IEEE P802.11
Wireless LANs

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| IEEE 802.11aj May Meeting Minutes |
| Date: 2014-05-22 |
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**ABSTRACT**

This document contains minutes of the May 2014 IEEE 802.11aj interim meeting in Beijing, China.

**MINUTES**

**New Contributions/Submissions:**

* 11-14/0333r2 TGaj Editor Report
* 11-14/0332/r3 TGaj CC12 comment database
* 11-14/0503r1 Comment resolution part 2
* 11-14/0715r0 Comment resolution part 3
* 11-14/0508r3 Proposed Text to CID 72, 119, 128 in CC12
* 11-14/0509r3 Proposed comment resolution to CID 72, 119, 128 in CC12
* 11-14/0713r1 Low power idle listening resolution to CID 144
* 11-14/0714r1 Enhanced beam tracking against blockage resolution to CID 145
* 11-14/0506r3 PHY related comment resolution
* 11-14/0391r1 Resolution to TGaj CC12 for CID 146
* 11-14/0718r0 Proposed text to TGaj CC12 for CID 146
* 11-14/0712r0 Channel generation for IEEE 802.11aj (45GHz) based on channel measurement
* 11-14/0716r1 PHY SIG Frame Structure for IEEE 802.11aj (45GHz
* 11-14/0717r0 LDPC coding for IEEE 802.11aj (45GHz)
* 11-14/0721r0 WLAN Access Network using RoF

**Wednesday (10:30-12:00) – IEEE 802.11aj meeting**

**IEEE 802.11 TGaj Chair, Xiaoming PENG (I2R)**

Chair called the meeting in order.

**Meeting Agenda (doc:** [**IEEE 802.11-14/0710r0**](https://mentor.ieee.org/802.11/dcn/14/11-14-0710-02-00aj-ieee-802-11aj-task-group-may-2014-report.ppt)**)**

Chair run through the IEEE 802 policies and procedures, IEEE 802 operations manual, patents related policies, call for potentially essential patents, IEEE LOA database, information on essential patents, patent claims, and pending patent applications and called for letters of assurance. No response to LOA request.

**No objection to the Patent Policy.**

**Chair discussed the agenda for the week as follows,**

**Agenda items for the week (doc: IEEE 802.11-14/0710r0)**

* Set agenda for the week
* Review from March meeting
* Approve the meeting minutes for March meeting
* Comment Resolution for CC12
* New submissions
* Planning for July 2014 Meeting

IEEE 802.11aj Agenda for the Week

* Wednesday May 21, 2014 10:30 – 12:30
* Review IEEE 802 & IEEE 802.11 Policies and Procedures
* Set agenda for the week
* Review from last meeting
* Approved the meeting minute in March meeting
* IEEE-802-11aj-task-group-meeting-schedule update
	+ 11-14/0333r2 – TGaj Editor Report
	+ 11-14/0332r0/r3 – TGaj CC12 comment database
	+ 11-14/0503r1 – comment resolution part 2
	+ 11-14/0715r0 – comment resolution part 3
	+ 11-14/0508r3 – Proposed Text to CID 72, 119, 128 in CC12
	+ 11-14/0509r3 – Proposed comment resolution to CID 72, 119, 128 in CC12
* Wednesday May 21, 2014 13:30 – 15:30
* TGaj officer election
	+ 11-14/0713r1 – Low power idle listening resolution to CID 144
	+ 11-14/0714r1 – Enhanced beam tracking against blockage resolution to CID 145
	+ 11-14/0506r3 – PHY related comment resolution
	+ 11-14/0391r1 – Resoluation to TGaj CC12ffor CID 146
	+ 11-14/0718r0 – Proposed text to TGaj CC12 for CID 146
* Wednesday May 21, 2014 16:00 – 18:00
* New submissions
	+ 11-14/0712r0 – Channel generation for IEEE 802.11aj (45GHz) based on channel measurement
	+ 11-14/0716r1 - PHY SIG Frame Structure for IEEE 802.11aj (45GHz)
* Thursday May 22, 2014 09:00 – 10:00
* Motion
* Plan for July 2014 Meeting

