IEEE P802.11
Wireless LANs

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| 802.11ba Teleconference Minutes April 2018 |
| Date: 04-02-18 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Leif Wilhelmsson | Ericsson AB | Mobilvägen 1, 22632 Lund, Sweden | +46-706-216956 | leif.r.wilhelmsson@ericsson.com |

Abstract

This document contains minutes from TG 802.11ba teleconferences in April 2018.

Rev 0: Minutes from TG 802.11ba teleconference on 2nd of April 2018.

Rev 1: Minutes from TG 802.11ba teleconference on 16th of April 2018 added.

**Teleconference on Monday, April 2nd, 2018, 5:00 – 6:00pm (ET)**

**Agenda:**

1. Call meeting to order

2. Agenda setting

3. Patent policy (link at the end of the email)

4. Attendance: send email to the chair or secretary (leif.r.wilhelmsson@[ericsson.com](http://ericsson.com/))

5. Presentations

    1) 17/1395r1 “Simple multiplexing of wake-up signals” - Leif Wilhelmsson

     2) 18/473 " WUR Discovery Frame Format" - Guoqing Li

6. Adjourn

Please note that teleconferences are bound by the conditions stipulated by the documentation below.  Please review them and bring up any questions/concerns you may have before proceeding with the teleconference:

IEEE Patent Policy - <http://standards.ieee.org/board/pat/pat-slideset.ppt>
Patent FAQ - <http://standards.ieee.org/board/pat/faq.pdf>
LoA Form - <http://standards.ieee.org/board/pat/loa.pdf>
Affiliation FAQ - <http://standards.ieee.org/faqs/affiliationFAQ.html>
Anti-Trust FAQ - <http://standards.ieee.org/resources/antitrust-guidelines.pdf>
Ethics - <http://www.ieee.org/portal/cms_docs/about/CoE_poster.pdf>
IEEE 802.11 Working Group Operations Manual –
<https://mentor.ieee.org/802.11/dcn/09/11-09-0002-16-0000-802-11-operations-manual.doc>

**Chair Minyoung Park (Samsung) calls the meeting to order at 5:00pm (ET).**

Minyoung goes through the agenda and asks if there is anything that should be added to the agenda. No discussion on the agenda, so the proposed agenda will be used.

Minyoung reviewes the IEEE 802 and 802.11 Policy and Procedure, and direct them to the links provided in the call for this meeting in case of questions. Minyoung asks if there is any potentially essential patent that people are aware of or if there are any questions in this matter.

No potentially essential patents reported and no questions asked.

Minyoung reminds about recording attendance by sending an email to the secretary.

**Presentations:**

**11-18/0473r3, “WUR Discovery Frame Format”, Guoqing Li (Apple):** The contribution is concerned with the filed sizes in the WUR Discovery frame format, i.e., the number of bits allocated to indicated compressed SSIF, BSSID, and PCR channel. The number of bits allocated is a trade-off between channel occupancy time and collision probability. As a result, it is proposed to allocate 16 bits for compressed SSID, 24 bits for compressed BSSID, and 16 bits for PCR channel. The method to generate the compressed BSSID is proposed to be based on reusing the CRC 32 polynomial in 802.11 truncate it to 24 bits.

**Question/Comment (Q):** You did not have a corresponding SP for SSID, is there a particular reason for that? I prefer if we can reuse a CRC polynomial also here.

**Answer(A):** No, there is no particular reason for that. I can add such a SP.

**Q:** Do you expect that this frame will use the higher or lower data rate?

**A:** Probably the lower data rate to get as good coverage as possible.

**Q:** How often do you expect the message to be sent?

**A:** Not very often, maybe once per second. However, this is my view and it is not decided by the group. I am open for recommendations from the group.

**11-18/1395r1, “Simple multiplexing of Wake-Up Signals”, Leif Wilhelmsson (Ericsson):** A means to multiplex wake-up signals is described, where the idea is to make use of that the Manchester coded symbol at one data rate will be orthogonal to the Manchester coded symbols of the other rate. Perfect orthogonality assumes that the transmitter and receiver are linear, but simulations with non-linear PA and a receiver based on an envelope detector show that the idea still works.

**Q:** You can only multiplex two signals?

**A:** Yes, the reason is that there are only two different signals available.

**Q:** I believe there is a problem that you will get worse coverage.

**A:** This is the case if you use FDM in case you need to split the total available power between different signals.

**Q:** I understand this orthogonality works well for the data part of the packet, but how about the syncwords? Right now we use the syncwords to indicate what data rate is used in the packet.

**A:** My intention as to illustrate the idea and get some feedback, rather than having a complete proposal. The issue you high-light needs to be addressed. I would envision that in case of multiplexing, the syncword for the lower rate would be used since the robustness is needed, and then additional information is to be included to identify the two intended receivers.

**Q:** Is the intention that this should be combined with FDM?

**A:** It could be in principle. The original idea was to allow for a way to multiplex signals within a 20 MHz channel without making the filter requirements harder, as would have been the case with FDM. Now, in the last f2f it was decided to not support FDM within a 20 MHz, so then it can be seen as a means to still multiplex wake-up signals also when only a 20 MHz channel is available.

**Q:** Did you assume perfect synchronization? I am thinking that the orthogonality will be lost if you have a synchronization error.

