IEEE P802.15

**Wireless Personal Area Networks**

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| --- | --- |
| Project | Study Group 15.6a |
| Title | **Meeting Minutes for July 2021**  |
| Date Submitted | July 20th, 2021 |
| Source | [Ryuji Kohno1,2 Marco Hernandez1 Takumi Kobayashi1,2 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 | By the discussion in previous meetings, SG15.6a has been focusing on amendment of existing IEEE802.15.6-2012 for WBAN with enhanced dependability and has prepared draft PAR and CSD with detail technical requirement in cases of WBAN for medical use case for human body and for automotive use case for vehicle body with their connected use cases. Necessity and demand for amendment of std.15.6 WBAN with enhanced dependability; amendment in 15.6 MAC and PHY for contention and interference in case of overlaid same std. BANs and co-exiting different UWB and narrow band wireless networks and bi-directional traffic of packets between senso, actuator nodes and coordinator for sensing and controlling feedback loop etc. and additional functionality. Corresponding to questions and comments of EC meeting for our draft of PAR and CSD for the amendment of IEEE802.15.6-2012, we have discussed and finalized revision of PAR and CSD to prepare for motion in WG closing session this week. Major issues revised in PAR and CSD at four SG15.6a sessions include IEEE802.1 TSN for MAC, EMC/EMI in a vehicle body, human BAN(HBAN), vehicle BAN(VBAN) with and without their mutual interaction and interference etc. Preparation for motion to be approved for submission to the WG for its approval and that the EC be requested to forward the PAR to NesCom. |
| Purpose | Minutes of Dependability Electronic Plenary Session on Webex, July 2021 |
| 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. |
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**SG15.6a 1st Session**

**Wednesday, July 14th, 2021, AM, 9:00-11:00 EDT**

**Room: Webex Virtual Conference**

* 1. Meeting called to order AM 9:00

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*

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

* 1. Opening Report *Ryuji Kohno (YNU / YRP-IAI)* doc.# 802. 15- 21-0353-00

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. 15-21-0364-00-06a

* Question about joint session. The UWB is a common PHY for 3 TGs. The same PHY or MAC layer might be used for 3 TGs or not? (*Kenichi Mori*)
	+ It would be useful, but of course it is not mandatory. Some kind of inter-operability would be minimum. (*Ryuji Kohno)*
* Other TGs might consider the inter-operability of the PHY or MAC layer with this group? (*Kenichi Mori*)
	+ Yes. Individual TGs or SGs focus on the specification of their PHY and MAC. But in our case, SG6a is an amendment of the 15.6 with enhanced dependability. The meaning of the enhanced dependability is that we would like to guarantee the inter-connectivity in the case of the coexistence with other UWB systems, like 15.4a, 4f and 4z which are also using UWB but have different specifications such as frame size. Our discussion point is how to guarantee enough performance in such messy environments. (*Ryuji Kohno)*

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. #15-21-0314-01-06a was approved.

**[Review]**

* 1. SG15.6a & IG DEP Activity for Amendment of IEEE802.15.6 Wireless BAN with Enhanced Dependability, *Ryuji Kohno (YNU / YRP-IAI)* *doc. #* *21-0023-02-0dep*
	2. (*Merged to 1.7*) Comments on PAR of IEEE802.156a from 802.3, *Ryuji Kohno, Marco Hernandez*

