IEEE P802.11  
Wireless LANs

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| IEEE 802.11 Technical Interest Group on Full Duplex  July, 2018 San Diego Meeting Minutes | | | | |
| Date: 2018-07-10 | | | | |
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Abstract

This document contains the meeting minutes of the IEEE 802.11 Topic Interest Group on Full Duplex (FD TIG) sessions in San Diego, CA.

Note: Highlighted text are action items.

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# Tuesday, July 10, 2018, PM1 Session

1. The IEEE 802.11 TIG meeting was called to order at 1:37 pm by the Chair, James Gilb (GA-ASI, GenXComm, Gilb Consulting). He offered his apologies to all the attendees for arriving late.
   * Proposed Agenda slide deck: [FD TIG July 2018 Agenda](https://mentor.ieee.org/802.11/dcn/18/11-18-1052-02-00fd-fd-tig-july-2018-agenda.ppt)

* **Meeting 1**
  + Administrative: Reminders, Rules, Guidelines, Resources, Participation, Announcements
  + Approval of minutes from May 2018.
    - 11-18-1008-00, 11-18-1148-00, 11-18-1151-00
  + Status of FD-TIG report
    - 11-18-1113-01
  + Contributions for FD-TIG report
    - 11-18-1224r1: FD Architecture in 802.11, Kome Oteri (InterDigital).
    - 11-18-1225r1: Technical Report on Full Duplex for 802.11 - FD Architecture, Kome Oteri (InterDigital)
    - 11-18-1019r1: Improving System Efficiency using Full Duplex Based Collision Detection, Genadiy Tsodik (Huawei).
    - 11-18-1222r0: system-level-simulation-results-of-full-duplex-transmission, Jason Yuchen Guo (Huawei Technologies).
    - 11-18-1242r0: proposed-FD-TIG-report-text-on-self-interference-cancellation Yan Xin et. al. (Huawei).
    - 11-18-1223r0: Proposed FD Functional Requirements, Ming Gan (Huawei).
* **Meeting 2**
  + Discussion on Other Contributions
  + Review of current FD-TIG report
    - 11-18-0498-0x
  + Assignment of tasks
  + Future Sessions planning

**Meeting 1**

1. **Administrative: Reminders, Rules, Guidelines, Resources, Participation, Announcements**
   * The Chair reviewed the Guidelines for IEEE-SA meetings, including meeting guidelines and attendance recording procedures on slides 4 and 5 of the agenda slides.
   * He also reminded attendees to record their attendance.
   * There were 32 people in room.
   * The Chair reminded everyone that ideally, the procedure would be consensus based and would only resort to voting if there were unresolvable issues.
   * Updated agenda to reflect new contributions
2. **Approval of Current Agenda and Past Minutes**

* Motion to approve agenda
  + Move: Allen Heberling, Second: Yan Xin: approved
* Motion to approve minutes for [May Meeting](https://mentor.ieee.org/802.11/dcn/18/11-18-1008-00-00fd-fd-tig-meeting-minutes-for-may-2018.docx), [Teleconference 06/28](https://mentor.ieee.org/802.11/dcn/18/11-18-1148-00-00fd-meeting-minutes-for-06282018-teleconference.docx) and [Teleconference 07/03](https://mentor.ieee.org/802.11/dcn/18/11-18-1151-00-00fd-meeting-minutes-for-0703018-teleconference.docx).
  + Move: Allen Heberling, Second: Kome Oteri; approved
  + The Chair introduced the schedule for the week and the agenda was approved

