IEEE P802.11  
Wireless LANs

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| WLAN Sensing SG – July, August and September 2020 Teleconference Meeting Minutes | | | | |
| Date: 2020-09-01 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Claudio da Silva | Intel |  |  | claudio.da.silva@intel.com |
| Tony Xiao Han | Huawei Technologies Co., Ltd |  |  | tony.hanxiao@huawei.com |

Abstract

This document contains the meeting minutes of the IEEE 802.11 Study Group on WLAN Sensing (SENS SG) teleconferences held in July, August and September 2020.

**Teleconference on July 21st, 2020**

1. The IEEE 802.11 SENS SG teleconference was called to order at 10:00am ET by the Chair (Tony Xiao Han, Huawei).
   1. Attendance log can be found in Appendix 1.
2. The agenda for the meeting can be found in IEEE 802.11-20/0996r5.
3. Guidelines on “Meeting Protocol, Attendance, Voting & Document Status” (slide 4) were reviewed. No items noted.
4. Patent policy guidelines (slides 6-9) were reviewed. No items noted.
5. Guidelines on the IEEE Codes of Ethics & Conduct, "individual process," and "fair & equitable consideration" (slides 10-12) were reviewed. Required notices (slide 13) were also reviewed. No items noted.
6. The proposed agenda (slide 17) was reviewed and approved without objection.
7. Chair reviewed the call for contributions (slide 18), SENS SG timeline (slides 19 and 20), and future teleconference times (slide 21) slides.
8. Presentation of “WLAN Localization and Sensing With Mid-Grained Channel Measurements,” doc. IEEE 11-20/1074r1, by Pu (Perry) Wang (MERL).
   1. Technical discussion followed for clarification of different aspects of the contribution, including measurement setup and goals (orientation/location).
9. Meeting adjourned at 11:15am ET.

**Teleconference on August 4th, 2020**

1. The IEEE 802.11 SENS SG teleconference was called to order at 10:00am ET by the Chair (Tony Xiao Han, Huawei).
   1. Attendance log can be found in Appendix 2.

2. The agenda for the meeting can be found in IEEE 802.11-20/1157r0.

3. Guidelines on “Meeting Protocol, Attendance, Voting & Document Status” (slide 4) were reviewed. No items noted.

4. Patent policy guidelines (slides 6-9) were reviewed. No items noted.

5. Guidelines on the IEEE Codes of Ethics & Conduct, "individual process," and "fair & equitable consideration" (slides 10-12) were reviewed. Required notices (slide 13) were also reviewed. No items noted.

6. The proposed agenda (slide 14) was reviewed and approved without objection.

1. Chair reviewed the call for contributions (slide 15), SENS SG timeline (slides 16 and 17), and future teleconference times (slide 18) slides.

8. Presentation of “Follow-ups on Channel Measurement Procedure for WLAN Sensing” by Chenchen Liu (Huawei), Doc. IEEE 11-20/1120r0.

* 1. Presenter introduced the concept of threshold-based feedback. Discussion on details of the proposed approach and on its complexity. Discussion on the impact of application-specific requirements to the proposed approach.

9. Meeting adjourned at 10:55am ET.

**Teleconference on August 18th, 2020**

1. The IEEE 802.11 SENS SG teleconference was called to order at 10:00am ET by the Chair (Tony Xiao Han, Huawei).
   1. Attendance log can be found in Appendix 3.
2. The agenda for the meeting can be found in IEEE 802.11-20/1157r1.
3. Guidelines on “Meeting Protocol, Attendance, Voting & Document Status” (slide 4) were reviewed. No items noted.
4. Patent policy guidelines (slides 6-9) were reviewed. No items noted.
5. Guidelines on the IEEE Codes of Ethics & Conduct, "individual process," and "fair & equitable consideration" (slides 10-12) were reviewed. Required notices (slide 13) were also reviewed. No items noted.
6. The proposed agenda (slide 15) was reviewed and approved without objection.
7. Chair reviewed the call for contributions (slide 16), SENS SG timeline (slides 17 and 18), and future teleconference times (slide 19) slides.
8. Presentation by Cheng Chen (Intel), “Overview of WLAN Sensing Protocol”, Doc. IEEE 11-20/1232r0.
   1. A possible framework of a WLAN sensing protocol was presented. Questions on different technical aspects of the contribution, including the requirement of a STA being associated with an AP to take channel measurements and on the impact of channel access mechanisms to the periodicity of channel measurements. General questions on re-using elements/protocols defined for positioning/ranging.
9. Presentation by Dongguk Lim (LGE), “Use Cases for Wireless LAN Sensing”, Doc. IEEE 11-20/1239r0.
   1. In the presentation, various WLAN sensing use cases that make use of home appliances were considered. Technical questions on KPI values and overall system architecture.
10. Meeting adjourned at 11:40am ET.