**[Presentation and discussion]**

* 1. Draft Responses to EC’s comments on PAR of IEEE802.15.6a from 802.3, *Marco Hernandez, Ryuji Kohno,* doc.#21-0384-00-06a
* I think the basic problem I see in this description is that you have here a human BAN, an independent network around human body. There is an exact use case we have today. What would be sufficient is just some kind of access point in the car to connect there to whatever the car is doing there.
 But I think what you want to have is a wireless vehicular area network, which is based on similar technology because the requirements are pretty similar. You have similar real time experiments, similar problems requirements and all the stuffs. So, instead of specifying separated network, which would cover this wireless area vehicular network, and human area network, you want to have it together. That is not directly written in the documents in the moment, not surely absolutely clear.
 I think that you will have use cases which are completely independent from the human body area network, only covering car stuffs. But you will also have human BAN use cases which also independent from the car side. But you will have also common use cases which can use same spectrum, you can optimize spectrum use, you can have same regulatory and environment requirements. This would make a lot of sense.
 And I think it is fine to add that instead of having 2 separated things which are separately specified, we want to reuse what we already have for body area network and vehicular area network. By doing so optimized communication between both domains can be done. (*Friedbert Berens*)
	+ Very good point. Our statements are not sufficient. I can refer your comments.
	 In my understanding, independently standardized networks could also try to solve contention issues by MAC bridge technology or something else. But in some use cases, if a car and a human body had a common standardized network, they could be more optimized and interact better.
	 Maybe we should also categorize use cases, vehicle network and human body network cases, and combined cases.
	 If we have common standard, it may be better than independent ones. Let us make such a revision later. (*Ryuji Kohno)*
* In the response “interaction between HBAN and VBAN,” I think “interaction” is too week. I think we are talking about “integration,” and that would be a better wording here. The “interaction” can also be just a bridge and something like that. but I think that is not what you want. You want to have an integrated system, a same system. (*Friedbert Berens*)
	+ Thank you for your suggestion. (*Ryuji Kohno)*
	1. (*Skipped*) Comments for 21-0365-0

**[Discussion]**

* 1. Harmonization between SG 15.6a and SG 15.4ab, and TG15.14 using UWB PHY, *Marco Hernandez, Ryuji Kohno*, doc.# 21-0153-00
* You want to share some common issues with the 15.14? (*Alberto Gallegos*)
	+ That is a very good question, because what 15.14 is that just taking the closest from 15.4 related UWB and put it into a new document. In fact, there is already published standard. So, we may more focus on harmonization with 15.4ab. (*Marco Hernandez)*
* My question is more general. I have not read the draft yet, but I read the std. 15.6-2012. Even though it shares some other common things with some application-wise, same as 15.14, 15.6 seems not to be a whole document described primitives in MAC and PHY layers. So, I was wondering if there is an intention to organize the whole documents like each function in PHY and MAC into primitives. (*Alberto Gallegos*)
	+ What do you mean primitives? Interface? I think std.15.6-2012 document has described good enough to minimum specification to be implemented. *(Marco Hernandez)*
* I was wondering why the documents are not organized in the same way as other standards which are used to describe exact primitives. If you are planning to share some common specification in UWB PHY. (*Alberto Gallegos*)
	+ At that time of establishing the 15.6, there were different TGs which described specification with different styles due to intension of different participants and stakeholders. So, the description styles were not always the same. (*Marco Hernandez*)
	+ In my expectation, 15.14 is establishing a new standard for the existing PHY. I think it is more general with multiple use cases covered. Some of their use case may be same as what we are focusing on at 15.6a, for the body area networks, but 15.14 may cover more use cases and applications. (*Ryuji Kohno*)
* I felt that they both share the same DNA because of the superframes and some similar approaches. There is a packet priority order in some use cases or applications, and there are some other shared common issues. Organization of the documents are a bit hard to be understood. For the implementation point of view, I think it would be better if they both organize in a similar way to other standard documents.
	+ Yes, I also had similar experience. In fact, if we cover too many use cases, it would be too complicate to implement. The simpler UWB PHY may be, the easier to be implemented. In my understanding, basic UWB PHY could be commonly used for the 15.14 hopefully. We ourselves in 15.6a cover more specified use cases with much higher dependability in general, such as medical human body case which needs much higher level of priority, less disconnection and so on. I hope to have some inter-operability as much as possible with a harmonization with 15.14. I am going to ask same question to the people in the 15.14 at the joint meeting on next Monday. Basically. they are independent and different standard. For MAC layer, we are based on 15.6 MAC which is a hybrid MAC, different from the 15.4 MAC. But in my understanding, 15.14 is focusing on UWB PHY. The MAC may be assumed mostly same as for the 15.4ab. The 15.4ab is an amendment for 4a, so it is basically 15.4 contention access type of the MAC protocol, but our case is hybrid to get contention free period for high priority and dependability requirements. That is because we have more specified use case for higher dependability for health care and car use cases only. (*Ryuji Kohno*)
* Is there 15.6 implementation? (Igor)
	+ Yes, there are several implementations of std.15.6-2012 in medical use cases. However, due to by-law of IEEE802, we cannot discuss on individual business detail. (*Ryuji Kohno)*
	1. Recessed.

