IEEE P802.11
Wireless LANs

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| Minutes for Task Group (TG) 802.11 beExtremely High ThroughputTelephone conferences in August and September 2019 |
| Date: 2019-08-05 |
| Author(s): |
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Abstract

This document contains the meeting minutes for the 7 Telephone conferences held in August and September 2019.

Revisions:

* Rev 0: Added the telephone conference held the 1st of August.
* Rev 1: Updated some style and typos. Thanks Joseph Levy (InterDigital) for comments.
* Rev 2: Added minutes from the telephone conference held the 8th of August.

**Thursday 1 August 2019, 19:30 – 22:00 ET

Introduction**

1. The Chair (Alfred Asterjadhi, Qualcomm) calls the meeting to order at 19:31.
2. The Chair goes through the IPR policy and procedure. He asks the members for any potentially essential patents. Nobody speaks up.
3. The Chair reminds members to report their attendance to Dennis Sundman (Ericsson). The Join.me software indicates up to 120 people to appear in the call.

**People signed in with their name and/or reported their attendance to the secretary:**
Alfred Asterjadhi (Qualcomm)
Dennis Sundman (Ericsson)
Steve Shellhammer (Qualcomm)
Suhwook Kim (LG Electronics)
Akira Kishida (NTT)
Dorothy Stanley (HPE)
Edward Au (Huawei)
Frank Hsu
George Cherian
Insung Jang
Jeongki Kim (LG Electronics)
Jinsoo Choi
Joseph Levy (InterDigital)
Junghoon Suh (Huawei)
Kazuto Yano (ATR)
Ming Gan (Huawei)
Osama Aboul-Magd (Huawei)
Payam Torab
Rojan Chitrakar (Panasonic)
Rui Yang (InterDigital)
Sang Kim
Srinivas Kandala (Samsung)
Xin Zuo (Tencent)
Yan Zhang (Marvell)
Yusuke Tanaka (Sony)
Yongho Seok (MediaTek)
Lei Huang (Panasonic)
Woojin Ahn (WILUS)
4. The chair asks if there is any objection to proceed with the presentations. Nobody objects.

**Submissions**

1. 11-19/0762r1, “Latency analysis for EHT” – Suhwook Kim (LG Electronics)

**Summary:** The authors have provided simulation results comparing different RU tone plans for 80 MHz using OFDMA.

**C (Comment/Question):** On slide 15, why does the persistent scheduler improve the results?
**A (Answer):** The latency improves for the persistent STAs but not for the others.
**C:** Regarding the setup, have all the 4 types of access categorizes been considered?
**A:** Generally, we considered the AC\_BE and AC\_VI.
**C:** Are you using single BSS? It would be more interesting with the OBSS case.
**A:** We will think about the OBSS case.
**C:** What types of traffic are you using, UDP or TCP?
**A:** UDP.
**C:** Probably you want to run also with TCP because this is used in reality.
**A:** Yes
**C:** How do you define latency? Maximum, average, or?
**A:** The average.
2. 11-19/1175r0, “ Considerations of new queue mechanisms for real-time applications” – Xin Zuo (Tencent)

**Summary:** The authors believe we need to target the worst case latency through some new mechanisms. The current EDCA mechansims cannot handle it. For this mechanism the authors believe we need to focus on certain types of data, namely frequent and small data. The critical data need to bypass the internal queues.

**C:** What is the difference between what you propose and .11aa?
**A:** I was not aware of .11aa, but would like to look at it.
**C:** Do you think the trigger based functionality from .11ax is insufficient?
**A:** I believe trigger based transmission still may not be sufficient for this kind of traffic.
**C:** The EDCA scheduler should be capable to do sufficient categorization.
**A:** I don’t think that is enough.
**C:** In slide 6, once the new queue is activated, does the access categories change?
**A:** No.
**C:** You mention that it is not good if a STA gets a large backoff size. Are you worried about collisions? Are you considering one or multiple RTA queues?
**A:** Regarding the collisions, I cannot say for certain, but we believe that since we limit the frames for this particular queue, it should not be fatal. For the queues, we would like to have it dynamically, so potentially one queue per service or something like this.
**C:** If there is only RTA data in the buffert. Will this improvement work well?
**A:** In that case it depends on how many STAs, interference, etc.
3. 11-19/1207r4, “Views on Latency and Jitter Features in TGbe” – Akira Kishida (NTT)

**Summary:** The authors believe we need to consider RTA mechanisms that can coexist with legacy systems as well as controlled systems.
4. 11-19/0806r2, “Enabling persistent allocation for EHT” – Lei Huang (Panasonic)

**Summary:** The authors want to consider reduction of control signalling for EHT UL MU transmissions.
5. 11-19/1242r0, “Wider Bandwidth Channel Access in EHT” – Woojin Ahn (WILUS)

**Summary:** The authors propose a new channel access mechanism for wider bandwidths. To this end they introduce an extended channel set. The extended channel set may not be the same as the primary channel set. EDCA in the primary 20 of the primary channel set.

**C:** Slide 8, when the primary channel set is busy, then AP switches to extended channel set. How does the STA know that the channel has switched?
**A:** In this case, the extended channel set will only be used if the primary is busy, so such STAs have to wait.
**C:** Slide 7, it seems you are proposing to duplicate the same behaviour on the second band. Is the secondary band contiguous or non-contiguous?
**A:** It can be both.

**Concluding remarks**

1. The Chair informs that the next telco will focus on Multi-AP.
2. The Chair mentions that if we want to run straw-polls on the telco, we need to use an e-poll system. For the e-poll system, the Chair asks for straw poll texts so that he can prepare e-polls before the meeting.

