**IEEE 802.15**

**Wireless Specialty Networks (WSN)**

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| Project | IEEE 802.15 Working Group for Wireless Specialty Networks (WSN) | |
| Title | **IEEE 802.15 SG 4ab (NG-UWB) minutes** | |
| Date Submitted | [22 September, 2021] | |
| Source | [Clint Powell] [] [Chandler, AZ] | Voice: [+1.480.586.8457] Fax: [--] E-mail: [cpowell@ieee.org] |
| Re: | [September 802.15 Interim Meeting held virtually] | |
| Abstract | [IEEE 802.15 Study Group 4ab minutes] | |
| Purpose | [Official minutes of IEEE 802.15 SG 4ab] | |
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# Thursday, 16 September 2021 – PM1 (Joint .4ab, .14, .15)

**Opening**

**1:05 PM** SG Chairs, Ben Rolfe (Blind Creek Associates), Clint Powell (Facebook), Phil Beecher (Wi-Sun Alliance), called the meeting to order and opened the agenda  
(*15-21-0494-00-0000*)

* > 80 attendees joined the meeting

## Legal

SG Chairs reminded the group of the following from the 802.15 opening meeting:

* IEEE-SA patent policy
* Submission of Letter(s) of Assurance (LoA) or to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) that the participant believes may be essential for any of the ongoing activities within the 802.15 WG.
  + No essential patent claims were brought forth
* IEEE Anti-Trust statement
* IEEE Copyright Policy, including Code of Ethics

**Announcements**

Don’t forget to turn on your mic and announce your name and affiliation before you speak.

**SG Meeting Activity**

Chairs took turns addressing each of the agenda’s main items:

* Review/Discuss Template for Call for Chair
* Call for participation to external SDO’s
* SG15 Content Dev. Update
* Next Steps
  + Maintenance of .4., .14, .15 going forward – need to start thinking about how to handle this
    - Will potentially be a topic starting at the Nov. Plenary

Chairs adjourned the joint mtg. @ 1:45pm.

# Thursday, 16 September 2021 – EV1

**Opening**

**5:05 PM** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the SG Agenda.  
(*15-21-0432-02-04ab*)

* >50 attendees joined the meeting

## Legal

Chair reminded the group of the following from the 802.15 opening meeting:

* IEEE-SA patent policy
* Submission of Letter(s) of Assurance (LoA) or to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) that the participant believes may be essential for any of the ongoing activities within the 802.15 WG.
  + No essential patent claims were brought forth
* IEEE Anti-Trust statement
* IEEE Copyright Policy, including Code of Ethics

**Announcements**

Don’t forget to turn on your mic and announce your name and affiliation before you speak.

Chair announced the agenda doc. # for the week. After reviewing and making a few changes to the agenda, no one objected to approving the modified agenda, so it was approved by unanimous consent.  
*(doc. # 15-21-0454-00-04ab)*

Chair asked if anyone objected to approving the SG4ab minutes from the July Plenary. Clint Powell (Facebook) commented that he had found several typos, corrected them, and suggested that the group approve the corrected version. No one objected to approving the modified minutes, so it was approved by unanimous consent.  
*(doc. # 15-21-0413-02-04ab)*

**SG Meeting Activity**

Using the meeting slides *(doc. # 15-21-0454-00-04ab)* Chair proceeding with running the meeting.

Chair invited Ersen Ekrem (Apple) to go over the latest revision to the Technical Guidance document (TGD).

*(doc. # 15-21-0297-01-04ab)*

Chair presented a draft Technical Specification Framework.

*(doc. # 15-21-0442-00-04ab)*

This document will be used by the TG as a place to initially identify the various sections expected/targeting to be contained in the draft spec. and to start pulling together all approved technical contributions, which at a certain point will become the basis for the development of the draft spec. text. Chair asked if the group had an concerns with using this document as a tool in which to pull together technical content.

Chair recessed the mtg. @ 6:23pm, until Fri. AM1

# Friday, 17 September 2021 – AM1

**Opening**

**9:05 AM** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the SG Agenda (*15-21-0432-03-04ab*)

* > 60 attendees joined the meeting

## Legal

Chair reminded the group of the following from the 802.15 opening meeting:

* IEEE-SA patent policy
* Submission of Letter(s) of Assurance (LoA) or to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) that the participant believes may be essential for any of the ongoing activities within the 802.15 WG.
  + No essential patent claims were brought forth
* IEEE Anti-Trust statement
* IEEE Copyright Policy, including Code of Ethics

**Announcements**

Don’t forget to turn on your mic and announce your name and affiliation before you speak.

