**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | March IEEE802.15.7r1 Minutes |
| Date Submitted | May 2015 |
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| Abstract | [Minutes of May 2015 Plenary Session]  |
| Purpose | [Description of what the author wants P802.15 to do with the information in the document.] |
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**Task group 802.15.7r1 met for 8 sessions during the May 2015 meeting.**

**Session 1 (11 May 2015)**

**AM 2 (10:30 – 12:30)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Yeong Min Jang – Kookmin University
* Rick Roberts – Intel
* Prof. Murat Uysal – Ozyegin University
* Shoichi Kitazawa – ATR
* Huan-Bang Li – NICT
* Ludvic Winkel – Siemens
* Nikola Serafimovsk – pureLiFi

Chair went through the patent policy slides (<http://standards.ieee.org/board/pat/pat-slideset.ppt>) and mentioned that there is some changes in the IEEE patent policy and the updated patent slides will be posted when available.

Agenda was confirmed Doc. 15-15-0351-02-007a-Agenda-for-May-meeting(May 2015).

Rick suggested some amendments for the Agenda.

Rick suggested review of doc. 303-r3

Draft TG7r1 Technical considerations Document as 293-r3

TCD comments doc. 364-r0

Nikola presented a quick review of the Conference Calls and the agreed action to contact Bob Haley regarding remit of the committee.

Hideky discussed doc. 293-r3.

Nikola discussed 293-r3 for LiFi

Ludvic seconded Rick’s point that the standard should not be concerned how the tech is used.

Ludvic requested that a section on Security is added to doc. 293-r3 to highlight the secure nature of LiFi.

Rick went through doc. 364-r0 with comments on the TCD (doc. 293-r3). The comments and conclusions are reflected in 364-r1.

Meeting recessed until PM 1.

**PM 1 (13:30 – 15:30)**

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Yeong Min Jang – Kookmin University
* Rick Roberts – Intel
* Shoichi Kitazawa – ATR
* Soo Young Chang – California State University Sacramento
* Michael Moure – The Boeing Company
* Charlie
* Bob Heile
* Nikola Serafimovsk – pureLiFi

Meeting called to order.

Rick continued going through doc. 364-r0 with comments on the TCD (doc 293-r3).

A number of items were tabled for Thursday, 14 May 2015.

**Session 2 (12 May 2015)**

**AM 1 (08:00 – 10:00)**

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Yeong Min Jang – Kookmin University
* Rick Roberts – Intel
* Prof. Murat Uysal – Ozyegin University
* Shoichi Kitazawa – ATR
* Yeong Min Jang – Kookmin University
* Koji Horisaki – Toshiba
* Andrew
* Nikola Serafimovsk – pureLiFi

Murat presented doc. 352-r1 as a proposal for OWC channel modeling.

Rick raised the issue of how the slower phosphor response may impact the detected signal (inter-symbol interference, etc.) because of the slower frequency response of the phosphor as well as the after-glow of the phosphor.

Adopting the Channel Model must be adopted by the time the Call for Proposal is sent out.

Call for Channel Model Contribution by July. Channel Model should include environment effects.

**AM 2 (10:30 – 12:30)**

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Rick Roberts – Intel
* Prof. Murat Uysal – Ozyegin University
* Shoichi Kitazawa – ATR
* Yeong Min Jang – Kookmin University
* Soo Young Chang – California State University Sacramento
* Prof. Jaesang Cha – Seoul National University of Science & Technology
* Michael McInnis – The Boeing Company
* Robert G. Moskowitz – HTT Consulting LLC
* Nikola Serafimovsk – pureLiFi

Yeong Min Jang presented **doc. 389-r0**.

Discussion on the document to determine the benefits and need for the rest of the recommendations.

Rob, there are already a number of message system that have been agreed 802.11p radio standard for transmission, messaging structure is 802.16.09 for WAVE and referred to Dedicated Short Range Communications, study for automobile engineers (SAE) has a dedicated group in the US that work on top of WAVE to provide vehicular communications. There are a number of 802.11 and 802.1609 participants looking at work in this area. Telecoms are countering DSRC with LTE-U. Verizon helped fund the changing of the city street lights with LED street lights if they could provide Microwave transmitters on the towers. Lights are already being designed to support a number of safety messages. DSRC is direct competition with OCC. Why OCC rather than the mandated DSRC for the 2018/2019 model year? Ruling will come out at the end of 2015 with stable documents for 802.16.09 for the US Dep. Of Transport ruling.

Corresponding European, Korean and Japanese agencies for Transport Safety have their impact in this context. Therefore, the bit-rate must account for the minimum length of the messages.