**Teleconference on September 1st, 2020**

1. The IEEE 802.11 SENS SG teleconference was called to order at 10:08am ET by the Chair (Tony Xiao Han, Huawei).
   1. Attendance log can be found in Appendix 4.
2. The agenda for the meeting can be found in IEEE 802.11-20/1344r0.
3. Guidelines on “Meeting Protocol, Attendance, Voting & Document Status” (slide 4) were reviewed. No items noted.
4. Patent policy guidelines (slides 6-9) were reviewed. No items noted.
5. Guidelines on the IEEE Codes of Ethics & Conduct, "individual process," and "fair & equitable consideration" (slides 10-12) were reviewed. Required notices (slide 13) were also reviewed. No items noted.
6. The proposed agenda (slide 14) was reviewed and approved without objection.
7. Chair reviewed the call for contributions (slide 17), SENS SG timeline (slides 18 and 19), and future teleconference times (slide 20) slides.
8. Presentation of “WLAN Sensing Procedures and Use Cases” by Claudio da Silva (Intel), Doc. IEEE 11-20/1266r0.
9. Technical discussion followed for clarification of expected/envisioned use of 11be features and on enabling an AP STA to make measurements with unassociated non-AP STAs, among others.
10. Presentation of “Discussion on WLAN sensing sequence design” by Rui Du (Huawei), Doc. IEEE 11-20/1328r0.
    1. Technical discussion followed for clarification of different aspects of the contribution, including details of how the plots in slide 11 were obtained and on the processing of multiple “pulses.” Comment that PHY modifications to sub-7 GHz PHYs are out of the scope of 11bf. Answer that potential modifications to sub-7 GHz PHYs would have to go through 11be.
11. Meeting adjourned at 11:30am ET.

**Appendix 1: Attendance log for the July 21st, 2020 teleconference**

The list below was recorded from IMAT and may be incomplete.

|  |  |
| --- | --- |
| AbidRabbu, Shaima' | Istanbul Medipol University; Vestel |
| Aboulmagd, Osama | Huawei Technologies Co. Ltd |
| Anwyl, Gary | MediaTek Inc. |
| Au, Kwok Shum | Huawei Technologies Co.,  Ltd |
| Au, Oscar | Origin Wireless |
| Aygul, Mehmet | Istanbul Medipol University; Vestel |
| Beg, Chris | Cognitive Systems Corp. |
| Berger, Christian | NXP Semiconductors |
| Bredewoud, Albert | Broadcom Corporation |
| Carney, William | Sony Corporation |
| Chen, Canfeng | Xiaomi Inc. |
| Chitrakar, Rojan | Panasonic Asia Pacific Pte Ltd. |
| Choi, Jinsoo | LG ELECTRONICS |
| Costa, D.Nelson | Peraso Technologies Incorporated |
| da Silva, Claudio | Intel Corporation |
| Dong, Xiandong | Xiaomi Inc. |
| Du, Rui | Huawei Technologies Co., Ltd |
| Eitan, Alecsander | Qualcomm Incorporated |
| feng, Shuling | MediaTek Inc. |
| Grigat, Michael | Deutsche Telekom AG |
| HAN, Xiao | Huawei Technologies Co. Ltd |
| Haskou, Abdullah | InterDigital, Inc. |
| Kadampot, Ishaque Ashar | Qualcomm Incorporated |
| Kasher, Assaf | Qualcomm Incorporated |
| Kim, Jeongki | LG ELECTRONICS |
| Kim, Sang Gook | LG ELECTRONICS |
| Kwon, Young Hoon | NXP Semiconductors |
| Lindskog, Erik | SAMSUNG |
| Merlin, Simone | Qualcomm Incorporated |
| Pare, Thomas | MediaTek Inc. |
| Patwardhan, Gaurav | Hewlett Packard Enterprise |
| Pushkarna, Rajat | Panasonic Asia Pacific Pte Ltd. |
| Rafique, Saira | Istanbul Medipol University, Vestel |
| Raissinia, Alireza | Qualcomm Incorporated |
| Rantala, Enrico-Henrik | Nokia |
| Rosdahl, Jon | Qualcomm Technologies, Inc. |
| Sedin, Jonas | Ericsson AB |
| Solaija, Muhammad Sohaib | Istanbul Medipol University; Vestel |
| Stavridis, Athanasios | Ericsson AB |
| Sun, Yingxiang | Huawei Technologies Co. Ltd |
| Tan, Danny | Huawei Technologies Co., Ltd |
| Turkmen, Halise | Vestel |
| Unterhuber, Paul | German Aerospace Center (DLR) |
| Varshney, Prabodh | Nokia |
| Wang, Chao Chun | MediaTek Inc. |
| Wang, Pu | Mitsubishi Electric Research Labs (MERL) |
| Xin, Yan | Huawei Technologies Co. Ltd |
| YANG, RUI | InterDigital, Inc. |
| Zhang, Meihong | Huawei Technologies Co., Ltd |

**Appendix 2: Attendance log for the August 4th, 2020 teleconference**

The list below was recorded from IMAT and may be incomplete.