**Attendees list**

Attendees 47

* Akifumi Kasamatsu (NICT)
* Alberto Gallegos (Ritsumeikan University)
* Ann Krieger (US DoD)
* Benjamin Rolfe (Blind Creek Associates)
* Bernhard Großwindhager (NXP)
* Billy Verso (Qorvo)
* Chenchen Liu
* Chris Calvert
* Don Sturek (Itron)
* Frank Leong (NXP)
* Friedbert Berens (FBConsulting)
* Hiroki Saito(ARIS)
* Hiroshi Harada (UKyoto)
* Hyunseob Oh (Samsung)
* Igor Dotlic (Qorvo)
* Iwao Hosako (NICT)
* Jack Zou
* James Pace
* Jeng-Shiann Jiang (Vertexcom)
* Jerome Henry (Cisco)
* Jonghoe Koo (Samsung)
* Jörg Robert (TU Ilmenau/Fraunhofer IIS)
* Juha Juntunen (Meteorcomm)
* Kamran Sayrafian(NIST)
* Kenichi Mori(ARIS)
* Kiyoshi Fukui (Oki)
* Kiyoshi Tada(ARIS)
* Larry Zakaib (Spark Microsystems)
* Marco Hernandez (YRP-IAI)
* Masatoshi Fukunaga
* Michael Cowan (Xylem/Sensus)
* Minsoo Kim (YRP-IAI)
* Norihiko Sekine (NICT)
* Paul Kettle
* Ryuji Kohno (YNU/YRP-IAI)
* Seong-Soon Joo (ETRI)
* Shang-Te Yang
* Shimi Shilo (Huawei)
* Stephan Sand (German Aerospace Center DLR)
* T. Suzuki(NICT)
* Takahashi Kuramochi (Lapis)
* Takumi Kobayashi (YNU/TCU)
* Tetsushi Ikegami (Meiji University)
* Tetsushi Yamamoto
* Thomas Almholt
* Wolfgang Küchler (NXP)
* Yasuharu Amezawa (Mobile Techno)

**SG6a 2nd Session**

**Thursday, July 15th 2021, AM 9:00-11:00 EDT**

**Room: Webex Virtual Conference**

* 1. Meeting called to order AM 9:00

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).
	2. Review the Agenda in last meeting and today’s agenda, *Ryuji Kohno, doc.# 21-0364-02-06a*

