IEEE P802.11  
Wireless LANs

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| IEEE 802.11 TGax  January 2015 Atlanta Meeting Minutes | | | | |
| Date: 2015-02-04 | | | | |
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Abstract

TGax meeting minutes from the IEEE 802.11 Atlanta session, January 12th – 16th, 2015.

**IEEE 802.11 Task Group ax**

**January 2015 Atlanta Meeting**

**Hyatt Regency Atlanta, Atlanta, GA**

**January 12th – 16th, 2015**

**Monday, January 12th, 2015, AM2 TGax Session (10:30-12:30)**

1. The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chair of the TGax, @10:30
   1. About 190 people are in the room.
2. Announcement
   1. Agenda Doc.11-14/1578r1 on the server. Rev. 2 is the working document.
   2. Meeting Protocol: Chair asked to state name and affiliation when speaking for the first time.
   3. Attendance reminder.
      1. The attendance server: https://imat.ieee.org/
      2. See 11-09-0517r0 for more information.
3. The chair reviewed the mandatory 5 slides of P&P.
   1. Instructions for the WG Chair.
   2. Participants, Patents, and Duty to Inform.
   3. Patent Related Links.
   4. Call for potentially essential patents.
      1. Chair asked if anyone is aware of potentially essential patents.
      2. No potentially essential patents reported.
   5. Other Guidelines for IEEE WG Meetings.
4. Agenda items for the week
   1. Approve TG and Teleconference minutes since November 2014 meeting.
   2. Elect Chairs for the four ad hoc groups (MAC, PHY, MU, Spatial Reuse).
   3. Agree on rules for the operation of the ad hoc groups.
   4. Continue to advance task group documents.
      1. Simulation Scenarios
      2. Evaluation Methodology
      3. Channel Model
      4. Function Requirements
   5. Technical Presentations
   6. Schedule Teleconference times.
5. General Flow of the meeting
   1. Slides 13 and 14 of the 14/1578r0 contain general flow of the meeting.
   2. There are eight meeting slots planed for TGax.

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| --- | --- | --- | --- | --- |
|  | Monday | Tuesday | Wednesday | Thursday |
| AM1 |  |  | TGax | TGax |
| AM2 | TGax | TGax |  |  |
| PM1 | TGax | TGax | TGax | TGax |
| PM2 |  |  |  |  |
| PM3 | TGax |  |  |  |

1. Agenda for Monday, January 12th, AM2 (10:30 – 12:30).
   1. Proposed Agenda for Monday AM2:
      1. Call meeting to order
      2. Patent policy, etc.
      3. Call for submissions
      4. Set and approve agenda
      5. Summary from the November 2014 session
      6. TG motions
         1. Approve TG meeting and Teleconference minutes since November 2014 meeting.
      7. Status of the specification Framework document (??)
      8. Presentations
         1. 11-15/0075, “Operation Rules for TGax Ad Hoc Groups”, Osama Aboul-Magd
      9. Recess
   2. Chair asked if there are any other items – No items proposed. Meeting will be conducted based on this order.
2. Call for submissions
   1. DSC and CCA
      1. 15/0025, “DSC and Roaming,” Graham Smith (SR Technologies)
      2. 15/0027, “Simulation Based Evaluation DSC in residential scenario,” M. Shahwaiz Afaqui (UPC)
      3. 15/0045, “Performance Analysis of BSS Color and DSC,” Masahito Mori (Sony)
      4. 15/0050, “Modeling components impacting throughput gain from CCAT adjustment,” Yu Wang (Ericsson AB)
      5. 15/0085, “Legacy Fairness Issues of Enhanced CCA,” John Son (WILUS Institute)
      6. 15/0105, “Dynamic CCA Management,” Sean Coffey (RealTek)
   2. OFDMA
      1. 15/0034, “DL-OFDMA Map Frame,” Katsuo Yunoki (KDDI Labs)
      2. 15/0066, “Downlink OFDMA Protocol Design,” Yongho Seok (Newracom)
      3. 15/0079, “OFDM Numerology for 11ax,” Daewon Lee (Newracom)
      4. 15/0091, “UL-OFDMA Procedure in IEEE 802.11ax,” Woojin Ahn (Yonsei Univ.)
      5. 15/0092, “DL-OFDMA Procedure in IEEE 802.11ax,” Jinsoo Ahn (Yonsei Univ.)
   3. MU
      1. 15/0010, “draft for integrated UL DL MU MIMO Frame Format,” Tae-Yoon Kim (Korea Univ.)
      2. 15/0029, “Discussion on integrated UL/DL MU-MIMO,” Tae-Yoon Kim (Korea Univ.)
      3. 15/0040, “Discussion on integrated UL-DL MU-MIMO-MAC,” TaeYoon Kim (Korea Univ.)
      4. 15/0064, “Consideration on UL-MU overheads,” Tomoko Adachi (Toshiba)
      5. 15/0086, “Uplink MU Transmission and Legacy Coexistence,” Reza Hedayat (Newracom)
      6. 15/0089, “MAC Efficiency Gain of Uplink Multi-user Transmission,” Leonardo Lanante Jr (Kyushu Inst. of Tech.)
   4. MAC
      1. 15/0035, “Scalable Channel Utilization,” Katsuo Yunoki (KDDI R&D Laboratories)
      2. 15/0037, “Structural Format Change,” Kyonggi University
      3. 15/0046, “11aa GCR-BA Performance in OBSS,” Yuichi Morioka (Sony)
      4. 15/0059, “Uplink RTS/CTS Control,” Sigurd Schelstraete (Quantenna)
   5. PHY
      1. 15/0048, “Non-Uniform Constellations for Higher Order QAMs,” Daniel Schneider (Sony)
      2. 15/0068, “Support of outdoor environments,” Young Hoon Kwon (Newracom)
      3. 15/0081, “Considerations on 11ax Auto-detection Methods,” Jaeyoung Song (KAIST)
      4. 15/0082, “Considerations on 11ax OFDMA Frequency Granularity,” Young-bin Kim (KAIST)
      5. 15/0097, “Performance Analysis of Frequency Selective Scheduling,” Ningbo Zhang (BUPT)
      6. 15/0099, “Payload Symbol Size for 11ax,” Sriram Venkateswaran (Broadcom)
      7. 15/0101, “Preamble structure for 11ax system,” Jiayin Zhang (Huawei)
   6. Simulation Scenarios and Evaluation Methodology
      1. 14/1342, “MAC Calibration Results,” Igor Kim (ETRI)
      2. 14/1343, “Multicast Scenarios for MAC Calibration,” Igor Kim (ETRI)
      3. 14/1392, “Simulation Results for Box-5 Calibration,” Suhwook Kim (LGE)
      4. 14/1523, “Offline Discussion Minutes of SLS Calibration,” Jiyong Pang (Huawei)
      5. 14/1590, “Multi-wall penetration loss model for HEW system level simulation,” Kejun Zhao et al. (National Engineering Research Center for Broadband Networks & Applications)
      6. 14/1597, “PHY abstraction and performance for outdoor channel models,” Kejun Zhao et al. (National Engineering Research Center for Broadband Networks & Applications)
      7. 15/0022, “MAC Calibration Results,” Xiaofei Wang (InterDigital)
      8. 15/0044, “Proposed Changes to Simulation Scenarios,” Masahito Mori (Sony)
      9. 15/0051, “Box5 Calibration Results,” Jiyong Pang (Huawei)
      10. 15/0052, “Box5 Results of One BSS Case,” Jiyong Pang (Huawei)
      11. 15/0053, “Box5 Results of 11ac SS6,” Jiyong Pang (Huawei)
      12. 15/0061, “FPS Network Traffic Model,” Allan Jones (Activision)
      13. 15/0065, “11ax EMD Revision Straw Poll,” Jiyong Pang (Huawei)
      14. 15/0071, “MAC calibration test 4 results,” Yanchun Li (Huawei)
      15. 15/0072, “U-APSD powser saving calibration results,” Yanchun Li (Huawei)
      16. 15/0073, “Simulation Results of Box5,” Ke Yao (ZTE)
      17. 15/0078, “Clarification on calibration test cases,” Guoqing Li (Apple)
      18. 15/0080, “MAC Calibration Results,” Geonjung Ko (WILUS Institute)
      19. 15/0093, “Text Update on PHY Abstraction and SP,” Yakun Sun (Marvell)
      20. 15/0103, “Power Save Calibration,” Yarkko Kneckt (Nokia)
      21. 15/0104, “SLS MAC Test 4 Results,” Chinghwa Yu (MediaTek)
   7. Others
      1. 15/0043, “In-band Full Duplex Radios and System Performance,” Kapseok Chang (ETRI)
      2. 15/0075, “Operating Rules for TGax Ad Hoc groups,” Osama Aboul-Magd (TGax chair)
      3. 15/0076, “Field Sample OBSS and Client Data,” Carol Ansley (ARRIS Group)
3. Summary from November 2014 Meeting
   1. Approved the first revision of the TG Specification Framework document
   2. Motion passed to form 4 ad hoc groups
      1. MAC
      2. PHY
      3. MU
      4. Spatial Reuse
   3. Motion passed to have 3 chairs per ad hoc group
      1. Agreed to conduct the ad hoc chairs election on Tuesday
      2. Call for nomination was sent on the TG reflector
      3. List of Nominee

