IEEE P802.11
Wireless LANs

|  |
| --- |
| Minutes of the 2025-01 meeting of the IEEE 802.11 Enhanced Light Communication Study Group |
| Date: 2025-01-13 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Mohamed Islim | pureLiFi | Edinburgh, UK |  | Mohamed.Islim@pureLiFi.com  |
| Volker Jungnickel | Fraunhofer HHI |  |  |  |
|  |  |  |  |  |

Abstract

This document contains the minutes of the January 2025 meeting of the IEEE 802.11 Enhanced Light Communication (ELC) Study Group.

Abbreviations:

Q: Question

A: Answer

C: Comment

Revision history:

R0: Minutes for first meeting slot

R1: Adding minutes for the second meeting slot and correcting a few typos

R2: Corrected few typos

**ELC Meeting slot# 1 January 13, 2025, PM2**

1. The IEEE 802.11 ELC SG meeting was called to order at by the Chair, Nikola Serafimovski (Cambridge University).
2. The Chair reviewed the IEEE-SA patent policy, logistics, and reminders, including meeting guidelines and attendance recording procedures.
3. No essential patents claimed.
4. All are reminded to record their attendance through the IMAT system and pay the registration fee.
5. The chair introduced the overall agenda in doc. 11-25/0141r0 for the meeting.
6. Nikola Serafimovski: We also have one submission to discuss:
* Enhanced Light Communication: Scope and Feature (doc. 11-25/0143r0)
1. **Motion to accept the agenda in 11-25/0141r0.**

**Approved with unanimous consent.**

1. Volker Jungnickel presented Enhanced Light Communication: Scope and Feature (doc. 11-25/0143r0)
2. The document provides a summary of what has been discussed so far as part of the SG.
3. Nikola Serafimovski: PAR and CSD have been uploaded since September.

Discussion:

C: Support of 400 nm and 600 nm might affect co-existence with other standards on VLC and OCC such as IEEE 802.15.7:

A: Co-existence document will be prepared as part of the Task Group.

1. The plan is to put PAR and CSD to a motion on Friday at the closing plenary session.
2. At 16:46, the Chair declares the SG’s meeting adjourned.

**ELC Meeting slot# 2 January 16, 2024, PM2**

1. The IEEE 802.11 ELC SG meeting was called to order at by the Chair, Nikola Serafimovski (Cambridge University).
2. The Chair reviewed the IEEE-SA patent policy, logistics, and reminders, including meeting guidelines and attendance recording procedures.
3. No essential patents claimed.
4. All are reminded to record their attendance through the IMAT system and pay the registration fee.
5. The chair introduced the overall agenda in doc. 11-25/0141r2 for the meeting.
6. Nikola Serafimovski: Submissions to be discussed:
	* Comments on proposed draft ELC PAR (doc. 11-24/1599r5)
	* Comments on proposed draft ELC CSD (doc. 11-24/1600r2)
7. Nikola Serafimovski: We also have two new contributions in the agenda:
	* Underwater-LiFi-prototype-performance (doc. [11-25/0175r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0175-00-0elc-underwater-lifi-prototype-performance.pptx))
	* Ad-hoc mode for ELC (doc. [11-25/0180r1](https://mentor.ieee.org/802.11/dcn/25/11-25-0180-00-0elc-ad-hoc-mode-for-elc.pptx))
8. Motion to accept the agenda in 11-25/0141r2.
9. Approved with unanimous consent.
10. Nikola Serafimovski: Comments received on proposed draft PAR and CSD (doc. 11-24/1599r5 and doc. 11-24/1600r2, respectively).
	* Minor editorial updates applied and suggested by the attendees.

Discussion:

C: Added a declaration under 7.1 of the PAR that there are no competing standards in the space of IEEE Std 802. We are building ELC on top of IEEE 802.11bb.

Q: There is a wireless standard for underwater communication: Subsea Wireless Group (SWiG). Should we add that under 7.1?

A: We have wireless local area networking in IEEE 802.11, IEEE 802.11bb extends it to Light Communication (LC), Enhanced LC (ELC) plans to improve on it. As the wireless standard for underwater communication is not relevant to IEEE 802 standards, we don’t need to list it here. The purpose of this question is to see if we are duplicating efforts within the IEEE 802 space.

C: Adding TM sign to IEEE Std 802.11TM

C: Delete Wireless LAN at the end of the title.

C: I wouldn’t talk about existing PHY, nor new ELC PHY.

C: This will be posted to the LMSC, other groups will post comments by Tuesday 11th Mar 2025. You will have another session or two to address any additional comments.

1. PAR revised to (doc. 11-24/1599r6).
2. Motion to approve PAR (doc. 11-24/1599r6) as the ELC SG PAR.
	* Mover: Volker Jungnickel
	* Seconded: Mohamed Islim
	* Yes/No/Abstain: 16/0/0, total: 16.
3. Comments invited on CSD.
	* No comments; No changes to CSD.
4. Stefan Videv presented Underwater-LiFi-prototype-performance (doc. 11-25/0175r1)
	* LiFi has been demonstrated as a feasible option for underwater communication. Results shown >100 m link with data rates > 500 Mbps, and > 1 Gbps at shorter distances of 1.5 m.
	* Demonstrated systems were not built based on IEEE 802.11.

Discussion:

C: What will happen if we use a communication protocol based on IEEE 802.11?

A: We expect same or a better performance when using IEEE 802.11.

1. Ilya Levitsky presented Ad-hoc mode for ELC (doc. 11-25/0180r1)
	* Highlighted various potential use-cases for ELC and their requirements. Most of the requirements are covered by ELC PAR.
	* Proposed a new use-case for ELC: Vehicular communication which needs Ad-hoc support that is not currently covered by the PAR.

Discussion

C: Authentication could take a long time (a few ms). One way to implement this, back light could be AP, headlight could be a station. ELC scope is currently limited, we can consider this later in the TG.

A: We can simplify authentication, but it will still require some time. We think it might require >100s of ms. If cars changed lanes, AP and station cannot work, we certainly need Ad-hoc. V2X applications require ad-hoc mode to achieve low latency, but reducing latency might need changes to the MAC specification and PAR.

C: IEEE 802.11b adjacent nodes are needed, and LC could try to reproduce what RF has achieved.

C: Interesting use case, but MAC changes might need more census from the wider group later in the task group.

A: We’ll collect more information from the group to move forward.

A: Leveraging MAC changes of IEEE 802.11p and IEEE 802.11bd for light PHY is suggested, but changes to bandwidth might affect signalling.

C: Ad-hoc mode is closer to IEEE 1609 and should be dealt with elsewhere, not in ELC.

A: Finding a killer application for ELC is important to see benefits, and more focus is needed in the TG.

C: Many use cases have already been added to ELC, but it's impractical to work out a solution for all cases with limited time.

A: NRU is willing to work on this if approved.

C: There are doubts about the use of LC for V2X in extreme weather conditions like ice and snow, which should be considered.

A: Weather effects on V2X is an issue that needs to be studied. Leveraging safety standards on headlights for weather conditions is suggested (Washers).

Nikola: Can you present the missing delta to enable to support this. This bears a lot of changes to the MAC.

A: Yes, we can provide support and work on this.

1. Straw poll SP1: Do you agree that ad-hoc mode should be considered in the context of ELC/802.11br?
	* Yes/No/Abstain: 10/7/5, Total 22.
2. At 17:31, the Chair declares the SG’s meeting adjourned.