IEEE P802.11
Wireless LANs

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| Meeting Minutes November 2019 |
| Date: 2019-11-11 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Matthew Fischer | Broadcom |  |  | Matthew.fischer@broadcom.com |
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Abstract

Minutes from TGbe full sessions during the November 2019 Plenary held at Waikoloa, Hawaii.

**REVISION NOTES:**

**R0**:

Minutes from Monday PM1

**END OF REVISION NOTES**

**Session 1: Monday 11 November PM1**

**Introduction**

1. The Chair calls the meeting to order at 13:31. The agenda is found in 11-19-1722r5.
2. The Chair reviews attendance and recaps the procedures.
3. The Chair reads the patent guidelines as found on slides 6-11 on 11-19-1722r5 and asks if there is anyone who is aware of potentially essential patents. There is no response.
4. The Chair reviews the proposed agenda items
5. The Chair reviews TGbe session schedule for the week and room assignments
6. The Chair reviews the lists of existing deferred straw polls and submissions noting that due to the number of submissions in the queue, that review of some submissions will occur during conference calls, as not all will be covered during this week
7. Chair asks for comment on the proposed schedule of slide 25, no comment received.
8. The Chair asks if there is any objection of approving the agenda as found in 1722r5. No objection is noted
9. **Motion to approve TG Minutes.**

Move to approve TGbe minutes of meetings and teleconferences from the September 2019 meeting until today:

[**https://mentor.ieee.org/802.11/dcn/19/11-19-1728-01-00be-meeting-minutes-september-2019.docx**](https://mentor.ieee.org/802.11/dcn/19/11-19-1764-03-00be-telephone-conference-meeting-minutes-october-and-november-2019.docx)

[**https://mentor.ieee.org/802.11/dcn/19/11-19-1764-03-00be-telephone-conference-meeting-minutes-october-and-november-2019.docx**](https://mentor.ieee.org/802.11/dcn/19/11-19-1764-03-00be-telephone-conference-meeting-minutes-october-and-november-2019.docx)

 **Move:** Srinivas Kandala **Second: Bin Tian**

**Discussion:** No discussion. **Result:** Approved with unanimous consent.

**Editor’s Report**

1. 11-19-1935r0 ”TGbe Editor’s Report” – Edward Au (Huawei)

**Summary:** The author provides guidelines to members for the creation of submissions that are to be used to define the modifications to the editor-controlled documents, the SFD and Draft.

**Discussion:**
**C:** Chair asks if there are any questions for the editor
R: no questions or comments

**Deferred Straw Polls**

1. As per the agenda item, the group is directed to the agenda itme for review of deferred straw polls as found in 11-19-1722r5 on slide 15, noting that items in green had been reviewed already in the AM1 PHY adhoc of November 11, 2019

The chair reviews the ordering of the straw polls and notes the addition of two documents on the topic of joint sounding protocol to the list of deferred straw polls, suggesting that these documents be reviewed at the end of the straw polls in the list and asks for comment
No comment received
2. 11-19-1535r1 - Sounding for AP Collaboration – Junghoon Suh (Huawei)

C: in your straw poll, is the serial transmission of NDPs is as shown in slide 3?
R: Yes
C: we do not support the sequence shown on slide 3, so we cannot support the proposal, can you change concurrent to joint?
R: author modifies straw poll 1
C: What is meant by AP Coordintaed sounding? Does this cover all modes? Serial and joint?
R: CSI computation is on the non-AP side, so serial sounding is included
C: is it implied that joint TX coordination requires both serial and joint NDP?
R: to be determined
C: But your strawpoll says that you have both
R: straw poll modified
C: does joint TX require sequential sounding?
R: no comment
C: similar to previous, for joint TX, need joint sounding, not convinced that sequential sounding works
R: sequential sounding does work for joint TX
C: disagree, need joint sounding for joint TX, due to phase and amplitude differences
R: no comment
C: agree with previous two commenters, need joint NDP, also disagree with serial NDP in slide 3
R: SIFS between NDP1 and NDP2, so channel is similar
C: agre that for null forming and CP, this is enough
R: no comment
C: slide 3, master AP sends NDP, how do slave APs determine sequence, can AP2 hear AP3?
R: yes, NDPA indicates the sequence
C: What if slave AP2 fails to TX NDP? How will AP3 know the timing? When the sequence breaks?
R: details can be discussed
 **Straw poll 1:**
For the AP collaboration sounding do you agree to have the Joint NDP transmission?
Including the Serial Sounding based on slide 3 is TBD
How and when to apply the Serial sounding and Joint Sounding, TBD

**Discussion:**
C: do not understand the straw poll, why is serial included?
R: AP collaboration sounding, not just joint TX

**Result:**
Y 11
N 31
A 75

C: I Propose to rerun straw poll with two bullets removed
 **Straw poll 1b:**
For the multi-AP system, do you agree to support Joint sounding?

**Discussion:**
C: do not understand the straw poll, why is serial included?
R: AP collaboration sounding, not just joint TX

**Result:**
Y 66
N 0
A 46
3. 11-19-1554r1 - Data Sharing for Multi-AP Coordination – Sungjin Park (LG)

Deferred
4. 11-19-1573r0 - Channel Info. Feedback Method 4 Multi-AP Coord – Dandan Liang (Huawei)

Deferred
5. 11-19-1553r1 – Joint Sounding for Multi-AP Systems– Jianhan Liu (Mediatek)

**Straw poll 1:**
Do you agree that 11be shall provide a joint NDP sounding scheme as optional mode for multiple-AP systems?
Note: Sequential sounding scheme can also be used for multi-AP systems.