**ACTION:** The committee needs to check through the coexistence/compliance with these different bodies to find the most appropriate fit. What is the impact of the predefined DSRC messages for OCC structure?

Yeong Min Jang presented **doc. 390-r0**

The conclusions in the document were already present in the TCD.

The agenda for the Wednesday meeting and Thursday meeting were discussed.

Meeting called to order until Session 3.

**Session 3 (13 May 2015)**

**PM 1 (13:30 – 15:30)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Rick Roberts – Intel
* Prof. Murat Uysal – Ozyegin University
* Shoichi Kitazawa – ATR
* Yeong Min Jang – Kookmin University
* Soo Young Chang – California State University Sacramento
* Prof. Jaesang Cha – Seoul National University of Science & Technology
* Nikola Serafimovsk – pureLiFi
* Paul Nikolich – YAS Partners

Meeting called to order and agenda was agreed.

Yeong Min Jang presented **doc. 404-r0** about lighthouse to ship communications.

**ACTION (due 01 June 2015): Yeong Min Jang** to edit the homepage to include links to the various CFA responses presented over the past 2 meetings.

Yeong Min Jang presented **doc. 414-r0**

Paul Nikolich – there is a standardization organization committee that is looking at organizing/gathering all the different work on Vehicular Networking side Yu Yuan is the chair for SCC42 (standards coordinating committee 42).

The committee has agreed to include the changes proposed by Yeong Min in **doc. 414-r1.**

Jaesang presented **doc. 410-r0** and agreed to remove the slide 5, slide 6, the Appendix, “VLC(OCC)” on slide 10 and the last bullet of the Conclusion. The presentation needs to be revised to reflect the latest comments in the PAR.

Session recessed.

**PM 2 (16:00 – 18:00)**

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Rick Roberts – Intel
* Prof. Murat Uysal – Ozyegin University
* Shoichi Kitazawa – ATR
* Yeong Min Jang – Kookmin University
* Soo Young Chang – California State University Sacramento
* Prof. Jaesang Cha – Seoul National University of Science & Technology
* Nikola Serafimovsk – pureLiFi
* Bob Heile – Wi-SUN Allianz
* Michael McInnis – The Boeing Company
* Pat Kinney – Kinney Consulting

Nikola raised the issue of the higher layer functionality required for the Handover and Interference Coordination.

BOB:

IEEE 802 stops at the link layer and the Industry associations provide the certifications and connection to the higher layer functionality.

You can provide a data link layer (L2) as a Standard, everything else is recommended practice.

“Recommended Practices” can be then leveraged by the LiFi association to provide compliance/certification. The organization that writes the Recommended Practices is a new Group that means a Study Group, PAR, CSD, etc. Exactly the same route as a traditional standard.

3 categorises of Standard

1. Traditional standard
2. Recommended practices – if you will implement something, then you MUST do this set of steps
3. Guide – provides various alternatives of how to achieve something with an architectural build

Certification organization would say you must follow (1) and (2) which then creates a more comprehensive standard/approach.

Practical adoption means a certification is absolutely necessary.

802.21 – media independent handover services, however mainly focused on cross PHY handover (WiFi to LTE).

802.15.4 – point of service reattaching from one node to another.

Mike:

You could do a skinney MAC that then allows a complete/higher intensity hosted on a server (802.11) practices.

**Conclusion:**

1. Layer 3 and higher that support Interference Coordination and Handover is outside of the scope of the 802.15.7r1.
2. A committee needs to be formed that will represent the Certification Authority to then create a PAR and begin the Standardization for the Layer 3 and higher to create the Recommended Practices.
3. The Recommended Practices group would then explore the set of options how to implement the best higher layer functionality including the possibility of using parts of various MACs and other groups.

Rick raised to topic for the Call for Proposals for the Channel Models **doc. 403-r0**.

The document was revised and accepted by the committee as **doc. 403-r1**. Rick to send out.

Bob:

“Short-Range” should be defined in to mean something. The committee needs to agree on the definition.

Bob:

QR codes are outside of the scope of this standardization committee. The QR codes are outside of the scope of the committee because every technology must have bidirectional communication capabilities. QR codes are unidirectional because they can be written on a paper.

You cannot have a Revision that has 3 different MAC.

Rick:

We need a structure that will deal with rolling images/frames of changing QR codes.

Pat:

The QR codes are effectively your symbols that are carrying more bits.

Rick, Bob, Nikola:

Yes, the QR-like symbol is a dynamic symbol that sends bits/seconds.

Nikola:

Is the concept to use some sort of complicated picture to transmit multiple bits per symbol per frame/time and is this the definition of LED-ID?

Jaesang:

No, this is not a LED-ID.

