IEEE P802.15

**Wireless Personal Area Networks**

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| Project | Task Group 15.6a |
| Title | **TG15.6a Meeting Minutes for November 2021**  |
| Date Submitted | November 17th, 2021 |
| Source | [Ryuji Kohno1,2 Marco Hernandez1 Takumi Kobayashi2 Minsoo Kim1][1; YRP-IAI (YRP International Alliance Institute), Japan, 2; YNU (Yokohama National University), Japan] | Voice: +81 90 5408 0611E-mail: kohno@ynu.ac.jp marco.hernandez@ieee.org kobayashi-takumi-ch@ynu.ac.jp minsoo@minsookim.com |
| Re: | Meeting Minutes |
| Abstract | Since PAR and CSD of SG15.6a as amendment of existing IEEE802.15.6-2012 for WBAN with enhanced dependability was approved by NesCom in September, Task Group TG15.6a 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 TG15.6a 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 6a. To harmonize activities of TG15.6a, 15.4ab and 15.14 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 TG15.4a and 14 and change to revision from amendment.  |
| Purpose | Minutes of Dependability Electronic Plenary Session on Webex, November 2021 |
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**TG15.6a 1st Session**

**Wednesday, November 10th, 2021, AM 9:10-11:00 ET**

**Room: Webex Virtual Conference**

* 1. Meeting called to order AM 9:10

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno,* doc.# 802.15- 21-0543-02-06a

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

Registration for 802 LMSC Plenaries and 802 Wireless Interims, Information,

doc.#15-21-0596-00-0000, By Chair Ryuji Kohno

* 1. Opening Report *Ryuji Kohno (YNU / YRP-IAI)* doc.# 802.15- 21-0544-00-06a

Chair showed IEEE Patent policy.

Chair issued Call for Potentially Essential Patents.

Þ No essential intellectual property in the scope of SG6a was declared.

Chair presented agenda of this meeting doc.# 802.15- 21-0543-02-06a

Þ Approved.

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

Þ Upon no comments on the May meeting minutes, doc. #15-21-0513-00-06a was approved.

**[Review]**

* 1. TG, SG15.6a & IG DEP Activity for Amendment of IEEE802.15.6 Wireless BAN with Enhanced Dependability, *Ryuji Kohno (YNU / YRP-IAI)* doc. # 21-0023-03-06dep
	2. Motion of TG officers, *Marko Hernandez (YRP-IAI)* doc. # 21-0567-03-06a
		+ Chair; Ryuji Kohno (YNU/YRP-IAI), Vice-chair; Marco Hernandez (YRP-IAI), Technical Editor; Minsoo Kim (YRP-IAI), Secretary; Takumi Kobayashi (YNU)
		+ Moved by Minsoo Kim(YRP-IAI), Seconded by Huang Bang Li(NICT)
		+ Approved.
	3. PAR and CSD of IEEE802.15.6a, *Marco Hernandez, Ryuji Kohno,* doc. # 21-0259-04-06a and doc.#21-0260-03-06a

**[Review for Technical Report]**

* 1. Application Matrix: use cases for automotive industry, *Ryuji Kohno*, doc.# 17-0398-00-0dep
		+ Merged to 1.7.
	2. ~~Application Matrix: use cases for medical fields: Dependable High Capacity BAN for Brain-Machine Interface, Masayuki Hirata, doc.#19-0545-01-0dep~~
		+ Skipped
	3. Channel and environment models including EMC&EMI for human and vehicle body Area networks(HBAN and VBAN), *Takumi Kobayashi*, doc.#21-0244-06-06a
	4. Channel and Environmental Models Classification for Vehicle Body Area Network (VBAN) on TG15.6a, *Takumi Kobayashi*, doc.#21-0560-00-06a
	5. Draft Technical Requirement for IEEE802.15.6a, *Marco Hernandez*, doc.#19-0577-00-06a
		+ Is implant not included in this amendment? (*Kamran Sayrafian*)
			- Implant is also included in this amendment. (*Ryuji Kohno*)
	6. Recessed.