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| --- | --- |
| AbidRabbu, Shaima' | Istanbul Medipol University; Vestel |
| Aldana, Carlos | Intel Corporation |
| Anwyl, Gary | MediaTek Inc. |
| Au, Kwok Shum | Huawei Technologies Co.,  Ltd |
| Au, Oscar | Origin Wireless |
| Aygul, Mehmet | Istanbul Medipol University; Vestel |
| Berger, Christian | NXP Semiconductors |
| Chen, Canfeng | Xiaomi Inc. |
| Chitrakar, Rojan | Panasonic Asia Pacific Pte Ltd. |
| Choi, Jinsoo | LG ELECTRONICS |
| Costa, D.Nelson | Peraso Technologies Incorporated |
| da Silva, Claudio | Intel Corporation |
| Dong, Xiandong | Xiaomi Inc. |
| Du, Rui | Huawei Technologies Co., Ltd |
| Eitan, Alecsander | Qualcomm Incorporated |
| Fang, Yonggang | ZTE TX Inc |
| HAN, Xiao | Huawei Technologies Co. Ltd |
| Jang, Insun | LG ELECTRONICS |
| Kadampot, Ishaque Ashar | Qualcomm Incorporated |
| Kasher, Assaf | Qualcomm Incorporated |
| Kim, Sang Gook | LG ELECTRONICS |
| Kwon, Young Hoon | NXP Semiconductors |
| Lindskog, Erik | SAMSUNG |
| LIU, CHENCHEN | Huawei Technologies Co. Ltd |
| Merlin, Simone | Qualcomm Incorporated |
| Ozbakis, Basak | VESTEL Electronics Corp. |
| Patwardhan, Gaurav | Hewlett Packard Enterprise |
| Pushkarna, Rajat | Panasonic Asia Pacific Pte Ltd. |
| Rafique, Saira | Istanbul Medipol University, Vestel |
| Raissinia, Alireza | Qualcomm Incorporated |
| Rantala, Enrico-Henrik | Nokia |
| RISON, Mark | Samsung Cambridge Solution Centre |
| Solaija, Muhammad Sohaib | Istanbul Medipol University; Vestel |
| Stanley, Dorothy | Hewlett Packard Enterprise |
| Stavridis, Athanasios | Ericsson AB |
| Sun, Yingxiang | Huawei Technologies Co. Ltd |
| Trainin, Solomon | Qualcomm Incorporated |
| Turkmen, Halise | Vestel |
| Unterhuber, Paul | German Aerospace Center (DLR) |
| Wang, Pu | Mitsubishi Electric Research Labs (MERL) |
| Xin, Yan | Huawei Technologies Co. Ltd |
| YANG, RUI | InterDigital, Inc. |
| ZEGRAR, Salah Eddine | [NV] {Vestel} |
| Zhang, Meihong | Huawei Technologies Co., Ltd |

**Appendix 3: Attendance log for the August 18th, 2020 teleconference**

The list below was recorded from IMAT and may be incomplete.

