IEEE P802.11
Wireless LANs

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| IEEE 802.11 TGbb Task Group on Light Communications May, 2019 Atlanta Minutes |
| Date: 2018-01-14 |
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Abstract

This document contains the Task Group on Light Communications (TGbb) meeting minutes from the IEEE 802.11 Atlanta meeting, January 2019.

**IEEE 802.11 Task Group TGbb**

**Monday, May 13, 2019, AM2 Session**

Attendance: around 19 people.

1. The IEEE 802.11 TGbb meeting was called to order at by the Chair, Nikola Serafimovski (pureLiFi). Tuncer Baykas (Vestel) recorded the minutes.

1. The Chair reviewed the IEEE-SA patent policy, logistics, and reminders, including meeting guidelines and attendance recording procedures.
	* It is reminded all to record their attendance.
2. The Chair introduced the overall agenda for the week
* Submissions to be discussed
	+ Evaluation Framework document
	+ Hear PHY proposals
	+ Hear MAC proposals
	+ Conference call schedule
1. The Chair run a motion to approve the Agenda.

**Approve the proposed agenda in doc. 11-19/614r2 for the week**

**Move: Harry Bims**

**Second: Volker Jungnickel**

**It was approved with unanimous consent.**

1. The Chair run a motion to approve the teleconference minutes

**Approve the minutes from the teleconference in doc. 11-19/0633r0.**

**Move: Sunwook Kim**

**Second: Harry Bims**

**Motion passed with unanimous consent.**

1. The Chair run a motion to approve the teleconference minutes

**Approve the minutes from the teleconference in doc. 11-19/0523r0.**

**Move: Sunwook Kim**

**Second: Vinayagam Mariappan**

**Motion passed with unanimous consent.**

1. Nikola Serafimovski (pureLiFi) presented doc. 11-19/0847r0 asPHY layer proposal.
	* During this discussion, Tuncer Baykas (Vestel) took over the role as Chair to allow Nikola Serafimovski to contribute to the technical discussion.

 C: ITU-T Technology can be brought here as a technology.

C: Simulation results will be provided. Current simulations are suggested of 1.5 MHz is a good value.

C: The PHY impacts the optimum shift value.

C: The group should be careful wh:le determining the optimum PHY.

C: IEEE 802.11 standards are not available as baseband chips.

C: If we goto 802.11ax we can access new MAC layer properties, but currently there are no baseband chips and modifications take time.

C: Switching from 2.4 GHz and 10 MHz would be a big change and 802.11ax would be main focus.

C: Maybe the should not be any mandatory PHY mode

C: In July session performance results will be provided

Q: Did you consider the effect of PWM?

A: Anything over 1 MHz would take care it.

Strawpoll Should the mandatory offset for existing 802.11 PHY modes as described in Slide 6 set to be 1.5 MHz for TGbb?

Y 3

N 5

A 9

.

Should the 11ax be used as the mandatory mode?

Y1

N7

A 10

1. Kai Lennert Bober (Fraunhofer HHI) presented LC Optimized PHY for LV doc. 11-18/865r0.

Q: Is the preamble of G9991 compatible with 802.11?

A: The preamble is constructed the same way but the bits are different?

Q: Is the sampling rates different?

A: Yes they are but you can work with the same clock.

Q: Is Bit loading and water filling the same?

A: Waterfilling optimizes information per bit] bit loading is an implementation.

Q: Slide 6 and 7, is there a new PHY SAP?

A: Just the waveform is required. Any PHY SAP can be used.

C: This presentation is an introduction as a successful technology

C: Gain scaling is used (Frequency domain transmit spectrum shaping)

C: MIMO is considered

C: There is preamble and header

C: There will be a preamble which can be understood by every one.

Q: Did you use the same light source?

C: For one line yes

Group recessed until PM2

**Monday, May 13, 2019, AM2 Session**

Attendance = 15 people in the room

Chair called the meeting to order

1. Strawpoll

Are you interested in further presetations discussing the potential suitability of the G.9991 PHY for 802.11bb?

