IEEE P802.11
Wireless LANs

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| IEEE 802.11aj November Meeting Minutes |
| Date: 2013-11-12 |
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**ABSTRACT**

This document contains minutes of the Novermber 2013 IEEE 802.11aj plenary meeting in Dallas, TX, USA.

**MINUTES**

**New Contributions/Submissions:**

1. 11-13-1416-02 IEEE 802.11aj Task Group Nov 2013 Report
2. 11-13-1301-01 TGaj Complete Proposal (60GHz)
3. 11-13/1291-01 Dynamic Bandwidth Control for 802.11aj (NT)
4. 11-13/1293-01 Opportunistic Transmissions in Multiple Alternative Channels in 802.11aj (60GHz NT)
5. 11-13/1346-01 Decentralized-Clustering-Mechanism-for-802.11aj-60GHz (NT)
6. 11-13/1292-01 Spatial Sharing Mechanism in 802.11aj (NT)
7. 11-13/1345-00 Dynamic Channel Transfer Procedure for 802.11aj 60GHz (NT)
8. 11-13/1282-01 MAC proposal for dynamic BW (NT)
9. 11-13/1364-01 Distributed Timeslot Allocation (DTA) Mechanism for 802.11aj 60GHz (NT)
10. 11-13/1365-01 45GHz Spectrum Allocation in China

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

**IEEE 802.11 TGaj Vice Chair, Eldad Perahia (Intel)**

Vice Chair called the meeting in order.

Meeting Agenda (doc: [IEEE 802.11-13/1416r0](https://mentor.ieee.org/802.11/dcn/13/11-13-1416-00-00aj-ieee-802-11aj-task-group-nov-2013-report.ppt))

Vice Chair run through the IEEE 802 policies and procedures, IEEE 802 operations manual, patents related policies, call for potentially essential patents, IEEE LOA database, and 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.**

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

Agenda items for the week**（**doc: [IEEE 802.11-13/1416r](https://mentor.ieee.org/802.11/dcn/13/11-13-1416-01-00aj-ieee-802-11aj-task-group-nov-2013-report.ppt)1**）**

* Set agenda for the week
* Review from September meeting
* Approve the meeting minutes for September meeting
* Proposal List (Response to intent of CFP (60GHz))
* New Technique Presentations
* Plan to Election of TG Technical Editor
* Planning for January 2014 Meeting

IEEE 802.11aj Agenda for the Week

* **Tuesday Nov 12, 2013 16:00 – 18:00**
	+ Review IEEE 802 & IEEE 802.11 Policies and Procedures
	+ Set agenda for the week
	+ Review from last meeting
	+ Approved the meeting minute in Sept meeting
	+ Proposal Presentation
		- TGaj Complete Proposal Presentation (CP) 11-13/1301r1
		- Dynamic Bandwidth Control for 802.11aj （NT) - 11-13/1291r2
* **Wednesday Nov 13, 2013 16:00-18:00**
	+ Opportunistic Transmissions in Multiple Alternative Channels in 802.11aj (60GHz NT) - 11-13/1293r2
	+ Decentralized-Clustering-Mechanism-for-802.11aj-60GHz (NT) – 11-13/1346r1
	+ Spatial Sharing Mechanism in 802.11aj (NT) – 11-13/1292r2
	+ Dynamic Channel Transfer Procedure for 802.11aj 60GHz (NT) - 11-13/1345r0
* **Thursday Nov 14, 2013 10:30 – 12:30**
	+ MAC proposal for dynamic BW （NT）– 11-13/1282r1
	+ Distributed Timeslot Allocation (DTA) Mechanism for 802.11aj 60GHz (NT) – 11-13/1364r1
	+ NT Proposal from James Yee (Withdraw)
	+ New submission
* **Thursday Nov 14, 2013 16:00-18:00**
	+ Election of TG Technical Editor
	+ 45GHz Spectrum Allocation in China – 11-13/1365r1
	+ Plan for January 2014 Meeting

