IEEE P802.11
Wireless LANs

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| Minutes of the May 2024 meetings of the IEEE 802.11 Coexistence Standing Committee |
| Date: 2024-05-15 |
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Abstract

This document contains the minutes of the May 2024 meetings of the IEEE 802.11 Coexistence Standing Committee.

# Tuesday, 2024-05-14, PM1 session

1. At 2024-05-14T13:33+02:00 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 11-24/622r1. At this time, 11-24/622r1 is identical to 11-24/622r0. The latter is stored on Mentor server.
2. At 2024-05-14T13:34+02:00 the chair presents the proposed agenda—contained in 11-24/620r2—for for this week’s meetings of the SC. At the time of presentation 11-24/620r2 is identical 11-24/620r1. The latter is stored on Mentor server.
3. At 2024-05-14T13:36+02:00 the chair presents the following motion as contained on page seven of 11-24/622r1:
	1. “Move to approve Coex SC agenda as contained in 11-24/0620r2.”
		1. Moved: Rich Kennedy
		2. Seconded: Manish Kumar
		3. The chair asks if there is any objection to approve this motion by unanimous consent.
			1. No attendee objects.
		4. The motion is approved.
			1. In approving the consent agenda contained in 11-24/0620r2 the minutes of the SC’s last meeting in March 2024, which are contained in 11-24/609r0, are also approved.
4. At 2024-05-14T13:37+02:00 the chair presents 11-23/448r1. The chair reminds all attendance of their obligations when attending the SC’s meeting. Furthermore, the chair also informs attendes of the IEEE SA rules on intellectual property and copyright.
5. At 2024-05-14T13:40+02:00 the chair continues to present from page eleven of 11-24/622r1.
6. At 2024-05-14T13:43+02:00 the chair declares the call for nominations for vice-chair of the SC closed. There are no additiona candidates except for the candidates listed on page 17 of 11-24/622r1. The candidates
	* Rich Kennedy
	* Manish Kumar
	* Sebastian Max
	1. The chair provides all candidates with an opportunity to introduce themselves. At 2024-05-14T13:46+02:00 all candidates have introduced themselves and explained why they stand for vice-chair.
7. At 2024-05-14T13:49+02:00, the chair begins the election process for the election of the first vice-chair. The procedure is outlined on page 18 of 11-24/622r1. The result of the first election round is as follows:
	* Rich Kennedy: 7
	* Manish Kumar: 45
	* Sebastian Max: 14
	1. Therefore, Manish Kumar is elected as first vice chair of the SC.
8. At 2024-05-14T13:55+02:00 the chair initiates the election of the second vice chair. The result of the second election round is as follows:
	* Rich Kennedy: 19
	* Sebastian Max: 38
	1. Therefore, Sebastian Max is elected as second vice chair of the SC.
9. At 2024-05-14T13:57+02:00 the chair presents the following motion as contained on page 20 of 11-24/622r1:
	1. “Move to confirm Manish Kumar and Sebastian Max as Coex SC Vice Chairs.”
		1. Moved: Rich Kennedy
		2. Second Juan Carlos Zúñiga
		3. The chair asks if there is any objection to approve this motion by unanimous consent.
			1. No attendee objects.
		4. The motion is approved.
10. At 2024-05-14T13:58+02:00 the chair presents page 21 of 11-24/622r1. The chair asks if there is any person other than the person listed on this page that would like to candidate for the position of secretary of the SC.
	1. There is no other candidate
	2. The Chair appoints Guido Hiertz as SC Secretary asking the SC for confirmation.
11. The asks if there is any objection to the following motion contained on page 22 of 11-24/622r1.
	1. “Move to confirm Guido Hiertz as the Coex SC Secretary.”
		1. There is no objection to confirm to approve the motion by unanimous consent.
	2. Guido is appointed secretary of the SC.
12. At 2024-05-14T13:59+02:00 Rich Kennedy presents 11-24/717r0. Rich concludes his presentation at 2024-05-14T14:05+02:00.
13. At 2024-05-14T14:05+02:00 Guido R. Hiertz presents 11-24/910r0. He ends his presntation at 2024-05-14T14:14+02:00.
14. At 2024-05-14T14:15+02:00 the chair presents 11-24/922r0. The chair concludes his presentation at 2024-05-14T14:17+02:00. Attendees discuss the chair’s presentation.