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| --- | --- | --- | --- |
| **MAC** | **PHY** | **MU** | **Spatial Reuse** |
| Eric Wong  (Apple) | Bo Sun  (ZTE) | Sigurd Schelstraete  (Quantenna) | Laurent Carou  (Orange) |
| Reza Hedayat  (Newracom) | Jianhan Liu  (MediaTek) | Kiseon Ryu  (LG) | Guido Hiertz  (Ericsson) |
| Brian Hart  (Cisco) | Yakun Sun  (Marvell) | Kaushik Josiam  (Samsung) | Jae Seung Lee  (ETRI) |

* + 1. Elections are on Tuesday (tomorrow)
    2. First Ad Hoc group meetings are scheduled during March 2015 meeting in Berlin.
  1. Generated new revisions of the TG Simulation Scenarios and Evaluation Methodology documents

1. TG Motion – Approval of TG Minutes (November 2014 Meeting and Telecon Minutes)
   1. **Motion: Approve TGax minutes of meetings and teleconferences from November 2014 plenary meeting to today:** 
      1. <https://mentor.ieee.org/802.11/dcn/14/11-14-1460-00-00ax-tgax-november-2014-san-antonio-meeting-minutes.docx>
      2. <https://mentor.ieee.org/802.11/dcn/14/11-14-1581-01-00ax-tgax-teleconference-minutes-2014-12-04.docx>
      3. **Moved: Al Petrick, Second: Stuart Kerry**
      4. **Result: Motion accepted with no objection.**
2. Presentations
   1. Osama Aboul-Mgd (Huawei Technologies, Chair of TGax) presented “Operating Rules for the TGax Ad Hoc Groups” based on the submission 15/0075r0..
      1. Summary:
         1. Set of rules for the operation of TGax ad hoc groups proposed.
         2. The rules are based on those utilized during IEEE 802.11ac development.
         3. To be voted on later this week (on Thursday).
      2. Discussions:
         1. No discussions.
   2. Guoqing Li (Apple) presented “Clarification on calibration test cases” based on the submission 15/0078r0.
      1. Summary:
         1. There are simulation parameters for MAC calibration which are not discussed in the document.
         2. Some clarifications proposed for MAC calibration test cases.
      2. Discussions:
         1. No discussion.
      3. **Motion**

**Move to accept changes in document 11-15/0078r0 and include them in the TG Simulation Scenarios document 11-14/0980r5**

