**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 | [6 Feb, 2024] |
| Source | [David Xun Yang][][Bantian, Shenzhen, China] | Voice: [+86.159.1411.7462]Fax: [--]E-mail: [david.yangxun@huawei.com] |
| Re: | [Jan 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, 15 Jan, 2024 – AM2

**Opening**

**10:39 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*15-24-0047-00-04ab*)

* ~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. #15-23-0637-03-04ab for the week. There was no discussion on the agenda.

Motion #1: Motion to approve agenda contained in document 15-23-0637-03.

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

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

Chair raised the motion of minutes for Nov Plenary *(doc. # 15-23-0619-00-04ab)* and telecons between Nov 2023 and Jan 2024 *(doc. # 15-24-0012-00-04ab)*. No discussion heard.

Motion #2: Motion to approve minutes contained in documents 15-23-0619-00 and 15-24-0012-00

* 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 introduced the objectives of this week and his plan to move forward. There was no further discussion on the plan. Chair asked for volunteers to work as PoCs. There were several discussions on the role of PoC.

**TG Meeting Activity**

Using the agenda *(doc. # 15-23-0637-03-04ab)* Chair proceeded with running the meeting.

Vice chair Clint Chaplin (SRA) reviewed the received comments in “Consolidated Comments Draft c” (*doc. # 15-24-010-03-04ab*). Comment assignees explained the proposed changes. There were discussions on the changes. Clint filled in the table with the discussion consensus and updated it into *15-24-010-03-04ab.*

**Presentation #1:**

Tero Kivinen (Self) presented “Background information to new frame format discussion”

(*doc. # 15-24-0050-00-04ab*)

This presentation introduces background information for the new frame format discussion.

There were discussions on the details.

Chair recessed the mtg. @ 12:31PM ET, until Mon. PM2.

# Monday, 15 Jan, 2024 – PM2

**4:03 PM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*15-24-0047-00-04ab*)

* ~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
* IEEE Copyright Policy, including Code of Ethics

Chair updated the agenda with requested submissions. No objection heard.

*(doc. # 15-23-0637-04-04ab)*

**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0637-04-04ab)* Chair proceeded with running the meeting.

**Presentation #2:**

Rojan Chitrakar (Huawei) presented “Proposed resolutions for draft C non-security Key ID field comments”

(*doc. # 15-24-0017-00-04ab*)

This presentation proposes resolution for Key ID field related comments.

There was no objection to the resolutions as in *doc. # 15-24-0017-00-04ab*.

**Presentation #3:**

Rojan Chitrakar (Huawei) presented “Proposed resolutions for Security comments - Part1-(Key-ID)”

(*doc. # 15-24-0018-00-04ab*)

This presentation proposes resolution for Key ID field related comments.

There was no objection to the resolutions as in *doc. # 15-24-0018-00-04ab*.

**Presentation #4:**

Bin Qian (Huawei) presented “Proposed Comments Resolution on Compact Frame”

(*doc. # 15-24-0024-00-04ab*)

This presentation proposes resolution for compact frame related comments.

There was no objection to the resolutions as in *doc. # 15-24-0024-00-04ab*.

**Presentation #5:**

Bin Qian (Huawei) presented “Frequency stitching in ranging”

(*doc. # 15-24-0026-01-04ab*)

This presentation proposes to apply frequency stitching in ranging applications.

There were discussions on the details of frequency stitching for ranging.

Chair introduced that we have rooms for breakout discussion on Tuesday and Wednesday.

**Presentation #6:**

Rojan Chitrakar (Huawei) presented “Proposed Resolution for Security Part-2 (Key lookup and Source)”

(*doc. # 15-24-0019-01-04ab*)

This presentation proposes resolution for comments related to Key lookup and source.

There were discussions on the details of Compact frame, Keysource, and KeyIndex.

Chair recessed the mtg. @ 5:43pm ET, until Tue. AM1.

# Tuesday, 16 Jan, 2024 – AM1

**8:06 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*15-24-0047-00-04ab*)

* ~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
* IEEE Copyright Policy, including Code of Ethics

**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0637-05-04ab)* Chair proceed with running the meeting.

**Presentation #7:**

Rojan Chitrakar (Huawei) presented “Proposed Resolution for Security Part-3 (Misc)”

(*doc. # 15-24-0020-00-04ab*)

This presentation proposes resolution for miscellaneous security related comments.

There were discussions on the detailed resolutions.