	1. Comment: To address the issue of the European Commission not recognizing IEEE standards and thus, not being able to use IEEE standards in normative references in ETSI’s documents is up to ETSI. ETSI could seek permission to copy text from the IEEE 802.11ax standard into an ETSI standard. ETSI welcome to approach IEEE SA staff.
	2. Comment: Could ETSI copy from IEEE 802.11?
	3. Comment: The Harmonised Standard EN 303 687 uses a normative reference to IEEE 802.11ax-2021 for the sole purpose of defining a test signal. This test signal bases on the IEEE 802.11ax OFDM PHY but does not contain any preamble structure. Therefore, the test signal is created as described in clause 27 in IEEE 802.11ax-2021. ETSI TC BRAN also discusses if it could be possible to convert the normative reference to IEEE 802.11ax-2021 into an informative reference. Alternatively, ETSI TC BRAN might decide to remove all normative references because the EN 303 687 is published with a ZIP file that contains example waveform files that may be used for testing.
	4. Comment: You can always ask IEEE for text to be copied. The less you need to copy the more likely IEEE SA will permit the text to be copied. Please let ETSI know that they can always talk to the chair of the IEEE 802 Executive Committee (EC).
	5. Comment: Does the European Commission (EC) recognize IETF as Standards Developing Organization?
	6. Comment: No. According to an ETSI document that records explanations by the EC to ETSI, the EC considers itself bount by the Technical Barriers to Trade (TBT) agreement by the World Trade Organization. Accordingly, the EC limits itself to recognizing ISO, IEC, ITU, CEN, CENELEC, and ETSI as SDOs. The EC does not recognize any other entity as SDO. In any document that may be used to provide a presumption of conformity, the EC mandates that all normative references are developed by an SDO.
	7. Comment: Can we have informal discussions with ETSI? Or do we need to have formal discussions?
	8. Comment: I would support such discussion to happen.
	9. Comment: ETSI TC BRAN has a Technical Officer that is an ETSI member just like IEEE SA dedicates staff to IEEE 802. Furthermore, there is ETSI staff that is in contact with the EC. Because of the existing Memorandum of Understanding between ETSI and IEEE it will be easily possible to initiate discussions between ETSI and IEEE SA at staff level. However, in the end there is nothing that IEEE or ETSI could do about the situation. The ETSI Directives clearly state that any publicly available and dated document may be used as normative reference in its standards and other publications. However, it is the EC that denies any document meant to provide a presumption of conformity (e. g. a Harmonised Standard) to be listed in the Official Journal of the EU (OJEU) if such document contains a normative reference to an SDO that the EC does not recognize. Therefore, the issue is not between ETSI and IEEE.
	10. Comment: If a document is not listed in the OJEU, such document cannot be used by a manufacturer to assess its products to issue a Declaration of Conformity (DOC) by the manufacturer itself. In case a needed document is not listed in the OJEU, the manufacturer must seek approval by a notified body to place its product on the market of the EU.
	11. Comment: For EN 301 893, ETSI TC BRAN might discuss to replace the currently used normative reference to IEEE 802.11-2020 by a normative reference to ISO/IEC 8802.11-2022. However, for EN 303 687 such replacement of the normative reference to IEEE 802.11ax-2021 is not possible because ISO/IEC has not accepted this standard for publication.
	12. Comment: This is not problem between IEEE SA and ETSI. We have the MOU. The key issue is generic. Also other ETSI groups have the problem of being unable to normatively cite certain documents. The same issue occurs at CEN and CENELEC. All of them have the issue not being able to use such documents as normative reference. How can we get IEEE to be reocognized as an SDO?
	13. Comment: It’s not an issue between IEEE and ETSI. It’s an issue between the EC and ETSI.
	14. Comment: This wouldn’t be a problem if we wouldn’t have the ISO problem. Most likely, IEEE will never be recognized as SDO. We need to look at IEEE’s ISO relationship.
	15. Comment: With IEEE 802.11-2025, would we have the issue at ISO again?
	16. Comment: I don’t know if IEEE 802.11-2025 will be adopted by ISO.
15. At 2024-05-14T14:46+02:00 Carlos Aldana presents 11-24/907r0. He concludes his presentation at 2024-05-14T14:52+02:00. Afterwards, Carlos presents BRAN(24)123a003. He concludes is second presentation at 2024-05-14T14:58+02:00.
