IEEE P802.15

**Wireless Personal Area Networks**

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| Project | Task Group 15.6ma |
| Title | **TG15.6ma Meeting Minutes for March 2024**  |
| Date Submitted | March 14th , 2024 |
| Source | [Ryuji Kohno1,2 Marco Hernandez1 Takumi Kobayashi1,3 Minsoo Kim1, Daisuke Anzai3 Seong-Soon Joo4[1; YRP-IAI (YRP International Alliance Institute), Japan, 2; YNU (Yokohama National University), Japan, 3; NiTech(Nagoya Institute of Technology), Japan]4: KPST(Korea Platform Service Technology), Korea] | Voice: +81 90 5408 0611E-mail: kohno@ynu.ac.jp marco.hernandez@ieee.org kobayashi-takumi@yrp-iai.jp minsoo@minsookim.com anzai@nitech.ac.jp wowbk@kpst.co.kr |
| 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 March, 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 March 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. 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 the sessions.  |
| Purpose | Minutes of Dependability Electronic Interim Session on Webex, March 2024. |
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**TG15.6ma 1st Session**

**Monday, March 11th, 2024, 1:30 PM- 3:30 PM Local Denver Time**

**Room Mineral D, 3rd Floor, Hyatt Regency Convention Center - Denver, Co,**

**with Webex Virtual Room #2**

* 1. Meeting called to order 1:35 PM

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

※New rules about the attendance and voting rights have been explained.

* 1. Opening Report *Ryuji Kohno (YNU / YRP-IAI)* doc.# 802.15- 24-135-01-06a

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- 24-0134-01-06a

Þ Approved.

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

Þ Upon no comments on the January meeting minutes, doc. #15-24-0075-00-06a was approved.

**[Review]**

* 1. ~~Basic Consensus in MAC and PHY of Revision of IEEE802.15.6-2012 (IEEE802.15.6ma),~~ *~~Ryuji Kohno~~* ~~(YRP-IAI/YNU), doc.#23-0557-02-06a~~
		+ Skipped due to time limitation.
	2. Modified MAC Superframe Structure based on 15.6-2012 for Coexisting Multiple Dependable BANs, *Seong-Soon Joo*,doc.#24-0122-00-006a,
		+ 6ma-2024 MAC does not use CSMA/CA because UWB does not have carrier. (*Marco Hernandez*)
		+ How to define the group coordinator is important to avoid collisions and interferences. (*Ryuji Kohno*)
	3. TG6ma draft action items (Progress and Action Items for drafft#1.11), *Marco Hernandez,* (YRP-IAI), doc.# 23-0360-04.
		+ Remained uncompleted issues have been listed out and a way to complete them has been discussed.
	4. TG6ma Timeline (Rescheduling Timeline), *Marco Hernandez,* (YRP-IAI), doc.# 23-0361-04
		+ Target on May meeting to submit for the WG letter ballot. (*Marco Hernandez*).
	5. Discussion

※New rules about the attendance and voting rights have been explained.

* 1. Recessed at 3:29 PM by chair, *Ryuji Kohno*

**Attendees list**

Attendees 13

***Name Affiliation***

* Daisuke Anzai Nagoya Institute of Technology
* Huan-Bang Li NICT
* Kamran Sayrafian NIST
* Libra Xiao NRT
* Marco Hernandez YRP-IAI
* Masayuki Hirata Osaka University
* Rani Keren Huawei
* 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, March 12th, 2024, 8:00 AM- 10:00 AM Local Denver Time**

**Room Mineral D, 3rd Floor, Hyatt Regency Convention Center - Denver, Co,**

**with Webex Virtual Room #2**

* 1. Meeting called to order 8:00 AM

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.# 15-24-0134-02-06ma, *Ryuji Kohno*
	4. MAC superframe structure for coexisting multiple dependable BANs, *Seong-Soon Joo,* doc.# 15-24-0150-00-006a
		+ Mode 1 MAC in situation coexisting with new and old BANs or in-BAN and out-BAN cases are needed to be discussed carefully. (*Ryuji Kohno*)
		+ Some portion can be considered as a kind of optional specifications. (*Ryuji Kohno*)
		+ New MAC explained in page 8 “6ma-2024” is current MAC which we are mainly focusing on. (*Marco Hernandez*)
		+ New BAN superframe can be controlled however, the superframe of old BAN cannot be changed. We need to consider and describe the details how to manage these two types of BANs coexisting. (*Ryuji Kohno*)
		+ We had discussed to group coordinator selection procedure but not decided yet. Minsoo’s proposal is using number of nodes covered by a coordinator. Also we can consider about the number of nodes of higher priority. We can continue to discuss about the procedure to selection of group coordinator. (*Ryuji Kohno*)
		+ From the view point of efficiency evaluation, do you have any opinion, Daisuke? (*Ryuji Kohno*)
			- Efficiency is quite depending on the parameters. It is needed to determine these parameters for the simulations. (*Daisuke Anzai*)
			- QoS levels also needed to be considered together with simulation parameters. (*Ryuji Kohno*)

