**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 TG 4ab (NG-UWB) minutes** |
| Date Submitted | [25 Sep, 2023] |
| Source | [David Xun Yang][][Bantian, Shenzhen, China] | Voice: [+86.159.1411.7462]Fax: [--]E-mail: [david.yangxun@huawei.com] |
| Re: | [Sep 802.15 Interim Meeting held in Hybrid Mode] |
| Abstract | [IEEE 802.15 Task Group 4ab minutes] |
| Purpose | [Official minutes of IEEE 802.15 TG 4ab] |
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# Monday, 11 Sep, 2023 – AM2

**Opening**

**10:35 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*15-23-0479-00-04ab*)

* >60 attendees joined the meeting

Chair introduced the hybrid meeting logistics.

Chair reminded the group of registration for 802 LMSC and wireless plenary.

## 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**

Chair announced the agenda doc. #15-23-0441-02-04ab for the week. There were several requests for presentations in available time slots.

Motion #1: Motion to approve agenda contained in document 15-23-0441-03.

* Moved by Clint Chaplin (SRA)
* Second by Clint Powell (HID)

No one objected to approve the motion. It was approved by unanimous consent.

Chair raised the motion of minutes for Jul Plenary *(doc. # 15-23-0427-00-04ab)* and telecons between Jul and Sep *(doc. # 15-23-0459-00-04ab)*. No discussion heard.

Motion #2: Motion to approve minutes contained in documents 15-23-0427-00 and 15-23-0459-00

* Moved by: David Xun Yang (Huawei)
* Second by: Clint Chaplin (SRA)

No one objected to approve the motion. It was approved by unanimous consent.

Chair emphasized the session objectives, process and goals of this week.

Chair introduced the overview of the draft status and how to proceed in this week. There were discussions on the term “technical complete”.

**TG Meeting Activity**

Using the agenda *(doc. # 15-23-0441-03-04ab)* Chair proceeded with running the meeting.

Presentation #1:

Carl Murray (Qorvo) presented “Text for UWB only MMS ranging”

(*doc. # 15-23-0468-00-04ab*)

This presentation proposes text changes for UWB only MMS ranging based on the current draft.

Questions/comments raised include the name/meaning of the bits in Figure 40, the role of narrow band in UWB only MMS ranging, PHY and MAC TBDs for further discussions, and the intension of this document.

Presentation #2:

Michael McLaughlin (Qorvo) presented “MMS with UWB. Up to 20 x LOS range.”

(*doc. # 15-23-0480-00-04ab*)

This presentation introduces How to implement MMS without narrowband assist and get up to 20 x range.

Questions/comments raised include the receiver processing procedure, and necessity of OOB technologies.

Presentation from Bin Qian (Huawei) (*doc. # 15-23-0461-00-04ab*) was deferred to Tuesday.

Chair suggested that people interested in the topic of privacy and security enhancement could attend TG4ac.

Chair recessed the mtg. @ 12:20pm ET, until Mon. PM2.

# Monday, 11 Sep, 2023 – PM2

**4:01 PM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*15-23-0479-00-04ab*)

* >60 attendees joined the meeting

## Legal

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

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	+ No essential patent claims were brought forth
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**TG Meeting Activity**

Using the agenda *(doc. # 15-23-0441-05-04ab)* Chair proceeded with running the meeting.

Presentation #3:

Xiliang Luo (Apple) presented “Best Practices for Getting 4ab Draft-0 Ready”

(*doc. # 15-23-0467-00-04ab*)

This presentation proposes several best practices to get draft-0 ready in time.

There were several discussions based on the proposed practices.

Presentation #4:

Huan-Bang Li (NICT) presented “Clarification of NB CCA for UWB channel access”

(*doc. # 15-23-0460-00-04ab*)

This presentation further explains NB-assisted UWB channel access.

Questions/comments raised include the selection of PHY parameters, operating bands, the numbers in NB CCA pattern, simulation results of the proposed NB CCA patterns, and receiver state machine.

There were some discussions on what to do next.

Vice chair Clint Chaplin (SRA) reviewed the received comments in “CC Consolidated Comments” (*doc. # 15-23-0475-02-04ab*). Commenters explained the intention of proposed changes. There were discussions on the explanations. Clint filled in the table with the discussion consensus and updated it into *15-23-0475-03-04ab.*

Chair encouraged people to review the comments and called for volunteers to resolve comments.

Chair updated the agenda based on the current progress.

Chair recessed the mtg. @ 6:03pm ET, until Tue. AM1.

# Tuesday, 12 Sep, 2023 – AM1

**8:01 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*15-23-0479-00-04ab*)

* >60 attendees joined the meeting

## Legal

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

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	+ No essential patent claims were brought forth
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**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0441-05-04ab)* Chair proceeded with running the meeting.

Presentation #5:

Chenchen Liu (Huawei) presented “Refinements on the CIR Report field of AC IE”

(*doc. # 15-23-0466-00-04ab*)

This presentation discusses the refinements on the CIR Report field of AC IE.