* + - 1. Discussions
         1. Some people asked to consider this motion later this week.
         2. Decided to have this motion later.
  1. Kapseok Chang (ETRI) presented “In-band Full Duplex Radios and System Performance” based on the submission 15/0043r1.
     1. Summary:
        1. Introduced the idea of simultaneous transmission and reception.
        2. System level simulations show that with sufficient SIC performance, IFD (In-Band Full Duplex) leads to several fold throughput enhancements compared to conventional half duplex concept.
        3. Key issue is the scheduling.
     2. Discussions:
        1. A member asked about the power consumption whether there are any evaluation results. The answer was no.
  2. Yanchun Li (Huawei Technologies) presented “Discussion on MAC Calibration Power Saving Test” based on the submission 15/0072r0.
     1. Summary:
        1. Huawei’s MAC calibration test 5 U-APSD’s simulation results match with the theoretical analysis.
        2. The energy efficiency ratio of U-APSD for delivering 120kbps codec in ideal case is 0.0662.
        3. Some text changes in simulation scenario are needed to let everyone get power saving test results aligned.
     2. Discussions:
        1. A member asked a question about the suggested value of 100 us for the ProbeDelay. 🡪 It was suggested considering the tradeoff between power save efficiency and time to send a packet.
        2. Another member asked if the suggested value for the ProbeDelay can be applied to all PS mechanisms.
     3. Next Step
        1. Chair suggested a motion on Thursday.
  3. Masahito Mori (Sony) presented “Proposed Changes to Simulation Scenario” based on the submission 15/0044r0.
     1. Summary:
        1. In SS3, the system throughput is considerably affected by whether to use wrap-around technique or not.
        2. Some changes to refine the SS proposed.
     2. Discussions:
        1. A member commented that the use of wrap around technique depends on the scale and density of WLAN network.
        2. Another member mentioned that we need to make sure that everyone is doing the same thing.
        3. A clarification asked if the presenter is suggesting geographical wrap around or radio based wrap around.
     3. **Straw Poll:**

**Do you agree with the suggested changes in Slide 6 marked in red?**

* + - 1. **Result: Y/N/A = 22/23/35**
  1. Carol Ansley (ARRIS) presented “Field Sample OBSS and Client Data” based on the submission 15/0076r1.
     1. Summary:
        1. Findings from a random sample of 2000 APs from a sample of US residential households reviewed.
        2. The Client and OBSS quantities and RSSI levels are summarized for comparison to simulation parameters.
     2. Discussions:
        1. A member asked about the frequency band measured 🡪 2.4 GHz band.
        2. Another member asked about the status of STAs 🡪 “actively” associated.
        3. Any suggestions from the results? 🡪 To compare with the simulation results, etc.
        4. A member asked future plans such as additional results 🡪 Indeed!
        5. A member asked about the traffic condition. 🡪 Have some data.

1. TGax meeting recessed @ 12:22 AM until PM1 (13:30) today.

**Monday, January 12th, 2015, PM1 TGax Session (13:30-15:30)**

1. Meeting called to order @ 13:30
   1. The agenda is contained in 11-14/1578r2
      1. Rev 2 is the working document.
   2. There were more than 190+ people in the room.
2. Reminder
   1. Chair reminded the IEEE 802 and IEEE 802.11 Policy and Procedure.
   2. Chair asked people to state name and affiliation when addressing for the first time in the session.
   3. Chair also reminded attendance.
3. Proposed agenda for this session
   1. Proposed Agenda for Monday PM1:
      1. Call meeting to order
      2. Reminder
         1. IEEE 802 and 802.11 Patent policy, etc.
         2. Attendance
      3. Presentations
         1. 15/0025 by Graham Smith
         2. 15/0027 by
         3. 15/0045 by
         4. 15/0050 by Yu Wang (Ericsson AB)
         5. 15/0085 by John Son (WILUS)
      4. Recess
   2. Chair asked if there is any objection to accept this agenda 🡪 No objection. Agenda accepted.
4. Presentation
   1. Graham Smith (SR Technologies) presented “Dynamic Sensitivity Control Roaming” based on the submission 15/0025r0.
      1. Summary:
         1. DSC is ‘dynamic’ only for the STA.
         2. In a managed network, the AP advertises the Upper Limit and Margin.
         3. STAs should roam when ~10dB differential for strong RSSI (which it is when using DSC).
         4. APs could tell a STA to roam (BSS Transition Management) when detected RSSI is outside desired cell radius (about UL – M + 6dBm).
      2. Discussions:
         1. DSC is for STAs – What about the AP? 🡪 For the Aps, it is completely open.
         2. A member asked about the roaming threshold.
      3. Next Step
         1. Chair suggested a motion to change
   2. M. Shahwaiz Afaqui (Technical Univ. of Catalonia (UPC)) presented “Simulation-based evaluation of DSC in residential scenario” based on the submission 15/0027r1.
      1. Summary:
         1. Simulation results for the residential scenario presented (using NS3).
         2. The DSC improves throughput and fairness.
         3. Plan to present more results in the future session.
      2. Discussions:
         1. Some members asked the simulation condition and default setting of NS3.
         2. Another member asked about the impact of preamble error 🡪 Not considered.
   3. Masahito Mori (Sony) presented “Performance Analysis of BSS Color and DSC” based on the submission 15/0045r0.
      1. Summary:
         1. Performance of BSS Coloring and DSC has been compared in SS3.
         2. In almost all thresholds, the gain of DSC method is higher than BSS color method if these methods are used individually.
         3. The possibilities of these methods (including combination) in other scenarios should be considered continuously.
      2. Discussions:
         1. No discussion.
   4. Yu Wang (Ericsson AB) presented “Modeling components impacting throughput gain from CCAT adjustment” based on the submission 15/0050r0.
      1. Summary:
         1. The gain in average user throughput of adjusted CCAT is reduced significantly after adding (1) MIMO transmission, (2) Automatic rate fallback, and (3) Realistic preamble detection and decoding.
         2. Adjusted CCAT or DSC provides system improvements but more realistic modeling is important to avoid overestimation of gains.
      2. Discussions:
         1. A member asked for a question about the impact of MCS selection algorithm.
   5. Jon Son (WILUS) presented “Legacy Fairness Issues of Enhanced CCA” based on the submission 15/0085r0.
      1. Summary:
         1. Legacy fairness is an important requirement when 11ax designs a new feature.
         2. Demonstrated that if AX STA does not apply the fair CCA threshold to Legacy frames, it incurs severe unfairness to Legacy BSS/STA.
         3. Even though AX STA applies the fair CCA threshold on Legacy frames, still the Legacy Airtime unfairness can degrade legacy performances.
      2. Discussions:
         1. A member asked for the criteria of fairness.
         2. Some members asked for clarification of simulation scenarios and conditions.
      3. Straw Poll

Do you agree to add the following text into 11ax SFD x.y.z 802.11ax CCA procedure shall maintain the current CCA threshold for legacy frames?