**[Review of Last Meeting on July 14th]**

* 1. Revised Response to Comments on PAR of IEEE802.15.6a from 802.3, *Ryuji Kohno, Marco Hernandez, doc.# 21-0365-01 and doc.# 21-0384-01*
	2. Response to EC March Meeting ‘s comments for SG15.6a Meeting, *Marco Hernandez*, *Ryuji Kohno* doc.# 21-0269-01
		+ Approved
	3. Drafting Response for Comments from 802.11 for 15.6a PAR and CSD *Marko Hernandez*, Ryuji Kohno, doc.#392-00-06a
		+ In doc.#392-00-06a, p.3 5.2b), Should be carefully explained in first time appeard “intra-BAN” *(Pat Kinney)*
			- Intra-BAN and Inter-BAN are also may makes confusion. We will revise texts and explanations or replace to same terminology. *(Ryuji Kohno)*
			- Same 15.6 two BAN co-located situation. In such case, Coordinator A of BAN-A and Coord B of BAN-B confusing each other. Maybe it can be replaced like inter-pico networks. Co-existing multiple BAN. *(Ryuji Kohno)*
			- Inter-BAN is easier to understand. Intra means within. *(Pat Kinney)*
			- We will consider to replacing to reduce misunderstanding. Like Inter-BAN and Inter-PAN including the other of 15.6 PAN. *(Ryuji Kohno)*
		+ Second question in doc.#392-00-06a, p.3:
			- No, IEEE Std 802.15.6-2012 is not only specified to a human body but also other bodies. However, the major application has been a human body. Due to recent increasing demand for a vehicle body, 15.6a aims to extend Std 15.6 to vehicle BAN(VBAN). Common standard for human BAN(HBAN) and VBAN can perform better enhanced dependability than in case of different standards. For instance, HBAN of an elderly driver can prevent an accident and incident while driving a car with VBAN which is the same standard as HBAN with less delay and packet loss etc. *(Ryuji Kohno)*
			- Maybe home BAN be defined separately, and scalability can be available in future. *(Ryuji Kohno)*
			- By the extension of BAN, human in home can be considered. *(Kamran Sayrafian)*
			- This is a PAR draft. I understand your opinions, but it is not addressed to extension. *(Pat Kinney)*
			- There is no limitation to discussion, but we should minimize use-cases otherwise it becomes totally new standard. *(Ryuji Kohno)*
		+ Third question in doc.#392-00-06a, p.3:
			- In my opinion, it should be 5.2b Scope of the project. *(Marco Hernandez)*
		+ 4th question in doc.#392-00-06a:
			- Suggestion is accepted. Removed.
		+ Comments for CSD, 5th question in doc.#392-00-06a
			- 5-1: In abstract, PAR is not correct. This is CSD. (Pat Kinney)
			- =>corrected
		+ 5-2: Please check versioning.
			- Accepted. It will be corrected.
		+ 5-3 Broad sets of applicability. a) suggest change “Enhancements to” –to- “Enhancements by”:
			- Accepted
		+ 5-4: Broad sets of applicability. a) “higher dependability “ relative to what?
			- higher dependability than the Std 15.6 *(Ryuji Kohno)*
		+ 5-5: CSD General: expand acronyms on first use: “BAN”, “UWB”, “HBAN”, and “VBAN”.
			- Accepted.
		+ 5-6: Economic feasibility:
			- b) Change “802.15.6 UWB technology” to “IEEE 802.15.6 UWB technology”
			=>Accepted
			- d) suggest change to “UWB technology incurs a very small energy consumption cost as compared to IEEE 802.15.4 devices. “ but add some clarification or explanation of what “very small” means.
			- What “Very small” means? *(Pat Kinney)*
			- It is not explaining as compared with 15.4. *(Ryuji Kohno)*
			- If possible, it can be removed *(Pat Kinney).*
			- We will check it later and if necessary, it is removed. *(Ryuji Kohno)*
			- There is no statement “as compared to IEEE 802.15.4 devices. “ in CSD Doc 260-02. *(Marco Hernandez)*
	4. Drafting Response for Comments from 802.1 for 15.6a PAR and CSD, *Marco Hernandez, Ryuji Kohno*, doc.# 21-0391-00
		+ In doc.# 21-0391-00, PAR 5.2b, 1st comment;
			- Accepted.
		+ In doc.# 21-0391-00, PAR 5.2b, 2nd comment;
			- Accepted.
		+ In doc.# 21-0391-00, PAR 5.2b, 3rd comment;
			- Revise sentence to show support to 802.1 TSN.
		+ In doc.# 21-0391-00, PAR 8.1, comments;
			- Accept to remove all explanatory notes in 8.1
		+ In doc.# 21-0391-00, The CSD needs to be provided as a final document with no strike through or editorial markup.
			- Accepted
		+ CSD 1.2.2 Compatibility 1st comment (a),
			- =>YES.
		+ CSD 1.2.2 Compatibility, second comment: The response to a) is not, therefore the following is appropriate:
		+ Response will be discussed by chair, vice-cair, technical editor and acting secretary. *(Ryuji Kohno)*
		+ CSD 1.2.4 Technical Feasibility
			- It is very hard to fully support. As fully as possible. *(Ryuji Kohno)*
			- How about just remove the mentioned part about synchronization? *(Minsoo Kim)*
			- Shall we describe some feasible technology for synchronization between TSN? *(Ryuji Kohno)*
			- TSN functionality is quite similar with 15.6.
			- How we can support. We will discuss to support TSN. *(Ryuji Kohno)*
			- In this CSD, we need to explain simply. We have already such a feasible technology. *(Ryuji Kohno)*
		+ Until when, we need to send you responses? *(Ryuji Kohno)*
			- By Wednesday evening. As soon as possible. *(Pat Kinney)*
			- At the end of the week, I would like to see tentative result *(Pat Kinney)*
		+ Chair, Vicechair, Technical editor and secretary will have discussion internally. *(Ryuji Kohno)*
		+ Do we need responses and revised PAR and CSD all before the leadership meeting? *(Ryuji Kohno)*
			- Yes. I can edit PAR. (Pat)
			- CSD should be received by our self. *(Ryuji Kohno)*

