IEEE P802.11
Wireless LANs

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| IEEE 802.11 Task Group AYSeptember 2015 Bangkok Meeting Minutes |
| Date: 2015-9-18 |
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Abstract

Task Group AY meeting minutes from the IEEE 802.11 Bangkok session, September 13-18, 2015.

**IEEE 802.11 Task Group AY**

**September 2015 Bangkok Meeting**

**September 13-18, 2015**

**Monday, September 14, 2015, AM2 Session (10:30-12:30)**

1. The IEEE 802.11ay task group meeting was called to order at 10:33 by the Chair, Edward Au (Marvell Semiconductor).
2. Agenda Doc. IEEE 802.11-15/0973r1
3. Chair reviewed the IEEE-SA patent policy, logistics, and reminders on Task Group rules.
	1. Chair asked if anyone has any questions about the IEEE-SA patent policy, logistics or reminders. No questions.
	2. Chair reminded all to record their attendance.
	3. Chair reminded all to upload their presentations.
	4. Chair asked if there were any questions on above items. None.
4. Chair reviewed the meeting time slots, meeting locations and agenda items for the week (see slides 10 and 11 of the agenda presentation).
5. Chair proceeded to discuss the appointment of a secretary for the September 2015 Bangkok meeting.
	1. Chair appointed Jeorge Hurtarte for the September Bangkok meeting (previously Jeorge was NG60 secretary).
	2. No objections noted on Jeorge’s appointment.
6. Chair reviewed the summary of the July 2015 Waikoloa, Hawaii, meeting, IEEE 802.11-15/0965r0.
7. Motion #9: Motion to approve the July 2015 Waikoloa Hawaii minutes
	1. Move: George Calcev (Huawei)
	2. Second: Carlos Cordeiro (Intel)
	3. No objections noted. Unanimous consent.
	4. The July 2015 Waikoloa Hawaii minutes were approved.
8. Chair reviewed the Task Group timeline (slide 17)
	1. Chair asked if there are any objections to the timeline.
	2. No objections noted.
	3. Some discussion on the level of confidence of the timeline.
9. Chair reviewed the number of presentations submitted so far and the week’s schedule for presentation.
	1. Chair asked if there are any questions.
	2. None noted.
10. Chair proceeded to discuss the Task Group AY leadership election logistics.
	1. Nominations were open up until this moment.
	2. Described the voting process.
	3. Chair asked if there any questions about the leadership election process. None noted.
	4. Candidates for Vice Chairs:
		1. SangHyun Chang (Samsung)
		2. Yan Xin (Huawei)
		3. Asked if any questions or objections for 2 Vice Chair positions. None.
		4. Asked if any questions or any other nominations for the Vice Chair positions. None.
		5. Asked each of the two candidates to introduce themselves and their backgrounds.
		6. Asked if any objections to elect SangHyun Chang as Vice Chair. No objections noted.
			1. SangHyun Chang appointed as Vice Chair.
		7. Asked if any objections to elect Yan Xin as Vice Chair. No objections noted.
			1. Yan Xin appointed as Vice Chair.
	5. Candidates for Secretary: Jeorge Hurtarte (Teradyne)
		1. Asked if any questions or any other nominations for the Secretary. None.
		2. Asked Jeorge Hurtarte to introduce himself and his background.
		3. Asked if any objections to elect Jeorge Hurtarte as Secretary. No objections noted.
			1. Jeorge Hurtarte appointed as Secretary.
	6. Candidates for Editor: Carlos Cordeiro (Intel)
		1. Asked if any questions or any other nominations for the Editor position. None.
		2. Asked Carlos Cordeiro to introduce himself and his background.
		3. Asked if any objections to elect Carlos Cordeiro as Editor. No objections noted.
			1. Carlos Cordeiro appointed as Editor.
	7. Candidates for Usage Model document lead: Rob Sun (Huawei)
		1. Asked if any questions or any other nominations for the Usage Model document lead position. None.
		2. Asked Rob Sun to introduce himself and his background.
		3. Asked if any objections to elect Rob Sun as the Usage Model document lead. No objections noted.
			1. Rob Sun appointed as Usage Model document lead.
	8. Candidates for Channel Model document lead: Alexander Maltsev (Intel)
		1. Asked if any questions or any other nominations for the Channel Model document lead position. None.
		2. Asked Alexander Maltsev to introduce himself and his background.
		3. Asked if any objections to elect Alexander Maltsev as the Channel Model document lead. No objections noted.
			1. Alexander Maltsev appointed as Channel Model document lead.
	9. Candidates for Functional Requirements document lead: Rob Sun (Huawei)
		1. Asked if any questions or any other nominations for the Functional Requirements document lead position. None.
		2. Asked Rob Sun to introduce himself and his background.
		3. Asked if any objections to elect Rob Sun as the Functional Requirements document lead. No objections noted.
			1. Rob Sun appointed as Functional Requirements document lead.
	10. Candidates for Simulation Scenario and Evaluation Methodology document lead: Laurent Cariou (Intel)
		1. Asked if any questions or any other nominations for the Simulation Scenario and Evaluation Methodology document lead position. None.
		2. Asked Laurent Cariou to introduce himself and his background.
		3. Asked if any objections to elect Laurent Cariou as the Simulation Scenario and Evaluation Methodology document lead. No objections noted.
			1. Laurent Cariou appointed as Simulation Scenario and Evaluation Methodology document lead.
11. Presentations
	1. Presentation by Rob Sun (Huawei), IEEE 802.11 TGay use cases, Doc. IEEE 11-15/0625r3.
		1. This document discusses nine use cases for 802.11ay.
		2. Opened the floor for discussion.
12. Chair noted that 45 participants were in attendance for the Monday AM2 session as of 11:18.
13. Resumed Presentations
	1. Presentation by Rob Sun (Huawei), IEEE 802.11 TGay Functional Requirements, Doc. IEEE 11-15/1074r0.
		1. Presenter introduced the first draft of the TGay Functional Requirements document.
		2. Opened the floor for discussion.
14. Chair indicated that all agenda items for this session have been covered.
	1. Chair asked if anyone would like to further present at this session. None.
15. Meeting recessed at 11:34 and will resume on Monday PM2.