**No objection to the agenda.**

**Chair presented the work completed in March meeting, as follows,**

* 11-14/0276r1 – TGaj Call for Proposals for 45GHz
* With new modified deadline of notification of intent
	+ - 11-14/011r0 - A low power demodulator prototype for SDR transceivers (40-60 GHz) – new contribution
* Specifically for OOK low power design
* 11-14/018r1-PHY-Simulations-and-Methodology
* 11-14/0333r0 – TGaj Editor Report
* Comment database is included in 11-14/0332 (received 151 comments)
	+ - 45GHz Channel Model
* 11-14/015r2 – Large Scale Characteristic of 45GHz
* 11-14/0403r0 – Small Scale Characteristic of 45GHz
* SEU will generate Matlab code for the channel model of 45GHz and share more details in the coming May meeting
	+ - Comment Resolution for D0.01 (CC12)
* 11-14/0334r2 – D0.01 comment resolution CIDs: 13, 59, 73, 76, 77, 79, 80, 81, 112, 117, 133, 149.
* 11-14/0407r2 – comment resolution CID 19, 20, 21, 22, 23 (part of), 24, 25 (part of), 28, 29, 30, 31, 32, 65
* 11-14/0408r1 – revised text proposal
* SEU will generate Matlab code for the channel model of 45GHz and share more details in the coming May meeting
* CID 127 for decentralized clustering Text proposal will be provided in next conference call
* 11-14/0390r1 – comment resolution
* CID 127 for centralized clustering
* Text proposal will be provided in next conference call
* 11-14/0391r0 – comment resolution CID 146
* 11-14/0408r1 – revised text proposal for comment resolution
	+ Updated version based on the discussion and feedback
* 11-14/0444r0 – comment resolution for CID 116
* 11-14/0445r0 – revised text proposal for CID 116

 **Chair presented the work completed in conference call, as follows,**

* 11-14/0503r0 - D0.01 Comment Resolution (part 2)
	+ Comment Resolution for CIDs: 1-18, 23, 25, 34, 36, 39, 48, 54-56, 57, 58, 60, 61, 63, 69, 74, 75, 78, 84, 88, 90-93, 95, 98, 100, 103, 106, 110, 122, 126, 134-141, 148 - Jiamin Chen (Huawei)
* 11-14/0509r1 - Proposed Resolution to Comment CID 72, 119, 128 in CC12
* 11-14/0508r1 - Proposed Revised Text to Resolve CID 72, 119, 128 in CC12
	+ Comment Resolution for CIDs: 72, 119, 128 - Chen Qian (I2R)
* 11-14/0503r0 - PHY Related Comment resolutions part 1
	+ Comment Resolution for CIDs: 82, 83, 85-87, 89, 94, 96, 97, 99, 101, 102, 104, 105, 107-109, 129, 131 - By Changming Zhang (Tsinghua Univ.)

**Jiaming CHENG (Huawei/HiSilicon) presented TGaj Editor Report(doc:** [**IEEE 802.11-14/0333r2**](https://mentor.ieee.org/802.11/dcn/14/11-14-0333-01-00aj-tgaj-editor-report.ppt)**)**

* 26 CIDs (out of a total of 151 received from CC12) were resolved and passed motion in March Beijing session:
* 19, 20, 21, 22, 24, 28, 29, 30, 31, 32, 65 (from11-14/0407r3, 11-14/0408r1)
* 116 (from 11-14/0445r1)
* 13, 63, 73, 76, 77, 79, 80, 81, 111,112, 113, 117, 133, 149 (from 11-14/0334r2)
* 2 CIDs were discussed but not motioned in March Beijing session :
* 127 (from 11-14/389r0 and 11-14/390r0),
* 146 (from 11-14/391r0)
* 80 CIDs were presented and discussed during the April 4th conference call:
* 1, 2, 3, 4, 6, 7, 9, 10, 11, 12, 14, 15, 16, 18, 23, 25, 34, 36, 39, 48, 54, 55, 56, 57, 58, 60, 61, 63, 69, 74, 75, 84, 88, 90, 91, 92, 93, 95, 98, 100, 103, 106, 110, 123, 134, 135, 136, 137, 138, 139, 140, 141, 148, 122, 126, 5, 8, 17 (from 11-14-0503r0)
* 72, 119, 128 (from 11-14/0508r1, 11-14/0509r1)
* 82, 83, 85, 86, 87, 89, 94, 96, 97, 99, 101, 102, 104, 105, 107, 108, 109, 129, 131 (from 11-14/0506r1)
* CIDs will be updated during the May session:
* 6, 14, 58, 61, 62 (from 11-14/0503r2)
* 72, 119, 128 (from 11-14/0508r3, 11-14/0509r3)
* 146 (from11-14/0391r1)
* 83, 96, 99, 101, 102, 105, 108 (from 11-14/0506r2)
* 6 CIDs will have resolution proposed during the May session:
* 59, 64, 78, 121 (from 11-14/0715r1)
* 144 (from 11-14/0713r1)
* 145 (from 11-14/0714r1)
* 37 CIDs will be processed later:
* 26, 27, 33, 35, 37, 38, 40, 41, 42, 43, 44, 45, 46, 47, 49, 50, 51, 52, 53, 66, 67, 68, 70, 71, 114, 115, 118, 120, 124, 125, 130, 132, 142, 143, 147, 150, 151