* 1. Draft UWB PHY Harmonization among SG15.6a. SG15.4ab, and TG15.14
		+ Discussion has been merged to 2.8.
	2. Recess

Attendees 41

* Akifumi Kasamatsu (NICT)
* Alberto Gallegos (Ritsumeikan University)
* Bernhard Großwindhager (NXP)
* Billy Verso (Qorvo)
* Carl Murray (Qorvo)
* Chenchen Liu
* Friedbert Berens (FBConsulting)
* Ghiath Rias Al-Kadi (NXP)
* Hendrik Ahlendorf (NXP)
* Hiroki Saito(ARIS)
* Igor Dotlic (Qorvo)
* Iwao Hosako (NICT)g
* Jack Zou
* James Pace
* Joerg Robert (TU Ilmenau/Fraunhofer IIS)
* Kai Lennert Bober (Fraunhofer HHI)
* Kamran Sayrafian(NIST)
* Kenichi Mori(ARIS)
* Kiyoshi Fukui (Oki)
* Kiyoshi Tada(ARIS)
* Larry Zakaib (Spark Microsystems)
* Marco Hernandez (YRP-IAI)
* Masatoshi Fukunaga(ARIS)
* Masayuki Hirata(OsakaU)
* Michael Cowan (Xylem/Sensus)
* Minsoo Kim (YRP-IAI)
* Norihiko Sekine (NICT)
* Pat Kinney(Kinney Consulting)
* Paul Kettle (Wyde Labs)
* Ryuji Kohno (YNU/YRP-IAI)
* Seong-Soon Joo (ETRI)
* Stephan Sand (German Aerospace Center DLR)
* T. Suzuki(NICT)
* Taeyoung Ha (Samsung)
* Takahashi Kuramochi (Lapis)
* Takumi Kobayashi (YNU/TCU)
* Tetsushi Ikegami (Meiji University)
* Tetsushi Yamamoto
* Wolfgang Küchler (NXP)
* Yasuharu Amezawa (Mobile Techno)
* Yumi Mori (Yokohama City University)

