IEEE P802.11
Wireless LANs

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| IEEE 802.11ba Task GroupMeeting Minutes for January 2018 Meeting,Irvine, CA, USA |
| Date: 01-18-2018 |
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Abstract

Meeting Minutes for the IEEE 802.11ba TG sessions held in Irvine, CA, USA, January 14-19, 2018.

**Monday, January 15, 2018, 10:00-12:00 am**

**Meeting Agenda:**

The meeting agenda is shown below, and published in the agenda document:

<https://mentor.ieee.org/802.11/dcn/17/11-17-1862-02-00ba-january-2018-tgba-agenda.pptx>

* Call meeting to order, TGba introduction
* Call for submissions
* Review agenda and approval
* IEEE 802 and 802.11 IPR Policy and procedure
* Participation in IEEE 802 Meetings
* Summary from November 2017 meeting
* Motion: November 2017 meeting (doc: IEEE 802.11-17/1800r0) and teleconference minutes (doc: IEEE 802.11-17/1824r3)
* TGba Spec Framework Document review and approval
* Presentations, Recess

**Chair Minyoung Park (Samsung) calls meeting to order at 10.05 am. (**About 100 persons in the room.)

Minyoung reminds about taking attendance.

Minyoung goes through the agenda document 11-17/1862r2.

The Main agenda items for this week are (slide 8):

* Review and approve draft text for TGba D0.1
* Review technical presentations
* Work on TGba task group documents
* Review TG timeline

There are 53 submissions for this meeting. These submissions are categorized and prioritized as shown on slide 9. Highest priority is given to contributions related to the creation of the specification text.

Minyoung asks if any contribution is missing. After some discussions of the current categorizations, the order of the presentations is slightly updated.

Minyoung asks if there are any questions or comments on the agenda. No questions asked.

**Motion to approve the agenda.**

Move: Johan Notor

Second Po-Kai Huang

Motion passed by unanimous consent.

Minyoung goes through the slides “Participants have a duty to inform the IEEE” (slide 25) and “Ways to inform IEEE” (slide 26).

Minyoung makes a Call for Potentially Essential Patents. No potentially essential patents reported and no questions asked.

Minyoung goes through “Other Guidelines for IEEE WG meetings” (slide 27) and Patent-related information (slide 28).

Minyoung goes through “Participation in IEEE 802 Meetings” (slides 29), and encourage people to read through the references on slides 30-32.

Summary from November 2017 meeting (slide 33):

* **Reviewed technical presentations**
* **Approved TGba Spec Framework Document (SFD)**
	+ IEEE 802.11-17/575r5
* **Confirmed TGba technical editor – Po-Kai Huang**
* **Identified subclauses in doc.: IEEE 802.11-17/1585r2 that have enough technical details to start writing draft text**
	+ Created four subgroups for draft text preparation for TGba D0.1 and called for volunteers
* **Reviewed the TG timeline**
* **Four subgroups prepared draft text for TGba D0.1**

**Motion:** Approve TGba minutes of November 2017 meeting [doc: IEEE 802.11-17/1800r0] and teleconference calls [doc: IEEE 802.11-17/1824r3]

**Move:** Johan Notor

**Second:** Alfred Asterjadhi

Motion passed by unanimous consent.

**Review of TGba Spec Framework Document (Po-Kai Huang).** Po-Kai goes through 11-17/0575r8 and in particular the additions that have been made since the last revision.

**Motion:** Move to approve 11-17/0575r8 as the latest revision of SFD.

**Move:** Po-Kai Huang

**Second:** Suhwook Kim

Motion passed by unanimous consent.

**Presentations:**

**11-18/0152r1 “Proposed Draft WUR PHY Specification” Steve Shellhammer (Qualcomm):** Steve goes through the current status of the PHY part of the specification in some detail, also pointing out various places where the group working on the PHY part of the specification has some ideas but where we do not have any decision in the TG.

**Question/Comment (Q):** I suggest you remove all the discussions in the revision that we will motion.

**Answer (A):** I agree. We decided to put the comment in because we believed it would be valuable to the rest of the TG to know about the discussions we have had in the group.

