IEEE P802.11
Wireless LANs

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| Minutes of the September 2023 meeting of the IEEE 802.11 Coexistence Standing Committee |
| Date: 2023-09-29 |
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Abstract

This document contains the minutes of the September 2023 meeting of the IEEE 802.11 Coexistence Standing Committee

Meeting location: Hyatt, Atlanta Buckhead, Georgia, USA

1. At 2023-09-13T10:31-04:00 the chair calls the meeting of the IEEE 802.11 Coexistence Standing Committee (SC) to order. Marc Emmelmann acts as chair of the SC. Guido R. Hiertz acts as recording secretary.
	1. The chair presents 11-23/1359r1 and 11-23/1357r0. The latter contains the proposed agenda. The chair reviews the proposed agenda.
	2. At 2023-09-13T10:34-04:00 the chair introduces the following motion as presented page 6 of 11-23/1359r1:
		1. “Move to approve Coex SC agenda as contained in 11-23/1357r01.”
			1. Moved: Rich Kennedy
			2. Seconded: Guido R. Hiertz
		2. The motion is approved by unanimous consent.
	3. As part of the approval of the consent agenda, the following motions are approved.
		1. Approval of the minutes: “Approve the Coex SC minutes contained in 11-23/1282r0.”
2. At 2023-09-13T10:35-04:00 chair introduces 11-23/448r1 and reminds all attendees of their obligations when attending this meeting.
	1. At 2023-09-13T10:38-04:00 the chair continues presenting 11-23/1359r1 from page 10 onwards.
3. At 2023-09-13T10:40-04:00 Ratnesh Kumbhkar begins presenting 11-23/1503r0.
	1. At 2023-09-13T10:48-04:00 attendees discuss page 3.
		1. Comment: Which frequency do you assume?
		2. Comment: It’s 5.8 GHz because Bluetooth SIG wants to go there.
		3. Comment: Is there an option that BLE uses 1 Mb/s? Is this typical duty cycle?
		4. Comment: The best case is lower duty cycle if there are no retransmissions. It could be higher if two transmissions fail.
		5. Comment: What is the duty cycle in W-Fi?
		6. Comment: We have done scenarios with lower Modulation and Coding Schemes, too. With long packets we occupy most of the TXOP. With full buffer we are close to 100 % duty cycle.
	2. At 2023-09-13T10:53-04:00 Ratnesh continues presenting from page 4.
	3. At 2023-09-13T11:03-04:00 attendees ask questions.
		1. Comment: I have a question about the impact on Bluetooth performance. What if you modify the parameters so that the 80 MHz are kept entirely free for Wi-Fi? The best would be to modify that the 80 MHz are avoided. Like eDAA does. BT could do offline scans to detect the channel usage by Wi-Fi. Then, the impact on Bluetooth would be similar to what you see with eDAA.
		2. Comment: Yes, Bluetooth could chose to avoid hopping to the Wi-Fi channels for some duration. In this case, the effect on Bluetooth should be lower.
		3. Comment: In the full buffer case for Wi-Fi, how do you define the normalized throughput?
		4. Comment: This is what Wi-Fi would see with no other interference or sharing.
		5. Comment: The normalized throughput on page 5 is close to 100 %.
		6. Comment: The is a small transient period during which Bluetooth uses these channels.
		7. Comment: So, Bluetooth is mostly operating outside of these 80 MHz, on page 5?
		8. Comment: Yes.
		9. Comment: What is an acceptable level of glitches for Bluetooth?
		10. Comment: It depends on the application and use case. This is something we need to decide on.
	4. At 2023-09-13T11:11-04:00 Ratnesh continues his presentation from page 7.
	5. At 2023-09-13T11:21-04:00 attendees discuss the presentation.
		1. Comment: On page 10, this is what I also see in my simulations. It does take significantly longer for Wi-Fi to reach 100 % throughput.
		2. Comment: Yes, I also observe that it takes longer.
	6. At 2023-09-13T11:23-04:00 Ratnesh continues from page 11.
	7. At 2023-09-13T11:27-04:00 attendees discuss page 12.
		1. Comment: Are you assuming a single radio with Bluetooth that also does scans? Or, do you assume a separate radio?
		2. Comment: We envisage a second radio for scanning.
		3. Comment: You can scan concurrently?
		4. Comment: You can keep it largely independent with the duty cycles in Bluetooth.
		5. Comment: Regarding the results for full buffer and LBT, why is the LBT scheme not reliably removing the four 20 MHz channels from use by Bluetooth? There are still Bluetooth packets lost.
