11. Comment: What is a COT?
	12. Comment: It’s the a different term for TXOP. In Bluetooth, it’s the time it can transmit without sensing.
9. At 2021-05-12T23:58+02:00 chair declares the meeting to be in recess.
10. At 2021-05-17T22:02+02:00 the chair calls the meeting of the SC to order. Andrew Myles acts as chair of the SC. Guido R. Hiertz acts as recording secretary.
	1. The chair presents 11-21/613r6. At this time, 11-21/613r6 is identical to 11-21/613r5. 11-21/613r6 will contain any modifications to 11-21/613r5 that may arise out of this meeting.
11. At 2021-05-17T22:03+02:00 the chair presents slide 11. At 2021-05-17T22:04+02:00 the chair continues from slide 57. At 2021-05-17T22:19+02:00 an attendee comments on slide 63:
	1. The availability of a draft Harmonized Standard is not a prerequisite for a notified body to admit a producting being put onto the European market.
	2. Yes, you are absolutely right.
12. At 2021-05-17T22:22+02:00 Stuart Strickland presents 11-21/705r0. Stuart explains that the simulation results use ns-3 as simulation platform. Stuart ends his presentation at 2021-05-17T22:59+02:00.
	1. Comment: The inefficiency of preamble detection is very disappointing.
	2. Comment: Have you considered fading in your simulation? Or did you consider the pathloss component, only? For example, as proposed in the IEEE 802.11ax simulation scenarios 11-14/980r16.
	3. Comment: Fading wasn’t considered
	4. Comment: We worked on this over the last two months. On slide 18, in a more complex coexistence scenario there is also not an issue with RTS/CTS, except −72 dBm in the upper left has a minor disadvantage.
	5. Comment: Yes.
	6. Comment: There isn’t really an issue. Except when one node drops down to −72 dBm. The reduction is caused by CCA-busy conditions.
	7. Comment: Yes, we mainly confirm your results.
	8. Comment: It’s probably not a good idea to introduce IEEE 802.11be at an EDT of −72 dBm.
	9. Comment: I would not completely disagree. However, the trough we see is related to a special condition.
	10. Comment: On page 8, could you please explain the middle result?
	11. Comment: Orange is better because the wireless medium is clean. Blue indicates that a device is transmitting when the medium is not clean.
	12. Comment: PD is clearly not working as it should be, we have some explanation why this is the case.
	13. Comment: Without RTS you are in trouble. Why isn’t preamble detection working?
	14. Comment: When two STAs chose the same backoff, both transmit at same time. The PDU size 4 ms and the preamble is just a few µs and it’s not recognized. Also, there is an artifact of full buffer traffic simulations.
	15. Comment: How is MCS selected?
	16. Comment: It always selects the most efficient MCS. It’s a genie algorithm.
	17. Comment: In situations with many collisions, the backoff will reach high values. Then, there is an increase in preamble misdetection. In DL, (APs have a lower default CWmax) you won’t see this as much.
	18. Comment: In recent weeks we tried to converge with Menzo’s results.
	19. Comment: The difference between STA and AP CWmax has an impact. On page 19, you say 45 % have signal above −57 dBm. But that’s not where this issue starts.
13. The following comments are submitted through the online conferencing system’s chat function.
	1. Comment: It would be great to see non full buffer results as well. Full buffer has certain phenomenon such as transmitter's blindness to preamble of an OBSS transmission, which is much less likely to occur in real life
	2. Comment: I think this "sync" behavior (where two BSS are in perfect spatial reuse) is enabled because the simulatoin uses Genie rate-adaptation.
	3. Comment: If both BSSs are full buffer they fall into a synchronize behavior where they ignore the other BSS's preambles because they are transmitting when they occur, so it degrades to ED coex. This does not occur in real life with non-full-buffer traffic
	4. Comment: still not clear why devices fall back to "ED only" deferral. it is 2 STAs competing for the medium. If one TX - the other one suppose to detect the transmission using PD detect. This work for RTS/CTS, so i'd expect this work for Data as well
	5. Comment: Since there are only two contenders, and all four devices are within PD or each other, I was surprised to see much "synchronized behavior". Yes, I agree, full buffer is also contriubting to the liklihood of "syncrhonized behavior".