**Q:** I believe the legacy part should refer to all the versions of OFDM PHY

**A:** I suggest you make a small motion that we can vote on, then we can include it.

**Q:** In Figure 32.2, I believe things like CSD needs more discussions.

**A:** I agree. This is why it is made as a comment.

**Q:** Do we really need a constellation mapper?

**A:** Not really, but we have not really discussed this in the TG.

**Q:** I don’t agree with Figure 32.2. The information is encoded in the time-domain.

**Q:** The Mark signal is just for spoofing, I think it should be called something else.

**A:** I see you point.

**Q:** I think low rate and high rate is better than MCS0 and MCS1.

**A:** We can discuss this further.

**The group is in recess at 12.30.**

**Monday, January 15, 2018, 1:30-3:30 pm**

**Meeting Agenda:**

The meeting agenda is shown below, and published in the agenda document:

<https://mentor.ieee.org/802.11/dcn/17/11-17-1862-02-00ba-january-2018-tgba-agenda.pptx>

* Call meeting to order
* IEEE 802 and 802.11 IPR Policy and procedure
* Presentations, Recess

**Chair Minyoung Park (Samsung) calls meeting to order at 1.30 pm. (**About 30 persons in the room.)

Minyoung makes a Call for Potentially Essential Patents. No potentially essential patents reported and no questions asked.

**Presentations:**

**11-18/0152r1 “Proposed Draft WUR PHY Specification”, Steve Shellhammer (Qualcomm):** The Q&A from the previous session is continued.

**Q:** With respect to adjacent channel interference, it seems it assumes the wake-up signal must be placed in the center of the 20 MHz channel.

**A:** Yes. However, this was just copied from the 802.11ac text. In case we would decide to support FDMA, we will have to add additional requirements.

**11-18/0144r1 “Omni-directional Multiple Antenna Transmission for WUS”, Dennis Sundman (Ericsson):** The contribution discusses different ways to obtain a more omni-directional transmission when multiple antennas are used at the transmitter.

**Q:** I prefer CSD.

**Q:** Should it be applied to both sync field and data?

**A:** Yes

**Q:** You refer to the narrowband part, the wideband part is the same as before?

**A:** Yes.

**Straw Poll:** For multiple transmit antennas, for the WUR part of the signal, do you:

1. Prefer to study the matter further
2. Prefer to use the CSD

**1/2: 17/1**

**11-18/0073r0 “WUR dual sync performance”, Jinyoung Chun(LGE):** The synchronization performance is studied for different lengths of the syncword as well as different symbol durations in the syncword. It is found that a symbol duration of 2us gives slightly better performance than 4 us.

**Q:** Is there any reason why you choose 10% for the false alarm rate? It seems pretty high to me.

**A:** We also checked with 1%, and the trend is similar also in this case although the absolute numbers are different.

**Q:** I believe Simulation case 2 makes more sense.

**A:** I agree.

**Q:** From where did you get the sequences?

**A:** From Steve’s presentation.

**Q:** How many local references are you using at the receiver side? How many correlators?

**A:** We only use one.

**Straw Poll:**

* Do you agree that in the SYNC field, 𝑆 is a sequence of 32 bits and the duration of each bit is 2 µs?

**Y/N/A: 17/0/7**

**11-18/0070r0 “WUR Dual SYNC Design Follow-up: SYNC bit Duration”, Rui Cao (Marvell):**

This presentation essentially repeats the message in the previous presentation. The straw poll is the same and therefore not run.

**11-18/0096r0 “WUR sync design”, Vinod Kristem (Intel):** Different sequences for synchronization are evaluated. The performance loss for both low rate and high rate are studied and found to be on the order of a few tenths of a dB.

**Q:** I wonder if you really need an AGC.

**A:** I believe this depends on the architecture, but it will have some impact when it comes to ACI performance. In addition, there has even been suggestions to include specific bits for AGC in earlier presentations from other companies.

**Q:** I agree we need some coarse AGC, but I believe it has basically settled during the legacy part.

**Q:** When do you set the AGC gain?

**A:** Once the packet is detected.

**11-18/0122r0 “Sync Field Bit Duration”, Steve Shellhammer (Qualcomm):** Similar as some earlier presentations, it is found that 2us symbol duration gives better results than 4us.

**11-18/0123r0 “Options for Sync Field Bit Sequence”, Steve Shellhammer (Qualcomm):** Different 32-bit sequences are evaluated.

**Straw Poll is deferred.**

**11-18/0100r0 “WUR Preamble Sequence Performance Evaluation” Justin Jia Jia (Huawei):** The performances for some different sequences are evaluated.