* + - 1. Y/N/A = 7/27/69

1. Recess @ 15:34 until PM3 (19:30) this evening.

**Monday, January 12th, 2015, PM3 (EVE) TGax Session (19:30-21:30)**

1. Meeting called to order by Osama Aboul-Magd (Huawei Technologies) at 19:30.
   1. The agenda is contained in 11-14/1578r2 which is on the server.
      1. Rev 3 is the working document.
   2. There were 190+ people in the room.
2. Administrative Items
   1. Chair reminded the IEEE 802 and IEEE 802.11 Policy and Procedure.
   2. Chair asked to address himself/herself when speaking for the first time.
   3. Chair also reminded to do attendance.
3. Set and approve agenda
   1. Proposed agenda for Monday PM3:
      1. Call Meeting to order
      2. IEEE 802 and 802.11 IPR Policy and procedure.
      3. Presentations – Simulation Scenarios, Evaluation Methodology and Calibration
      4. Recess
   2. Chair asked for comments for the agenda. – No response.
   3. Chair asked for approval of the proposed agenda. – Agenda approved.
4. Presentation
   1. Jiyong Pang (Huawei Technologies) presented “Offline Discussion Minutes of SLS Calibration” based on the submission 14/1523r4.
      1. Summary:
         1. Jiyong went through the document highlighting the changes from the previous version such as preamble model, RBIR PHY and control frame detection.
      2. Discussions:
         1. No discussion.
   2. Jiyong Pang (Huawei Technologies) presented “11ax EMD Revision Straw Poll” based on the submission 15/0065r2.
      1. Summary:
         1. Two straw polls
      2. Straw Poll #1:

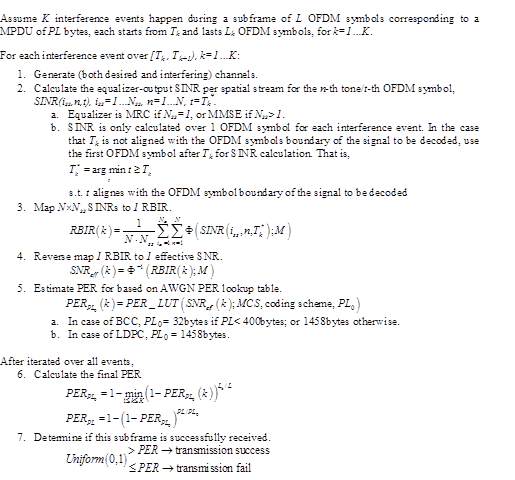
Do you think the agreements in 1523r4 should be added into the 11ax EMD 0571r6?

* + - 1. Discussions
         1. Q: Any text to adopt? 🡪 No specific text prepared. Just like to know peoples preference.
         2. C: Would like to see the text to adopt.
         3. Chair suggested next SP.
    1. Straw Poll #2:

Do you agree to include the following words at the end of the section “System Simulation Calibration” of the 11ax EMD 0571r6?

- Note that to facilitate the calibration, system simulations are suggested to be implemented in line with the agreements achieved in [1523r4].

* + - 1. Discussion
         1. Some members asked to change the straw poll text.
  1. Jiyong Pang (Huawei Technologies) presented “Box5 Calibration Results” based on the submission 15/0051r1.
     1. Summary:
        1. Jiyong presented Box 5 calibration results of four companies.
        2. Jiyong asked more companies to participate this activity.
     2. Discussions:
        1. No discussion.
  2. Jiyong Pang (Huawei Technologies) presented “Box 5 Results of 11ac SS6” based on the submission 15/0053r1.
     1. Summary:
        1. The simplified 1-BSS case of 11ac SS6 has been well calibrated by four companies.
        2. Simulation results of the 3-BSS case of 11ac SS6 presented.
     2. Discussions:
        1. A member commented that more parameters need to be aligned.
  3. Yakun Sun (Marvell) presented “Text Update on PHY Abstraction and SP” based on the submission 15/0093r1.
     1. Summary:
        1. Propose the text change in the TGax Evaluation Methodology regarding the modeling of the time-varying and asynchronous interference.
     2. Discussions:
        1. No discussion.
     3. Straw Poll
        1. **Do you support to update the PHY abstraction procedure in [1] to:**



* + - 1. Chair asked if there is any objection. 🡪 No objection. Motion will be prepared.
  1. Kome Oteri (InterDigital) presented “MAC Calibration Results” based on the submission 15/0022r0.
     1. Summary:
        1. MAC simulations for calibration conducted.
        2. Results for Tests 1a, 1b, 2a, 2b, and 3 were mostly similar to other contribution results.
     2. Discussions:
        1. No discussion.
  2. Chao-Chun Wang (MediaTek) presented “TGax SLS MAC Calibration Test 4 Results” based on the submission 15/0104r1.
     1. Summary:
        1. Provide the test 4 results of SLS MAC calibration.
        2. To complete the missing part of the test very soon.
     2. Discussions:
        1. A member asked for the reason of assuming non-full buffer traffic condition. 🡪 Offline discussion suggested.
  3. Suhwook Kim (LG Electronics) presented “Simulation results for Box 5 calibration” based on the submission 14/1392r4.
     1. Summary:
        1. Updated simulation results for Box 5 calibration presented.
        2. Some additional parameters for performance analysis assumed.
     2. Discussions:
        1. A member asked for the details of simulation conditions and the reason why hidden node occurs in the situation described in slide 15.
  4. Allan Jones (Activision) presented “FPS Traffic Model” based on the submission 15/0061r5.
     1. Summary:
        1. Allan explained the changes from the previous version.
     2. Discussions:
        1. A member asked for a clarification on the requirement of 50 ms latency 🡪 Round trip time.
     3. **Straw Poll:**