**No objection to the agenda.**

**Vice Chair presented the work completed in September meeting, as follows,**

* List of Proposals has been responded
* 1 Completed Proposal and 12 New Technique Proposals
* 3 New Technique Proposals being presented in Sept session
* 1 Complete proposal and 8 New Technique Proposals to be presented in November session
* Two new technique proposals have been presented and one new technique proposal has been withdrawn
* Consideration of PHY design for 1.08GHz channel – 11-13/1109r0
* Beam codebook design scheme - 11-13/1110r0
* Two other contributions
* PCP selection considering supported channels capability – 11-13/1183r0
* Back-haul usage model - 11-13/177r4
* Approved a motion of “Call for nomination of TGaj Technical Editor and Election of TGaj Technical Editor in November meeting”

**Vice Chair proposed to approve the IEEE 802.11aj September meeting minutes -**[**11-13/1209r0**](https://mentor.ieee.org/802.11/documents?is_dcn=1209)

* No objection
1. **Presentations on Tuesday:**
	1. **Jiaming CHEN (Huawei/Hisilicon) presented the complete proposal (60GHz) (doc:** [**IEEE 802.11-13/1301r1**](https://mentor.ieee.org/802.11/dcn/13/11-13-1301-01-00aj-tgaj-complete-proposal-presentation-60ghz-cp.pptx) **and doc:** [**IEEE 802.11-13/1302r0**](https://mentor.ieee.org/802.11/dcn/13/11-13-1302-00-00aj-tgaj-complete-proposal-specification-60ghz-cp.docx)**)**
* Enables the low power/low cost portable/mobile devices and the high performance devices, guaranteeing interoperability and communication between 11aj and 11ad devices
* Supports dynamic bandwidth operation at 1.08GHz/2.16GHz channel
* Supports dynamic channel transfer to coordinate the allocation of operating channel
* Supports opportunistic transmissions and refined spatial sharing
* Supports enhanced mobile device support mode
* Supports distortion compensation for I/Q imbalance and PA nonlinearity

**Comments:**

* Q: Carlos Cordeiro (Intel) concerns the back compatibility of the complete proposal of 11aj (60 GHz) with 11ad.
* A: The PAR and FRD requires the TGaj amendment shall maintain the backward compatibility with 11ad. So, all the separate technique proposals shall comply with this requirement. It is reasonable to discuss the backward compatibility in detail in separate technique proposal and try to reach a consensus.
* Q: Jianhan LIU (Mediatek) concerns the PA nonlinearity with memory effect; the treatment (Slide 29) in the proposal does not work in reality. It is better to reconsider this.
* A: The simulation results show that PA nonlinearity distortion can be estimated and compensated by the proposed method when use the parameters and assumptions in contribution 13/1109r1. Jianhan mentioned that PA memory effect as well as practicability shall be considered. So, need to evaluate the affect on this trechnique proposal.
* Q: Bo SUN (ZTE) points that the title of 802.11-13/1109r1 is wrong in slide 6.
* A: It will be corrected in the next revision.
* Q: Gal Basson (Wilocity) asks why do we need this new PHY mode (additional spreading sequence), there is not 12 dB gap between MCS0 and MCS1
* A: Jianhan Liu (Mediatek) explains that there is actually 12 dB gap of SNR between Control PHY and MCS1 for data transmission in 11ad from simulation results. And the method is a simple implementation.
	1. **Khiam-Boon Png (I2R) presented Dynamic Bandwidth Control for 802.11aj (60GHz New Technique Proposal) (doc:** [**IEEE 802.11-13/1291r2**](https://mentor.ieee.org/802.11/dcn/13/11-13-1291-02-00aj-dynamic-bandwidth-control-for-802-11aj-60ghz-nt.ppt)**)**
* This presentation is part and in support of the complete proposal described in IEEE 802.11-13-1301r0 (slides) and IEEE 802.11-13-1302r0 (text)
* This document is to propose a channelization for China 60GHz frequency band for 802.11aj (60GHz)
* This document is to propose a MAC protocol amendment to support dynamic bandwidth for 802.11aj (60GHz)
* The proposed MAC protocol supports the backward compatibility with 802.11ad legacy device

