# IEEE P802.15

**Wireless Personal Area Networks**

|  |  |  |
| --- | --- | --- |
| Project | Task Group 15.6ma | |
| Title | **TG15.6ma Meeting Minutes for July 2023** | |
| Date Submitted | July 13rd, 2023 | |
| Source | [Ryuji Kohno1,2  Marco Hernandez1  Takumi Kobayashi1,3  Minsoo Kim1,  Daisuke Anzai3  [1; YRP-IAI (YRP International Alliance Institute), Japan,  2; YNU (Yokohama National University), Japan,  3; NIT(Nagoya Institute of Technology)] | Voice: +81 90 5408 0611  E-mail: kohno@ynu.ac.jp  marco.hernandez@ieee.org  kobayashi-takumi@yrp-iai.jp  minsoo@minsookim.com  anzai@nitech.ac.jp |
| Re: | Meeting Minutes | |
| Abstract | Since PAR and CSD of SG15.6ma as amendment of existing IEEE802.15.6-2012 for WBAN with enhanced dependability was approved by NesCom in November, Task Group TG15.6ma has been drafting technical requirement in cases of WBAN for medical use case for human body(HBAN) and for automotive use case for vehicle body(VBAN) with their connected use cases. In November meeting, to summarize technical requirement TG15.6ma has reviewed focused uses cases necessary for enhanced dependability in which channel propagation and environment of HBAN and VBAN with their mixed use can be categorized and modeled. Particularly to perform enhanced dependability in dense environment coexisting multiple overlaid BANs and different UWB and narrow band WPAN, WSN, WLAN etc. necessary technical requirement has been summarized in PHY and MAC layers. Then technical requirement document(TRD) has been approved by TG motion. Possible solutions to ensure enhanced dependability in PHY and MAC have been presented and discussed. Latest status of ETSI Smart BAN standard has been presented to find a way to make interoperability with IEEE802.15.6 and 6ma. To harmonize activities of TG15.6ma, 15.4ab using UWB PHY, TRD and technical guidance document(TGD) have been reviewed in joint and individual sessions. Next step has been discussed including telco for harmonization with TG15.4ab and change to revision from amendment. | |
| Purpose | Minutes of Dependability Electronic Plenary Session on Webex, July 2023. | |
| Notice | This document has been prepared to assist the IEEE P802.15. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein. | |
| Release | The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15. | |

**TG15.6ma 1st Session**

**Monday, July 10th, 2023, PM 1:30- PM 3:30 Berlin Local Time**

**at the room 12 in 2nd Floor, Estrel Hotel, Berlin, Germany with Webex Virtual Room #2**

* 1. Meeting called to order PM 1:30

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*

Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).

Registration information.

By Chair Ryuji Kohno

* 1. Opening Report *Ryuji Kohno (YNU / YRP-IAI)* doc.# 802.15- 23-0318-00-06a

Chair showed IEEE Patent policy.

Chair issued Call for Potentially Essential Patents.

Þ No essential intellectual property in the scope of TG6a was declared.

Chair presented agenda of this meeting doc.# 802.15- 23-0317-04-06a

Þ Approved.

* 1. Approval of previous meeting minutes *Takumi Kobayashi (YNU / YRP-IAI)*

Þ Upon no comments on the May meeting minutes, doc. #15-23-0282-00-06a was approved.

**[Review]**

* 1. Overview of IG-DEP, SG6a, TG6a and TG15.6ma for Revision of IEEE 802.15.6-2012 Wireless BAN with Enhanced Dependability, *Ryuji Kohno* (YRP-IAI/YNU), doc.# 22-0389-02-06ma

**[Progress for Draft Documentation]**

* 1. TG6ma draft comments, *Marco Hernandez, Ryuji Kohno,* doc.#23-0362-00-06a
     + Preliminary version of draft#1 has been posted in WG private repository in order to request comments for it.
  2. Progress and Action Items for Draft#1, *Marco Hernandez, Ryuji Kohno*, doc.#23-0360-00-06a
  3. Discussion for Draft#1
     + Most of parts in draft#1 has been agreed while MAC part needs more discussion in a way to combine updated old standard and added new schemes for common consensus of enhanced dependability.*(Ryuji Kohno)*
  4. Rescheduling Timeline, *Marco Hernandez, Ryuji Kohno* doc.#23-0361-00-06a
     + We expected 2 months delay but if needed to complete, there is possibility to extend little more. (*Ryuji Kohno*)
     + No objection from the attendees.
  5. Preliminary harmonization with 4ab, *Marco Hernandez,* doc.#22-0634-03-06a
  6. Discussion
  7. Recessed (22:09 PM), *Ryuji Kohno*