**The meeting is declared to be in recess at 3.37 pm.**

**Monday, January 15, 2018, 4:00-6:00 pm**

**Meeting Agenda:**

The meeting agenda is shown below, and published in the agenda document:

<https://mentor.ieee.org/802.11/dcn/17/11-17-1862-02-00ba-january-2018-tgba-agenda.pptx>

* Call meeting to order
* IEEE 802 and 802.11 IPR Policy and procedure
* Presentations, Recess

**Chair Minyoung Park (Samsung) calls meeting to order at 4.00 pm. (**About 80 persons in the room.)

Minyoung makes a Call for Potentially Essential Patents. No potentially essential patents reported and no questions asked.

**Presentations:**

**11-18/0085r0, “Spec Text for WUR Negotiation and WUR Mode”, Po-Kai Huang (Intel):** Po-Kai goes through the text that has been prepared for the specification.

**11-18/0165r0, “Proposed spec text for D0.1”, Alfred Asterjadhi (Qualcomm):** Alfred goes through the specification text related to WUR frame format.

**11-18/0166r1, “Spec Text for WUR Wake Up Frame”, Jeongki Kim (LGE):** Jeongki goes through the suggested specification text related to wake-up frames.

**11-18/0198r0, “Spec Text for WUR Beacon Frame”, Ming Gan (Huawei):** Ming goes through the text proposed for the specification.

**Recess at 6.00 pm.**

**Tuesday, January 16, 2018, 8:00-10:00 am**

**Meeting Agenda:**

The meeting agenda is shown below, and published in the agenda document:

<https://mentor.ieee.org/802.11/dcn/17/11-17-1862-04-00ba-january-2018-tgba-agenda.pptx>

* Call meeting to order
* IEEE 802 and 802.11 IPR Policy and procedure
* Presentations, Recess

**Chair Minyoung Park (Samsung) calls meeting to order at 8.00 am. (**About 45 persons in the room.)

Minyoung reminds about taking attendance.

Minyoung goes through the agenda and asks if there is any discussions on the agenda. No questions and the agenda will be used.

Minyoung makes a Call for Potentially Essential Patents. No potentially essential patents reported and no questions asked.

**Presentations:**

**11-18/0129r1, “Spec Text for WUR Beacon Frame” Rojan Chitrakar (Panasonic):** Rojan goes through the suggested specification text for the WUR beacon frame.

**11-18/0086r0, “Spec Text for Vendor Specific Frame” Po-Kai Huang (Intel):** Po-Kai goes through the suggested specification text for the vendor specific frame.

**11-18/0156r2, “Waveform Design for SYNC Field”, Alphan Sahin (Interdigital):** The idea of constellation based OOK is extended by also using the blank GI idea and compare the performance with constellation based OOK with plain OOK. The gain of using blank GI is stated to be around 1 dB.

**Q:** I don’t understand why you obtain a gain when used for correlation.

**A:** Basically in the same way as for data, by reducing the noise power.

**Q:** I have seen other presentations where they showed the gain also without blank GI for the sync. Maybe this was for the low data rate.

**A:** I have not considered the low data rate, just the high data rate.

**11-18/0143r1, “OOK Symbol Design”, Dennis Sundman (Ericsson):** Different OFDM symbols to use for signaling ON is considered. A complete search over 12^4 possible QPSK symbols on the 12 populated sub-carriers is performed.

**Q:** It is not clear to me that PAPR is so important here, not like for OFDM

**A:** I agree.

**Q:** Any idea why ideal OOK is better?

**A:** No.

Q: I believe it would be good to put the used sequences in the presentation. This would give others a chance to compare.

Q. Why did you select QPSK?

A: Because it was feasible to perform the search.

**11-18/0071r0, “Performance Investigation of Partial OOK”, Eunsung Park (LGE):** Partial OOK is studied for both the low rate and the high rate, and suitable lengths of the ON period is found.

Q: You run the simulation at 20 MHz, not 4 MHz?

A: Yes, but the trend is the same.

Q: Do you use rectangular pulse?

A: No, we used a sequence for the 13 sub-carriers.

**11-18/0072r0, “OOK Waveform Generation”, Eunsung Park (LGE):**

**Q:** You only look at BPSK input to the IFFT, but I believe we should consider larger alphabet to possibly further optimize.

**Q:** You provide two options to generate the signal, either using masking or constellation based?

**11-18/0142r1, “Additional Results for 62.5 kb/s: Symbol Structure and P-OOK”, Dennis Sundman (Ericsson):** The presentation is basically a follow-up from the last f2f with some addition results.

**Q:** If you have long sequences of no signal (OFF), you may have issues with other STAs not backing off.

**A:** We believe this is just a corner case. It is easy to see that other STAs may find the channel to be idle whether there is a wake-up signal or not. Our assumptions us that in practice you will not notice a difference and then it is better to target good link performance.