**Ajourn.**

**Thursday 1 August 2019, 19:30 – 22:00 ET**

**Introduction**

1. The Chair (Alfred Asterjadhi, Qualcomm) calls the meeting to order at 10:00.
2. The Chair goes through the IPR policy and procedure. He asks the members for any potentially essential patents. Nobody speaks up.
3. The Chair reminds members to report their attendance to the secretary Dennis Sundman (Ericsson). From the application, there appears to be about 100 participants.

**Recorded attendance through the join.me app and through e-mail:**
	* Adrain Garcia Rodriguez
	* Al Petrick
	* Alfred Asterjadhi
	* Bo Sun
	* Carl Kain (Noblis/USDOT)
	* Dibakar
	* Dongguk Lim (LG)
	* Gaurav Patwardhan (HP Enterprises)
	* Insun Jang
	* Jason Yuchen Guo (Huawei)
	* Jeongki Kim (LG)
	* Jinsoo Choi
	* Joseph Levy (InterDigital)
	* Junghoon Suh (Huawei)
	* Kazuto Yano (ATR)
	* Kosuke Aio (Sony)
	* Lei Huang
	* Lei Wang
	* Li Nan (ZTE)
	* Li Yiqing
	* Miguel Lopez (Ericsson)
	* Ming Gan (Huawei)
	* Osama Aboul-Magd (Huawei)
	* Payam Torab
	* Rojan Chitrakar
	* Ross Jian Yu (Huawei)
	* Ryuichi Hirata (Sony)
	* Sameer Vermani (Qualcomm)
	* Sebastian Max (Ericsson)
	* Shimi Shilo
	* Sigurd Schelstraete
	* Steve Shellhammer (Qualcomm)
	* Suhwook Kim
	* Taewon Song
	* Thomas Handte (Sony)
	* Xiaogang Chen (Intel)
	* Yonggang Fang (ZTE)
4. The Chair asks for any announcements.

**Submissions**

1. 11-19/1118r1, “Enhancements for Time-Critical Data Transmissions” – Thomas Handte (Sony)

**Summary:** The authors have identified what they believe some key features for time-critical transmissions: channel diversity and efficient channel access. The authors propose resource unit (RU) hopping (besides OFDMA and MU-MIMO) as an example to obtain channel diversity. For efficient channel access the authors propose HE MU MIMO in DL and HE TB PPDU in UL.

**C:** Slide 10. 1) Are you trying to push ACK to upper layer? 2) Are you trying to split the MSDU into several parts, is this not possible with fragmentation?
**A:** 1) It can be achieved in higher layers, but we prefer to do it in lower layers. 2) Fragmentation is not enough for what we want.
**C:** Proposal 1. Is the target to improve the MU efficiency? How does this relate to our PAR document?
**A:** I think it fits well the real time latecy parts of the PAR.
2. 11-19/1092r1, “Evaluation of Multi-AP Joint Processing” – Xiaogang Chen (Intel)

**Summary:** The authors have identified and study two potential challenges for joint transmissions: synchronization and power imbalance across slave APs. The authors conclude that joint transmission may have challenges in high MCS. Power imbalance not a large problem.

**C:** Slide 7. Can you elaborate on the definition of the SNR.
**A:** The definition of SNR is based on the single AP SNR.
**C:** Slide 10. 1) This looks like SU MIMO? 2) What is this 8x4?
**A:** 1) No. 2) Each AP has 8 antennas and 4 spatial streams.
3. 11-19/1096r0, “EHT Multi-AP Feature Discussion” – Yonggang Fang (ZTE)

**Summary:** The authors have discovered that the fine timing measurement (FTM) mechanism used for positioning can be enhanced under the Multi-AP assumption.
4. 11-19/1102r0, “A Unified Procedure for Multi-AP Coordination” – Jason Yuchen Guo (Huawei)

**Summary:** The authors propose a slave trigger frame format to synchronize transmissions among slave APs. They believe the TGax trigger frame format can be reused to some extent.

**C:** Slide 5. The Basic TF, does it operate on the same channel?
**A:** Assuming OFDMA, they can be on different channels. For coordinated spatial reuse, they can be on the same channel. For joint transmission, I believe it is TBD.
5. 11-19/1097r0, “Sounding Procedure in AP Collaboration” – Ross Jian Yu (Huawei)

Summary: The authors provide 3 options for collecting CSI between STAs and APs.

**C:** Slide 6. Why are there two triggers after the NDP2?
**A:** This is just an example, in which there can be an error.
**C:** Slide 11. Do you have any idea of which option you believe is better?
**A:** I slightly prefer opt1 for coordinated beamforming. For a feature like joint beamforming it requires further study.
**C:** So a conclusion is that certain modes are suitable for certain options?
**A:** Yes.
6. 11-19/1129, “Consideration on Multi-AP coordination” – Li Nan (ZTE)

**Summary:** The authors show examples on how Multi-AP coordination can work.
7. 11-19/1089r0, “Joint Transmissions: Backhaul and Gain State Issues” – Sameer Vermani (Qualcomm)

**Summary:** The authors highlight backhaul requirements and sensitivity to gain state errors at the STAs. The backhaul needs at least as much data as goes to the STA. The authors note that need more backhaul capacity is needed than the fronthaul capacity. Gain state mainly affects joint transmissions. The authors believe we need to maintain a gain state error less than 0.8 dB.

**C:** Slide 6. You require 4 SS and 160 MHz MCS 9. This sounds challenging? Unless wired backhaul.
**A:** I agree this is challenging. With a wired backhaul it is easier.
**C:** Slide 6. You assume that the master AP is connected to Ethernet.
**A:** Yes.

**Adjourn.**