**Should we add the FPS network model information (FPS 3 Column on Slide 16) to the Simulation Scenarios document (0980 current rev) in the reference traffic profile sections?**

* + - 1. **Result: Y/N/A =23/0/42.**
      2. **Motion will be entertained later this week.**
  1. Geonjung Ko (WILUS) presented “MAC Calibration Results” based on the submission 15/0080r0.
     1. Summary:
        1. MAC calibration results for Test 1, 2 and 3 provided.
     2. Discussions:
        1. No discussion.
  2. Kejun Zhao (National Engineering Research Center for Broadband Networks & Applications) presented “Multi-wall penetration model for HEW” based on the submission 14/1590r0.
     1. Summary:
        1. Presented a multi-wall penetration loss model for indoor simulations to give more precise path loss calculations for SLS.
     2. Discussions:
        1. A member asked for clarification about the difference between slide 6 and slide 9.
        2. Another member asked for the data source and possible changes to current simulation model.
  3. Igor Kim (ETRI) presented “MAC Calibration Results” based on the submission 14/1342r0.
     1. Summary:
        1. MAC calibration results presented.
        2. Simulation results show similar trend with other companies results.
     2. Discussions:
        1. No discussion.
  4. Igor Kim (ETRI) presented “Multicast Scenarios for MAC Calibration” based on the submission 14/1343r1.
     1. Summary:
        1. Presentation given during the conference call revisited.
     2. Discussions:
        1. Discussion to be continued in the next session..

1. Recess @ 21:30 until AM2 (10:30) Tuesday.

**Tuesday, January 13th, 2015, AM2 TGax Session (1030-12:30)**

1. Meeting called to order by Osama Aboul-Magd (Huawei Technologies), chair of TGax, @ 10:30.
   1. The agenda document 11-14/1578r3 is on the server.
      1. Rev 4 is the working document.
      2. There were 190+ people in the room.
2. Administrative Items
   1. Chair reminded the IEEE 802 and IEEE 802.11 Policy and Procedures.
   2. Chair asked people to state name and affiliation when addressing for the first time.
   3. Chair also reminded people to do attendance.
3. Agenda setting
   1. Proposed agenda for this session:
      1. Call Meeting to order
      2. Administrative Items
      3. Agenda Setting
      4. Presentations
         1. Selection of Ad Hoc Chairs
         2. Straw Poll (11-14/1343) from yesterday
         3. PHY submissions
      5. Recess
   2. Chair asked if there is any objection to proceed with this agenda. No objection.
      1. The agenda for Tuesday AM2 was approved.
4. Straw Poll (11-14/1343)
   1. **Straw Poll: Do you agree to include the proposed tests into the scenarios for MAC simulator calibration?**
      1. **Discussion**
         1. **A member commented that it is not clear what will be the meaning of including those scenarios. 🡪 The behavior of STAs is different from the other ones.**
      2. **Result: Y/N/A = 6/38/66**
5. Selection of Ad Hoc Chairs
   1. Following people were elected as the co-chairs of the Ad Hoc groups by affirmation.
      1. MAC Ad Hoc: Eric Wang (Apple), Reza Hedayat (NEWRACOM), Brian Hart (Cisco)
      2. PHY Ad Hoc: Bo Sun (ZTE), Jianhan Liu (MediaTek), Yakun Sun (Marvell)
      3. MU Ad Hoc: Sigurd Schelstraete (Quantenna), Kiseon Ryu (LG), Kaushik Josiam (Samsung)
      4. Spatial Reuse Ad Hoc: Laurent Cariou (Orange), Guido Hiertz (Ericsson), Jae Seung Lee (ETRI)
6. Presentations – PHY submissions
   1. Sriram Venkateswaran (Broadcom) presented “Payload Symbol Size for 11ax” based on the submission 15/0099r4.
      1. Summary
         1. Proposed that 11ax shall have one longer payload symbol size of duration 12.8 us based on a 256 FFT in 20 MHz.
         2. Also proposed to use the following CP sizes: 0.8 us, 1.6 us and 3.2 us.
      2. Discussions
         1. Some members asked for clarification such as symbol format and FFT size.
         2. Another member is concerned about the CFO requirement, especially for the 5GHz. 🡪 200 K Hz CFO in 5GHz band.
         3. Justification of having different CP sizes 🡪 to cover most of the scenarios.
         4. A member mentioned this is a good direction to go but not sure if this is the only way to go.
      3. Straw Polls
         1. **Straw Poll#1: Do you agree to add to the TG Specification Framework:**

**–   3.y.z.  Data symbols in an HE PPDU shall use DFT period of 12.8 us and subcarrier spacing of 78.125 kHz.**

* + - * 1. **Result: Y/N/A = 80/3/53**
      1. **Straw Poll #2: Do you agree to add to the TG Specification Framework:**

**– 3.y.z. Data symbols in an HE PPDU shall use DFT period of 12.8 us and subcarrier spacing of 78.125 kHz.**

* + - * 1. **Result: Y/N/A = 73/0/56**
  1. Jiayin Zhan (Huawei Technologies) presented “Preamble structure for 11ax system” based on the submission 15/0101r1.
     1. Summary
        1. Proposed to prepend legacy preamble for 11ax PPDU duplicated on each 20MHz for the backward compatibility with legacy devices.
        2. HE-SIG-A transmitted with 64-FFT duplicated on each 20MHz is used to indicate common control information.
     2. Discussions
        1. A member asked for questions on HE-SIG-A design such as use of 64-FFT, duplication.
        2. Another member expressed a concern of having a long preamble.
        3. There was a question about the cyclic prefix design for HE-SIG-A 🡪 Not defined yet.
     3. **Straw Polls**
        1. **Straw Poll #1: Do you agree to add to TG Specification Framework**

**x.y.z An HE PPDU shall include the legacy preamble (L-STF, L-LTF and L-SIG), duplicated on each 20 MHz, for backward compatibility with legacy devices.**

* + - * 1. **Result: Y/N/A = 116/0/20**
      1. **Straw Poll #2: Do you agree to add to the TG Specification Framework:**