**Comments:**

* Q: Carlos Cordeiro (Intel) asks why there is a need for transmission of the BHI in both the large band and the small band. He suggested that only a single BHI for each BSS to be transmitted in the large band while the DTI reside in the respective small band since:
1. 11aj STAs will anyways have to support the large band; and
2. There is no meaningful power consumption increase by requiring the STA to tune to the large band to receive the BHI – this is something commonly done in Wi-Fi.

From the PCP/AP side, requiring the PCP/AP to transmit the BHI twice increases the power consumption and overhead. Plus, we cannot ignore the fact that the PCP is just like any other STA and could be as simple as a mobile phone. So, with the proposed structure, you are actually penalizing simple devices at no gain in power, performance or overhead.

* A: We consider that requiring only the PCP/AP to hop between the big and small band will be simpler in operation rather than having all STAs having to hop between the big and small band. Moreover, it is unsure that the BF done in the big band between STAs and PCP/AP for BHI communications can be reused in the small band during the DTI. As such more time and power may be wasted in doing two sets of BF (once in the big band, once in the small band) not to mention the fact that each pair of PCP/AP and STA will have to keep 2 sets of BF information.

**Vice Chair proposed to recess the session.**

**No objection.**

**The meeting recessed at 18:00pm.**

**Wednesday (16:00-18:00) – TGaj meeting**

**IEEE 802.11 TGaj Vice Chair, Eldad Perahia (Intel)**

Vice Chair called the meeting in order.

Vice Chair showed the agenda for the session as follows,

**Agenda items for the session（doc:** [**IEEE 802.11-13/1416r1**](https://mentor.ieee.org/802.11/dcn/13/11-13-1416-01-00aj-ieee-802-11aj-task-group-nov-2013-report.ppt)**）**

* Opportunistic Transmissions in Multiple Alternative Channels in 802.11aj (60GHz NT) - 11-13/1293r2
* Decentralized-Clustering-Mechanism-for-802.11aj-60GHz (NT) – 11-13/1346r1
* Spatial Sharing Mechanism in 802.11aj (NT) – 11-13/1292r1
* Dynamic Channel Transfer Procedure for 802.11aj 60GHz (NT) - 11-13/1345r0

**No objection to the agenda.**

**Presentations:**

1. **Khiam-Boon Png (I2R) presented Opportunistic Transmissions in Multiple Alternative Channels in 802.11aj (60GHz NT) (doc: IEEE 802.11-13/1293r2)**
* This presentation is part and in support of the complete proposal described in IEEE 802.11-13-1301r1 (slides) and IEEE 802.11-13-1302r0 (text)
* This document is to propose a solution for opportunistic transmission over alternative channels to increase the network throughput.

**Comments:**

* Q: Carlos Cordeiro (Intel) asked that in Slide 8, why it did not create a new BSS. It is similar as Wi-Fi direct. Why is it so important to keep one BSS?
* A: The opportunistic transmission scheme is used for STAs to have bursty data transfer with each other directly whilst remaining in the BSS with an AP so that they can still have access to the distribution services (i.e. internet).
* Q: The proposed scheme is similar to TDLS scheme already in the 802.11 standards. What is the difference between the two schemes?
* A: We will study the TDLS scheme in details and have a follow up presentation.
1. **Dejian Li (Huawei/CWPAN) presented Decentralized-Clustering-Mechanism-for-802.11aj-60GHz (NT) (doc: IEEE 802.11-13/1346r1)**
* This presentation is part and in support of the complete proposal described in IEEE 802.11-13-1301r0 (slides).
* This document is to propose a MAC protocol amendment to support decentralized PCP/AP clustering for 802.11aj (60GHz).
* The proposed MAC protocol supports the backward compatibility with 802.11ad legacy device.