**Monday, September 14, 2015, PM2 Session (16:00-18:00)**

1. The meeting was called to order at 16:00 by the Chair, Edward Au (Marvell Semiconductor).
2. Agenda Doc. IEEE 802.11-15/0973r2
3. Chair reviewed the IEEE-SA patent policy, logistics, and reminders on Task Group rules.
	1. Chair asked if anyone has any questions about the IEEE-SA patent policy, logistics or reminders. No questions.
	2. Chair reminded all to record their attendance.
4. Chair reviewed the agenda for Monday PM2.
	1. Chair asked if there were any more presentations or objections to the agenda. None.
5. Resumed Presentations
	1. Presentation by Alexander Maltsev (Intel), Simulation scenarios for TGay PHY layer evaluation methodology, Doc. IEEE 11-15/1144r0. Key points reviewed:
		1. Legacy IEEE 802.11ad simulation scenarios with the proposal of their extension into 802.11ay, including:
			1. Large indoor area - hotel lobby
			2. Outdoor open area hotspot access
			3. Outdoor street canyon hotspot access
			4. Street canyon backhaul
		2. Opened the floor for discussion.
	2. Presentation by Kerstin Johnsson (Intel), Proposed Merged for Simulation, Doc. IEEE 11-15/1146r0. Key points reviewed:
		* 1. Recommendation for merging simulation models:
				1. Usage Model 1: Ultra Short Range (USR) Communications
				2. Usage Model 2: 8K UHD Wireless Transfer at Smart Home – Recommending merging with Usage Model 3
				3. Usage Model 3: Augmented Reality/Virtual Reality Wearables
				4. Usage Model 4: Data Center 802.11ay Inter-Rack Connectivity – Recommending merging with Usage Model 8 (Backhauling)
				5. Usage Model 5: Mass Data Distribution/Video on Demand – Recommending merging with Usage Model 6 (Offloading)
				6. Usage Model 6: Mobile Offloading and Multi-band Operation
				7. Usage Model 7: Mobile Fronthauling – Recommending merging with Usage Model 8 (Backhauling)
				8. Usage Model 8: Wireless Backhauling
				9. Usage Model 9: Docking Station – Recommending merging with Usage Model 3.
			2. Potential MAC Simulation Scenarios:
				1. SLS For AR/VR commuter
				2. SLS for Offloading
				3. SLS for Backhauling
		1. Opened the floor for discussion.
6. Chair noted that 62 participants were in attendance for the Monday PM2 session as of 17:07.
7. Resumed Presentations
	1. Presentation by Simon Qu (Blackberry), PDF of Spatial Angles Reflected from Ceiling in the Conference Room Channel Model, Doc. IEEE 11-15/1028r0. Key points reviewed:
		1. This submission presents an analytical expression for the probability density function (PDF) of the spatial angles with 1st-order reflection from the ceiling in the conference room channel model specified in [Alexander Maltsev et al.: “Channel models for 60 GHz WLAN systems”, IEEE 802.11-09/0334r8].
		2. Opened the floor for discussion.
	2. Presentation by Robert Müller (Ilmenau University of Technology), Overview and discussion about the next steps for 802.11ay channel modeling, Doc. IEEE 11-15/1094r0. Key points reviewed:
		1. An overview on the different channel model types
			1. Various models can be used as the basis for the extension to mmWave and broadband signals.
			2. A simple ray racing model may be good for indoor but not for outdoor?
			3. The most promising solution is a physical-stochastically model (GBSCM)
			4. Parameterization with ray tracing and measurements
		2. Next steps
			1. Extension of the calibration 🡪 AGC calibration for dual pol. waveguide systems
			2. Outdoor: Above roof top to street level measurements
			3. Development of an HRPE for broadband signals and antenna spacing greater than λ/2
			4. Analysis of broadband effects in the channel and modeling methods
			5. Extension of the current physical-stochastically models
		3. Opened the floor for discussion.
	3. Presentation by Alexander Maltsev (Intel), Channel Models for IEEE 802.11ay, Doc. IEEE 11-15/1150r0. Key points reviewed:
		1. This document is the initial version containing a high level description of the proposed channel models to be used in IEEE 802.11ay group.
		2. Opened the floor for discussion.
8. Chair reviewed the schedule for the next presentations.
	1. There was some discussion about slide 6 of IEEE 11-15/1146r0.
	2. Chairman reminded if anyone had further presentations to upload them before the next session.
9. Meeting recessed at 17:53 and will resume on Tuesday AM1.

