

Cisco/UDel Meeting Minutes
October 2, 2015

Attendees: Jim Seymour, Len Cimini, Chien-Chung Shen, Li Li
Minutes Taken By: Li Li, Chien-Chung Shen

Slides #2, #3, #4 –Simulation models and results for mixed traffic (VoIP and FTP).

Slide #5, - Simulation setting for LAA with different energy detection thresholds.

- Jim: Is CCACS for preamble decoding?
- Li: Yes, CCACS (CCA-Carrier Sense) is the threshold for preamble decoding, and CCAED is the threshold for energy detection.
- Len: What's the simulation value for the shadowing fading?
- Li: I used 4 as the standard deviation as given in the 3GPP document.

Slides #6, #7 – Simulation results and conclusions: 1) The nodes in the edge have better performance than those in the middle; 2) Decreasing LAA CCAED will decrease the performance of both WiFi and LAA.

Slides #8, #9 – Analysis for the simulation results.

- Jim: Is this a right way of thinking the problem? This does not make too much sense. By decreasing the LAA CCAED, LAA should be more easily to be blocked, and WiFi should keep the same.
- Li: I see, I made a mistake here, I should exchange the block times of WiFi and LAA.
- Len: You should correct this error, send us new results as soon as possible, and make sure the new results make sense.
- Jim: Your simulation should not use these tables. It should be based on actual measurements. If the received power is higher than the detection threshold, it can transmit; otherwise, it is blocked.
- Li: Yes, I use actual measurements in the simulation, but I interpret it in a wrong way.
- Len: Tell us what you are exactly simulating this.
- Li: I use actual measurements to generate and update these tables each time.
- Li: One more thing is that do we need to consider the impact of interference? In the current simulations, we assume that there is no interference at all if the received power is lower than the threshold. But it's not true in the real simulation.
- Len: Maybe you need to do this eventually, but now focus on the current setting, and the results should match the intuition.

Slides #11, #12, #13 - Simulation results and conclusions for Multi-carrier LBT with Option 1 (WiFi-like).

- Li: In this case, both WiFi and LAA will either work in 80 MHz or do not work. Is this correct?
- Jim: For 802.11 ac, they can also use 20 or 40 MHz.
- Li: They can work with 20 or 40 MHz, but this will not happen in this setting.

- Jim: So, you do allow 20 MHz or 40 MHz, but each AP will try to grab the entire bandwidth each time.
- Li: Yes, for WiFi-like Multi-carrier LBT, it will be like this.
- Jim: I will check with Wi-Fi group to see whether there are some schemes to occupy 40 MHz instead of 80 MHz.
- Li: To avoid this, there are two cases: 1) there are some nodes working only with 20 MHz, and 40 MHz (802.11b, 802.11n).
- Jim: Yes, by considering the legacy of 802.11b/n, some 802.11ac or LAA nodes will only be able to occupy part of the entire bandwidth.
- Li & Shen: The second case: are there any services will not occupy 80 MHz even it's available? Like VoIP.
- Jim: Not so sure about this. I think we can include some legacy nodes, LAA will have more flexibility than WiFi in this case, and it would be interesting to see what happens. Then, we can study some other possible issues in the next steps.

Slides #14, #15 – Multi-carrier LBT with Option 2 (LBT extension).

- Jim: In Option 1, you only do LBT on the primary channel, and you do LBT on all channels in Option 2. What's DeferMAX, does it have something to do with LBT procedure, like CW?
- Li: No, it means that if LBT procedure is finished on one sub-channel, it will wait for at most "DeferMAX" to see whether LBT procedures are finished on other sub-channels.
- Jim: I think LAA can get one sub-channel if LBT procedure finishes, and then gather other sub-channels if LBT procedures finish.
- Li: LAA needs to wait for synchronization, and will send out the Proposals by Qualcomm and Ericsson.

Actions Items:

- **Correct the simulation error about detection thresholds.**
- **Include some 802.11 b/n nodes.**
- **Consider multi-carrier LBT at different locations.**

Next meeting: Friday October 16, 11am-12pm (EDT)