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

**Tuesday, July 20th, 2021, AM, 11:00-13:00 EDT**

**Room: Webex Virtual Conference**

* 1. Meeting called to order AM 11:00

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*

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

* 1. Approval of agenda of this joint session.
		+ Common Response for Comments from 802.1, .3, and .11
		+ Consensus on UWB PHY
			- Different MAC 802.15.4 and 802.15.6
			- Coexistence among different Std. WSN (WPAN) using UWB
			- Avoidance of mutual interference in PHY and MAC
			- Cognitive radio for all co-existing radios
			- Necessary Consensus
		+ We need to know what is different in these three Study Groups. *(Ryuji Kohno)*
		+ 15.4 and 14a has common part of addressing so MAC bridge can be used but 15.6 using different length of address. *(Benjamin Rolfe)*
			- 802.1 TSN requested 15.6a to think about how synchronize. Concept level of the 15.6 are considered. We are considering co-existing with WPANs in spatially dense situation. Our purpose of use of MAC bridge is interference mitigation. *(Ryuji Kohno)*

=> Agenda is approved.

* + - Do we need the motion approved 15.4ab and 6a? *(Benjamin Rolfe)*
			* It should be last session. *(Ryuji Kohno)*

**[Discussion]**

* + - It is better to introduce the answers to EC comments. *(Pat Kinney)*
	1. Review of responses to 802. 3 doc.#802.15.21-0384-03 *(Pat Kinney, Clint Powel)*.
		+ In comment for 5.4 of SG15.6, “We revised” => “We have revised” *(Pat Kinney)*
			- I agree for that *(Ryuji Kohno)*
		+ We do not need to add the other use case, is that correct?
			- That is correct *(Marco Hernandez)*
			- => second bullet of p.11 (of doc.#0384-03) has been deleted.
	2. Review for the response to 802.11 *(Pat Kinney and Clint Powel)*
		+ “Change intra by inter” (p.3, doc.# 0392-02)=> “Replaced intra with inter” *(Pat Kinney)*
		+ “Around the cabin room” (p.3, doc.# 0392-02) => “Within the cabin interior.” *(Pat Kinney)*
		+ “IEEE Std. 802.15.6” (p.5, doc.# 0392-02) => • “IEEE Std. 802.15.6-2012” *(Clint Powel)*
		+ Clint, can you send us your updated response slide for us? *(Ryuji Kohno)*
			- I will send both of response to 802.1 and 802.3. *(Clint Powel)*
	3. Review for the response to 802.1 *(Pat Kinney and Clint Powel)*
		+ (p.4, doc.# 0391-03) “Support for ~~~” => “P802.15.6a incorporates support for~~~”
		+ (p.7, doc.# 0391-03) “We refer to 802~~” => The 802.15 WG will work with the 802~~~”
		+ (p.8, doc.# 0391-03) “15.6a” => “P802.15.6a”
		+ “Access Point” => “Access Point (AP)”
		+ Although 802.1 requested to fully support synchronization, our 15.6a is using this synchronizing structure to avoid interference issues*. (Ryuji Kohno)*
		+ I will suggest deleting the second sentence. *(Marko Hernandez)*
		+ We are not fully support synchronization infrastructure, but similar concept of 802.1 can be used to avoid to mutual interference. *(Ryuji Kohno)*
		+ “Looking at supporting ~~~” has been removed.
		+ Reviewing 802.1 TSN PAR
			- 5.2.a has states “Support for station-to-infrastructure~~~”.
			- (p.8, doc.# 0391-03), “5.2.a of the PAR now states ”Support for ~~”” added. Second sentence has been edited.
	4. Adjourn