**Presentation #8:**

Rojan Chitrakar (Huawei) presented “Proposed Resolution for MMS – Synchronized Responders”

(*doc. # 15-24-0021-00-04ab*)

This presentation proposes resolution for MMS – Synchronized Responders related comments.

**Presentation #9:**

Bin Qian (Huawei) presented “Proposed Comments Resolution on 10.39.7.3”

(*doc. # 15-24-0022-00-04ab*)

This presentation proposes resolutions to comments on SBP Request IE.

There was no objection to the resolutions as in *doc. # 15-24-0022-00-04ab*.

**Presentation #10:**

Bin Qian (Huawei) presented “Proposed Comments Resolution on 10.39.7.4”

(*doc. # 15-24-0023-00-04ab*)

This presentation proposes resolutions to comments on SBP Response IE.

There was no objection to the resolutions as in *doc. # 15-24-0023-00-04ab*.

**Presentation #11:**

Bin Qian (Huawei) presented “Proposed Resolution on Sensing Comments Part 1”

(*doc. # 15-24-0025-00-04ab*)

This presentation proposes resolutions to comments related to sensing.

Chair planned to discuss the plan for the meetings in the second half of PM2.

Chair recessed the mtg. @ 9:42am ET, until the second half of Tue. PM2.

# Tuesday, 16 Jan, 2024 – PM2

**5:10 PM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*15-24-0047-00-04ab*)

* ~60 attendees joined the meeting

## Legal

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

* IEEE-SA patent policy
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	+ No essential patent claims were brought forth
* IEEE Anti-Trust statement
* IEEE Copyright Policy, including Code of Ethics

Chair updated the agenda with requested submissions. No objection heard.

*(doc. # 15-23-0637-06-04ab)*

**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0637-06-04ab)* Chair proceed with running the meeting.

**Presentation #12:**

Bin Qian (Huawei) presented “Proposed Resolution on Sensing Comments Part 1”

(*doc. # 15-24-0025-01-04ab*)

This presentation is the updated version based on *doc. # 15-24-0025-00-04ab*.

There was no objection to the resolutions as in *doc. # 15-24-0025-01-04ab*.

**Presentation #13:**

Rojan Chitrakar (Huawei) presented “Proposed Resolution for Security Part-3 (Misc)”

(*doc. # 15-24-0020-01-04ab*)

This presentation is the updated version based on *doc. # 15-24-0020-00-04ab*.

There was no objection to the resolutions to comment # 140, 141 and 584 as in *doc. # 15-24-0020-01-04ab*.

**Presentation #14:**

Alexander Krebs (Apple) presented “DraftC comment resolution proposals”

(*doc. # 15-24-0065-00-04ab*)

This presentation was to reassign comments and resolve miscellaneous comments.

There was no objection to the resolutions as in *doc. # 15-24-0065-01-04ab*.

**Presentation #15:**

Mickael Maman (ST microelectronics) presented “DraftC comment resolution proposals”

(*doc. # 15-24-0063-00-04ab*)

This presentation proposes resolutions to RSS related comments.

There was no objection to the resolutions as in *doc. # 15-24-0063-00-04ab*.

Chair recessed the mtg. @ 6:02pm ET, until the second half of Wed. AM1.

# Wednesday, 17 Jan, 2024 – AM1

**9:03 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*15-24-0047-00-04ab*)

* ~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
* IEEE Copyright Policy, including Code of Ethics

**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0637-06-04ab)* Chair proceed with running the meeting.

**Presentation #16:**

Larry Zakaib (Spark Microsystems) presented “Proposed 4ab Draft C Comments Resolution for SSBD”

(*doc. # 15-24-0066-01-04ab*)

This presentation proposes resolutions to comments related to SSBD.

Chair recessed the mtg. @ 9:41am ET, until the second half of Wed. PM2.

# Wednesday, 17 Jan, 2024 – PM2

**5:02 PM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*15-24-0047-00-04ab*)

* ~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
* IEEE Copyright Policy, including Code of Ethics

Chair updated the agenda based on requests. *(doc. # 15-23-0637-07-04ab)*

**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0637-07-04ab)* Chair proceed with running the meeting.

**Presentation #17:**

Rojan Chitrakar (Huawei) presented “Proposed Resolution for Security Part-3 (Misc)”

(*doc. # 15-24-0020-03-04ab*)

This presentation proposes resolutions for added comments compared to *doc. # 15-24-0020-01-04ab*.

There was no objection to the resolutions for comment # 627 and 502 as in doc. # 15-24-0020-03-04ab.