**x.y.z HE-SIG-A (using DFT period of 3.2 us and subcarrier spacing of 312.5 kHz) is duplicated on each 20MHz after the legacy preamble to indicate common control information.**

* + - * 1. **Result: Y/N/A = 81/0/48**
  1. Young Hoon Kwon (NEWRACOM) presented “Support for Outdoor Environments” based on the submission 15/0068r0.
     1. Summary
        1. Several issues in supporting outdoor environment:
           1. Negligible performance degradation in legacy PHY header.
           2. Slight performance degradation for the short control frames.
           3. Significant performance degradation in management frames.
     2. Discussions
        1. A member asked for justification of assuming Beacon size of 500 Byte.
        2. Another member asked performance degradation at a LOS STA.
  2. Kejun Zhao (National Engineering Research Center for Broadband Networks and Application) presented “PHY Abstraction and Performance for Outdoor Channel Model” based on the submission 14/1597r0.
     1. Summary
        1. PHY abstraction for outdoor channel models is necessary to be considered in Box0.
        2. Suggestions for outdoor channels and the SNR to PER performance curves presented.
     2. Discussions
        1. A member mentioned that it is not clear what was suggested.
        2. Another member recommended to check the evaluation methodology document.

Chair asked if there is any objection to recess until PM2. 🡪 No objection.

1. Recess at 12:30 until PM1 (13:30) today.

**Tuesday, January 13th 2015, PM1 Session (13:30-15:30)**

1. The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chair of TGax, @13:30
   1. Agenda 11-14/1578r3 is on the server. Rev 4 is working document.
   2. There were 200+ people in the room.
2. Administrative Items
   1. Chair reminded the IEEE 802 and IEEE 802.11 P&P.
   2. Chair asked people to state name and affiliation when addressing for the first time in the session.
   3. Attendance!
3. Agenda Setting
   1. Proposed agenda for this session - Tuesday PM2
      1. Call Meeting to order
      2. IEEE 802 and 802.11 IPR Policy and procedure.
      3. Agenda Setting
      4. Presentations
         1. The rest of the PHY presentations.
         2. PHY Motions.
      5. Recess
   2. Chair asked if there are any objections to proceed with this agenda – no objections.
      1. The agenda approved.
4. Presentations
   1. Ningbo Zhang (BUPT) presented “Performance Analysis of Frequency Selective Scheduling” based on the submission 15/0097r0.
      1. Summary
         1. Frequency-selective scheduling can provide gain for both single user and multiple user cases.
         2. The performance gain of single user is larger than that of multiple users.
         3. The inaccurate CSI feedback may lead to scheduling performance loss, but need further study.
      2. Discussions
         1. No discussion.
   2. Daniel Schneider (Sony) presented “Non-Uniform Constellations for Higher Order QAM” based on the submission 15/0048r0.
      1. Summary
         1. Significant gain of NUC compared to UC
            1. Gain up to 0.6 dB for 256-QAM
            2. Gain up to 0.9 dB for 1024-QAM
         2. Moderate complexity increase.
      2. Discussions
         1. A member asked for more information such as transmit EVM, IQ imbalance and receiver phase noise.
         2. Another member requested to disclose the simulation conditions.
   3. Jaeyoung Song (KAIST) presented “Consideration on 11ax Auto-detection Methods” based on the submission 15/0081r1.
      1. Summary
         1. To keep coexistence with legacy IEEE 802.11 devices, it is important to investigate methods for auto-detection in 11ax.
      2. Discussions
   4. Young-bin Kim (KAIST) presented “Consideration on 11ax OFDMA Frequency Granularity” based on the submission 15/0082r1.
      1. Summary
         1. Considering OFDMA with 256FFT for 20MHz bandwidth, the candidate parameters for frequency granularity can be as follows:
            1. Sub-band partitioning: 4 or 8
            2. # of subcarriers for guard band: at most 12~16
            3. # of used subcarriers per frequency segment: 56 or 58
            4. # of pilot subcarriers based on pilot overhead: less than 4
      2. Discussions
         1. No discussion.
5. PHY Motions
   1. **PHY Motion #1:** 
      1. **Move to add to the TG Specification Framework:**

**-  3.y.z.  Data symbols in an HE PPDU shall use DFT period of 12.8 us and subcarrier spacing of 78.125 kHz.**

* + 1. **Moved by Sriram Venkateswaran, Seconded by Peter Loc**
    2. **Result: Y/N/A = 61/17/22, motion passes.**
  1. **PHY Motion #2:** 
     1. **Move to add to the TG Specification Framework:**

**– 3.y.z.  Data symbols in an HE PPDU shall support guard interval durations of 0.8 us, 1.6 us and 3.2 us.**

* + 1. **Moved by Sriram, Seconded by Kaushik Josiam**
    2. **Result: Y/N/A = 66/0/38, motion passes.**
  1. **PHY Motion #3:** 
     1. **Move to add to TG Specification Framework**

**- x.y.z An HE PPDU shall include the legacy preamble (L-STF, L-LTF and L-SIG), duplicated on each 20 MHz, for backward compatibility with legacy devices.**

* + 1. **Moved by Jiayin Zhang, Seconded by Wookbong Lee**
    2. **Result: Y/N/A = 83/0/10, motion passes**
  1. **PHY Motion #4:**
     1. **Move to add to the TG Specification Framework:**

**- x.y.z HE-SIG-A (using DFT period of 3.2 us and subcarrier spacing of 312.5 kHz) is duplicated on each 20MHz after the legacy preamble to indicate common control information.**

* + 1. **Moved by Jiayin Zhang, Seconded by Wookbong Lee**
    2. **Result: Y/N/A = 66/0/35**