Chair announced the agenda doc. # for the week. After reviewing and making a few changes to the agenda, no one objected to approving the modified agenda  
*(doc. # 15-21-0432-04-04ab)*.

**SG Meeting Activity**

Using the modified agenda *(doc. # 15-21-0432-04-04ab)* Chair proceeding with running the meeting.

Mingyu Lee and Aniruddh Rao (both Samsung) presented “Narrowband-UWB Coupling MAC”.

*(doc. # 15-21-0504-00-04ab)*

This presentation discussed use of a mirroring channel to identify available UWB channel and reduce collisions.

Questions raised included:

* Several concerns were raised over narrowband fading and it causing the fixed channel coupling concept not work to well
* A specific NB technology was not proposed, just how one could be coupled with UWB

Xiaohui Peng (Huawei) presented “UWB Sensing Methods and KPIs”.

*(doc. # 15-21-0505-00-04ab)*

This presentation discussed multiple methods for presence detection.

Zhenzhen Ye (Redpoint Positioning) presented “Downlink TDOA (DL-TDOA) Location Service in 802.15”.

*(doc. # 15-21-0488-00-04ab)*

This presentation included a recap of the presentation given in the May mtg. and expanded on that. The benefit claimed is that it can support more tags than UL-TDOA and 2-way ranging.

* The proposal will use the beacon period (ala 15.4) for synchronization

Chair asked if there were any presentations that could be given during this mtg.

Chair recessed the mtg. @ 11:00am, until Fri. PM1

# Friday, 17 September 2021 – PM1

**Opening**

**1:05 PM** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the SG Agenda (*15-21-0432-05-04ab*)

* > 50 attendees joined the meeting

## Legal

SG Chair reminded the group of the following from the 802.15 opening meeting:

* IEEE-SA patent policy
* Submission of Letter(s) of Assurance (LoA) or to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) that the participant believes may be essential for any of the ongoing activities within the 802.15 WG.
  + No essential patent claims were brought forth
* IEEE Anti-Trust statement
* IEEE Copyright Policy, including Code of Ethics

**Announcements**

Don’t forget to turn on your mic and announce your name and affiliation before you speak.

Chair announced the agenda doc. # for the week. After reviewing and making a few changes to the agenda, no one objected to approving the modified agenda  
*(doc. # 15-21-0432-05-04ab)*.

**SG Meeting Activity**

Using the modified agenda *(doc. # 15-21-0432-05-04ab)* Chair proceeding with running the meeting.

Continued with Q&A discussion re: Zhenzhen Ye (Redpoint Positioning) presented “Downlink TDOA (DL-TDOA) Location Service in 802.15”, given in Fri. AM1.

*(doc. # 15-21-0488-00-04ab)*

Questions were asked re below topics:

* Superframe, BOP, CFP, CAP concepts use from 802.15.4
* Inbound/Out of band service discovery
* Clock drift

Chair asked if there were any presentations that could be given during this mtg.

Chair recessed the mtg. @ 2:00pm, until Mon. EV1

# Monday, 20 September 2021 – AM2 (Joint .4ab, .6a, .14)

**Opening**

**11:05 AM** SG Chairs, Clint Powell (Facebook), Ben Rolfe (Blind Creek Associates), Ryuji Kohno (YNU), called the meeting to order and opened the agenda  
(*15-21-0503-00-0000*)

* > 50 attendees joined the meeting

## Legal

SG Chairs reminded the group of the following from the 802.15 opening meeting:

* IEEE-SA patent policy
* Submission of Letter(s) of Assurance (LoA) or to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) that the participant believes may be essential for any of the ongoing activities within the 802.15 WG.
  + No essential patent claims were brought forth
* IEEE Anti-Trust statement
* IEEE Copyright Policy, including Code of Ethics

**Announcements**

Don’t forget to turn on your mic and announce your name and affiliation before you speak.