**Q:** Practical sync is usually quite good.

**A:** Agree

The straw poll is deferred.

**Recess at 10.00**

**Tuesday, January 16, 2018, 1:30-3:30 pm**

**Meeting Agenda:**

The meeting agenda is shown below, and published in the agenda document:

<https://mentor.ieee.org/802.11/dcn/17/11-17-1862-04-00ba-january-2018-tgba-agenda.pptx>

* Call meeting to order
* IEEE 802 and 802.11 IPR Policy and procedure
* Presentations, Recess

**Chair Minyoung Park (Samsung) calls meeting to order at 1.36 pm. (**About 80 persons in the room.)

Minyoung reminds about taking attendance.

Minyoung goes through the agenda and make a minor adjustment.

Minyoung makes a Call for Potentially Essential Patents. No potentially essential patents reported and no questions asked.

**Presentations:**

**11-17/0684r1, “WUR Action Frame Format”, Lei Huang (Panasonic):** The presentation is concerned with how an AP can change WUR parameters of a non-AP STA in WUR mode, which currently is not supported in the SFD. It is proposed to revise the frame format to allow for this functionality.

**Q:** I think whether you want to do this will depend on what parameters you want to update. I think it would be good to have some use case to see the benefit.

**Q:** You can always tear down and re-negotiate.

The straw poll is deferred.

**11-18/0061r1, “WUR Wake Up Frame Format”, Lei Huang (Panasonic):** The presentation is about how to differentiate unicast, multicast and broadcast WUR Wake Up frames.

The straw poll is deferred.

**11-17/1334r1, “Vendor Specific WUR Frame Follow Up” Po-Kai Huang (Intel):** This is a follow-up of an earlier presentation with the main target to now the text to the SFD and D0.1.

**Straw Poll:**

* Do you support to add the following texts in SFD and D0.1?
	+ The TD control field of vendor specific frame carries 12 LSBs of OUI

**Y/N/A: 18/0/16**

**11-18/0104r1, “Clarification for Variable-length WUR frame”, Jeongki Kim (LGE):** There is ambiguity for SFD texts on variable-length WUR frame, and this contribution describes two solutions to resolve this.

**Q:** I agree that we need to clarify this and personally I prefer Option 2.

**Straw Poll:**

* Which option do you prefer as a method for distinguish CL and VL WUR Wake Up frame?
	+ Option 1: 1 bit CL/VL indicator is present in FC field of Wake Up frame
		- If the indicator is CL, the Misc. is included in FC field. Otherwise, the Length is included in FC field
	+ Option 2: Length field is always present when Type field is 1 (Wake Up frame)
		- If the Length is 0, the frame is CL. Otherwise, the frame is VL

**Option1/Option 2: 18/11**

**11-18/0103r1, “Further considerations on WUR frame format”, Jeongki Kim (LGE):**

**Q:** Seems to me that one could have an approach with a simple list, rather than the more complicated formula you suggest. I don’t really see the use case where this is needed.

**Q:** I believe we are adding too many things. The WUR was expected to be simple device just waking up the PCR.

Straw Polls are deferred.

**11-18/0160r2 “WUR Discovery Frame Content”, Guoqing Li (Apple):** This presentation is concerned with what information should be included in the WUR Discovery frame. The suggestion is to include information related to SSID, what channel is used by the PCR, and AP ID.

**Straw Poll:**

Do you agree to include the following text to SFD:

WUR Discovery frame includes the following mandatory information:

* + Compressed SSID: size and compression method are TBD
	+ PCR operation channel: TBD bits
	+ AP Identifier: either partial BSSID, hashed BSSID or TXID, size and compression method TBD
	+ Reserved/optional: 2 bits

The straw poll is deferred

**Recess 3.32 pm**

**Wednesday, January 17, 2018, 1:30-3:30 pm**

**Meeting Agenda:**

The meeting agenda is shown below, and published in the agenda document:

<https://mentor.ieee.org/802.11/dcn/17/11-17-1862-05-00ba-january-2018-tgba-agenda.pptx>

* Call meeting to order
* IEEE 802 and 802.11 IPR Policy and procedure
* Presentations, Recess

**Chair Minyoung Park (Samsung) calls meeting to order at 1.30 pm. (**About 60 persons in the room.)

Minyoung reminds about taking attendance.

Minyoung goes through the agenda and asks if there are any questions. No questions asked.