1. **Discussion of Contributions**
   * [11-18/1113r1](https://mentor.ieee.org/802.11/dcn/18/11-18-1113-01-00fd-status-update-of-the-report-of-full-duplex.docx) **Status of FD TIG Yan Xin (Huawei). Presented by Yan Xin.**
     + Simple update from r0 presented in teleconference
     + A new contribution was presented by Allen and updated based on Allen’s input: [New-Text-for-FD-TIG-Report (11-18/1127r1)](https://mentor.ieee.org/802.11/dcn/18/11-18-1127-01-00fd-new-text-for-fd-tig-report.docx)
       - Add FD functional requirements.
       - Add real world implementation of full duplex
       - Add economic feasibility
     + Q: any major sections missing and is there any section we need to complete?
       - Based on new contributions in this meeting, we will be able to narrow the gap to the ideal report.
       - Also, need to address impacts on OBSS to be submitted by September.
   * [11-18/1224r1](https://mentor.ieee.org/802.11/dcn/18/11-18-1113-01-00fd-status-update-of-the-report-of-full-duplex.docx) **FD Architecture in 802.11, Kome Oteri (InterDigital). Presented by Kome Oteri.**
   * [11-18/1225r1](https://mentor.ieee.org/802.11/dcn/18/11-18-1113-01-00fd-status-update-of-the-report-of-full-duplex.docx) **Technical Report on Full Duplex for 802.11 - FD Architecture, Kome Oteri (InterDigital). Presented by Kome Oteri**
     + Q: What about exchanging capabilities?
       - Yes, it should happen.
     + Q: Is this a new frame format?
       - Yes, likely this will be required.
       - AP sends out a standalone frame to self
       - Second case is AP sends out frame with instructions
       - Not decided at this time
     + Q: Which stations can transmit?
       - It depends on the interference between stations, in some cases it is OK, in some cases it is not.
     + Q: Is the interference scenario static? Does it change within a TXOP?
       - This needs to be determined during standards development.
     + Oteri presented [11-18-1165-01](https://mentor.ieee.org/802.11/dcn/18/11-18-1113-01-00fd-status-update-of-the-report-of-full-duplex.docx), updates will be made to 02
     + No objection to adding the text to the FT TIG report.
   * [11-18/1019r1](https://mentor.ieee.org/802.11/dcn/18/11-18-1113-01-00fd-status-update-of-the-report-of-full-duplex.docx) **Improving System Efficiency using Full Duplex Based Collision Detection, Genadiy Tsodik  (Huawei). Presented by Genadiy Tsodik**
     + Understand that FD is not only a throughput multiplier but can be used for different benefits
     + Q: Agree with conclusions that FD can be used outside realm of doubling the throughput
       - Clarify that you can resolve the throughput but no specific scheme to resolve collisions.
       - Theoretical because not connected to realistic scenarios e.g. no impairment. But have some ideas of how collision resolution can be done but can be obtained with different probabilities
       - Q: useful for dense environments?
         * Yes.
       - Can you get some text to Yan this week ?
         * The key point is throughput is more than 2x throughput increase
   * [11-18/1222r0](https://mentor.ieee.org/802.11/dcn/18/11-18-1113-01-00fd-status-update-of-the-report-of-full-duplex.docx) **system-level-simulation-results-of-full-duplex-transmission, Jason Yuchen Guo (Huawei Technologies). Presented by Jason Yuchen Guo**
     + Q: is all traffic full duplex or some?
       - Adaptive full duplex, i.e. full duplex only if it is beneficial.
       - It would be great to see what percentage was full duplex
     + Q: was the link adaptation perfect or not?
       - Genie aided.
     + Q: why is the comparison with EDCA and not 11ax (OFDMA type).
       - We can also compare with 11ax mode but it is not much different as there are not many nodes. The difference is between 15% and 27% as shown on slide 9
       - Why is the gain more than 100%? Does it have to do with EDCA vs FD?
         * Yes, by combining trigger-based transmission and FD. (60% from trigger based) and SUL boosts it to 200%
       - Q: 110 dB does that include Tx power and Rx sensitivity?
         * No.
       - Q: what section will this be placed in the report and can you put together some text ?
         * Yes, I can. It will be in the “Benefits / Feasibility study” section.
   * [11-18/1223r0](https://mentor.ieee.org/802.11/dcn/18/11-18-1223-00-00fd-proposed-fd-functional-requirements.doc) **Proposed FD Functional Requirements, Ming Gan (Huawei). Presented by Ming Gan (Huawei)**
     + Comment: consider softening the language by reducing the use “shall”.
     + @ least twice: suggests going up to 3x….. change to “up to twice” – from PHY 2x and CSMA efficiency.
2. **General Questions**
   * + Q: what is the goal for finishing up the work of the TIG. Should we plan to finish by September or ask for an extension?
       - We prefer see the status of the draft in September then make a decision.
       - We will have a set a set of releases between now and September then finalize in September.
       - We can then take vote to decide on what to do and make a suggestion to the Task Group.
         * Option 1: Can suspend work for a little while.
         * Option 2: Can request to set up a study group.
         * Option 3: Others.

Recess at 3.22 pm till 4 pm on Thursday

# Thursday, July 12, 2018, PM2 Session

The session resumed at 4:05 pm with about 25 people in the room.

**Meeting 2**

1. **Discussion of Contributions**
   * [**11-18/1242r0**](https://mentor.ieee.org/802.11/dcn/18/11-18-1242-00-00fd-proposed-fd-tig-report-text-on-self-interference-cancellation.docx) **proposed-FD-TIG-report-text-on-self-interference-cancellation Yan Xin et. al. (Huawei). Presented by Yan Xin.**
     + Q: is 30 dB down the correct number?
       - Yes. Based on the publications
     + Q: how will the filters change for the non-linear part change given that they are dependent on the signal transmitted?
       - Will be the same as the method for estimating the filter for the linear part.
2. **Future Plans:**
   * Questions to Yan Xin (Huawei) as Interim Editor:
     + What sections are we missing based on the framework?
       - OBSS and latency
       - Effective throughput for all devices in a fully saturated BSS.
       - Clause for recommendation
     + Can we get this resolved before September?
       - Will leave open for now
     + When can we get a draft together or do you need some help?
       - Can make first cut based on the current submissions?
       - Kome’s contribution is stable and I am working with Allen and Ming.
       - Jason’s needs some additional work
   * Future Plans
     + First draft distributed, 8/2
     + Conference call 8/9, 7 am PDT.
       - Overview of draft and collection of comments.
       - Discuss NGV and EHT requirements
     + Second draft distributed 8/24
     + Conference call 8/30, 7 am PDT
       - Continue draft improvement
       - Prepare recommendations and presentation
       - Planning for September.
     + Third draft distributed 9/5.
     + Press release write-up in September
   * Recommendation Discussion
     + Discussion on forming a SG to create a PAR and 5C
     + Decide on a fixed set of scenarios to go after.
     + Both EHT TIG and NGV have opportunities for FD to address some of the challenges/goals. How will the FD TIG/SG interact with them ?
     + Suggestions:
       - Opportunity in NGV but need to take a look at the report
       - Talk/socialize with people in EHT and see if there is support as well.
     + Review document, review recommendations
     + Allen Heberling to do research on NGV documents and EHT documents and bring to conference call.
3. The meeting was adjourned at 4:43 pm
   * Note: closing report can be found here: [FD TIG Closing Report](https://mentor.ieee.org/802.11/dcn/18/11-18-1336-00-00fd-fd-tig-closing-report.ppt)
   * The final Agenda can be found here: [FD TIG Final Agenda](https://mentor.ieee.org/802.11/dcn/18/11-18-1052-02-00fd-fd-tig-july-2018-agenda.ppt)