**Attendees list**

Attendees 43

* Ryuji Kohno (YNU/YRP-IAI)
* Marco Hernandez (YRP-IAI)
* Minsoo Kim (YRP-IAI)
* Takumi Kobayashi (YNU)
* Benjamin Rolfe (Blind Creek Associates)
* Jerome Henry (Cisco)
* Kai Lennert Bober (Fraunhofer HHI)
* Seong-Soon Joo (ETRI)
* Stephan Sand (German Aerospace Center DLR)
* Tetsushi Ikegami (Meiji Univ.)
* Akifumi Kasamatsu (NICT)
* Billy Verso (Qorvo)
* Carlos Aldana
* Clark Palmer (Meteorcomm LLC)
* Claudio da Silva (Meta)
* Daoud Serang
* Frank Leong (NXP)
* Friedbert Berens (FBConsulting)
* Gary Stuebing
* Ghiath Rias Al-Kadi (NXP)
* Hiroki Saito (ARIS)
* Hiroshi Harada (Ukyoto)
* Huan-Bang Li (NICT)
* Hugues de Perthuis (NXP)
* Igor Dotlic (Qorvo)
* Iwao Hosako (NICT)
* Jarek Niewczas (Qorvo)
* Joe Polland
* Juha Juntunen (Meteorcomm)
* Kamran Sayrafian (NIST)
* Kristian Granhaug (Novelda)
* Masatoshi Fukunaga
* Mingda Zhou
* Norihiko Sekine (NICT)
* Pooria Pakrooh (Qualcomm)
* ST - Jean-Marie Andre(Apple)
* Sven Zeisberg (Zigpos)
* Teyoung Ha (Samsung)
* Takashi Kuromachi (Lapis)
* Tetsushi Yamamoto
* Thomas Almholt
* Yasuharu Amezawa (Mobile Techno)
* Zhenzhen Ye (Red Point)

**TG6a 2nd Session**

**Thursday, November 11th 2021, AM 9:10-11:00 ET**

**Room: Webex Virtual Conference**

* 1. Meeting called to order AM 9:10

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).
	Registration for 802 LMSC Plenaries and 802 Wireless Interims, Information, doc.#15-21-0596-00-0000, By Chair Ryuji Kohno
	2. 802 Mtg. Non-Registration Consequences, doc.#21-15-0567, By Chair Ryuji Kohno (YNU / YRP-IAI)
	3. Review today’s agenda, *Ryuji Kohno,* doc.# 21-0544-03-06a
		+ Approved.

**[Presentation]**

* 1. ETSI SmartBAN in Medical/Wellbeing IoT, *Matti Hamarinen*, doc.# 15-21-0583-00-006a
	2. [Discussion] Harmonization with ETSI Smart BAN
		+ Target range is 1.5 ~ 2m ?(*Benjamin Rolfe*)
			- Yes, at the moment. (*Matti Hamarainen*)
			- We are going to make simple and easy robust communication. (*Matti Hamarainen)*
		+ Do you assume about transmission power like typically -40dBm? *(Benjamin Rolfe)*
			- Not discussed about implementation issues. (*Matti Hamarainen*)
		+ We defined 0 to 7 priority in std.15.6. ETSI smart BAN defined 4 priorities. Who decides the priority order? (*Ryuji Kohno*)
			- Smart coordinator should does. (*Matti Hamarainen*)
		+ You have 40 chnnels as CCH and 37 channels as DCH. Do they have co-existing problem? *(Minsoo Kim)*
			- We are assume use case within 2m so, we assume that it is not so big problem as physically separated. *(Matti Hamarainen)*
	3. Harmonization with TG4ab and TG14, *Marco Hernandez*, doc.#15- 21-0510-00-6a