Minyoung makes a Call for Potentially Essential Patents. No potentially essential patents reported and no questions asked.

**Presentations:**

**11-18/0123r0, “Options for Sync Field Bit Sequence”, Steve Shellhammer (Qualcomm):** This is a continuation of the presentation from an earlier session where the straw poll was deferred.

**Straw Poll:**

Do you support using the following 32-bit S sequence in Sync field?

Option 1

* S2 = [0, 1, 1, 1, 0, 1, 0, 1, 0, 0, 1, 0, 1, 0, 0, 1, 0, 1, 1, 0, 0, 1, 1, 0, 1, 1, 0, 0, 0, 1, 1, 0]

Option 2

* S3 = [1, 0, 1, 0, 0, 0, 1, 1, 0, 1, 1, 0, 1, 1, 1, 1, 0, 0, 0, 0, 1, 0, 0, 1, 1, 1, 0, 0, 0, 1, 0, 1]

**Option 1 Y/N/A: 4/0/28**

**Option 2 Y/N/A: 9/0/21**

**11-18/0096r1, “WUR Sync Design”, Vinod Kristem (Intel):** Different sync sequences are evaluated.

**Straw Poll 2:**

Do you support the following?

The design of preamble sequence S or its complement (Low rate is indicated by [S S], High rate is indicated by [S complement]) should consider maximum OFF period.

**Y/N/A: 35/0/5**

**Straw Poll 3:**

Do you support the following?

The design of preamble sequence S or its complement (Low rate is indicated by [S S], High rate is indicated by [S complement]) should consider maximum OFF duration to enable fast AGC and to reduce the impact of channel sensing on third party 802.11 stations.

**Y/N/A: 6/12/19**

**Straw Poll 4:**

Do you support the following proposal?

We propose to use the following 32-bit preamble sequence S (S5 in the presentation), with 2 us bit duration.

S = [1 0 1 0 1 0 1 0 0 1 0 1 1 0 0 1 1 0 0 1 1 0 0 1 0 1 1 0 0 1 0 1].

(Low rate is indicated by [S S], High rate is indicated by [S complement])

**Y/N/A: 3/0/33**

**11-18/0100r1, “WUR Preamble Sequence Performance Evaluation”, Ming Gan (Huawei)**

**Straw Poll:**

* Do you support S3 to use to construct the short preamble sequence $[\overbar{S}]$ and the long preamble sequence $[S S]$?
	+ S3 = [1 0 1 0 0 1 0 0 1 0 1 1 1 0 1 1 0 0 0 1 0 1 1 1 0 0 1 1 1 0 0 0];

where the bit duration is 2 us.

**Y/N/A: 11/0/21**

**11-18/0103r3, “Further considerations on WUR frame format”, Jeongki Kim (LGE):**

**Straw Poll 1:**

* Do you agree to modify the SFD as following?
	+ R.4.7.3.A: A ~~non-individually addressed~~ wake-up frame that has the Address field set to a value of TBD indicates that the AP intends to transmit group addressed frames ~~may include the information for indicating the group addressed frame transmission~~ through PCR
		- ~~The details of indicating the group addressed frame transmission (e.g., using Group ID or additional bit) is TBD~~

**Y/N/A: 18/8/11**

**Straw Poll 2:**

* Do you agree to modify the SFD as following?
	+ AP may negotiate one or more Group IDs ~~to~~ with a STA through PCR using WUR Action frame during WUR negotiation and WUR mode signaling procedure
		- The assigned Group ID is used in a wake-up frame
		- The details for group ID (e.g., ~~ID allocation procedure (e.g., WUR Action frame or others similar to 11ac procedure), ID structure,~~ etc.) are TBD

**Y/N/A: 27/0/3**

**Straw Poll 3:**

* Do you agree the following?
	+ If the Frame Body is present in the WUR Wake Up frame and the Address field is set to 0, the Frame Body contains multiple WIDs.

**Y/N/A: 15/1/13**

**11-18/0160r6, “WUR Discovery Frame Content”, Guoqing Li (Apple):**

**Straw Poll:**

* Do you agree to include the following text to SFD:

WUR Discovery frame includes the following mandatory information:

* Compressed SSID: size and compression method are TBD
* PCR operation channel: TBD bits
* AP Identifier: size and compression method TBD

**Y/N/A: 37/0/8**

**11-18/0061r3, “WUR Wake Up Frame Format”, Lei Huang (Panasonic):**

**Straw Poll:**

* Do you support to modify R4.9.1.F of 11ba SFD as follows?