**Jiaming CHENG (Huawei/HiSilicon) presented the comments resolution, as follows**

* TGaj CC12 comment database(doc: [IEEE 802.11-14/0332r3](https://mentor.ieee.org/802.11/dcn/14/11-14-0332-03-00aj-d0-01-comment-database.xlsx))
* Comment resolution part 2(doc: [IEEE 802.11-14/0503r1](https://mentor.ieee.org/802.11/dcn/14/11-14-0503-02-00aj-d0-01-comment-resolution-part-2.doc))
* Comment resolution part 3(doc: [IEEE 802.11-14/0715r0](https://mentor.ieee.org/802.11/dcn/14/11-14-0715-01-00aj-d0-01-comment-resolution-part-3.doc))

**Xiaoming (I2R) presented the comments resolution on behalf of Chen Qian, as follows**

* Proposed Text to CID 72, 119, 128 in CC12 (doc: [IEEE 802.11-14/0508r3](https://mentor.ieee.org/802.11/dcn/14/11-14-0508-04-00aj-proposed-revised-text-to-resolve-cid-72-119-128-in-cc12.docx))
* The complete revised text proposal to resolve CID 72, 119, 128 is provided in IEEE 802.11-14-0508r3.
* Suggest to remove the changes in D0.01 and revised the text proposal according to IEEE 802.11-14-0508r3.
* Proposed comment resolution to CID 72, 119, 128 in CC12(doc: [IEEE 802.11-14/0509r3](https://mentor.ieee.org/802.11/dcn/14/11-14-0509-03-00aj-proposed-resolution-to-comment-cid-72-119-128-in-cc12.pptx))

**Comment:**

**In Annex AB:**

Change “AP or PCP may use” into “An AP or PCP uses…, selects…, stores… ”

Change “should be” into “is typically”

Change “may schedule” into “schedules”

Change “should select” into “selects”

**Chair proposed to recess the session.**

**No objection.**

**The meeting recessed at 12:00pm.**

**Wednesday (13:30-15:30) – IEEE 802.11aj meeting**

**TGaj officer election (doc:** [**IEEE 802.11-14/0710r1**](https://mentor.ieee.org/802.11/dcn/14/11-14-0710-02-00aj-ieee-802-11aj-task-group-may-2014-report.ppt)**)**

* Task Group Officer Position
* Xiaoming handover to Haiming WANG to chair the part of electing TGaj Chair position
* Task Group Chair: Xiaoming PENG
	+ Motion to approve the Task Group Chair Position
	+ Result: Y 8 N 0 A 0
	+ Motion passed
* Other Task Group Officer Positions
* TG Vice Chair: Eldad Perahia / Haiming WANG
* TG Secretary: Peng HAO
* TG Technical Editor: Jiamin CHEN
	+ Motion to approve the above Task Group Officer Positions
	+ Result: Y 8 N 0 A 0
	+ Motion passed

**Bo GAO (THU) presented Low power idle listening resolution to CID 144 (doc:** [**IEEE 802.11-14/0713r1**](https://mentor.ieee.org/802.11/dcn/14/11-14-0713-01-00aj-low-power-idle-listening-resolution-to-cid-144.ppt)**)**

* Introduction of comment #144: power consumption of idle listening is considerable.
* Sleeping schedule is a natural way to reduce the power consumption…
* Detection performance evaluation using 1-bit sampling
* Preamble modification in 802.11aj
* Power saving

Q: If transmitting two more Ga/Gb128 sequences, the transmitter will spends more power to transmist them. Whether you consider those situations?

A: The scheme focuses on reducing idle listening. Based on the CSMA/CA mechanism, the duration of idle listening is much longer than that of transmitting these two Ga/Gb128 sequences. The time for transmiting Ga128 is really short and can be ignored.