**No Comments.**

1. **Khiam-Boon Png (I2R) presented Spatial Sharing Mechanism in 802.11aj (NT) (doc: IEEE 802.11-13/1292r1)**
* This presentation is part and in support of the complete proposal described in IEEE 802.11-13-1301r1 (slides) and IEEE 802.11-13-1302r0 (text).
* This document is to propose a spatial sharing mechanism to assess two pair of devices with directional transmission that can be used concurrently for spatial sharing, based on the priori information of beamforming training results among devices in a network.
* The proposed method applies to the initial recommendation of resource allocation in either scheduled slots or contention based slots, it is only a recommended procedure, instead of mandatory procedure.

**Comments:**

* Q: Carlos Cordeiro (Intel) asked in slide 14, there is no way that 11ad devices receive SSW feedback. This is a new frame. Beamforming is before association. Source AID and Destination ID are still unkown.
* A: We accept the suggestion and will designate a new frame for the proposed scheme instead of proposing an amendment to the current SSW feedback frame. This new frame will be used exclusively between two devices after they have associated with the PCP/AP and not before the association such as in the A-BFT.
1. **Jiamin Chen (Huawei/Hisilicon) presented Dynamic Channel Transfer Procedure for 802.11aj 60GHz (NT) (doc: IEEE 802.11-13/1345r0)**
* This document is to propose a MAC protocol amendment to support dynamic channel transfer procedure for 802.11aj (60GHz).

**No Comments.**

**Vice Chair proposed to recess the session.**

**No objection.**

**The meeting recessed at 17:00pm.**

**Thursday (10:30-12:30) – TGaj meeting**

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

Chair called the meeting in order.

Chair showed the agenda for the session as follows,

**Agenda items for the session（doc:** [**IEEE 802.11-13/1416r**](https://mentor.ieee.org/802.11/dcn/13/11-13-1416-02-00aj-ieee-802-11aj-task-group-nov-2013-report.ppt)**2）**

* MAC proposal for dynamic BW (NT) (doc: [IEEE 802.11-13/1282r1](https://mentor.ieee.org/802.11/dcn/13/11-13-1282-01-00aj-mac-proposal-for-dynamic-bw.pptx))
* Distributed Timeslot Allocation (DTA) Mechanism for 802.11aj 60GHz (NT) (doc: [IEEE 802.11-13/1364r2](https://mentor.ieee.org/802.11/dcn/13/11-13-1364-02-00aj-distributed-timeslot-allocation-dta-mechanism-for-802-11aj-60ghz.pptx))

**No objection to the agenda.**

**Presentations:**

1. **Carlos Cordeiro (Intel Corp.) presented MAC proposal for dynamic BW (NT) (doc: IEEE 802.11-13/1282r1)**
* We propose new techniques (NTs) that are aligned with and build on the BW management techniques described in 11-13/292r0
* The proposed NTs extend 11ad MAC schemes with the goal of facilitating development and adoption of 11aj
	+ Fully backward compatible with 11ad
	+ Reuse 11ad mechanisms as much as possible
	+ Simple extensions
	+ Meet the 11aj requirements for operation on channels with different BW

**Comments:**

* Q: Khiam Boon (I2R): Does BF done in A-BFT in large band considered as valid for the small band?
* A: Essentially yes, but you can re-do BF training if RTS/CTS fails
* Q: Khiam Boon: In 11ad, it is not explicitly stated that a BSS cannot schedule a transmission if another BSS has already scheduled a transmission in a timeslot.
* A: 11ad, due to directional transmission, interference may not be occuring most of the time.
* Q: Khiam Boon: If there is no explicit medium access protection of the BSS, it difficult to satisfy the condition of having three independent logic channel?
* A: During the clustering, one BSS can use one of the smaller channel while the other BSS can use the other smaller channel and no interference will result in this case.
1. **Haiming Wang (SEU) presented • Distributed Timeslot Allocation (DTA) Mechanism for 802.11aj 60GHz (NT) (doc: IEEE 802.11-13/1364r3)**
* This presentation describes a New Technique proposal of the Distributed Timeslot Allocation (DTA) Mechanism for IEEE 802.11aj (60 GHz).
* Using the proposed DTA mechanism, more than two non-overlapped BSSs can be established with only 2×2.16 GHz channels at 60 GHz band in China.