**Disucssion**
C: why do we need to specify sequential, but you are not going to define what it is?
R: Because even though it is not included, it cannot be prevented
C: can you instead say that individual AP sends NDP and polls feedback
R: we can define it, as just not sending NDP jointly, but do not want to define from the floor – in your mind, each AP sounding individually, is a sequential sounding mode, and if you agree with that, then you agree with the straw poll
C: I agree that that mode is present
R: no comment
C: are you saying that the difference between sequential and serial is that each AP sends NDPA and NDP
R No, not saying any of that, each AP is sending NDP not jointly, no comment on NDPA
C: if each NDP is independent, 10 ms later, there’s aging,
R: such sequential sounding can be used for other things, but the APs can decide to use it also for joint TX, this cannot be prevented
C: this mode imples that joint transmission is not going to be applied
R: what you do with the sequence is up to the AP, when to use any type of sounding is up to the AP
C: clarify joint sounding? How about when NDP packet is transmitted independently

**Result:**
Y 51
N 1
A 45

**Straw poll 2:**
Do you agree that joint NDP sounding scheme for multi-AP system with less or equal to total 8 antennas at AP has all antennas active on all LTF tones and uses 802.1ax P matrix across OFDM symbols?

(underlined text is addition due to discussion)

**Disucssion**
C: on all LTF tones means exlude 2x LTF for the sounding packet?
R: to make active on all LTF tones means the same as 11ax
C: for total exceeding 8, what is the solution?
R: there is no statement about that case, we do not have a scheme for more than 8
C: not clear to me, the number of antennas, 8 on the AP side?
R: in total, yes, I amend by adding ”at AP”

**Result:**
Y 40
N 2
A 46
6. 11-19-1594r2 - Coord. Beamforming/Null Steering Protocol in 11be – David L Perez (Nokia)

Deferred
7. 11-19-1582r0 – Coordinated AP Time/Frequency Sharing in a Transmit Opportunity in 11be – Lochan Verma (Qualcomm)

**Summary:** The author provides a proposal for sharing of resources within a TXOP among APs

**Discussion:**
**C:** Do all AP have to hear each other?
R: All Aps that participate need to hear each other
C: slide 7, TB PPDU is a requirement or an option?
R: not a requirement
C: allocation of TXOP can create inefficiency, no idea how much data is pending at targeted APs
R: TX indication and request is a phase that is used to determine the neighbor’s requirements, CTR frame can be poor or rich, level of detail of the request/response will determine
C: first sequence is query, second includes a long TXOP, it would be better with sequences separated in time
R: disagree
C: slide 10, sharing TDMA, each AP will start TX at given time – how do you know that the channel control will be maintained from one AP to the next?
R: first TX indication slide 6, lets the TXOP owner establish control with NAV
C: complications, at T2, could be a big gap between AP2 and AP3
R: good observation, have analysis for such cases, short answer, yes, because it is CSMA/CA, there are cases where time is allocated, but an AP failed to access the channel
C: Aps can hear each other, how does master ensure that all requested Aps can hear the request
R: no different than existing trigger rules – if you can hear and decode, then you respond, then master adds that AP to the target list
C: slide 10, do you require that AP2 and AP3 and AP4 hear each other?
R: no, master must hear all, but slaves only need to hear the master
C: ignoring details, see introduction, question on the benefits, this is coordination, have seen that latency improvement is achieved through multi-link or additional queue, how does this scheme offer latency improvement?
R: later presentation will show results, example, assume exposed transmitter, he never has a chance to transmit, but because of sharing, this exposed STA can be invited to participate, so worst case latency improves
C: but you need a specific procedure to determine which STA it is that needs this service
R: which applications would benefit, are AR, VR
C: how do you guarantee that the AP will share? AP will be greedy.
R: gurantee, we cannot, fair, we cannot guarantee
C: slide 7, is there random allocaiton? How to poll which Aps?
R: no predeinfed list, AP sends CTI and 25 hear, but only one succeeds in decoding and only for that AP, CCA says it can respond, so you receive only one CTR, so that is on the fly group formation, example, 25 hear the CTI, 25 are able to respond, 25 received CTRs, TXOP owner can determine the list
C: how can the TXOP owner separate the CTRs?
R: I know neighbor Aps, I can allocate some resources and use UL OFDMA to separate
C: that’s grouping
R: no
C: currently to do scheduling, you need to be associated with an AP
R: otherwise, it is random access
C: if an AP sends CTR, is it possible that there was a contention and one AP beat another AP?
R: all Aps doing EDCA, and one wins and then shares
C: to protect the TXOP, do slave Aps get to send CTS2SELF or something?
R: CTI is good enough
C: and then CTR as well
R: yes
C: legacy?
R: LSIG
C: slide 9, motivation, if Aps are on different primary channels, what is the benefit
R: AP1, AP2, using same 80, but different primary, you do not block your neighbor’s primary if you use this scheme
C: slide 10, master AP transmissions cause NAV to be set at slave Aps, so they cannot actually transmit
R: an exception would be created to allow the slave transmissions
C: why would the master AP share? How does the master make this determination?
R: if in a network that is ESS, managed, then the manager can set up sharing and force it

**Recess.**

**Session 2: Monday November 11 EV**

**Introduction**

1. At 19:31 the Chair, Alfred Asterjadhi (Qualcomm) calls the meeting to order.
2. The Chair reminds the group about the IPR policy and asks if there is anyone who is aware of potentially essential patents. There is no response.
3. The Chair reminds members about attendence.
4. The agenda for the session is found 1722r6. In this meeting we will discuss the PHY category.