Y 6

N 0

A 5

1. Jeong Gon Kim (Korea Polytechnic University) presented VLC based Simulation Results in Enterprise and Industrial Environment comments on 11-19/875r2.
	* Q: What is your clock speed?
	* A: The Bandw:dth :s 20 Mhz.
	* C: Please provide the 802.11a performance.
	* C: EbNo value of 80 dB is too high
	* C: The frontend should be transparent
	* C: Normal link budget says 20-30 dB should be enough.
	* Q What is the pulse shape?
	* A: I will check it with my student.
2. Volker Jungnickel (Fraunhofer HHI) presented Updated PHY Evaluation Framework 11-19/877r0
3. Motion to accept the changes in doc 11-19/0877r0 and apply them to the 11-19/0187r3 and create 11-19/0187r4

Moved: Volker Jungnickel

Seconded by: Marc Emmelman

Y: 8

N: 0

A: 2

Motion passes

1. Nikola Serafimovski (pureLiFi) presented doc. 11-19/0848r0 Evaluation methodology for MAC proposals.
	* During this discussion, Tuncer Baykas (Vestel) took over the role as Chair to allow Nikola Serafimovski to contribute to the technical discussion.
	* C: Simulation scenarios should not be in this document.
	* C: At least one channel model should be selected as mandatory mode.
	* C: The group should have at least on scenario that every proposer should have?
	* C: The mechanisim for MAC evaluation should be captured
	* C: Group discussed how many scenarios should be considered.
	* Q: Any objection to have one baseline scenario? What should be that scenario?
	* Q: Any objection to have two baseline scenarios of the PHY layer?
	* C: Industiral and Enterprise Coference Room are selected as baseline scenarios
	* C: It is not clear how to do MAC simulations
	* C: Initial curves should be available for PHY layer.
	* C: Group decided to finalize the review of the document
	* Q: How do you determine the out of time delivery?
	* A: It is a PHY layer determination
	* End to End latency is measured from the time the MAC at the transmitting BSS, receives a packet the until the time that the mAC at receiving at successfully receives.
	* Group is content with the transmission latency part.
	* C: We can improve the document this week.
	* 11-19/0848r1 will be uploaded and discussed during the week

The meeting is recessed until TUE PM2.

**Tuesday, May14, 2019, PM2 Session**

Attendance = 20 people in the room

1. The IEEE 802.11 TGbb meeting was called to order at by the Chair, Nikola Serafimovski (pureLiFi). Tuncer Baykas (Vestel) recorded the minutes.

1. .It is reminded all to record their attendance.
2. Suhwook Kim (LG) LC MAC Submission 11-19/0757r1
	* C: It is very high level.
	* C: Why do you support Contetion Free Access?
	* Q: What is BSS color?
	* A: It is an short identifier in PHY layer.
	* C: OFDMA took a long time to implemeted.
	* C: OFDMA could be implemented easily.
	* C: OFDMA is an example contention free access.
	* C:
3. The Chair asked comments for the strawpoll.

**Do you agree to define contention free channel access in 11bb MAC.**

 **Detailed operation TBD**

Strawpoll text is changed to

**Shoul a contention free channel access be defined in 11bb MAC to avoid hidden terminal problem that would occur with physical listen before talk?**

Examples of contention free access mechanisem include HCCA trigger based OFDMA

It does not include RTS CTS

Detailed operation TBD

Y 5

N 0

Moe information required 12

1. Nikola Serafimovski (pureLiFi) presented proposed-mac-channel-access-features-for-tgbbdoc. 11-19/0846r1.

During this discussion, Tuncer Baykas (Vestel) took over the role as Chair to allow Nikola Serafimovski to contribute to the technical discussion

* + C: We shouldn't restrict resource blocks.
	+ C: More work need to implement it with bit loading
	+ C: More explanation is needed.
1. Nikola Serafimovski (pureLiFi) continue preseantion of MAC proposal evaluation methodology doc. 11-19/848r1.
	* C: Group discussed possible ways to go forward
	* .C: Add sentence define haractheristics of the PHY underlying in the proposals PER vs SNR for the relevant MCS
	* C: Add sentence Derive SINR for all users from every AP
	* C: Delete examples for simulations
	* C: Keep baseline scenarios
	* 11-19/848r2 is saved
2. Motion to accept the changes in doc 11-19/0848r2 and apply them to the 11-19/0187r4 and create 11-19/0187r5

Moved: Kai Lennert Bober

Seconded by: Marc Emmelmann

Y: 8

N: 0

A: 8

Motion passes

The meeting is in recess.