**Presentation #18:**

Rojan Chitrakar (Huawei) presented “Proposed Resolution for Security Part-3 (Misc)”

(*doc. # 15-24-0019-02-04ab*)

This presentation proposes resolution for miscellaneous comments.

There was no objection to the comment resolutions in doc. # 15-24-0019-02-04ab.

**Presentation #19:**

Rojan Chitrakar (Huawei) presented “Proposed resolutions for draft C non-security Key ID field comments”

(*doc. # 15-24-0017-01-04ab*)

This presentation proposes resolutions for added comments compared to *doc. # 15-24-0017-00-04ab*.

There was no objection to the resolution for comment # 168 as in doc. # 15-24-0017-01-04ab.

**Presentation #20:**

Larry Zakaib (Spark Microsystems) presented “Proposed-comments-resolution-for-LE-UWB-PHY based on Draft C - Clause 33 and related clauses”

(*doc. # 15-24-0077-00-04ab*)

This presentation proposes resolutions for LE-UWB-PHY related comments.

There was no objection to the comment resolutions in doc. # 15-24-0077-00-04ab.

Chair recessed the mtg. @ 5:50pm ET, until Thu. AM1.

# Thursday, 18 Jan, 2024 – AM1

**8:03 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*15-24-0047-00-04ab*)

* ~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
* IEEE Copyright Policy, including Code of Ethics

Chair reviewed the agenda and discussed how to utilize the time between Jan and Mar more efficiently. *(doc. # 15-23-0637-08-04ab)*

**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0637-08-04ab)* Chair proceed with running the meeting.

Alexander Krebs (Apple) discussed comments in “Consolidated Comments Draft c”

(*doc. # 15-24-0010-05-04ab*).

Comments # 497, 73, 52, 318, 683, 894, 685, 7, 600, 601, 602, 603, 562, and 606 were discussed. Resolutions to comments # 685, 601, 603 were accepted with unanimous consent.

Chair recessed the mtg. @ 9:57am ET, until Thu. AM2.

# Thursday, 18 Jan, 2024 – AM2

**10:32 AM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*doc. #* *15-24-0047-00-04ab*)

* >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
* IEEE Copyright Policy, including Code of Ethics

**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0637-08-04ab)* Chair proceed with running the meeting.

Alexander Krebs (Apple) continued to discuss comments in “Consolidated Comments Draft c”

(*doc. # 15-24-0010-05-04ab*).

Comments # 605, 607, 11, 689, 609, 608, 690, 611, 9, 563, and 320 were discussed. Resolutions to comments # 11, 690, and 320 were accepted with unanimous consent.

Larry Zakaib (Spark Microsystems) requested to update his resolution to comment # 119 as in *doc. # 15-24-0077-01-04ab*.

Chair recessed the mtg. @ 12:22pm ET, until Thu. PM1.

# Thursday, 18 Jan, 2024 – PM1

**13:37 PM ET** Chair, Ben Rolfe (Blind Creek Associates), called the meeting to order and opened the TG Agenda.
(*doc. #* *15-24-0047-00-04ab*)

* >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
* IEEE Copyright Policy, including Code of Ethics

**TG Meeting Activity**

Using the updated agenda *(doc. # 15-23-0637-09-04ab)* Chair proceed with running the meeting.

**Presentation #21:**

Rojan Chitrakar (Huawei) presented “Proposed Resolution for Security Part-3 (Misc)”

(*doc. # 15-24-0020-04-04ab*)

This presentation proposes updated resolutions for comments # 581 and 582.

There was no objection to the resolutions for comments # 581 and 582 as in doc. # 15-24-0020-04-04ab.

Alexander Krebs (Apple) continued to discuss comments in “Consolidated Comments Draft c”

(*doc. # 15-24-0010-05-04ab*).

Comments # 692, 694, 75, 149, 276, 150, 41, 14, 206, 323, 695 and 207 were discussed.

Resolutions to comments # 694, 75 and 14 were accepted with unanimous consent.

Chair updated the agenda with new request. *(doc. # 15-23-0637-10-04ab)*

**Presentation #22:**

Tero Kivinen (Self) presented “Calculations on the 24-bit address formats”

(*doc. # 15-24-0085-00-04ab*)

This presentation provides background information for the address format discussion.

There were discussions on the details.

Chair reviewed his plan on the telecons between Jan and Mar. (*doc. #* *15-24-0047-02-04ab*).

Chair adjourned the mtg. @ 3:31pm ET.