**[MAC & Ranging]**

* 1. Simulation results for Nagoya I. T. and YRP-IAI MAC proposal Based on TG6ma Channel Model, *Daisuke Anzai*, doc.#15-23-0352-04-006a
		+ We need to evaluate delay time as well as throughput. (*Ryuji Kohno*)
			- These results are tentative results and we are going to evaluate more detail. (*Daisuke Anzai*)
		+ More realistic parameters like superframe length can provide more precise results of simulations. We can discuss later. (*Seong-Soon Joo*)
	2. Preliminary Evaluation on Ranging Accuracy with Interference Cancellation in Coexistence Environments, *Daisuke Anzai*, doc.#15-24-0057-01-006a
		+ In your simulation, ranging performance between coordinator to node has been evaluated however ranging for coordinator to coordinator is also important. (*Ryuji Kohno*)
		+ In my understanding, with and without M-sequence simulations, have you simulated the performance in pulse level or packet level? (*Ryuji Kohno*)
			- Packet header structure has been considered in our simulations. (*Daisuke Anzai*)
			- You have simulated in sequence level of simulations based on cross-correlation of different M-sequence for each users like CDMA approach. Am I correct? (*Ryuji Kohno*)
			- Yes, it is. (*Daisuke Anzai*)
	3. Joint work with 802.1; Draft PAR and CSD 802.1ACea: Amendment to IEEE Standard 802.1AC-2016, *Marco Hernandez*, doc.# 15-23-453-01 & 15-23-454-01
		+ Essentially they were focusing on wired connection but now also focused on wireless? (*Ryuji Kohno*)
			- Yes, they are. (*Marco Hernandez*)
		+ What is next step for them? (*Ryuji Kohno*)
			- They discussed about timeline. (*Marco Hernandez*)
	4. Recessed (9:59 AM)

Attendees 12

***Name Affiliation***

* Daisuke Anzai Nagoya Institute of Technology
* Kamran Sayrafian NIST
* Libra Xiao NRT
* Marco Hernandez YRP-IAI
* Masayuki Hirata Osaka University
* Radhakrishna Canchi Kyosera International Inc
* Ryuji Kohno YNU/YRP-IAI
* Seong-Soon Joo Korea Platform Service Technology (KPST)
* Stuart Kerry OK-Brit; Self
* Takafumi Suzuki NICT
* Takumi Kobayashi Nitech/YRP-IAI
* Yasuharu Amezawa Mobile Techno

**TG15.6ma 3rd Session**

**Wednesday, March 13th, 2024, 9:00 AM- 10:00 AM Local Denver Time**

**Room Mineral D, 3rd Floor, Hyatt Regency Convention Center - Denver, Co,**

**with Webex Virtual Room #2**

* 1. Meeting called to order 9:05 AM

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.#24-0134-03-06ma, *Ryuji Kohno*
	4. Review of the last session TG6ma, *Ryuji Kohno*
	5. ~~Comment-Resolution Database for Pre-Ballot WG,~~ *~~Marco Hernandez,~~* ~~doc.# 23-0476-13~~
		+ Skipped as limited meeting time. (*Ryuji Kohno*)
	6. ~~Basic Consensus in MAC and PHY of Revision of IEEE802.15.6-2012 (IEEE802.15.6ma),~~ *~~Ryuji Kohno~~*~~,~~
		+ Skipped as limited meeting time. (*Ryuji Kohno*)

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

* 1. Performance Evaluation of Channel Coding Based on TG6ma Channel Model for Some Classes of Coexistence, *Daisuke Anzai,* doc.# 15-24-0051-01
		+ We have discussed about interleaver in January meeting. (*Ryuji Kohno*)
			- Our simulation does not include interleaver. (*Kento Takabayashi*)
		+ We have random interleaver in the draft already. (*Marko Hernandez*)
	2. Hybrid ARQ Scheme for High QoS Packets in High Class of Coexistence of IEEE 802.15.6ma, *Kento Takabayashi*, doc.# 23-0576-02
		+ We discussed a lot about the HARQ for TG6ma standard. Now we need to find specified parameters for implementation and define them in the document. (*Ryuji Kohno*)
	3. Evaluation of IEEE 802.15.6ma Ultra-wideband Physical Layer Utilizing Super Orthogonal Convolutional Code, *Kento Takabayshi*, doc.# 23-00562-08
		+ Data rate in the simulation is quite low. We would like to wait some results in more higher data rate used in our new BAN standard. (*Ryuji Kohno*)
		+ We have to find the optimum parameters for the code sets and the other parameters in PHY layer technologies. (*Ryuji Kohno*)
		+ LDPC and BCC is used to achieve compatibility with the other standards like 4ab. (*Marko Hernandez*)
		+ FEC issues should be finalize for the draft document. (*Ryuji Kohno*)