|  |  |  |
| --- | --- | --- |
| Aboulmagd, Osama | Huawei Technologies Co. Ltd | |
| Abushattal, Abdelrahman | Istanbul Medipol University; Vestel | |
| Au, Kwok Shum | Huawei Technologies Co.,  Ltd | |
| Au, Oscar | Origin Wireless | |
| Aygul, Mehmet | Istanbul Medipol University; Vestel | |
| Beg, Chris | Cognitive Systems Corp. | |
| Berger, Christian | NXP Semiconductors | |
| Chen, Canfeng | Xiaomi Inc. | |
| Chitrakar, Rojan | Panasonic Asia Pacific Pte Ltd. | |
| Choi, Jinsoo | LG ELECTRONICS | |
| Costa, D.Nelson | Peraso Technologies Incorporated | |
| da Silva, Claudio | Intel Corporation | |
| Dong, Xiandong | Xiaomi Inc. | |
| Du, Rui | Huawei Technologies Co., Ltd | |
| Fang, Yonggang | ZTE TX Inc |  |
| feng, Shuling | MediaTek Inc. | |
| Ghaderipoor, Alireza | MediaTek Inc. | |
| HAN, Xiao | Huawei Technologies Co. Ltd | |
| Handte, Thomas | Sony Corporation | |
| Haskou, Abdullah | InterDigital, Inc. | |
| Hsieh, Hung-Tao | MediaTek Inc. | |
| Jang, Insun | LG ELECTRONICS | |
| Kasher, Assaf | Qualcomm Incorporated | |
| Kim, Sang Gook | LG ELECTRONICS | |
| Kwon, Young Hoon | NXP Semiconductors | |
| Lim, Dong Guk | LG ELECTRONICS | |
| Lopez, Miguel | Ericsson AB | |
| Ma, Li | MediaTek Inc. | |
| Nikolich, Paul | self employed/various | |
| Ozbakis, Basak | VESTEL Electronics Corp. | |
| Pushkarna, Rajat | Panasonic Asia Pacific Pte Ltd. | |
| Rafique, Saira | Istanbul Medipol University, Vestel | |
| Raissinia, Alireza | Qualcomm Incorporated | |
| Rantala, Enrico-Henrik | Nokia |  |
| RISON, Mark | Samsung Cambridge Solution Centre | |
| Sedin, Jonas | Ericsson AB | |
| Sherlock, Ian | Texas Instruments Incorporated | |
| Singh, Gurdev | SAMSUNG ELECTRONICS | |
| Solaija, Muhammad Sohaib | Istanbul Medipol University; Vestel | |
| Sun, Yingxiang | Huawei Technologies Co. Ltd | |
| Trainin, Solomon | Qualcomm Incorporated | |
| Turkmen, Halise | Vestel |  |
| Varshney, Prabodh | Nokia |  |
| Wang, Pu | Mitsubishi Electric Research Labs (MERL) | |
| Wilhelmsson, Leif | Ericsson AB | |
| YANG, RUI | InterDigital, Inc. | |
| ZEGRAR, Salah Eddine | [NV] {Vestel} | |
| Zeng, Ruochen | NXP Semiconductors | |
| Zhang, Meihong | Huawei Technologies Co., Ltd | |

**Appendix 4: Attendance log for the September 1st, 2020 teleconference**

The list below was recorded from IMAT and may be incomplete.

|  |  |
| --- | --- |
| AbidRabbu, Shaima' | Istanbul Medipol University; Vestel |
| Aboulmagd, Osama | Huawei Technologies Co. Ltd |
| Aldana, Carlos | Intel Corporation |
| Au, Kwok Shum | Huawei Technologies Co.,  Ltd |
| Au, Oscar | Origin Wireless |
| Aygul, Mehmet | Istanbul Medipol University; Vestel |
| Beg, Chris | Cognitive Systems Corp. |
| Berger, Christian | NXP Semiconductors |
| Chen, Canfeng | Xiaomi Inc. |
| Chen, Cheng | Intel Corporation |
| Choi, Jinsoo | LG ELECTRONICS |
| Costa, D.Nelson | Peraso Technologies Incorporated |
| da Silva, Claudio | Intel Corporation |
| de Vegt, Rolf | Qualcomm Incorporated |
| Dong, Xiandong | Xiaomi Inc. |
| Du, Rui | Huawei Technologies Co., Ltd |
| Grigat, Michael | Deutsche Telekom AG |
| HAN, Xiao | Huawei Technologies Co. Ltd |
| Handte, Thomas | Sony Corporation |
| Haskou, Abdullah | InterDigital, Inc. |
| Jang, Insun | LG ELECTRONICS |
| Kadampot, Ishaque Ashar | Qualcomm Incorporated |
| Kasher, Assaf | Qualcomm Incorporated |
| Kim, Sang Gook | LG ELECTRONICS |
| Kwon, Young Hoon | NXP Semiconductors |
| Lim, Dong Guk | LG ELECTRONICS |
| LIU, CHENCHEN | Huawei Technologies Co. Ltd |
| Lopez, Miguel | Ericsson AB |
| Pushkarna, Rajat | Panasonic Asia Pacific Pte Ltd. |
| Rafique, Saira | Istanbul Medipol University, Vestel |
| Raissinia, Alireza | Qualcomm Incorporated |
| Ramesh, Sridhar | Maxlinear Inc. |
| Sahin, Onur | InterDigital, Inc. |
| Sedin, Jonas | Ericsson AB |
| Singh, Gurdev | SAMSUNG ELECTRONICS |
| Solaija, Muhammad Sohaib | Istanbul Medipol University; Vestel |
| Sosack, Robert | Molex Incorporated |
| Sun, Yingxiang | Huawei Technologies Co. Ltd |
| Trainin, Solomon | Qualcomm Incorporated |
| Tsai, Tsung-Han | MediaTek Inc. |
| Turkmen, Halise | Vestel |
| Varshney, Prabodh | Nokia |
| Wang, Chao Chun | MediaTek Inc. |
| Xin, Yan | Huawei Technologies Co. Ltd |
| YANG, RUI | InterDigital, Inc. |
| Yee, James | MediaTek Inc. |
| Zeng, Ruochen | NXP Semiconductors |
| Zhang, Meihong | Huawei Technologies Co., Ltd |
| Rosdahl, Jon | Qualcomm Technologies, Inc. |