**A:** I agree that the signal will no longer be perfectly orthogonal, but what we have seen in several contributions is that the synchronization error is rather small so I don’t expect a large degradation.

**Q:** I just want to make a comment on multiplexing on the MAC layer, as you already mentioned. It is possible to multiplex both by using group addresses and having a list of IDs.

**Q:** In the figure on page 5, I see that the signals are orthogonal for this particular data sequences. Is this the case for random data?

**A:** Yes.

**Meeting is adjourned at 5.57pm (ET).**

**List of Attendees:**

|  |  |  |
| --- | --- | --- |
|  | Name | Affiliation |
| 1 | Minyoung Park | Samsung |
| 2 | Leif Wilhelmsson | Ericsson |
| 3 | Jarkko Kneckt | Apple |
| 4 | Steve Shellhammer | Qualcomm |
| 5 | Enrico-Henrik Rantala | Nokia |
| 6 | Po-Kai Huang | Intel |
| 7 | Junghoon Suh | Huawei |
| 8 | Osama Aboul-Magd | Huawei |
| 9 | Roger Marks | Huawei |
| 10 | Hanseul Hong | Yonsei Univ. |
| 11 | Yongho Seok | Mediatek |
| 12 | Shahrnaz Izizi | Intel |

**Teleconference on Monday, April 16th, 2018, 11:00 – 12:00pm (ET)**

**Agenda:**

1. Call meeting to order

2. Agenda setting

3. Patent policy (link at the end of the email)

4. Attendance: send email to the chair or secretary (leif.r.wilhelmsson@[ericsson.com](http://ericsson.com/))

5. Presentations

    1) 0064-01-00ba-Secure WUR frames (Alfred, Qualcomm)

    2) 0420-00-00ba-Considerations on VL WUR frames (Alfred, Qualcomm)

    3) 0682-00-00ba OOK Waveform for FDMA (Alphan, InterDigital)

6. Adjourn

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Affiliation FAQ - <http://standards.ieee.org/faqs/affiliationFAQ.html>
Anti-Trust FAQ - <http://standards.ieee.org/resources/antitrust-guidelines.pdf>
Ethics - <http://www.ieee.org/portal/cms_docs/about/CoE_poster.pdf>
IEEE 802.11 Working Group Operations Manual –
<https://mentor.ieee.org/802.11/dcn/09/11-09-0002-16-0000-802-11-operations-manual.doc>

**Chair Minyoung Park (Samsung) calls the meeting to order at 5:00pm (ET).**

Minyoung goes through the agenda and asks if there is anything that should be added to the agenda. No discussion on the agenda, so the proposed agenda will be used.

Minyoung reviewes the IEEE 802 and 802.11 Policy and Procedure, and direct them to the links provided in the call for this meeting in case of questions. Minyoung asks if there is any potentially essential patent that people are aware of or if there are any questions in this matter.

No potentially essential patents reported and no questions asked.

Minyoung reminds about recording attendance by sending an email to the secretary.

**Presentations:**

**11-18/0064r1, “Secure WUR frames “, Alfred Asterjadhi (Qualcomm):** The presentation is concerned with security. It is proposed to authenticate WUR frames via message integrity code (MIC) as an optional procedure. It is also proposed to define a Frame Check Sequence (FCS) that carries either MIC (for protected frames) or CRC (for unprotected frames).

Because the data rate is very low, it is proposed to limit the size of the MIC to 2-3 bytes as a compromise between integrity and transmission overhead.

**Question/Comment (Q):** On slide 6, how is the local TSF constructed?

**Answer (A):** Essentially it is constructed by combining the partial TSF received in the packet and the MSB from local TSF

**Q:** ON slide 5, I believe there is a typo in the second last bullet. Should be us rather than ms.

**Q:** Could there be a problem with clock drift?

**A:** The drift should not be a problem with for the value currently specified.

**Q:** Are the keys also used for broadcast?

**A:** Yes. Note that the keys are shared using the main radio, and then used by the WUR. Also key updates of are done using the main radio.

**Q:** I believe is we just reuse things we will be able to finalize it until July. But I believe it is important that we don’t start develop completely new things.

**11-18/0420r0, “Considerations on VL WUR frames”, Alfred Asterjadhi (Qualcomm):** The contribution is concerned with multi-cast transmission and how to address several WURs. It is proposed to order the WIDs to simplify for a WUR to have the possibility to stop the reception earlier without having to check all WIDs.

No questions on 11-18/0420r0.

11-18/682r0 is not presented as it is believed the remaining time will not suffice.

**Meeting is adjourned at 11.50pm (ET).**

**List of Attendees:**

|  |  |  |
| --- | --- | --- |
|  | Name | Affiliation |
| 1 | Minyoung Park | Samsung |
| 2 | Leif Wilhelmsson | Ericsson |
| 3 | Dennis Sundman | Ericsson |
| 4 | Alfred Asterjadhi | Qualcomm |
| 5 | Alphan Sahin | Interdigital |
| 6 | Po-Kai Huang | Intel |
| 7 | Gaurav Patwardhan | HPE |
| 8 | Jeongki Kim | LGE |
| 9 | Kiseon Ryu | LGE |
| 10 | Peter Loc | Huawei |
| 11 | Kaiying Lv | ZTE |
| 12 | Yunsong Yang | Huawei |
| 13 | Woojin Ahn | WILUS |
| 14 | Jason Lee | ETRI |