**Wednesday, January 16, 2019, AM1 Session**

Attendance = 10 people in the room

1. The IEEE 802.11 TGbb meeting was called to order at by the Chair, Nikola Serafimovski (pureLiFi). Matthias Wendt (Signify) and Volker Jungnickel (Fraunhofer HHI) recorded the minutes.

1. The Chair reviewed the IEEE-SA patent policy, logistics, and reminders, including meeting guidelines and attendance recording procedures.
	* It is reminded all to record their attendance.
2. The Chair introduced the schedule for this meeting slot.
* Number of slots requested for Vancouver
* Discuss Evaluation Methodology doc. 11-18/1429r4
1. **Motion**

**“Amend the proposed agenda in doc. 11-18/2122r2 for the week as shown in doc. 11-18/2122r3.”**

**Move: Harry Bims**

**Second: Volker Jungnickel**

**Approved with unanimous consent, motion passes**

1. The Chair discussed the number of slots to request for Vancouver. The outcome was 5.
2. Nikola Serafimovski /pureLiFi) discussed his contribution 11-18/1429r4.

**He made a straw poll asking the question**

**“Is Shot Noise as a parameter considered relevant for the Evaluation Methodology?**

**Y / N / A 1 / 4 / 3**

* + Another individual contribution in doc. 11-18/0178r1 was uploaded that will have an impact onto the evaluation methodology in particular for the MAC.
	+ The discussion of doc. 11-18/1429r4 was postponed after the presentation of the new contribution.
1. Volker Jungnickel (Fraunhofer HHI) presented doc. 11-18/1429r4.
	* It proposes a frequency upshift method taken over from fixed networks (i.e. ITU-T G.hn) by which the baseband processing of any 802.11 PHY can be reused over LC channels. It works nicely over LOS channels but there are some issues in multipath/NLOS channels.
	* The method is only intended to simplify MAC layer simulations and study the fundamental question, such as whether 802.11 MAC will work over LC or not. For real data transmission, this simplification might be used but it is not recommended as it is only a “quick-and-dirty” integration of LC into 802.11 that would cost significant performance in particular in multipath and NLOS scenarios. The author will explain this in a forthcoming contribution.
	* The advantage of the proposed scheme is that it can be used to study any MAC layer mechanism defined in 802.11 as the same PHYs are being used. Existing evaluation frameworks could be reused and the protocol performance tested more efficiently over LC channels.
	* There has been a discussion about the pros and cons of this approach which was in general considered promising.

The meeting is in recess.

**Wednesday, January 16, 2019, PM2 Session**

Attendance = 10 people in the room

1. The IEEE 802.11 TGbb meeting was called to order at by the Chair, Nikola Serafimovski (pureLiFi). Marc Emmelmann (Koden-TI) recorded the minutes.

1. The Chair reviewed the IEEE-SA patent policy, logistics, and reminders, including meeting guidelines and attendance recording procedures.
	* It is reminded all to record their attendance.
2. The Chair introduced the schedule for this meeting slot.
* How to simplify MAC simulations in TGbb
	+ Doc. 11-19/0178r2
* Discussion on the Evaluation Methodology
	+ Doc. 11-19/0187r0
	+ Doc. 11-19/0186r0
	+ Doc. 11-18/1429r4
1. **Motion**