**[Review of Last Meeting on November 10th]**

* 1. Selected Focused Use Cases, *Ryuji Kohno*, doc.#21-15-0DCN-00-6a
	2. Channel and Environmental Models Classification for Vehicle Body Area Network(VBAN) on TG15.6a, *Takumi Kobayashi*, doc.# 21-15-0560-00-6a
	3. Draft Technical Requirement for IEEE802.15.6a, *Marco Hernandez*, doc.#21-15-0577-6a
		+ Priority and QoS issues should be added onto the TRD. (*Ryuji Kohno*)
		+ Aggregate data rate issues should be added onto the TRD. *(Ryuji Kohno)*
		+ You consider to One BAN? *(Kamran Sayrafian)*
			- We are considering multiple BAN. *(Marco Hernandez)*
		+ What is the background to define the communication range 5m or 10m? *(Kamran Sayrafian)*
			- HBAN could be approaching to the vehicle so we changed as 10m. *(Marco Hernandez)*
			- Like a key-less entry system assumes similar coverage range. *(Ryuji Kohno)*
			- One VBAN is enough in my opinion. If VBAN does not have transmission power limitation, one VBAN can cover whole of vehicle. (*Kamran Sayrafian*)
			- We also have to look at channel and bandwidth. If some devices in the same vehicle, each device cannot use the same channels. We have to consider about channels like 15.4a. (*Ryuji Kohno*)
		+ How about definition of maximum transmission power and consider safety issue. (*Kamran Sayrafian*)
			- As we assumes, even bus and pick-ups, 5m and 10m is enough to cover the vehicle and it is easier way to define the coverage range. (*Ryuji Kohno*)
	4. Recess

Attendees 43

* Ryuji Kohno (YNU/YRP-IAI)
* Marco Hernandez (YRP-IAI)
* Minsoo Kim (YRP-IAI)
* Takumi Kobayashi (YNU)
* Seven Zeisberg (HTW)
* Yoshio Kashiwagi (Nissin Systems)
* *Matti Hamalainen (University of Oulu); invited guest speaker*
* Jean-Marie Andre (ST)
* Benjamin Rolfe (Blind Creek Associates)
* Seong-Soon Joo (ETRI)
* Sangsung Choi (KMU)
* Stephan Sand (German Aerospace Center DLR)
* Tetsushi Ikegami (Meiji Univ.)
* Akifumi Kasamatsu (NICT)
* Bernhard Grobwindhager (NXP)
* Billy Verso (Qorvo)
* Carl Murray (Qorvo)
* Chris Calvert
* Clark Palmer (Meteorcomm LLC)
* Daoud Serang
* Frank Leong (NXP)
* Gary Stuebing
* Hiroki Saito (ARIS)
* Hiroshi Harada (UKyoto)
* Igor Dotlic (Qorvo)
* Iwao Hosako (NICT)
* Jarek Niewczas (Qorvo)
* Joe Polland
* Jonghoe Koo (Samsung)
* Kamran Sayrafian (NIST)
* Kiyoshi Tada (ARIS)
* Larry Zakaib (Spark Microsystems)
* Masayuki Hirata (Osaka University)
* Mingda Zhou
* Norihiko Sekine (NICT)
* Phil Beecher (WiSUN)
* Raphael Guimond
* Srivatha (NXP)
* Takashi Kuromachi (Lapis)
* Tetsushi Yamamoto
* Wolfgang Kuechler (NXP)
* Xiliang Luo (Apple)
* Yasuharu Amezawa (Mobile Techno)

**SG15.6a/4ab/14 Joint Session**

**Monday, November 16th, 2021, AM 11:10-12:00 ET**

**Room: Webex Virtual Conference**

* 1. Meeting called to order AM 11:00

By Chairs Clint Powell, Benjamin Rolfe and Ryuji Kohno

* 1. Registration for 802 LMSC Plenaries and 802 Wireless Interims, Information, doc.#15-21-0596-00-0000, By Chairs Clint Powell, Benjamin Rolfe and Ryuji Kohno
	2. Roll Call *Clint Powell*
	Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).
	Chair showed IEEE Patent policy.
	Chair issued Call for Potentially Essential Patents.
	3. Joint session 15.6a, 15.4ab, 15.14 November Plenary Meeting, *Marco Hernandez*, doc.#15-21-0604-00-6a
		+ Presentation by Clint is added to TG6a next session.
		+ TG6a members will join to TG4ab session.