**Attendees list**

Attendees 11

***Name Affiliation***

* Daisuke Anzai Nagoya Institute of Technology
* Hiroki Saito ARIS
* Kento Takabayashi Toyo University
* Marco Hernandez YRP-IAI
* Masayuki Hirata Osaka University
* Minsoo Kim YRP-IAI
* Radhakrishna Canchi Kyosera International Inc
* Ryuji Kohno YNU/YRP-IAI
* Sang-Kyu Lim ETRI
* Seong-Soon Joo Korea Platform Service Technology (KPST)
* Takafumi Suzuki NICT
* Takumi Kobayashi Nitech/YRP-IAI
* Yasuharu Amezawa Mobile Techno

**TG15.6ma 2nd Session**

**Tuesday, July 11th, 2023, PM 4:00- PM 6:00 Berlin Local Time**

**at the room 12 in 2nd Floor, Estrel Hotel, Berlin, Germany with Webex Virtual Room #2**

* 1. Meeting called to order PM 4:04

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).  
     Registration Information, By Chair *Ryuji Kohno*
  2. 802 Mtg. Non-Registration Consequences, by Chair *Ryuji Kohno*
  3. Confirmation of Agenda, doc.#23-0317-04-06ma, *Ryuji Kohno*
  4. Review of the last session TG6ma, *Ryuji Kohno*

**[Presentation and Discussion on MAC Proposals for Revision]**

* 1. Definition of Coexistence Levels and How to Support Higher Levels, *Minsoo Kim*, doc.#15-23-0631-04-06ma
  2. Qualitative approach to coexistence and QoS mechanisms, *Marco Hernandez*, doc.#15- 23-0101-04-06ma
     + Tomorrow, Kento is going to present about the details about coding issues with HARQ. (*Ryuji Kohno*)
     + Your class 0 seems little different with what Minsoo presented. (*Kamran Sayrafian*)
       - I will check later. (*Marco Hernandez*)
     + Intra-BAN means in the same 15.6ma (15.6a) systems. (*Ryuji Kohno*)
       - I have some comment about terminology. (*Kamran Sayrafian*)
       - Let us discuss offline. (*Marco Hernandez*)
  3. Simulation results for Nagoya I. T. and YRP-IAI MAC proposal Based on TG6ma Channel Model, *Daisuke Anzai*, doc.#15-23-0352-00-06ma
     + How to manage traffics of various priority packets? (*Kamran Sayrafian*)
       - We can discuss more deeply, and Minsoo and Dr. Joo will present some proposals using control channel. (*Ryuji Kohno*)
  4. MAC Protocol Proposal for Multiple BAN Environment (Level 1), *Minsoo Kim*, doc.#15-23-0639-04-06ma
  5. Proposed text for 6ma MAC - 4. General framework elements, *Seong-Soon Joo*, doc.#15-23-0322-00-06ma
     + We have discussed about replacement “coordinator” instead of “hub”. (*Marko Hernandez*)
     + I can see some specified numbers in subsection 4.7 in your document however, our TRD has already accepted with official motion and that have numbers as well. Let us discuss. (*Marko Hernandez*)
  6. Proposed text for 6ma MAC - Interference Avoidance, *Seong-Soon Joo*, doc.#15-23-0324-00-06ma
  7. Proposed text for 6ma MAC - Beacon Access Phase, *Seong-Soon Joo,* doc.#15-23-0367-00-06ma
  8. Proposed text for 6ma MAC - Dependable BAN Operation, *Seong-Soon Joo,* doc.#15-23-0368-00-06ma
  9. Proposed text for 6ma MAC - Frames and IEs for dependable BAN, *Seong-Soon Joo,* doc.#15-23-0369-00-06ma
  10. Proposal of control and data channels unification for 6ma MAC, *Minsoo Kim,* doc.#15-23-0387-00-06ma
  11. Recessed (5:43PM)