…

GID is GROUP ID provided by the AP and identifies one or more WUR STAs, and has a consecutive value range which is not used by WID and TXID

…

**Y/N/A:** Deferred

**11-18/0096r2, “WUR Sync Design”, Vinod Kristem (Intel):**

**Straw Poll 5:**

Do you support the following?

The preamble sequence S or its complement (Low rate is indicated by [S S], High rate is indicated by [S complement]) should be designed such that the contiguous OFF period is no more than 8 us.

**Y/N/A: 11/0/24**

**11-18/0124r0, “Shorter ‘On’ Time Duration Study” Steve Shellhammer (Qualcomm):** Simulation results are presented for when the “on” time is reduced. Similar performance gains that have been seen by others are reported.

**Q:** What is the sampling rate?

**A:** 4 MHz

**Q:** This 1 dB gain does not really solve the problem with 7 dB less TX power.

**A:** I fully agree.

**Q:** This is a gain that comes with no cost.

**Recess at 3.30 pm**

**Thursday, January 18, 2018, 8:00-10:00 am**

**Meeting Agenda:**

The ad-hoc meeting agenda is shown below, and published in the agenda document:

<https://mentor.ieee.org/802.11/dcn/17/11-17-1862-06-00ba-january-2018-tgba-agenda.pptx>

* Call meeting to order
* IEEE 802 and 802.11 IPR Policy and procedure
* **Motions**
* Presentations, Recess

**Chair Minyoung Park (Samsung) calls meeting to order at 8.02 am. (**About 90 persons in the room.)

Minyoung remindes about taking attendance.

Minyoung goes through the agenda for the two sessions today and asks if there are any questions on the agenda. No objections to the agenda so the proposed agenda will be used.

Minyoung makes a call for potentially essential patents. No potentially essential patents reported and no questions asked.

**Motions:**

1. **Spec text**
	1. **PHY spec text – Steve Shellhammer**
	2. **MAC spec text**
		1. **85**
		2. **86**
		3. **129**
		4. **165**
		5. **166**
		6. **198**
2. **Jeongki Kim/Kiseon – 18/103, 18/104**
3. **Guoqing Li – 18/160r6**
4. **Vinod Kristem**

**11-18/0246r1, “PHY Text Motion”, Steve Shellhammer (Qualcomm):**

**Motion:**

Move to adopt the spec text in document 802.11/18-152r5 into the 802.11ba draft D0.1

Move: Steve Shellhammer

Second: Shahrnaz Azizi

Motion passed by unanimous consent.

**11-18/0085r3, “Spec Text for WUR Negotiation and WUR Mode”, Po-Kai Huang (Intel):** Po-Kai goes through the updated text for WUR negotiation and WUR mode and high-lights the changes that have been made.

**Motion:** Move to adopt the spec text in doc 11-18/0085r3 into 11ba draft D0.1

**Move:** Po-Kai Huang

**Second:**. Suhwook Kim

Motion passed by unanimous consent.

**11-18/0165r2, “Proposed spec text for D0.1”, Alfred Asterjadhi (Qualcomm):**

**Motion:** Move to adopt the spec text in doc 11-18/0165r2 into 11ba draft D0.1

**Move:** Alfred Astejadhi

**Second:** Po-Kai Huang

Motion passed by unanimous consent.

**11-18/0166r3, “Spec Text for WUR Wake Up Frame” Jeongki Kim (LGE)**

**Motion:** Move to adopt the spec text in doc 11-18/0166r3 into 11ba draft D0.1

**Move:** Kiseon Ryu

**Second:** Po-Kai Huang

Motion passed by unanimous consent.

**11-18/0129r2, “ Spec Text for WUR Beacon Frame”, Rojan Chitrakar (Panasonic):**

**Motion:** Move to adopt the spec text in document 802.11-18/129r2 into the 802.11ba draft D0.1

**Move Rojan Chitrakar**

**Second Ming Gan**

Motion passed by unanimous consent.

**11-18/0198r1, “Proposed Text for WUR Beacon Generation and Counter”, Ming Gan (Huawei)**

**Motion:** Move to adopt the spec text in document 802.11-18/198r1 into the 802.11ba draft D0.1

**Move Ming Gan**

**Second: Po-Kai Huang**

Motion passed by unanimous consent.

**11-18/0086r0, “Spec Text for Vendor Specific Frame”, Po-Kai Huang (Intel):**

**Motion** Move to adopt the spec text in document 802.11-18/0086r0 into the 802.11ba draft D0.1

**Move: Po-Kai Huang**

**Second: Ming Gan**

Motion passed by unanimous consent.