**Attendees list**

Attendees 73

* A Rocha ,
* Akifumi Kasamatsu , NICT
* Aniruddh Rao , Samsung
* Benjamin Rolfe , Blind Creek Associates
* Billy Verso , Qorvo
* Bin Tian , Qualcomm
* Carl Murray , Qorvo
* Carlos Aldana , Facebook
* Chittabrata Ghosh , Facebook
* Chunyu ,
* Clint Chaplin , Samsung
* Clint Powel , Facebook
* Dag T. Wishland , Novelda
* David xun Yang ,
* Dries Neirynck , Novelda
* Edward Au , Huawei
* ErsenEekrem ,
* Frederic Nabki , Spark
* Friedbert Berens , FBConsulting
* Gary Stuebing ,
* Ghiath Rias Al-Kadi , NXP
* Hendrik Ahlendorf , NXP
* Hiroki Saito , ARIS
* Hyunseob OH , Samsung
* Ido Bettesh ,
* Igor Dotlic , Qorvo
* Iwao Hosako , NICT
* Jack Zou ,
* Jay Holcomb , Itron
* jeng-shiann jiang , vertexcom
* Jerome Henry , Cisco
* Jim Schuessler , Samsung
* Joe Polland ,
* Joerg Robert , TU Ilmenau/Fraunhofer IIS
* Jonghoe Koo , Samsung
* Junyoung Choi , Samsung
* Kamran Sayrafian , NIST
* Larry Zakaib , Spark Microsystems
* Maroco Hernandez , YRP-IAI
* Masatoshi Fukunaga ,
* Michael McLaughlin , Qorvo
* Mingda Zhou , Redpoint Positioning
* Minsoo Kim , YRP-IAI
* Mohammad Rahmani , Spark Microsystems
* Nicolas Paillusseau , Spark Microsystems
* Nirohiko Sekine , NICT
* Pat Kinney , Kinney Consulting
* Phil Beecher , Wi-SUN
* Rani Keren , Huawei
* Riku Pirhonen , NXP
* Ryuji Kohno , YNU / YRP-IAI
* Sansung Choi ,
* Santosh Gupta , Qualcomm
* Seong-Soon Joo , ETRI
* Shimi Shilo , Huawei
* Shoichi Kitazawa , Muroran IT
* Srivathsa , NXP
* Stephan Sand , German Aerospace Center DLR
* Sven Zeisberg ,
* T. Suzuki , NICT
* Takumi Kobayashi , YNU
* Tero Kivinen , IKI
* Tetsushi Ikegami , Meiji University
* Tetsushi Yamamoto ,
* Thomas Almholt ,
* Vamsi Amalladinne , Qualcomm
* Volker Jungnickel , Fraunhofer
* Xiliang Luo ,
* Yasuharu Amezawa , Mobile Techno Co.
* Yeong Min JANG , KokuminU
* Yongsen Ma , Redpoint Positioning
* Yoshio Kashiwagi , Nissin systems
* Youg Liu ,

**SG6a 3rd Session**

**Thursday, July 19th 2021, PM 7:00-9:00 EDT**

**Room: Webex Virtual Conference**

* 1. Meeting called to order AM 9:00

By Chair Ryuji Kohno (YNU / YRP-IAI)