* 1. Adjourn

**Attendees list**

Attendees 77

* Clint Powel (Meta)
* Marco Hernandez (YRP-IAI)
* Pat Kinney
* Chris Hett (L+G)
* Hugues de Perthuis (NXP)
* Srivathsa (NXP)
* Yongsen Ma (Redpoint Positioning)
* Aniruddh Rao (Samsung)
* Benjamin Rolfe (Blind Creek Associates)
* Jonghoe Koo (Samsung)
* Harry Bims (Bim’s Laboratories)
* Joerg Robert (TU Ilmenau/Fraunhofer IIS)
* Minsoo Kim (YRP-IAI)
* Oded Redlich (Huawei)
* Shoichi Kitazawa (Muroran IT)
* Stephan Sand (German Aerospace Center DLR)
* Young Liu (Apple)
* Tetsushi Ikegami (Meiji University)
* Bharat Bhatia (3dB)
* Ankur (Samsung)
* Ann Krieger (U.S. DoD)
* Bernhaard Groβwindhager (NXP)
* Billy Verso (Qorvo)
* Bin Tian (Qualcomm)
* Boris Danev (3db)
* Carl Murray (Qorvo)
* Carlos Aldana (Facebook)
* Clark Palmer (Meteorcomm LLC)
* Clint Chaplin (SRA)
* Daoud Serang (CML Microcircuits)
* David Barras (3db)
* David Yang (Huawei)
* Dries Neirynck
* Ersen Ekrem　　　　　　（Apple）
* Frederic Nabki (Spark)
* Friedbert Berens (FBConsulting)
* Gary Stuebing
* Hendrik Seidel (NXP)
* Henk de Ruijter Silicon Labs
* Hyunseob Oh
* Igor Dotlic (Qorvo)
* Iwao Hosako (NICT)
* Jack Zou
* Jarek Niewczas (Qorvo)
* Kamran Sayrafian (NIST)
* Kangjin Yoon (Meta)
* Kiyoshi Tada (ARIS)
* Larry Zakaib (Spark Microsystems)
* Lisa Meihac (Qorvo)
* Lochan Verma
* Masatoshi Fukunaga
* Mingda Zhou
* Mohammed Rahamani (Spark Microsystems)
* Nicolas Paillusseau (Spark Microsystems)
* Phil Beecher (WiSUN)
* Pooria Pakroh (Qualcomm)
* Rani Keren (Huawei)
* Raphael Guimond
* Rias Al-kadi (NXP)
* Riku Pirhonen (NXP)
* Robert Golshan
* Robert Muller
* Ryuji Kohno (YNU/YRI-IAI)
* Junyoung Choi (Samsung)
* Sangsung Choi (KMU)
* Shigenobu Sasaki (Niigata University)
* Shimi Shilo (Huawei)
* Jean-Marie Andre (ST)
* Stuart Kerry (OK-Brit; Self)
* Sven Zeisberg (Zigpos)
* Takumi Kobayashi (YNU)
* Thomas Almholt
* Varun Reddy (Qualcomm)
* Wolfgang Kuechler (NXP)
* Xiliang Luo (Apple)
* Youngwan So
* Zhenzhen Ye (Redpoint positioning)

**SG6a 3rd Session**

**Tuesday, November 16st 2021, AM 9:10-11:00 ET**

**Room: Webex Virtual Conference**

* 1. Meeting called to order AM 9:10

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).
	Registration for 802 LMSC Plenaries and 802 Wireless Interims, Information, doc.#15-21-0596-00-0000, By Chair Ryuji Kohno
	2. 802 Mtg. Non-Registration Consequences, doc.#21-15-0567, By Chair Ryuji Kohno (YNU / YRP-IAI)
	3. Review the today’s agenda, *Ryuji Kohno,* doc.# 21-15-0544-00-06a and doc.#21-15-543-05-tg15-6a
		+ Approved

**[Review of Last Meeting on Nov. 11th]**

* 1. Solution for Harmonization with ETSI Smart BAN, *Ryuji Kohno*, doc.# 21-15-0606-00-6a
	2. Solution for Harmonization among SG15.6a, SG15.4ab, and TG15.14 Using UWB PHY, *Marco Hernandez*, doc.# 21-15-0604-00-6a
		+ We can discuss with 15.4ab and 15.6a about co-existing, commonality and inter-operability issues on telecon before next January meeting. (*Ryuji Kohno*)
		+ Multiple use-case has trade-off on system complexity. (*Benjamin Rolfe*)
	3. Discussion on Use case document, *Marco Hernandez* and *Kamran Sayrafian.*
		+ We need some volunteers support us to discuss on use-case issues. (*Marco Hernandez*)
			- Dr. Kamran Sayrafian agreed to join to next telecon.
		+ We need opinion from experts on vehicular environment to consider about VABN surrounding use-cases. (*Kamran Sayrafian*)