Chairs announced the agenda doc. # for the week. After reviewing and making a few changes to the agenda, no one objected to approving the modified agenda, so it was approved by unanimous consent.  
*(doc. # 15-21-0503-01-0000)*

**SG Meeting Activity**

Marco Hernandez (YNU) and Ryuji gave an overview of the following doc:

*(doc. # 15-21-0497-00-006a)*

* The document reviews the motivation behind the proposed amendment to 802.15.6: Collocated HBAN and VBAN networks operating independently within a vehicle and interacting with each other
* Topics for collaboration between .6a, .4ab, and .14 include:
  + Common PHY
    - .6a will determine if there is a consensus on adopting the 15.4 UWB PHY
  + Channel model
    - Channel models used by .6a include:
      * *doc. # 15-08-0780-12-0006* – used for BAN (802.15.6)
      * *doc. # 15-21-0244-05-006a* – proposed for HBAN/VBAN (.6a)
  + Coexistence
* Goal is to meet again during Nov. Plenary
  + Update on PHY direction (common w/15.4 UWB or not) from .6a
  + Update on channel model development for HBAN/VBAN applications from .6a
  + Once the PHY and Channel Model(s) are determined, this will help in paving the way to discussing coexistence

Chairs asked if there was any other business?

* Ryuji asked “What about coexistence with other UWB standards using UWB technology, such as 802.11?”
  + Clint and Ben replied there are several general options that can be employed and that this topic may also be brought/taken up in the 802.19 WG

Chairs adjourned the joint mtg. @ 12:50pm.

# Monday, 20 September 2021 – EV1

**Opening**

**5:05 PM** Chair, Ben Rolfe (Blind Creek Associates) called the meeting to order and opened the SG Meeting Slides (*15-21-0450-01-04ab*)

* >30 attendees joined the meeting

## Legal

Chair reminded the group of the following from the 802.15 opening meeting:

* IEEE-SA patent policy
* Submission of Letter(s) of Assurance (LoA) or to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) that the participant believes may be essential for any of the ongoing activities within the 802.15 WG.
  + No essential patent claims were brought forth
* IEEE Anti-Trust statement
* IEEE Copyright Policy, including Code of Ethics

**Announcements**

Don’t forget to turn on your mic and announce your name and affiliation before you speak.

Chair announced the agenda doc. # for the week. After reviewing and making a few changes to the agenda, no one objected to approving the modified agenda  
*(doc. # 15-21-0432-06-04ab)*.

**SG Meeting Activity**

Chair reviewed the next steps

* 5 standalone sessions + 1 joint w/.14, .15 + 1 joint w/.6a, .14

Chair reminded everyone of the TG officer installment process

Teleconference Schedule: biweekly on Tues. @ 10am Eastern on the following dates:

* Oct. 5
* Oct. 19
* Nov. 2

Chair recessed the mtg. @ 5:25pm, until Tues. EV1

# Tuesday, 21 September 2021 – EV1

**Opening**

**5:05 PM** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order

Chair opened with and updated agenda:

*(doc. # 15-21-0432-06-04ab)*

* >45 attendees joined the meeting

## Legal

Chair reminded the group of the following from the 802.15 opening meeting:

* IEEE-SA patent policy
* Submission of Letter(s) of Assurance (LoA) or to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) that the participant believes may be essential for any of the ongoing activities within the 802.15 WG.
  + No essential patent claims were brought forth
* IEEE Anti-Trust statement
* IEEE Copyright Policy, including Code of Ethics

**Announcements**

Don’t forget to turn on your mic and announce your name and affiliation before you speak.

**SG Meeting Activity**

Carlos Aldana (Facebook) presented an update to “Preamble codes for Data Communications”, originally presented during the July Plenary Mtg.

*(doc. # 15-21-0377-01-04ab)*

This presentation updated the proposed codes and subsequent analysis.

Several questions were asked and answered.

Carlos Aldana (Facebook) presented “Advanced Coding for Data comm”.

*(doc. # 15-21-0506-0-04ab)*

This presentation explored the use of better codes that could provide nearer Shannon capacity.

Several questions were asked and answered.

Chenchen Liu (Huawei) presented “Ways to achieve higher date rate for the hrp-uwb phy”.

*(doc. # 15-21-0501-0-04ab)*

This presentation explored various options (5) to consider when looking to increase the effective data rate.

One question was asked and answered.

Chair asked if there was any additional business, and none was raised.

Chair adjourned the mtg. @ 6:30pm