	1. Comment: When was the TC BRAN document discussed?
	2. Comment: This happened during ETSI TC BRAN meeting #123a on April 22nd.
	3. Comment: There was another TC BRAN meeting on April, 23rd, too.
	4. Comment: This was presented by the Bluetooth SIG as their proposal for medium access of Narrowband Frequency Hopping in EN 303 687.
16. At 2024-05-14T15:06+02:00, the chair declares the meeting to be in recess.

# Tuesday, 2024-05-14, Evening session

1. At 2024-05-14T19:34+02:00 the chair of the IEEE 802.11 Coexistence SC calls the meeting to order. Marc Emmelmann acts as chair of the SC. Guido R. Hiertz acts as recording secretary.
	1. The chair presents 11-24/620r2. The chair modifies the agenda that is contained in 11-24/620r3, now.
	2. The SC approves the modified agenda in 11-24/620r3 by unanimous at 2024-05-14T19:37+02:00.
2. At 2024-05-14T19:38+02:00 Phil Beecher presents 15-24/280r0. He concludes his presentation at At 2024-05-14T19:45+02:00.
	1. Comment: They are asking for the FCC part 19 rules to be modified. There are allocations on a licensed basis. These are geographically limited. This licensed spectrum is not utilized. They also look at substantially increasing the transmit power. IEEE 802.18 will submit comments to FCC. IEEE 802.19.3 is a recommended practice that explains how to use improve coexistence by using existing features in IEEE 802.11 and IEEE 802.15. It explains what to do in a mixed environment when looking for a certain performance parameter to be optimized.
3. At 2024-05-14T19:51+02:00 Carlos Aldana presents 11-24/360r4. He ends his presentation at 2024-05-14T19:55+02:00.
	1. Comment: When you say, we agree, who is “we” in “we agree?”
	2. Comment: The authors of the document agree on the proposed way forward. It’s not the individuals that author other contributions listed in 11-24/360r4.
4. At 2024-05-14T19:56+02:00 Carlos presents 15-24/212r5. At 2024-05-14T20:06+02:00, Carlos concludes his presentation.
	1. Comment: Is Listen-before-Talk (LBT) the only solution? Did you discuss alternatives? What is the thinking about LBT in general? Where are we getting closer together?
	2. Comment: LBT has been the one aspect that we discussed a lot. There were no details discussed about what other aspects to discuss. We had contentious discussions. IEEE 802.15 members do not want to be leaders on spectrum regulaton. Instead, they follow spectrum regulation rules and changes. They don’t want to have a specification that confines them. Instead, they want to have the liberty to be able to react to changing regulatory requirements. However, I say, LBT is here to stay. Let’s think about how IEEE 802.15.4ab can make the best of LBT.
	3. Comment: Thanks. I will need to educate myself regarding the disadvantages of LBT.
	4. Comment: IEEE 802.15.4 contains multiple channel access mechanisms. In a lot of applications LBT provides benefits. However, there are also applications where LBT provides no benefits. Or, LBT might be even giving you disadvantages.
	5. Comment: I cannot follow your slides. It seems that you conclude that 11-24/148 would state that LBT should be mandatory and that the people mentioned in 15-24/212 all support this conclusion.
	6. Comment: 11-24/148 is just a document by myself and another author.
	7. Comment: Is this supported by the other individuals mentioned within the document?
	8. Comment: I haven’t reached out to them. They need to speak for themselves.
	9. Comment: I definitely believe in politeness in communication.
	10. Comment: In my studies I looked at the impact of a narrowband hopper’s transmissions on the transmission’s of a wideband system. My conclusions hold if many channels are available. For the hopping system, there needs to be an opportunity to find an idle channel. Our idea is to search as quickly as possible to find a channel that may be used. I am not convinced that this conclusion also applies for the upper 5 GHz band. It doesn’t provide enough channels. I am not stating that an application, which 802.15.4ab implements, can be supported in less spectrum.
	11. Comment: In my simulations I assumed that the full 480 MHz is being used with a 2 MHz spacing channel plan. So, there are more than 200 channels available for the hopper. Giving the hopper a high probability to find an idle channel.