The Committee discussed and is considering to restructure the TCD **doc. 293-r3** to include and make a separation of the different requirements from the receiver structure (Photo Diode or Image Sensor).

Meeting recessed until Thursday 15 May AM 1.

**Session 4 (14 May 2015)**

**AM 1 (08:00 – 10:00)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Rick Roberts – Intel
* Shoichi Kitazawa – ATR
* Yeong Min Jang – Kookmin University
* Soo Young Chang – California State University Sacramento
* Prof. Jaesang Cha – Seoul National University of Science & Technology
* Nikola Serafimovsk – pureLiFi

Meeting called to order and the agenda was agreed.

The standardization schedule and milestones (**doc. 274-r0**) were discussed.

**ACTION (due 10 July 2015): Yeong Min Jang** will present a contribution on the safety considerations of UV and near UV for the human body.

Jaesang was interested in the safety standards for infrared (IR) and visible light (VL).

Rick presented **doc. 364-r2**.

The committee agreed that the TCD should not contain any numbers that specify a threshold for the submission of documents.

The complete integration of the comments was postponed until July, 2015 meeting in Hawaii.

There is a motion on the floor to table the discussion on **doc. 411-r5** until July, 2015 meeting in Hawaii. Motion passed. However, if there is any additional time the review of the document may be discussed at the end of the meeting for **AM 2.**

**AM 1 (08:00 – 10:00)**

Yeong Min Jang (Kookmin University) – Chair

Attendees:

* Prof. Oshima – Panasonic in Osaka,
* Hideki Aoyama – Panasonic Japan
* Rick Roberts – Intel
* Shoichi Kitazawa – ATR
* Yeong Min Jang – Kookmin University
* Soo Young Chang – California State University Sacramento
* Prof. Jaesang Cha – Seoul National University of Science & Technology
* Nikola Serafimovsk – pureLiFi
* Koji Horisaki – Toshiba
* Robert Moskowitz – HTT Consulting
* Jaehwan Kim – ETRI
* A
* B

Meeting called to order.

Aoyama – san discussed **doc. 424-r0**.

Jaesang has confirmed that he is the copyright owner of the lighthouse image and will provide it freely to the committee for the inclusion in the TCD **doc. 293.**

The topic of the Channel Model was discussed and agreed that the presentations in July 2015 should include both IR, VL and UV wavelengths.

Robert Moskowitz presented **doc. 427-r0** about the security of the original 802.15.7. The security section is incomplete and must be updated significantly. Critical problem for unidirectional is that there is no known method for key management protocol.

Data object security is required for moving forward in this context. There are a couple of new options to deal with the new security structure. The 48-bit MAC will directly impact how the Security Section is written.

Key Management Protocol (KMP) Support was discussed. EthType support should be added to provide 802.11 support as well as 802.3. This would support 802.1X and allow interoperability.

It might be possible to state the known attach against QR-codes by using OCC (eg., people pasting links over existing QR-codes and then downloading malware to devices) can be directly avoided in specific use-cases.

Highly recommended to add the Information Element to 802.15.7 to improve the functionality of the technology for other aspects. EthType should also be included to allow bridging between 802.11 and Ethernet. The committee should add an Annex to account for how 802.15.9 can work with 802.15.7r1.

The goal is that by Hawaii, there should be a strategic document detailing the steps that need to be taken to incorporate the changes required for security including IE, EthType and 48-bt MAC changes that will be required.

Wii-SUN has already implemented 802.15.9.

Rob Point of Information: It is within your remit to make a motion that will mean that there will be an exact cut-off point for a particular feature or not.

Nikola: We need a complete and finalized channel model in July.

Jeasang: I disagree because we need more discussion because 2 months are not enough.

Nikola: The corporate participants will provide Channel Models that will be the bases for the finalizing the channel model. It will be up to the committee to accept or not.

Jaesang: This may be a voting matter.

Robert: Mr. Chairman please make sure that you resolve this issue rapidly and readily and avoid it at all cost. This is critical for the long term.

Chair raised the motion for voting members only: “The 802.15.7r1 Committee will entertain channel model proposals at the July Kona meeting with selection to be done at the July meeting?”

The Committee voted **YES (3) and NO (4).** The channel model will NOT be completed in July 2015.

The Channel Model finalization will be presented in July 2015 and again in September 2015 where ideally there will be a finalized channel model.

Nikola and Hideki suggested that everyone should provide a list of comments that should be considered regarding the TCD in a table format that is easy for discussion.

The Call for Proposals for Channel Models was updated as **doc. 402-r2**.

**ACTION (due 15 May 2015):** Yeong Min Jang to release **doc. 402-r2**.

Meeting called to order.