1. Presentations – OFDMA
   1. Daewon Lee (NEWRACOM) presented “OFDM Numerology for 11ax” based on the submission 15/0079r1.
      1. Summary
         1. Any changes to numerology should be reviewed carefully and benefits should be clearly identified, as it has significant impact to transceiver implementation.
         2. TGax group needs to discuss the supported deployment type (and supported channel delay spreads) for 11ax, before determination and adoption of larger FFT sizes.
      2. Discussions
         1. No discussion.
   2. Katsuo Yunoki (KDDI Labs.) presented “DL-OFDMA MAP frame” based on the submission 15/0034r0.
      1. Summary
         1. DL-OFDMA Map frame is proposed for efficient reception of DL-OFDMA PPDU.
         2. This scheme will enable narrower band reception of DL-OFDMA PPDU. It also may realize operation with lower energy consumption on a STA side.
      2. Discussions
         1. A member asked a question about the simulation results.
   3. Sean Coffey (RealTek) presented “Spatial Reuse AP Management” based on the submission 15/0105r0.
      1. Summary
         1. Multiple different versions of spatial reuse via variations in CCA rules have been proposed for 11ax.
         2. Evaluations of achievable gains vary widely.
         3. Enabling a degree of configurability benefits all approaches.
      2. Discussions
         1. A member asked for a clarification of CCA. The answer was “Signal Detect.”
         2. Another member commented that alignment among the various proposals will be very important.

Chair asked if there is any objection to recess. 🡪 No objection.

1. Recessed at 15:30 until AM1 (8:00) Wednesday.

**Wednesday, January 14th 2015, AM1 Session (8:00-10:00)**

1. The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chairperson of TGax, @8:00
   1. Agenda 11-14/1578r4 is on the server. Rev 5 is working document.
   2. There were about 190+ people in the room.
2. Administrative Items
   1. Chair reminded the IEEE 802 and IEEE 802.11 P&P.
   2. Chair asked people to address himself/herself when speaking for the first time.
   3. Attendance
3. Agenda for this session
   1. Wednesday AM1
      1. Call Meeting to order
      2. IEEE 802 and 802.11 IPR Policy and procedure
      3. Agenda Setting
      4. Presentations
         1. Continue with the remaining submissions
         2. OFDMA
         3. MU
         4. MAC
      5. Recess
   2. Chair asked if there are any objections to proceed with this agenda – no objections.
      1. The agenda approved.
4. Presentations
   1. Jinsoo Ahn (Yonsei Univ.) presented “DL-OFDMA Procedure in IEEE 802.11ax” based on the submission 15/0092r1.
      1. Summary
         1. Alternative Primary Channel (APCH) based OFDMA proposed.
            1. Protection for Multiuser and Wideband operation
            2. RTS-to-Self as a OFDMA session initiator
            3. Resource Allocation frame is needed
            4. Mechanisms for OFDMA RTS/CTS
      2. Discussions
         1. A member asked about the detailed design of the proposal such as resource size on the primary channel and relevant duration settings.
      3. Straw Polls
         1. **Straw Poll #1: Do you agree to add to the TG Specification Framework:**

**4.y.z DL OFDMA shall support both basic transmission (without RTS/CTS) and RTS/CTS based transmission**

* + - * 1. **Discussion**

**A member commented that we already have RTS/CTS mechanism today and the intention of the proposal is not clear.**

**Another member asked if the RTS/CTS is mandatory or optional 🡪 It is optional.**

* + - * 1. **Result: Y/N/A = 6/4/many**
      1. **The slide set contains four straw polls but the rest of the SPs are canceled.**
  1. Woojin Ahn (Yonsei Univ.) presented “UL-OFDMA Procedure in IEEE 802.11ax” based on the submission 15/0091r1.
     1. Summary
        1. UL-OFDMA might cause massive control overhead, and unstable transmission protection.
        2. Introduced several possible solutions to the discussed issues:
     2. Discussions
        1. No discussion.
     3. Straw Polls
        1. **Straw Poll #1: Do you agree to add to the TG Specification Framework:**

**x.y.z AP shall indicate UL OFDMA initiation.**

* + - * 1. **Result: Y/N/A = 9/0/many**
      1. **Straw Poll #2: Do you agree to add to the TG Specification Framework:**

**x.y.z UL OFDMA uplink channels shall be allocated considering STAs’ channel status.**

* + - * 1. **Result: Y/N/A = 8/1/many**

**The straw poll #3 contained in doc.15/0091r1 was canceled.**

* 1. Yongho Seok (NEWRACOM) presented “DL OFDMA Protocol Design” based on the submission 15/0066r0.
     1. Summary
        1. Proposed Downlink OFDMA protocol design considerations:
           1. the frequency selectivity information of the recipient STA
           2. the sub-channel assignment structure to the recipient STA
        2. Proposes the PHY Header design consideration of the Downlink OFDMA PPDU.
     2. Discussions
        1. A member commented a similar mechanism defined by 802.11ac can be used for sub-channel assignment.
        2. Another member asked the need for additional calibration procedure. 🡪 The answer is it is not necessary.
  2. Tomo Adachi (Toshiba) presented “Consideration on UL-MU overheads” based on the submission 15/0064r1.
     1. Summary
        1. The impact of UL-MU overheads discussed.
        2. DL BA responses after UL-MU transmission should be multiplexed.
        3. Need to find a more rough way to grasp or estimate TX demands.
     2. Discussions
        1. No discussion.
     3. **Straw Poll: Do you agree to include in the specification framework a mechanism by which DL BA/ACKs, in responses to UL MU transmission, are multiplexed**

**- eg. DL MU-MIMO, DL-OFDMA, single PSDU**

* + - 1. **Result: Y/N/A = 60/1/51**
  1. Leonard Lanante (Kyushu Institute of Technology) presented “MAC Efficiency Gain of Uplink Multi-User transmissions” based on the submission 15/0098r0.
     1. Summary
        1. MAC efficiency gain can be obtained from uplink multi-user transmission.
        2. From our simulations, there is about 3x throughput/efficiency gain for 10 users in short packets.
     2. Discussions
        1. A member asked if power consumption is considered. The answer was not.
  2. Katsuo Yunoki (KDDI Labs.) presented “Scalable Channel Utilization” based on the submission 15/0035r1.
     1. Summary
        1. Wide band channel operation scheme in HEW has been pointed out to have better spectral utilization efficiency.
        2. A scalable channel utilization scheme fitting for the OFDMA scheme proposed.
     2. Discussions
        1. No discussion.