	12. Comment: I believe 160 MHz channels are a good assumption. I am skeptical about 320 MHz channels.
	13. Comment: On slide six of 15-24/212r5, I could not follow your conclusion. You are stating that NB FH devices filter a lot of stuff left and right of the desired channel. I don’t understand why NB FH systems should reduce the ED level. You are assessing that NB FH has beneficial aspects and because of this you are proposing to penalize NB FH operation.
	14. Comment: NB is not more efficient from a perspective of b/s/Hz. We are concluding that the far away NB FH device is creating issues to the wideband systems. I am just looking at the radius of the transmission that is causing issues. My slides are not looking at the NB to NB effects. It’s just the detrimental effects of NB on WB. It’s just a mathematical exercise.
	15. Comment: On slide 15, you propose that NB shall apply LBT with the parameters shown.
	16. Comment: Spectrum regulation mandates the use of LBT in some bands. Spectrum regulation in EN 300 440 does not require any LBT, however.
	17. Comment: I recommend looking at pages ten and eleven in <https://www.etsi.org/images/files/Magazine/ETSI_Enjoy_MAG_2023_N04_October.pdf>
		1. The chair presents page eleven of the document available from this URL.
	18. Comment: This report shows that in Europe, several Harmonised Standards address the same band. Please allow me to emphasize that Harmonised Standards do not constitute spectrum regulation. Harmonised Standards define requirements for placing products on the market of the EU. It is possible to place products on the market of the EU that do not comply with the requirements in a Harmonised Standard. Of course, such products need to comply with the respective spectrum regulation. This regulation, however, is not defined by ETSI. Without issuing a Declaration of Conformity by itself, a manufacturer needs to seek approval by a notified body. Notified bodies may admit products to the market of the EU within the limits of spectrum regulation and the notified body’s authority to assess products for their compliance with all essential market requirements of the EU.
	19. Comment: Please consider the figure on page eleven in the aforementioned ETSI magazine. The figure explains that in Europe, the 5.8 GHz band is regulated under a different regime than the U-NII3 band in the US. In Europe, the 5.8 GHz band may be use without by license-exempt devices if such devices qualify as Short Range Device (SRD). Market requirements on SRD operation are described in EN 300 440. Spectrum regulation for SRD is described in ECC recommendation 70-03. SRD opration is not WAS/RLAN operation. At the same time, Europe also permits for licensed Broadband Fixed Wireless Access (BFWA) in the 5.8 GHz band. Market requirements for BFWA are covered in EN 302 502. Furthermore, Europe permits for Wireless Industrial Applications in the 5.8 GHz band. Market requirements for this application is described in EN 303 258.
	20. Comment: It is important not confuse market requirements, which ETSI establishs, and spectrum regulation. Spectrum regulation is limited to nations.
	21. Commen: For 6 GHz the current version of EN 303 687 mandates the use of LBT.
	22. Comment: ETSI is not doing spectrum regulation. Nowhere in European spectrum regulation you will find a requirement to implement LBT. From a point of view of spectrum regulation, as defined developed and agreed by European countries and defined by ECC, there may be many different modes of medium access. LBT is one of the modes but not a mandatory one. Other modes of accessing a license-exempt spectrum can be a duty cycle reduction etc. Harmonised Standards are a technical interpretation how to comply with spectrum regulation. Typically, Harmonised Standards defined just one or two modes that are considered to fulfil regulatory requirements. In spectrum regulation, there is no obligation to use a specific access technique.
	23. Comment: In EN 303 687 the use of LBT is mandatory. Furthermore, the European Radio Equipment Directive requires to make efficient and effective use of the spectrum.
	24. Comment: FCC regulation does not specify anything. In the license-exempt 6 GHz band, FCC requires the use of a contention-based protocol. There are various methods to demonstrate that you have such a thing.
	25. Comment: EN 303 687 permits the use of Short Control Signaling (SCS). It’s constrained to 2500 µs within an observation interval of 50 ms. So, the duty cycle is 5 %.
	26. Comment: Are you saying that ranging could be possible?
	27. Comment: No, I am just saying that SCS is a permitted mode of operation that does not use or implement LBT.
	28. Comment: In my view, ranging messages are not control message. I would argue that ranging is data traffic and control traffic. Thus, I believe that IEEE 802.15.4ab does cannot qualify as SCS.