**Bo GAO (THU) presented Enhanced beam tracking against blockage resolution to CID 145 (doc:** [**IEEE 802.11-14/0714r1**](https://mentor.ieee.org/802.11/dcn/14/11-14-0714-01-00aj-enhanced-beam-tracking-against-blockage-resolution-to-cid-145.ppt)**)**

* Introduction of comment #145
* Introduction of human blockage, block model.
* Giving beam traking schemes both from PHY and MAC perspective
* Explaining enhanced beam tracking
* Showing performance evalutions including received power trajectory, which illustrates the proposed scheme can switch to a second-best link when current link is blocked, as well as switch back when the blockage vanishes.

**Comment:**

* Q: Is there similar switch scheme already existed?
* A: The proposed scheme is based on beam tracking of 11ad. It uses one reserved bit in existed IE, and it uses a new IE.
* Recommend (from Jon) adding reference like Diagram number.

**Chanming ZHANG (THU) presented PHY related comment resolution (doc:** [**IEEE 802.11-14/0506r3**](https://mentor.ieee.org/802.11/dcn/14/11-14-0506-03-00aj-phy-related-comment-resolutions-part-1.doc)**)**

* Approve the suggestion and merged MR SC PHY and HR SC PHY into SC PHY.
* The related paragraphs/table of CID 96, 99, 83 are deleted.
* CID 105. Solved after merging.

**No comment.**

**Dejian LI (Huawei) presented resolution to TGaj CC12 for CID 146 (doc:** [**IEEE 802.11-14/0391r1**](https://mentor.ieee.org/802.11/dcn/14/11-14-0391-01-00aj-resolution-to-tgaj-draft-0-01-cid-146.ppt)**)**

* Review of the proposal.

**Comment**: (Jon) Keep the original title of 9.33.8.1 and then add two subclauses (DMG and CDMG) in 9.33.8.1. Do not put a new name on what have already been done (existed clause).

**Chair proposed to recess the session.**

**No objection.**

**The meeting recessed at 15:00pm.**

**Wednesday (16:00-18:00) – IEEE 802.11aj meeting**

**Haming Wang(SEU) presented Channel Generation of 802.11aj (45GHz) Based on Channel Measurement (doc:** [**IEEE 802.11-14/0712r1**](https://mentor.ieee.org/802.11/dcn/14/11-14-0712-01-00aj-channel-generation-for-ieee-802-11aj-45ghz-based-on-channel-measurement.pptx)**)**

* This document is to gives process of channel realization generation of 45 GHz band..
* Review of generation of the channel impulse response of 11ad
* Realization process
* Modeling of parameters
* Statistical measurement at 45 GHz band
* Channel Measurement Scenario
* Measurement process
	+ Frequency domain measurement
	+ Scanning measurement in the angular domain
* Modeling
* Clustering will be improved to better classifying rays in the angular domain;
* Inter-cluster and intra-cluster parameters will be statically computed to describe the 45 GHz channel more accurately.
* We will put the new parameter list and some examples of channel generation of 11aj (45GHz) in our website in June 2014, and the hyperlink will be sent to the email reflector.
* More information of channel generation for 11aj (45 GHz) in conference room will be provided in this July session.
* **Comment:**

Q: Whether the 11aj will open the matrix code for generating the channel model for 45GHz?

A: We will give an example of channel model for 11aj (45GHz). If necessary, we can create the generation program of channel model of 45GHz living room. Meanwhile, to the channel model of 11aj(60GHz), users can download the channel model from 11ad documents.

**Shiwen HE (SEU) presented PHY SIG Frame Structure for IEEE 802.11aj (45GHz) (doc:** [**IEEE 802.11-14/0716r3**](https://mentor.ieee.org/802.11/dcn/14/11-14-0716-03-00aj-phy-sig-frame-structure-for-ieee-802-11aj-45ghz.ppt)**)**

* The proposal presents a kind of physical layer SIG frame structure in millimeter-wave multi-user MIMO WLAN communication for IEEE 802.11 aj (45GHz).
* Challenges of future WPAN
* Limited spectrum resources
* Requirement for high data rate
* Features of future WPAN
* Large bandwidth
* Multiple channel mode
* Multi-user
* Multi-stream
* 45GHz millimeter-wave communication
* Digital home appliances
* Ultra-high-speed (10Gbps) wireless applications
* The SIG frame structure try to achieve the following technical goals
* Dynamic bandwidth
* Multi-user & Multi-stream
* Energy efficiency
* Scrambler
* Single & Multi-carrier
* Dynamic bandwidth
* Achieving dynamically channel bandwidth selection for 1080MHz BSS to enhance the adaptability in different channel environments and improve spectral efficiency.
* **Comment:**

Q: Why you use B53, or what did B53 use before in the packet head?