		6. Comment: It takes a certain duration to remove the channels.
	8. At 2023-09-13T11:30-04:00 Ratnesh continues from page 12 and at 2023-09-13T11:34-04:00 he concludes his presentation.
		1. Comment: The ten percent beacon loss is also what I see. This might be ten percent extra of what is already there. The density of hops will increase if Bluetooth restricts itself to just 80 MHz out of 160 MHz.
4. At 2023-09-13T11:36-04:00 Sebastian Max begins presenting 11-23/1477r1.
	1. At 2023-09-13T11:57-04:00 attendees discuss the presentation.
		1. Comment: You presentation is very clear. Thank you. The optimistic model, however, is useless. The pessimistic model is not pessimistic enough. When interference shows up, its impact depends on it being present before or after preamble. If it shows up before the preamble, the pessimistic model is acceptable. If interference occurs after the preamble, it can be more devastating. AGC was set already. Narrowband Frequeny Hopping can also fool Wi-Fi receiver in false detects. In this state, you also fail to receive packets. The pessimistic model is not pessimistic enough.
		2. Comment: Thank you. In the scenario here, you cannot get more pessimistic. Because here, it will fail, anyway.
		3. Comment: When you end up with a marginal SINR, differences occur.
		4. Comment: In the scenario here, we always trigger ED at the Wi-Fi device. Therefore, we always have intereference after the preamble.
		5. Comment: Bluetooth signals are quite wide.
		6. Comment: How wide?
		7. Comment: Depends on implementations. Furthermore, EN 303 687 allows for 14 dBm. You assume just 10 dBm, however. Is it fair to consider three Wi-Fi with six Narrowband Frequency Hopping devices? That would be just two NB per Wi-Fi.
		8. Comment: What kind of assumptions should we apply is a question that we need to anser. We need to look at different scenarios. In the scenario here, it will always fail. Therefore, for this scenario the BT transmit power does not matter.
		9. Comment: We also see something like your model B. Thus, this model seems reasonable. Furthermore, your segments three and four for the 1280 B would also hop into another channel.
		10. Comment: Here, the assumption is just that the segment is filled so that the next connection interval is used.
		11. Comment: Your traffic mode, what does it mean?
		12. Comment: The TXOPs are always full. It’s just that traffic is not that deterministic with artificial full-buffer traffic models.
		13. Comment: I believe a video stream of 100 Mb/s should translate into lower duty cycles.
		14. Comment: With FTP, there is a nice KPI. This is the download time of the FTP file.
	2. At 2023-09-13T12:08-04:00 Sebastian continues his presentation.
	3. At 2023-09-13T12:21-04:00 attendees ask questions on page twenty.
		1. Comment: You are assuming that BT is transmitting in 20 MHz.
		2. Comment: Bluetooth is still hopping around. Still hops over the total 480 MHz.
		3. Comment: Puncturing doesn’t have the best history in Wi-Fi. Dynamic puncturing would be great to have. Unfortunately, the IEEE 802.11be draft is a bit incomplete here. Wi-Fi 7 testing does not have it. Puncturing will come to the market, later.
		4. Comment: Which channels do you puncture?
		5. Comment: Unless the primary 20 MHz channel is interfered, I assume in my simulator that any 20 MHz can be punctured.
		6. Comment: If BT would hop more frequent, so that the hopping frequency was higher, then there is an improvement. The benefits you see is from the long stay of 10 ms.
		7. Comment: This was suggested to me. If BT was hopping every 1 ms, then there would be issues.
	4. At 2023-09-13T12:28-04:00 Sebastian continues from page 21. He concludes his presentation on page 22 at 2023-09-13T12:31-04:00.
5. The chair asks if there is any objection to extend meeting time by 10 min. Nobody objects.
6. At 2023-09-13T12:32-04:00 Menzo Wentink presents 11-23/1622r0.
	1. At 2023-09-13T12:38-04:00 attendees discuss the presentation. There is a question on the presentation’s page six.
		1. Comment: Regarding your 20 MHz point you have almost 70 % beacon loss. How, is the beacon jitter?
		2. Comment: Yes, there is vey high jitter.
	2. At 2023-09-13T12:40-04:00 Menzo concludes his presentation.
7. At 2023-09-13T12:41-04:00 the chair declares the meeting adjourned.