**“Move to amend the proposed agenda in 11-18/2122r3 for the week as shown in doc. 11-18/2122r4”**

**Moved: Harry Bims**

**Seconded: Volker Jungnickel**

**No discussion, Motion is approved by unanimous consent.**

1. Volker Jungnickel (Fraunhofer HHI) presented doc. 11-19/0178r2 — How to simplify MAC simulations in TGbb which contains a few minor updates only.
2. Kai Lennert Bober (Fraunhofer HHI) presented doc. 11-19/187r0 — Evaluation methodology for PHY and MAC proposals.
* The intention is to handle this as empty task group document which is then filled in step by step with content coming from individual contributions. This way, the evaluation framework will match more directly what TGbb actually needs and contain no material which is only confusing.
* The goal is to finish the PHY part during this January session so that simulation work can start besides preparing the proposals. The MAC part should be discussed and finished in teleconferences and at the March meeting.
1. **MOTION**

 **“Accept doc. 11-19/0187r0 as the TGbb Evaluation Methodolgy document”**

 **Move: Volker Jungnickel**

 **Second: Athanasios Stavridis**

 **No discussion, approved by unanimous consent, motion passes.**

1. Volker Jungnickel (Fraunhofer HHI) presented doc. 11-19/0186r0 — PHY Evaluation Methodology
	* The Chair suggested to do on-screen modification (to become revision 1) based on discussion of the document. This was agreed in the group.
2. **STRAW POLL**

**“Are less than 10 channel impulse responses sufficient to evaluate the relative performance of different PHY proposals?”**

 **Y / N / A = 4 / 0 / 4**

* + Discussion on document will continue in next slot. Rev 1 will be uploaded and in the next slot, Rev 2 will be used to capture additional modifications.

The meeting recessed.

**Wednesday, January 16, 2019, PM2 Session**

Attendance = 10 people in the room

1. The IEEE 802.11 TGbb meeting was called to order at by the Chair, Nikola Serafimovski (pureLiFi). Harry Bims (Bims Laboratories) recorded the minutes.

1. The Chair reviewed the IEEE-SA patent policy, logistics, and reminders, including meeting guidelines and attendance recording procedures.
	* It is reminded all to record their attendance.
2. The Chair introduced the schedule for this meeting slot.
* Conference call schedule
* TGbb Timeline update doc. 11-18/1290r1
* Discussion on the Evaluation Methodology
* Doc. 11-19/0186r1
* Doc. 11-19/0187
1. There was group discussion about a future teleconference schedule for TGbb. A schedule of 3 teleconferences was approved by the task group.
2. **Motion**

 “**TGbb would like to request the following teleconference times.”**

**09:30 AM EDT for 1h on 1 Feb.**

**09:30 AM EDT for 1h on 15 Feb.**

**09:30 AM EDT for 1h on 7 Mar.**

**Move: Volker Jungnickel**

**Second: Athanasios Stavridis**

**Motion was approved with unanimous consent.**

1. The WG reviewed and updated the timeline for standards development of the 802.11bb amendment.
2. **Motion**

**“Accept Document 11-18/1290r2 as the TGbb timeline” .**

**Move: Volker Jungnickel**

**Second: Athanasios Stavridis**

**The motion was approved by unanimous consent**.

1. Volker Jungnickel (Fraunhofer HHI) presented doc. 11-19-0186-01-00bb, entitled “PHY Evaluation Methodology” to the group for discussion. The document was previously made available on Mentor.
	* Docs. 11-18/1582r4 and 11-18/1603r1 were reviewed by the task group while discussing channel impulse responses for the analytical front end model.
	* The group selected a set of channel impulse responses and fixed the metrics for evaluation.
2. **Straw poll**:

**“Does the group want the Hospital ward model to be included in the PHY Evaluation?**

**There was unanimous consent to take out the Hospital ward model as binding for simulations.**

1. **Motion**

**“Move to accept the Evaluation Methodology as contained in Document 11-19/0186r2 and incorporate its contents into the TGbb Evaluation Methodology Document 11-19/0187.”**

**Move: Volker Jungnickel**

**Second: Marc Emmelmann**

**The motion was approved by unanimous consent.**

The meeting was adjourned.