**11-18/0103r3, “Further considerations on WUR frame format”, Jeongki Kim (LGE):**

**Motion 1:**

Move to modify the following TGba SFD text as following

* + AP may negotiate one or more Group IDs ~~to~~ with a STA through PCR using WUR Action frame during WUR negotiation and WUR mode signaling procedure
		- The assigned Group ID is used in a wake-up frame
		- The details for group ID (e.g., ~~ID allocation procedure (e.g., WUR Action frame or others similar to 11ac procedure),~~ ID structure, etc.) are TBD

**Moce: Kiseon Ryu**

**Second: Suhwook Kim**

Motion passed by unanimous consent.

**Motion 2:**

Move to add the following into TGba

* + If the Frame Body is present in the WUR Wake Up frame and the Address field is set to 0, the Frame Body contains multiple WIDs.

**Move: Kiseon Ryu**

**Second: Suhwook Kim**

Motion passed by unanimous consent.

**11-18/0160r7 “WUR Discovery Frame Content” Guoqing Li (Apple):**

**Motion**

Move to include the following text in the SFD:

WUR Discovery frame includes the following mandatory information:

* + Compressed SSID: size and compression method are TBD
	+ PCR operation channel: TBD bits
	+ AP Identifier: size and compression method TBD

**Move: Guoqing Li**

**Second: Po-Kai Huang**

Motion passed by unanimous consent.

**11-18/0096r3, “WUR Sync Design”, Vinod Kristem (Intel):**

**Motion:**

Move to modify SFD as follows:

The duration of each bit in the SYNC field is TBD (either 2 or 4) µs. The specific bit sequence of S is TBD. The contiguous OFF period of $[S,S$] or $\overbar{S}$ is no more than 8 us.

**Move: Shahrnaz Azizi**

**Second: Steve Shellhammer**

Motion passed by unanimous consent.

**11-18/0073r2, “WUR dual sync performance”, Jinyoug Chun (LGE):**

**Motion:** Move to modify the section R3.2.2.C in 11ba SFD as following

* + The SYNC field structure depends on the data rate of the Data field. When the Data field uses the high data rate, the structure of the SYNC field is $\overbar{S}$, where $S$ is a sequence of ~~TBD~~ 32 bits, and $\overbar{S}$ is the complementary sequence of $S$. When the Data field uses the low data rate, the structure of the SYNC field is $[S,S]$. The duration of each bit in the SYNC field is ~~TBD (either~~ 2 ~~or 4)~~ µs. The specific bit sequence of $S$ is TBD.

**Move: Dongguk Lim**

**Second: Eunsung Park**

Motion passed by unanimous consent.

**11-1334r3, “Vendor Specific WUR Frame Follow Up”, Po-Kai Huang (Intel):**

**Motion:** Move to add the following texts in SFD and D0.1

* + The TD control field of vendor specific frame carries the 12 LSBs of the OUI

Move Po-Kai Huang

Second Alfred Asterjadhi

Motion passed by unanimous consent.

**11-18/0120r1,“How to describe WUR PPDU Waveform Generation ”, Junghoon Suh (Huawei):** Junghoon discusses different options for describing the waveform generation.

**Recess at 10.00 am.**

**Thursday, January 18, 2018, 1:30-3:30 pm**

**Meeting Agenda:**

The ad-hoc meeting agenda is shown below, and published in the agenda document: <https://mentor.ieee.org/802.11/dcn/17/11-17-1862-08-00ba-january-2018-tgba-agenda.pptx>

* Call meeting to order
* IEEE 802 and 802.11 IPR Policy and procedure
* TG timeline discussion
* Goal for March 2018 F2F meeting
* Teleconference call schedule
* TGba SFD assignment for TGba D0.2
* Presentations
* Adjourn

**Chair Minyoung Park (Samsung) calls meeting to order at 1.30 pm. (**About 70 persons in the room.)

Minyoung remindes about taking attendance.

Minyoung goes through the agenda for the two sessions today and asks if there are any questions on the agenda. No objections to the agenda so the proposed agenda will be used.

Minyoung makes a call for potentially essential patents. No potentially essential patents reported and no questions asked.

Minyoung presents the TG timeline: Nothing has changed. We will see how much progress is made in March and change then if needed.