	6. Comment: the only problem may occur is when DATA PPDUs collide. But since we have just UL traffic from just 2 devices doing full buffer traffic... so i'd expect data PPDUs to be of same size
	7. Comment: So if one uses different frame sizes, does this sync still occur?
	8. Comment: I would agree that the synchronization that inhibits preamble detection is an aretefact of full buffer traffic. At reduced loads, deferral would likely be dominated by PD and the differencres we see between different ED thresholds would be less of a factor.
	9. Comment: so after transmission of PPDU STA will wait for an ack. if ack arrive - you receive it. if not - you enter into recovery
	10. Comment: Frame sizes are following a distribution
	11. Comment: Frame sizes will have limited impact on the synchronization behavior. It is driven more by the channel congestion created by full buffer traffic
	12. Comment: I guess the duration of the PPDUs may not be the same all the time. E.g. if some MPDU are damaged and we have to retransmit them.
	13. Comment: You also see more PD deferral even when the channel is fully loaded, as long as each transmitter is not full-buffer. e.g. 10 devices each with 10% load fills the medium, but each transmitter is idle 90% of the time so hears most of the other preambles
	14. Comment: Yes, in a real world environment, there will be a lot more variation, so more opportunity for efficient detection among the many devices contending, each from different states.
	15. Comment: this is possible, but difference between them shall be significant and be present constantly
	16. Comment: Back to Rate-Adaptation: the simulation assumes that the client knows what MCS to use in both cases - when there is a collision and when there isn't??
	17. Comment: Of course, the severity of any effect of using different EDs depends most heavily on whether PD is effective. If, in real world scenarios, PD is more effective than in our simulations, differing EDs will have much less impact on performance.
	18. Comment: We have simulated using all MCSs and then taken the envelope of the results. In effect it is ideal rate adaptation.
	19. Comment: the simulation does not know what MCS to use. the graph shows best TPT obtained from all trials for all range of MCSes. if i got the explanation correctly
	20. Comment: correct
	21. Comment: Yes, the MCS selection is idealized, so it represents the best possible selection.
	22. Comment: It is the so called Genie rate selection algo
	23. Comment: Can this be an effect of MCS selection? i'd expect that both BSSes would use same MCS. But can it be that in some cases TPT value for BSS1 obtained from sims with MCS X and for BSS2 - with MCS Y. and because of that the TPT is different . Just brainstorming
14. At 2021-05-17T23:17+02:00 Menzo Wentink presents 11-21/851r0. Menzo ends his presenation at 2021-05-17T23:40+02:00.
	1. Comment: You are drawing the conclusion that we are all better of using PD/ED. Can you comment on how to maintain coexistence with non-Wi-Fi and keeping this method?
	2. Comment: Within Wi-Fi we do not have an issue with ED of −62 dBm.
	3. Comment: With other technologies in the band we have to change how we operate.
	4. Comment: I have experience in the field in the last fifty years. I know these simulations are complex but they are too simple. Without fading you did not simulate the indoor environment sufficiently. A person walking in a room may easily changes SINR by 10 dB or more. We are arriving at conclusions that are interesting in theory bu the results aren’t meaningful in practe. If you model the RF environment to this higher (right) degree, these effects will go away.
	5. Comment: I agree with everything you said. We forced ourselves to simplifications. We would end up at the same conclusions.
	6. Comment: You are simulating a quasi-static RF environment. I am wondering the usefulness of these results. I tried to simulate this thirty years ago. We build the first smart antenna system. What is the usefulness of these results if the people doing it recognize that it is not effective?
	7. Comment: These scenarios come from 3GPP and we need to answer them.
	8. Comment: Do your simulations take PA power backoff into account?
	9. Comment: No.
	10. Comment: I suggest to fix the MCS in your simulations. Then change the SINR.
	11. Comment: This is interesting work. Although imperfect. The simulations aren’t showing real life. ETSI allows to do a second step in the future. Maybe we should do real experiments.
	12. Comment: What are you next steps?
	13. Comment: We haven’t decided.
	14. Comment: We have seen some phenomena that surprised us. We like to further investigate. We will also do some measurements. This doesn’t have the urgency as it was some months ago.
	15. Comment: We have a lot of silicon vendors in the call. If they could offer special builds of their firmware, we could perform real-life tests with variable ED threshold.
15. At 2021-05-17T23:59+02:00 chair declares the meeting to be adjourned.