**Tuesday, September 15, 2015, AM1 Session (08:00-10:00)**

1. The meeting was called to order at 08:02 by the Chair, Edward Au (Marvell Semiconductor).
2. Agenda Doc. IEEE 802.11-15/0973r3
3. The chair reviewed the IEEE-SA patent policy, logistics, and reminders on Task Group rules.
	1. Chair asked if anyone has any questions about the IEEE-SA patent policy, logistics or reminders. No questions.
	2. Chair reminded all to record their attendance.
4. Presentations
	1. Presentation by Cagatay Capar (Ericsson), Efficient Beam Selection for Hybrid Beamforming, Doc. IEEE 11-15/01131r0. Key points reviewed:
		1. Optimal beam search becomes computationally complex in a MIMO scenario.
		2. A suboptimal search where transmit-receive antenna arrays are matched pairwise is an efficient alternative to exhaustive search.
		3. For a simulated indoor scenario, a pairwise search based on only signal power results in comparable performance.
		4. Performance of the pairwise search can be improved by changing the metric used to match array pairs, or increasing the number of candidates kept in each array pair matching.
		5. Opened the floor for discussion.
	2. Presentation by Alexander Maltsev (Intel), SU-MIMO Configurations for IEEE 802.11ay, Doc. IEEE 11-15/1145r0. Key points reviewed:
		1. This work proposes SU-MIMO configurations to be used to support channel models, evaluation methodology, and standard development in IEEE 802.11ay.
		2. It is proposed to consider MIMO schemes utilizing one or two Phased Antenna Arrays (PAAs) with rectangular geometry. Each element of the PAA can have single linear (H or V) polarization or dual (H and V) polarization.
		3. The considered schemes exploit spatial and polarization diversity channel properties and allow system operation in LOS and NLOS conditions.
		4. The maximum SU-MIMO configuration is limited to 4 x 4 scheme and supports 4 streams.
		5. Floor opened for discussion.
5. Chair noted that 60 participants were in attendance for the Tuesday AM1 session as of 09:03.
6. Resumed Presentations
	1. Presentation by Edward Au (Marvell Semiconductors), TGay Selection Procedure, Doc. IEEE 11-15/1079r1. Key points reviewed:
		1. Presented the selection procedure for the development of IEEE 802.11ay draft amendment.
		2. Floor opened for discussion.
		3. Chair indicated that this document will be put out for approval at the next November 2015 meeting.
7. Chair asked if there are any objections to cancel the rest of the Task Group AY meetings for the week as there were no more presentations.
	1. No objections noted.
8. Chair reviewed the schedule for the next conference call on October 27, 2015 at from 10:00 ET to 11:00 ET and the goals for the November 2015 Dallas meeting.
9. Chair asked if there are any objections to adjourn the Task Group AY Bangkok meeting.
	1. No objections noted.
10. The Task Group AY Bangkok meeting was adjourned on September 14, 2015 at 09:44.