Recessed (10:00 AM)

Attendees 11

***Name Affiliation***

* Daisuke Anzai Nagoya Institute of Technology
* Kamran Sayrafian NIST
* Kento Takabayashi Toyo University
* Marco Hernandez YRP-IAI
* Masayuki Hirata Osaka University
* Radhakrishna Canchi Kyosera International Inc
* Ryuji Kohno YNU/YRP-IAI
* Seong-Soon Joo Korea Platform Service Technology (KPST)
* Takafumi Suzuki NICT
* Takumi Kobayashi Nitech/YRP-IAI
* Yasuharu Amezawa Mobile Techno

**TG15.6ma 4th Session**

**Thursday, March 14th, 2024, 8:00 AM- 10:00 AM Local Denver Time**

**Room Mineral D, 3rd Floor, Hyatt Regency Convention Center - Denver, Co,**

**with Webex Virtual Room #2**

* 1. Meeting called to order 8:00 AM
	2. Roll Call *Ryuji Kohno*
	Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).
	Registration Information, By Chair *Ryuji Kohno*
	3. 802 Mtg. Non-Registration Consequences, by Chair *Ryuji Kohno*
	4. Confirmation of Agenda, doc.#24-0134-04-006a, *Ryuji Kohno*
	5. Review of the last session TG6ma, *Ryuji Kohno*
	6. Overview of 15.6ma MAC harmonization, doc.#15-24-0078-01-006a, *Marco Hernandez, Seong-Soon Joo*.
		+ What is dynamic CAP and CFP? How we can decide length of CAP and CFP period? (*Ryuji Kohno*)
			- Will be decided by scheduler. We will continue to discuss more details.(*Marco Hernandez*)
		+ Looks good but still we need to carefully check in any cases like more dynamic environments. (*Ryuji Kohno*)
		+ What is the duration in MAC frame? Why we need this information? (*Seong-Soon Joo*)
			- We have to inform the length of CAP and the other periods. (*Marco Hernandez*)
			- Also we need them to bridging with higher layer infrastructure. (*Marco Hernandez*)
		+ All coordinator can hear each other? (*Kamran Sayrafian*)
			- Yes, that is assumption. Coordinator can hear all the others. But nodes cannot because network coordination is not task for nodes. (*Marco Hernandez*)
			- Hidden node problem? (*Kamran Sayrafian*)
			- Might be, yes. We will consider later. (*Marco Hernandez*)
	7. Review of draft#1.14 for Pre-Ballot WG, *Marco Hernandez, Daisuke Anzai, Seong-Soon Joo, Takumi Kobayashi, Minsoo Kim, Ryuji Kohno*
	8. Comment-Resolution Database for Pre-Ballot WG, *Marco Hernandez*, *Ryuji Kohno*, doc.#23-0476-13

**[Summary of Channel Models, Channel Coding, and Interference Mitigation]**

* 1. TG6ma Channel Model Document for Enhanced Dependability, *Takumi Kobayashi*, doc.#22-0519-04, 24-0179-006a
	2. Comments to channel-model-document, *Takumi Kobayashi*, doc.#23-0605-01
	3. Interference Mitigation Schemes in Class 3, 5, 6, and 7 of Coexistence in TG6ma, *Takumi Kobayashi,* doc.#24-0073-00

**[Summary of MAC Protocol]**

* 1. Progress report of 802.15.6ma, *Marco Hernandez,* doc.# 23-0056-04
	2. TG6ma Timeline(Rescheduling Timeline), *Marco Hernandez,* doc.#23-0361-04
		+ Two months extended. (*Marco Hernandez*)
	3. Draft discussion, *All*
	4. Any other business?
		+ No.
	5. Adjourn (9:55 AM)

Attendees 20

***Name Affiliation***

* Ann Krieger U.S. DoD
* Frederic Nabki SPARK Microsystems
* Huan-Bang Li NICT
* Josef Gruber IFX
* Kamran Sayrafian NIST
* Libra Xiao NRT
* Marco Hernandez YRP-IAI
* Masayuki Hirata Osaka University
* Rani Keren Huawei
* Run Chen NRT
* Ryuji Kohno YNU/YRP-IAI
* Seong-Soon Joo Korea Platform Service Technology (KPST)
* Shang-Te Yang -
* Sven Zeisberg HTW
* Takafumi Suzuki NICT
* Takumi Kobayashi Nitech/YRP-IAI
* Xiliang Luo Apple
* Yasuharu Amezawa Mobile Techno
* Zhepeng Ma Calteah
* Zhonxing Yu Calterah -