A: The SIG-A structure is totally new, which is not depended on 11ad or 11ac.If the group chooses the structure, we will consider the compability with / relationship with 11ad and before.

**Chair presented the proposed draft plan (doc:** [**IEEE 802.11-14/0710r2**](https://mentor.ieee.org/802.11/dcn/14/11-14-0710-02-00aj-ieee-802-11aj-task-group-may-2014-report.ppt)**)**

* 22 May 2014 approve creation of new draft with all comments that have been approved
* Two conference calls complete those outstanding CC12 comments(June 12, Jun26, July 1)
* Get ready TGaj technical draft D0.2 for new comment collection call (at least 20 days for the comment collection, before the 2nd conference call)

**Chair proposed to recess the session.**

**No objection.**

**The meeting recessed at 6:00pm.**

**Thursday (9:00-10:00) – TGaj meeting**

**IEEE 802.11aj Chair, Xiaoming PENG (I2R)**

Chair called the meeting in order.

Chair showed the agenda for the session as follows

* 11-14/0717r0 – LDPC coding for IEEE 802.11aj (45GHz)
* 11-14/0721r0 – WLAN Access Network using RoF
* Motion
* Plan for July Meeting

**Weimin presented LDPC coding for IEEE 802.11aj (45GHz) (doc:** [**IEEE 802.11-14/0717r0**](https://mentor.ieee.org/802.11/dcn/14/11-14-0717-00-00aj-ldpc-coding-for-45ghz.pptx)**)**

* Introduction of LDPC background information
* LDPC scheme in 802.11ad may cause address conflict and high complexity
* Showing the proposed LDPC design including follows:
* Base matrix
* Signal field coding

Conclusion:

 Proposed LDPC sheme can achieve:

* Low complexity
* good for LDPC pipeline decoder

**Comment:**

Q: (Xiaoming Peng) Did you get simulation result comparison between the proposed one and existed one in 11ad?

A: Yes, and we will put that in a later version.

**Wenjing XU presented WLAN Access Network using RoF (doc:** [**IEEE 802.11-14/0721r0**](https://mentor.ieee.org/802.11/dcn/14/11-14-0721-00-00aj-wlan-access-network-using-rof.pptx)**)**

Introduction of system setup

CS and BS

Proposed scheme is able to suppress the sidelobes

**Comment:**

Q: (Xiaoming Peng) What is the requirement for the change of MAC/PHY for the setup? Do we expect the wireless transmission after the RoF to be Omni or directional?

A: No request on the change of MAC/PHY.

**Motion**

**To approve the updated TGaj meeting schedule (doc:** [**IEEE 802.11-14/0710r2**](https://mentor.ieee.org/802.11/dcn/14/11-14-0710-02-00aj-ieee-802-11aj-task-group-may-2014-report.ppt)**)**

* Moved by: Jon Tosdahl
* Seconded by: Jiaming Chen
* Results:Y 9 N 0 A0

**To approve the comment resolution for the following CIDs for CC12**

* + CID 1-12, CID 14-18, 23, 25, 34, 36, 39, 48, 54-58, 60-63, 69, 74, 75, 84, 88, 90-93, 95, 98, 100, 103, 106, 110, 122, 123, 126, 134-141, 148 (from 11-14/0503r2)
	+ CID 72, 119, 128 (from 11-14/0508r4, 11-14/0509r3)
	+ CID 82, 83, 85, 86, 87, 89, 94, 96, 97, 99, 101, 102, 104, 105, 107, 108, 109, 129, 131 (from 11-14/0506r3)
	+ CID 146 (11-14/391r1 and 11-14/718r0)
	+ CID 59, 64, 78, 121 (from 11-14/0715r1)
* Moved by: Jiaming Chen
* Seconded by: Dejian Li
* Results: Y 6 N 0 A0

**Plan for July 2014 Meeting**

Goals for July Meeting

* Comment Resolution for outstanding CID for CC12
* New Comment Resolution for 802.11aj new version (D0.2)
* New Submissions for 45GHz
* **Conference Call times**
1. June 12, 2014, 9pm (ET)

Beijing Time: June 13, 2014, 9am

1. June 26, 2014, 9pm (ET)

Beijing Time: June 27, 2014, 9am

1. July 2, 2014, 9pm (ET)

Beijing Time: July 3, 2014, 9am

**No objection to the conference call times**

* **Chair proposed to adjourn the TGaj session for the week.**

**No objection.**

**The meeting adjourned at 10:00am.**