Presentation #6:

Rojan Chitrakar (Huawei) presented “Secured compressed frames for MMS ranging” (*doc. # 15-23-0216-01-04ab*) and its text proposal “Text proposal for 15.4ab Secure compressed PSDU” (*doc. # 15-23-0335-01-04ab*)

This presentation discusses the security of MMS ranging.

Questions/comments raised include security level, CRC reliability, etc.

Presentation #7:

Bin Qian (Huawei) presented “Further considerations on frequency stitching and CIR reports” (*doc. # 15-23-0461-01-04ab*) and its text proposal “Proposed updates for 10.36” (*doc. # 15-23-0462-00-04ab*)

This presentation discusses the further details for frequency stitching and related CIR report.

Vice chair Clint Chaplin (SRA) continued to review the received comments in “CC Consolidated Comments” (*doc. # 15-23-0475-04-04ab*), which included the comments from Riku Pirhonen (NXP). There were volunteers to be the assignees of selected comments. Clint filled in the table with the discussion consensus and updated it into *15-23-0475-05-04ab.*

Chair reviewed the current progress and introduced following tasks for today. There was a request to have presentation in Tue. AM2.

Chair recessed the mtg. @ 10:02am ET, until Tue. AM2.

# Tuesday, 12 Sep, 2023 – AM2

**10:34 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*15-23-0479-00-04ab*)

* >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
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**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0441-06-04ab)* Chair proceed with running the meeting.

Presentation #8:

Aniruddh Rao Kabbinale (Samsung) presented “Processed Target Feature Report for UWB sensing”

(*doc. # 15-23-0491-02-04ab*)

This presentation proposes to enable request and response for Processed Target feature report for UWB sensing.

Presentation #9:

Bin Qian (Huawei) presented “Proposed updates for section 16”

(*doc. # 15-23-0464-00-04ab*)

This presentation proposes the text changes related to device type, sensing and LDPC.

Chair recessed the mtg. for 5 mins.

Vice chair Clint Chaplin (SRA) continued to review the received comments in “CC Consolidated Comments” (*doc. # 15-23-0475-05-04ab*). There were volunteers to be the assignees of selected comments. Clint filled in the table with the discussion consensus and updated it into *15-23-0475-06-04ab.*

Chair recessed the mtg. @ 12:31pm ET, until Wed. PM1.

# Wednesday, 13 Sep, 2023 – PM1

**1:31 PM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*15-23-0479-00-04ab*)

* >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
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Chair changed the agenda based on some requests. *(doc. # 15-23-0441-09-04ab).* No objection to the updated agenda.

**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0441-09-04ab)* Chair proceeded with running the meeting.

Presentation #10:

Tero Kivinen (Self) presented “List of issues to be solved by the privacy group”

(*doc. # 15-23-0422-02-04ac*)

This presentation provides a list of issues that SG privacy group needs to address.

There were discussions on how to cooperate together.

Breakout report and discussion:

* Carl Murray (Qorvo) and Riku Pirhonen (NXP) summarized their progress of breakout discussions.
* Vinod Kristem (Apple) presented “Group Consensus on Operating Parameter Sets” (*doc. #15-23-0502-01-4ab*) and “4ab Device(s) and feature sets” (*doc. #15-23-0308-03-4ab*).

Presentation #11:

Alex Krebs (Apple) presented “Resolution proposal for compressed PSDU coexistence”

(*doc. # 15-23-0481-01-04ab*)

This presentation discusses coexistence between legacy 15.4 MHR and newly compressed PSDU frame formats.

Questions/comments raised include CRC field and the name of NB-AP.

Presentation #12:

Mingyu Lee (Samsung) presented “Resolution Proposals for the Assigned Comments” (*doc. # 15-23-0504-00-04ab*) and “Updates of AP Format” (*doc. # 15-23-0510-00-04ab*)

This presentation introduces resolutions to the comments assigned to Mingyu and AP related formats.

Vice chair Clint Chaplin (SRA) reviewed the progress of comment resolutions.

Chair recessed the mtg. @ 3:33pm ET, until Thu. AM1.

# Thursday, 14 Sep, 2023 – AM1

**8:0 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*doc. # 15-23-0479-00-04ab*)

* >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
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**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0441-09-04ab)* Chair proceeded with running the meeting.

Chair introduced the current progress and updated the list of documents for comment resolutions based on the reports from comment assignees.

Presentation #13:

Riku Pirhonen (NXP) presented “Resolution Proposals for the Assigned Comments” (*doc. # 15-23-0509-03-04ab*)

This presentation proposes changes to 4ab Draft 0 B made in comments #254, #255, #258 and #258 regarding use of UWB for NBA-MMS control and reporting.