**[Feasible Solution for Coexistence with discussion]**

* 1. Coordinator-to-coordinator communication for Body Area Networks, *Minsoo Kim,* doc.# 21-15-0582-02-6a
		+ Is communication between coordinator to coordinator of different BANs still covered in 15.6a? (*Kamran Sayrafian*)
			- Yes. (*Ryuji Kohno* and *Minsoo Kim*)
		+ Mobility of coordinator for HBAN and coordinator for VBAN can be considered. (*Kamran Sayrafian*)
			- Optimum configuration can be chosen from several network topology by cognitive radio concept. *(Ryuji Kohno)*
			- This issue can be considered by combining with handover technologies. (*Minsoo Kim*)
			- Complexity and power consumption are very important from the viewpoint of industry. (*Kamran Sayrafian*)
			- We will consider for both of mandatory requirement and optional functionalities to take a balance of power consumption and functionality. (*Ryuji Kohno*)

**[Finalizing Technical Requirement]**

* 1. Discussion on Harmonization with TG4ab, *Clint Powell* and *Benjamin Rolfe,* doc.#15-21-0297-00-04ab
		+ Ben explained Technical Guideline Document; TGD of 15.4ab.
		+ On p.3, “must” means mandatory requirement and “may” on p.4 are optional? (*Ryuji Kohno*)
			- “Must” means something must be addressed and considered in 4ab, and “may” means something may be considered. (*Benjamin Rolfe*)
	2. Summarizing Technical Requirement, *Marco Hernandez* and *Ryuji Kohno*, doc.# 21-15-0577-02-06a and doc.# 21-15-0615-00-06a
		+ All revisions have been approved.
		+ What does BAN Density means? (*Kamran Sayrafian*)
			- It means the number of nodes in 20m \* 20m square meter. (*Marco Hernandez*)
			- We can change as TBD and keep discussion on any proposals. (*Ryuji Kohno*)
	3. TG motion to technical requirement draft doc.# 21-15-0615-00-06a.
		+ Moved by Marco Hernandez, Seconded by Minsoo Kim.
		+ Approved by unanimous consent.
	4. Other businesses ex. Teleco etc. for January Meeting?
		+ We will announce by mail distribution to next teleco before January meeting.
		+ No other business.
	5. Adjourn

Attendees 40

* Ryuji Kohno (YNU/YRP-IAI)
* Marco Hernandez (YRP-IAI)
* Minsoo Kim (YRP-IAI)
* Takumi Kobayashi (YNU)
* Sven Zeisberg (HTW)
* Benjamin Rolf (Blind Creek Associates)
* Chunyu Hu (Meta)
* Clint Powel (Meta)
* Curl Murray (Qorvo)
* Joerg Robert (TU Ilmenau/Fraunhofer IIS)
* Oded Redlich (Huawei)
* Seong-Soon Joo (ETRI)
* Akifumi Kasamatsu (NICT)
* Ankur (Samsung)
* Bernhard Grobwindhager (NXP)
* Dag T. Wisland (Novelda AS)
* Hiroki Saito (ARIS)
* Hiroshi Harada (UKyoto)
* Hugues de Perthuis
* Iwao Hosako (NICT)
* Joe Polland
* Kamran Sayrafian (NIST)
* Kiyoshi Tada (ARIS)
* Larry Zakaib (Spark Microsystems)
* Masatoshi Fukunaga
* Masayuki Hirata (Osaka University)
* Mohammad Rahmani (SPARK microsystems)
* Mingyu Lee (Samsung)
* Norihiko Sekine (NICT)
* Sangsung Choi (KMU)
* Shimi Shilo (Huawei)
* Jean-Marie Andre (ST)
* Pooria Pakrooh (Qualcomm)
* Takashi Kuromachi (Lapis)
* Tetsushi Yamamoto
* Tetsushi Ikegami (Meiji University)
* Thomas Almholt (TI)
* Yasuharu Amezawa (Mobile Techno)
* Youngwn So
* Zhenzhen Ye (Redpoint Positioning)