* 1. Roll Call *Ryuji Kohno*Announcement to attendance by using IEEE Attendance Tool (IEEE IMAT).
	2. Review the Agenda in last meeting and today’s agenda, *Ryuji Kohno,* doc.# 21-364-03-06a
	3. Final Response to Comments on PAR of IEEE802.15.6a from 802.3, *Marco Hernandez, Ryuji Kohno,* doc.#21-384-04-06a
		+ The communication between an HBAN and a VBAN is only through a coordinator? (*Kamran Sayrafian)*
			- So far, yes. *(Marco Hernandez)*
			- Yes. From a coordinator to a coordinator. That is also the answer for the 802.1, a MAC bridge concept of TSN. *(Ryuji Kohno)*
		+ By the same concept, a coordinator of a HBAN can also connect with a coordinator of another HBAN? *(Kamran Sayrafian)*
			- Yes, I think so. That is a good question. Not only HBAN and VBAN, but you are also talking multiple VBANs, right? *(Ryuji Kohno)*
		+ The way I interpreted is the VBAN is an instantiation of a HBAN, because it is in the same standard, so 2 HBANs should also be able to connect… *(Kamran Sayrafian)*
			- As a byproduct, HBAN and VBAN may work separately. That means multiple VBAN can also communicate to each other. But it is a kind of a byproduct. *(Ryuji Kohno)*
	4. Final Response for Comments from 802.1 for 15.6a PAR and CSD, *Marco Hernandez, Ryuji Kohno,* doc.# 21-391-04-06a
	5. Final Response for Comments from 802.11 for 15.6a PAR and CSD, *Marco Hernandez, Ryuji Kohno,* doc.# 21-392-06-06a
		+ Regarding 5.2.b – expand acronym: “intra-BAN”, PANs is used as a plural form. Should the BAN also be BANs? *(Ryuji Kohno)*
			- The PAN could be confusing because of our reference to WG as a PAN in the old days. So, if you are referring it to piconets, it would be better this is an inter-piconets or something like that. The BAN should be plural. *(Pat Kinney)*
		+ Making a standard or a protocol for vehicular body area network is within the scope of this amendment? Is it planned to come up with a standard for vehicle body area network, that might not be necessarily the same as the current 15.6? Because none of the channel models they have at 15.6 would apply to the vehicles body. *(Kamran Sayrafian)*
			- Since March meeting, we are also discussing such a new channel modeling on the vehicle and the nearby vehicle. It is already included in a previous document. We are modeling not only the radio propagation channel model but also the coexisting model in this amendment. (Ryuji Kohno)
	6. Study Group Motion to approve resolutions to PAR and CSD comments from 802.1, 802.3, 802.11, *Ryuji Kohno,* doc #21-403-00-06a
		+ Moved by Ryuji Kohno, seconded by Marco Hernandez.
			- Unanimously approved.
	7. Finalizing draft CSD, *Marco Hernandez, Ryuji Kohno,* doc #21-260-03-06a
	8. Finalizing draft PAR, *Marco Hernandez, Ryuji Kohno,* doc.#21-259-04-06a
		+ In 5.4 Purpose, still PANs remains. The current standard 15.6 uses PAN but we changed terminology. *(Ryuji Kohno)*
			- If you want piconets, fine. If you want to refer to them as personal area networks, but have you defined personal area networks elsewhere? If not, then piconets. *(Pat Kinney)*
	9. Study Group Motion to approve updated PAR and CSD according to resolutions to comments from 802.1, 802.3, 802.11, *Ryuji Kohno,* doc #21-404-00-06a
		+ Moved by Ryuji Kohno, seconded by Marco Hernandez
			- Unanimously approved.

**[Presentation of Feasible Technologies for BAN with Enhanced Dependability]**

* 1. MAC Solution for Coexisting BANs and Other Networks with MAC-Bridge and Integrated Terminal, *Minsoo Kim,* doc #19-503-02-0dep
	2. Considerations and countermeasure technology on radio environment surrounding BANs including EMC issues on PHY layer, *Ryuji Kohno,* doc #21-387-00-06a
	3. Recessed.

Attendees 26

* Akifumi Kasamatsu (NICT)
* Ben Rolfe (BCA)
* Clint Powell (Facebook)
* Hendrik Seidel (NXP)
* Hiroki Saito(ARIS)
* Iwao Hosako (NICT)
* Jeng-Shiann Jiang (Vertexcom)
* Jerome Henry (Cisco)
* Jonghoe Koo (Samsung)
* Kamran Sayrafian(NIST)
* Kenichi Mori(ARIS)
* Kiyoshi Tada(ARIS)
* Marco Hernandez (YRP-IAI)
* Masatoshi Fukunaga
* Masayuki Hirata(OsakaU)
* Minsoo Kim (YRP-IAI)
* Pat Kinney(Kinney Consulting)
* Ryuji Kohno (YNU/YRP-IAI)
* Sven Zeisberg
* T. Suzuki(NICT)
* Taeyoung Ha (Samsung)
* Takahashi Kuramochi (Lapis)
* Takumi Kobayashi (YNU/TCU)
* Tetsushi Ikegami (Meiji University)
* Tetsushi Yamamoto
* Yasuharu Amezawa (Mobile Techno)