	29. Comment: The ranging itself is performed with UWB. In NB only command, control and reporting assisting and steering the UWB ranging is transmitted.
	30. Comment: What is short range?
	31. Comment: I recommend reading <https://www.etsi.org/deliver/etsi_en/300400_300499/300440/02.02.01_60/en_300440v020201p.pdf>
	32. Comment: Is just a name. SRD communcation could also be communication to a satellite. It’s not about range. It’s about the power. The name is misleading. There is no range limit. Actually, there are discussions to modify the terminology to something else like low-power operation or similar.
	33. Comment: It seems we are just debating about what we can get away with. But what we should do is to agree how we achieve good coexistence.
	34. Comment: It is important that user experience is good in any market regardless of regulation. LBT is a proven mechanism.
	35. Comment: The current impression is that IEEE 802.15 is being educated by someone coming to the room telling them what is best to do. We need open-minded discussions that are not discriminating.
	36. Comment: Different systems taking different approaches to coexistence are generally worse than using the same mechanism. We can have this discussion.
	37. Comment: What I hear is that we have LBT as suggested solution. What is the counter solution?
	38. Comment: We have multiple channel access mechanisms. One of them is LBT with a linear backoff. A linear backoff allows for much better latency properties. Nobody is disputing that these mechanisms are needed.
	39. Comment: I have a question to the IEEE 802.15.4ab community: what is the general design plan to coexistence? Will there be a desire to have a descriptive coexistence mechanism in the draft before the draft. What’s the plan for IEEE 802.15?
	40. Comment: We already have several tools. Nobody implements stuff that doesn’t make sense. An awful lot of deployments don’t use LBT because the duty cycle of their application is extremely low. LBT doesn’t make sense to these applications. However, there are also more high-performance systems that use LBT and CSMA. If your goal is latency, one solution is the best. If packet loss is important, another solution is the best one.
	41. Comment: It’s very different to estimate what the solution will be if there are so many different possibilities in the field. When there are so many options it fights the need for some determinism.
	42. Comment: Isn't it the point of standardization to agree on one or more methods? Leaving coexistence methods up to implementation, conditions, and use cases seems to be the opposite of that.
	43. Comment: My question is about the typical Power Spectral Density of narrowband and wideband transmissions.
	44. Comment: Each group has its own goals. My overarching goal is that we suffer from the tragedy of the commons if we do not agree on a common method. If we do not agree, we will all achive less than what we could achieve and share if we would use a single method for all.
	45. Comment: Sensing by itself is not a coexistence mechanism. If we say you shall always do this, then this is not sufficient. This does not always solve the problem. We have a coexistence working group that develops coexistence standards. Let’s have a look at the standards and guides of IEEE 802.19.
	46. Comment: We added eDAA, LBT and adaptive frequency hopping with IEEE 802.15.4ab on top of IEEE 802.15.4. The IEEE 802.11be coexistence document states that LBT doesn’t work with UWB. They cannot detect LBT. So, this project already stated that it not coexisting with other technologies in the same band. IEEE 802.11 has restricted its solution space so much that it cannot come up with a solution for coexistence with non-Wi-Fi technologies.
	47. Comment: We should develop a joint solution as one industry.
	48. Comment: What was said earlier, is important. None of us should look at spectrum regulation and try to find loopholes. Instead, we shall develop a solution jointly. A solution that works for all of us, for all participating entities. And we should not state that regulation or requirements prohibit the use of A, mandate the use of B, restrict solutions to C etc. In Europe, through ETSI, it’s the industry that defines its own fate. The market requirements in Harmonised Standards can be changed. These market requirements are not enforced on us like spectrum regulations that are defined by nations and their governments.
5. The chair declares the meeting to be in recess at 2024-05-14T21:22+02:00.

# Wednesday, 2024-05-15, AM2 session

1. At 2024-05-15T10:30+02:00 the chair calls the meeting to order.
	1. The chair presents 11-24/622r1.
	2. Afterwards, the chair presents the proposed agenda for this session. This proposed agenda is contained in 11-24/620r3.
2. Comment: I would like to thank the chair for its splendid leadership during yesterday evening’s coexistence discussions.
3. At 2024-05-15T10:35+02:00, in the absence of any further business, the chair declares the meetings of SC adjourned.