Attendees 24

***Name Affiliation***

* Carlos Aldana Meta
* Clark Palmer Meteorcomm LLC
* Daisuke Anzai Nagoya Institute of Technology
* Dries Neirynck
* Eric Ackermann Fraunhofer HHI
* Friedbert Berens FBConsulting
* Iwao Hosako NICT
* Jerome Henry Cisco
* Kento Takabayashi Toyo University
* Kristian Granhaug Novelda
* Lennert Bober Fraunhofer HHI
* Marco Hernandez YRP-IAI
* Masayuki Hirata Osaka University
* Minsoo Kim YRP-IAI
* Norihiko Sekine NICT
* Radhakrishna Canchi Kyosera International Inc
* Ryuji Kohno YNU/YRP-IAI
* Seong-Soon Joo Korea Platform Service Technology (KPST)
* Soeelal Marskecherg Fraunhofer HHI
* Takafumi Suzuki NICT
* Takumi Kobayashi Nitech/YRP-IAI
* Thomas Kürner TU Braunschweig
* Weidong Tang NRT
* Yasuharu Amezawa Mobile Techno

**TG15.6ma 3rd Session**

**Wednesday, July 12th, 2023, AM 9:00- AM 10:00 Berlin Local Time**

**at the room 12 in 2nd Floor, Estrel Hotel, Berlin, Germany with Webex Virtual Room #2**

* 1. Meeting called to order AM 9:07

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).  
     Registration Information, By Chair *Ryuji Kohno*
  2. 802 Mtg. Non-Registration Consequences, by Chair *Ryuji Kohno*
  3. Confirmation of Agenda, doc.#23-0317-05-06ma, *Ryuji Kohno*
  4. Review of the last session TG6ma, *Ryuji Kohno*

**[Presentation and Discussion on Channel Coding Proposals for Revision]**

* 1. Harmonization with 4ab: data rates & FEC, *Marco Hernandez,* doc.#22-0610-04-06a.
     + Preamble sequence in original 15.6-2012 is Kasami sequence. Can we keep using the same sequence with original 15.6-2012? (*Ryuji Kohno*)
       - We can discuss and performance analysis in co-existing situation with the other systems like 4z and 4ab and compatibility with them.(*Marco Hernandez*)
     + We can use doubly encoded channel coding like concatenated code which has higher dependability for more higher priority data (*Ryuji Kohno*)
  2. Concept of channel coding for IEEE802.15.6ma, *Kento Takabayashi*, doc.#22-0244-01-006a
     + Let me confirm that Table #1 is applied to priority level 0~7 and Table#2 is applied for level 8 only, is it correct? (*Ryuji Kohno*)
       - Yes, it is. (*Kento Takabayashi*)
     + We are trying to analyze performance about Table#1 specifications by simulation. (*Daisuke Anzai*)

**[Ranging, Localization]**

* 1. Ranging and localization in TG6ma, *Ryuji Kohno*
  2. Preliminary Performance Evaluation of Ranging in Coexistence Environment, *Daisuke Anzai,* doc.# 23-0353-00-006a.
     + Static situation and moving situation are totally different in ranging and localization. (*Ryuji Kohno*)
     + We will try to analyze in moving situation as well as fixed static situation. (*Daisuke Anzai*)
     + Let us discuss about MAC with localization. (*Ryuji Kohno*)

Recessed (10:01AM)  
  
Attendees 24

***Name Affiliation***

* Ankur Samsung
* Bernhard Groβwindhager NXP
* Claudio Anliker ETHZ
* Daisuke Anzai Nagoya Institute of Technology
* Friedbert Berens FBConsulting
* Hiroki Saito ARIS
* Huan-Bang Li NICT
* Kamran Sayrafian NIST
* Kento Takabayashi Toyo University
* Kristian Granhaug Novelda
* Lochan Verma Apple
* Marco Hernandez YRP-IAI
* Masayuki Hirata Osaka University
* Robert Zhou
* Run Chen NRT
* Ryuji Kohno YNU/YRP-IAI
* Seong-Soon Joo Korea Platform Service Technology (KPST)
* Shimi Shilo Huawei
* Sven Zeisberg HTW
* Takumi Kobayashi Nitech/YRP-IAI
* Tim Godfrey EPRI
* Vinod Kristem
* Weidong Tang NRT
* Yasuharu Amezawa Mobile Techno

**TG15.6ma 4th Session**

**Thursday, July 13th, 2023, AM 8:00- AM 10:00 Berlin Local Time**

**at the room 12 in 2nd Floor, Estrel Hotel, Berlin, Germany with Webex Virtual Room #2**

* 1. Meeting called to order AM 8:00

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).  
     Registration Information, By Chair *Ryuji Kohno*
  2. 802 Mtg. Non-Registration Consequences, by Chair *Ryuji Kohno*
  3. Confirmation of Agenda, doc.#23-0231-03-06ma, *Ryuji Kohno*
  4. Review of the last session TG6ma, *Ryuji Kohno*