**Comments:**

Q: Chaoqun Wang (Mediatek): Is the distribution of time between the BSS fixed after the initial setup?

A: Yes, but re-negotiation is possible.

Q: Chaoqun Wang (Mediatek): For re-negotiation, the second PCP/AP need to associate with the first PCP/AP again? How can that be done?

A: We need a new dynamic method to re-allocate time duration. Details can be figured out.

Q: Khiam-Boon Png (I2R) asked whether there is fundamental difference between the DTA mechanism and Carlos’s inter BSS dynamic BW operation. What is the advantage of the proposed scheme compared to the clustering scheme?

A: For building more than two non-overlapped channels, it is similar. However, in the DTA mechanism, no small band is required. In Carlos’s inter BSS operation, clustering is used to partition time duration.

**Chair proposed to recess the session.**

**No objection.**

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

**Thursday (16:00-18:00) – TGaj meeting**

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

Chair called the meeting in order.

Chair showed the agenda for the session as follows,

**Agenda items for the session（doc:** [**IEEE 802.11-13/1416r**](https://mentor.ieee.org/802.11/dcn/13/11-13-1416-02-00aj-ieee-802-11aj-task-group-nov-2013-report.ppt)**2）**

* Election of TG Technical Editor
* 45GHz Spectrum Allocation in China – 11-13/1365r1
* Plan for January 2014 Meeting

**No objection to the agenda.**

1. **Election of TG Technical Editor**

**Candidate: Jiamin Chen (Huawei)**

**Motion: Y: 9/N: 0/A: 0**

1. **Haiming Wang (SEU) presented 45GHz Spectrum Allocation in China (doc:** **[802.11-13/1365r2](https://mentor.ieee.org/802.11/dcn/13/11-13-1365-02-00aj-45ghz-spectrum-allocation-in-china.pptx))**

**Comments:**

Q: Liang Li (Veno Technologies) congradulates this achievement.

Q: Masahiro Umehira (Ibaraki University in Japan) asked whether this band can be used for other purposes, such as ISM band at 2.4 GHz.

A: From now, it is just used for wireless access systems.

Q: Masahiro Umehira (Ibaraki University in Japan) asked whether two small bands of 1.08 GHz can be bonded for 11ad.

A: Due to the specification of 45 GHz band in China, there are only two types of bandwidth configurations, 540 MHz and 1080 MHz.

Q: Bruce (Marvell Semiconductor) asked whether this band is available to be use or in near future.

A: When the final formal document is released by MIIT of China, this band can be use legally. It will be before the end of this year, but we don’t know the exact date.

Q: Bruce (Marvell Semiconductor) suggested sending an email to the reflector to tell every one that 45 GHz band in China will be officially released.

1. **Plan for January 2014 Meeting**
	1. **Proposal Merge**
	2. **Draft Specification for 60GHz**
	3. **New Submission for 45GHz**
2. **Next Meeting**
* **Next TGaj meeting will be held on Jan 8 – 9, 2014 in Sanya China**
	+ [**http://www.ieee802.org/11/Meetings/Meeting\_Plan.html**](http://www.ieee802.org/11/Meetings/Meeting_Plan.html)
* **Meeting Venue: Howard Johnson Resort Sanya Bay**
* **Hotel Reservation:**
	+ **Jianqiang Xu**
	+ **Phone:86- 0898-31581188 ，13907548488**
	+ **E-mail：xujianqiang888@163.com**
* **Reservation：“IEEE 802.11aj meeting ”**

**Chair proposed to recess the session.**

**No objection.**

**The meeting recessed at 16:40pm.**