* **2017**
	+ January: TGba formation meeting
* **2018**
	+ January: TGba Draft 0.1
	+ May: TGba Draft 1.0
	+ September: TGba Draft 2.0
* **2019:**
	+ March: MDR (mandatory document review)
	+ July: formation of sponsor ballot pool
	+ September: Sponsor ballot
* **2020**
	+ July: RevCom

**Goal for March 2018:**

* Review and approve TGba D0.1
* Review spec text documents for TGba D0.2
* Review technical presentations
* Work on TGba task group documents
* Review TG timeline

**Teleconference Call Schedule:**

Proposed schedule (Mondays, 1 hour each)

* + Jan 29, 10:00 ET
	+ Feb 12, 17:00 ET
	+ Feb 26, 23:00 ET

**11-18/0258r0, “Assignment for Draft 0.2”, Po-Kai Huang (Intel):** Po-Kai presents his proposal concerning how to work on Draft 0.2, and in particular different parts of the specification are assigned to specific people to coordinate the work. Concerning Draft 1.0, it is proposed to focus on TBD and empty sections in order to reach Draft 1.0 status.

**11-18/0120r3, “How to describe WUR PPDU Waveform Generation ”, Junghoon Suh (Huawei):**

**Straw Poll 1:**

How do you want to describe the WUR waveform generation procedures in the spec text?

* Option 1

**Y/N/A: 6/2/16**

* Option 2
	+ Number of examples for sequence TBD

**Y/N/A: 15/2/9**

* Option 3
	+ Number of examples TBD

**Y/N/A:8/5/11**

Straw Poll 2:

How do you want to describe the WUR waveform generation procedures in the spec text?

* Option 2
	+ Number of examples for sequence TBD
* Option 3
	+ Number of examples TBD

**Option 2/Option 3/A: 19/7/10**

**11-18/0097r0, “2 us OOK pulse for high rate”, Vinod Kristem (Intel)**

**Q:** Is there a reason why you select 64-QAM in this case?

**A:** I just wanted to see if the result was very different compared to rotated B-PSK

**Q:** What is the main reason for the different performance?

**A:** Because of the non-linear behavior.

**Q:** Do you believe the relative performance for different waveforms would differ for different implementations?

**A:** I really don’t know.

**11-18/0156r4, “Waveform Design for SYNC Field”, Alphan Sahin (Interdigital):**

**Straw Poll 1:**

Do you agree that the constellation-based OOK waveform should be considered as a candidate waveform for SYNC field of 802.11ba?

**Y/N/A: 4/14/16**

**Straw Poll 2:**

Do you agree that the constellation-based OOK waveform should be considered as a candidate waveform for Data field of 802.11ba?

**Y/N/A: 4/14/11**

**11-18/0094r1, “Fixing TBDs in WUR frames”, Alfred Asterjadhi (Qualccomm):**

**Straw Poll 1:**

* Do you support to amend the following text in the TGba SFD:
	+ “The length of the Frame Body field is in units of ~~TBD~~ 2 octets, and is up to ~~8 or~~ 16 ~~(TBD)~~ octets.”

**Y/N/A: 13/6/15**

**Straw Poll 2:**

* Do you support using one of the following CRC engines from IEEE 802.11 to compute the CRC?
	+ 32-bit CRC, 16-bit CRC, 8-bit CRC

**Y/N/A: 36/0/2**

**Straw Poll 3: (Please refer to 11-18/0094r1 for the figures illustrating the straw poll text below)**

* Which option do you prefer for embedding BSSID info. in the FCS?
	+ Option 1: Compute the CRC assuming that Embedded BSSID field is present
		- Embedded BSSID field is not present in the transmitted WUR frame
	+ Option 2: Compute the CRC and then XOR the Embedded BSSID with the CRC

**Option 1/Option 2/Abstain: 18/3/17**

**Motion 1: Move to add to the TGba SFD:**

The CRC of WUR frames shall use one of the following CRC engines from IEEE 802.11

* + 32-bit CRC, 16-bit CRC, 8-bit CRC

**Move: Alfred Asterjadhi**

**Second: Po-Kai Huang**

Motion passed by unanimous consent.

**Motion 2: Move to add the following to the TGba SFD:**

* + The method for embedding BSSID info. in the FCS is as follows:
		- Compute the CRC assuming that Embedded BSSID field is present
			* Embedded BSSID field is not present in the transmitted WUR frame
			* The contents of the Embedded BSSID field is TBD

**Move: Alfred Asterjadhi**

**Second: Ming Gan**

Motion passed by unanimous consent.

**The meeting is adjourned at 3.30 pm.**