**[Summary of Channel Models]**

* 1. Summary Table of Channel and Environmental Modeling Activities for BANs on TG15.6ma, *Takumi Kobayashi,* doc.# 15-23-0045-05 and 15-22-0519-02-006a.
     + Can you share MS-Word file of the channel model document? (*Kamran Sayrafian*)
       - Sure. I will upload to Mentor as rev.3. (*Takumi Kobayashi*)
  2. Low Complexity Adaptive Schemes for Energy Detection Threshold in the IEEE802,15,6 CSMA/CA, *Kamran Sayrafian,* doc.#15-23-0406-00-006a.
     + If the threshold is too high or low, performance would be worth. We can discuss and consider the optimum threshold. (*Ryuji Kohno*)
     + The threshold should be adaptively determined according to channel and environment as well as traffic loads in PHY and MAC. If geographical information of coexisting BANs and PANs is available, then the threshold for detection could be precisely determined. So, ranging and localization capability of 15.6ma may be useful to the detection, identification, recognition of entire coexisting environment and results in ensure enhanced dependability. (Ryuji Kohno)

**[Summary of Ranging and Localization]**

* 1. Ranging functionality of 15.6ma, *Ryuji Kohno*, doc.#15-23-0402-00.
     + To follow up the discussion in 4.7, ranging functionality of 15.6ma does involved in std. document for the enhanced dependability while ranging was not involved in std. 15.6-2012 but listed in TRD of 15.6ma. (*Ryuji Kohno*)

**[Summary of Channel Coding]**

* 1. Overview of FEC proposals for 15.6ma, *Marco Hernandez*, doc.# 15-22-0611-04.
     + While keep unique error-controlling with FEC and HARQ of 15.6ma, commonality useful for common implementation with 15.4ab, FEC for lower QoS levels 0-3 of packet priority order, common LDPC of 15.4ab are assigned while for higher QoS levels 4-7, various outer codes of concatenated coding with the same LDPC as inner code of QoS level 0-3. (*Ryuji Kohno*)

**[Summary of MAC Protocol]**

* 1. ~~MAC Protocol Proposal for Multiple BAN Environment (Level 1,2,3),~~ *~~Minsoo Kim,~~* ~~doc.#15- 22-0639-02~~
  2. ~~Proposed text for 6ma MAC - General framework elements & Beacon Access Phase, Seong-Soon Joo, doc.#15-23-0322-01 and 15-23-0367-01~~
  3. Overview and convergence of MAC proposals for 15.6ma, *Minsoo Kim*, 15-23-0408-00-006a
     + This document describes agreement to converge different two MAC proposals after discussion. (*Seong-Soon Joo*)
     + Length of Superframe should be revised as multiple times of fixed basic Superframe Length. (*Ryuji Kohno*)
     + Approach to revise 15.6-2012 to make it enhanced dependability and approach to add new MAC function could proceed in parallel. *(Marco Hernandez)*

**[Progress and Timeline]**

* 1. TG6ma draft revision, *Marco Hernandez*, doc.#15-23-0407-00-06ma.
     + Updated Timeline was proposed and approved.
     + Before September meeting, pre-Ballot will be scheduled to listen to comments from WG15 voting members.
  2. Progress report of 802.15.6ma, *Marco Hernandez,* 15-23-0056-02-06ma.
     + Each chapter and session of draft#1 document have been reviewed if it has done or TBD. Each part has be confirmed who and how to proceed.
  3. Draft discussion
     + Remote Teleco will be scheduled to prepare for all the document before pre-Ballot.
  4. Any other business?
     + No.
  5. Adjourn (9:53AM)

Attendees 12

***Name Affiliation***

* Seong-Soon Joo Korea Platform Service Technology (KPST)
* Carlos Aldana Meta
* Daisuke Anzai Nagoya Institute of Technology
* Hiroki Saito ARIS
* Kamran Sayrafian NIST
* Marco Hernandez YRP-IAI
* Masayuki Hirata Osaka University
* Minsoo Kim YRP-IAI
* Ryuji Kohno YNU/YRP-IAI
* Takafumi Suzuki NICT
* Takumi Kobayashi Nitech/YRP-IAI
* Yasuharu Amezawa Mobile Techno