Presentation #14:

Mingyu Lee (Samsung) presented “Resolution Proposals for the Assigned Comments” (*doc. # 15-23-0504-01-04ab*) and “Updates of AP Format” (*doc. # 15-23-0510-01-04ab*)

This presentation provides the updated resolutions to the comments assigned to Mingyu and AP related formats.

Presentation #15:

Rojan Chitrakar (Huawei) presented “Text proposal for 15.4ab Secure compressed PSDU”

(*doc. # 15-23-0335-02-04ab*)

This presentation provides the updates to the security of MMS ranging based on received comments.

Presentation #16:

Bin Qian (Huawei) presented “Proposed further updates for 10.36.7”

(*doc. # 15-23-0496-00-04ab*)

This presentation provides the updates to Parameters/IEs related to CIR reports.

Presentation #17:

Bin Qian (Huawei) presented “Proposed updates for section 16”

(*doc. # 15-23-0464-02-04ab*)

This presentation proposes the updated text changes related to device type, sensing and LDPC based on offline discussions.

Presentation #18:

Michael McLaughlin (Qorvo) presented “Revised UWB wake-up radio modulation”

(*doc. # 15-23-0516-00-04ab*)

This presentation proposes a new wake-up burst (WUB) modulation method which has a 3dB BER advantage.

Presentation #19:

Aniruddh Rao Kabbinale (Samsung) presented “Proposed Text for PTF report IEs in 10.36.7”

(*doc. # 15-23-0505-00-04ab*)

This presentation proposes the text for Processed Target Feature Report IEs.

There was a request to review the document for more time.

Presentation #20:

Carl Murray (Qorvo) presented “Text for UWB only MMS ranging”

(*doc. # 15-23-0468-01-04ab*)

This presentation proposes the updated text changes related to UWB only MMS ranging based on offline discussions.

Presentation #21:

Rojan Chitrakar (Huawei) presented “resolutions for D0-B hyper block comments”

(*doc. # 15-23-0501-00-04ab*)

This presentation is to resolve the comments on hyper block.

Vice Chair Clint Chaplin (Samsung) reviewed the progress of comment resolutions. (*doc. # 15-23-0475-08-04ab*)



Chair introduced his timeline on comment collection.

Chair recessed the mtg. @ 10:03am ET, until Thu. PM1.

# Thursday, 14 Sep, 2023 – AM2

**10:30 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*doc. # 15-23-0479-00-04ab*)

* >40 attendees joined the meeting

## Legal

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

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	+ No essential patent claims were brought forth
* IEEE Anti-Trust statement
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**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0441-09-04ab)* Chair proceeded with running the meeting.

Vice chair Clint Chaplin (SRA) continued to review the received comments in “CC Consolidated Comments” (*doc. # 15-23-0475-08-04ab*). Clint Chaplin filled in the table with the discussion consensus and updated it into *15-23-0475-09-04ab.*

Chair recessed the mtg. @ 12:34pm ET, until Thu. PM1.

# Thursday, 14 Sep, 2023 – PM1

**1:33 PM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*15-23-0479-00-04ab*)

* >60 attendees joined the meeting

Chair reminded the group of registration for 802 LMSC and wireless plenary.

## 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
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Editor Billy Verso (Qorvo) suggest to have more time to resolve comments. Chair reallocated the slots accordingly. No objection heard. The agenda was updated to *doc. # 15-23-0441-11-04ab.*

**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0441-11-04ab)* Chair proceeded with running the meeting.

Chair introduced his thought on the time for comment collection after Sep meeting.

Vice chair Clint Chaplin (SRA) continued to review the received comments in “CC Consolidated Comments” (*doc. # 15-23-0475-09-04ab*). There are several questions to handle dedicated comments. Clint filled in the table with the discussion consensus and updated it into *15-23-0475-10-04ab.*



Chair reviewed the drafting list including all the text proposals and comment resolutions. There were several requests to update the list.

There was a request to recess the meeting for a while. Chair agreed to recess the meeting for 5 min @2:55pm. Chair updated the agenda with the latest status of text proposals and comment resolutions. *(doc. # 15-23-0441-13-04ab)*

**Motion #1:**

* Move to instruct the technical editor to apply the documents identified in the “Drafting List” in document 15-23-0441-11 to update Draft 0 and the list in 15-23-0374-04 slide 2. Where later versions are given in 15-23-0441-12 use the later version
* Moved by: Alex Krebs (Apple), Second by: Carlos Aldana (Meta)
* Motion passes with unanimous consent

**Motion #2:**

* Move to instruct the technical editor to apply the comment resolutions with Editor Status marked as Ready in document 15-23-0475-10
* Moved by: Clint Chaplin (SRA), Second by: Larry Zakaib (Spark)
* Motion passes with unanimous consent

Chair introduced next step options and consideration of time. Discussions on the options. Few people were in favor of option 1 or 2.

Chair reviewed teleconference schedule.

Chair asked if there is any other business. No requests heard.

Chair adjourned the mtg. @ 3:37pm ET.