1. Discussion on the agenda for tomorrow
   1. We will have discussions on Spec Framework and Ad Hocs.
2. Recessed at 10:00 until PM1 (13:30) today.

**Wednesday, January 14th 2015, PM1 Session (13:30-15:30)**

1. The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chairperson of TGax, @13:30
   1. Agenda 11-14/1578rX is on the server. Rev Y is working document.
   2. There were about 190+ people in the room.
2. Reminder and Announcements
   1. Chair reminded people the IEEE 802 and IEEE 802.11 P&P.
   2. Chair asked people to address himself/herself when speaking for the first time.
   3. Attendance
3. Agenda for this session
   1. Wednesday AM1
      1. Call Meeting to order
      2. IEEE 802 and 802.11 IPR Policy and procedure
      3. Agenda Setting
      4. Presentations
         1. Continue with remaining presentations
         2. 11-15/0086 Uplink MU Transmission and Legacy Coexistence
         3. 11-15/0046 11aa GCR-BA Performance in OBSS
         4. 11-15/0059 Uplink RTS/CTS Control
         5. 11-15/0040 Discussion on integrated UL-DL MU-MIMO-MAC
         6. SFD Motions
      5. Recess
   2. Chair asked if there are any objections to proceed with this agenda – no objections.
      1. The agenda approved.
4. Presentations
   1. Sigurd Schelstraete (Quantenna) presented “Uplink RTS/CTS Control” based on the submission 15/0059r1.
      1. Summary
         1. Proposed to provide a mechanism to allow the AP to control the RTS/CTS policy for associated STAs.
         2. A possible implementation involves:
            1. Definition of dedicated information element
            2. New Action frame type of Category WNM
            3. IE could also be included in Beacon
      2. Discussions
         1. A member asked for justification of using RTS/CTS in a dense environment. 🡪 Current situation shows the need for it.
         2. Another member commented that he is not sure about allowing STAs to switch ON/OFF this function is good or not.
         3. Another member pointed out that some STAs automatically do this.
         4. There was a request to show some simulation results.
         5. A clarification asked if this is only for the uplink transmissions.
      3. **Straw Poll: Do you support adding a mechanism that allows the AP to individually configure the use of RTS/CTS by its associated STAs?**
         1. **Result: Y/N/A = 51/2/69**
   2. Reza Hedayat (NEWRACOM) presented “Uplink MU Transmission and Coexistence” based on the submission 15/0086r2.
      1. Summary
         1. CSMA/CA is an important aspect of 802.11 operation that needs to be observed in presence of UL MU MIMO and UL OFDMA frames.
         2. UL MU transmissions require additional considerations so that the unintended nodes accurately sense the status of the medium across the whole bandwidth (or at least across the primary channel) in presence of UL MU PPDUs.
      2. Discussions
         1. No discussion.
   3. Yuichi Morioka (Sony) presented “11aa GCR-BA Performance in OBSS” based on the submission 15/0046r0.
      1. Summary
         1. GCR-BA is currently the most promising technique to realize 11ax use cases such as video distribution in a stadium.
         2. GCR-BA with a selection by throughput makes performance improve even in a severe environment.
         3. The number of BAR Destinations should be limited to be a few to improve the performance.
      2. Discussions
         1. A member asked for a question on the requirement of packet loss rate.
5. Motions
   1. **OFDMA Motions**
      1. **OFDMA Motion #1:**

**Move to add to the TG Specification Framework:**

**x.y.z AP shall indicate UL OFDMA initiation.**

* + - 1. **Moved by Woojin Ahn, Seconded by Jinsoo Ahn**
      2. **Discussion**
         1. **The question is not clear enough.**
      3. **Motion to amend:**

**Move to change the original motion to:**

**Move to add to the TG Specification Framework:**

**x.y.z AP shall provide a mechanism to control UL OFDMA initiation:**

* + - * 1. **Moved by Stuart Kerry, Seconded by Bo Sun**
        2. **Result: Motion passed without objection.**
      1. **Amended Motion**

**Move to add to the TG Specification Framework:**

**x.y.z AP shall provide a mechanism to control UL OFDMA initiation.**

* + - 1. **Result: Y/N/A = 17/12/59, motion fails.**
    1. **OFDMA Motion #2:** 
       1. **Move to add to the TG Specification Framework:**
       2. **x.y.z UL OFDMA uplink channels shall be allocated considering STAs’ channel status**
       3. **Moved by Woojin Ahn, Seconded by Jinsoo Ahn**
       4. **Result: Y/N/A = 7/41/16, motion fails.**
  1. **MU Motion**
     1. **MU Motion #1:**

**Move to include in the specification framework a mechanism by which DL BA/ACKs, in responses to UL MU transmission, are multiplexed**

**eg. DL MU-MIMO, DL-OFDMA, single PSDU**

* + - 1. **Moved by Tomoko Adachi, Seconded by Stuart Kerry**
      2. **Discussion**
         1. **A member suggested tomorrow morning to vote for this motion.**

1. Presentation
   1. Ke Yao (ZTE) presented “Simulation Results of Box 5” based on the submission 15/0073r1.
      1. Summary
         1. Presented ZTE’s simulation results of Box 5 calibration.
      2. Discussions
         1. No discussion.
2. Discussion on the agenda for tomorrow
   1. We will have five motions for SS and EV documents.
      1. Allan (15/0061)
      2. Guoqing (15/0078)
      3. Jiyong (14/1523)
      4. Lan Zhou/Yunchun (15/0071)
      5. Yakun Sun (15/0093)
   2. We also have a presentation from Yarkko Kneckt on power save calibration.
3. Recessed at 15:30 until AM1 (8:00), Thursday.

**Thursday, January 15th, 2015, AM1 Session (8:00-10:00)**

1. The meeting called to order by Osama Aboul-Magd (Huawei Technologies), the chairperson of the TGax, @8:00 AM
   1. About 200+ people are in the room.
   2. Agenda 14/1578r5 is on the server. Rev. 6 is the working document.
2. Reminder and Announcements
   1. Chair reminded IEEE 802 and 802.11 IPR P&P.
   2. Chair asked people to state name and affiliation when addressing for the first time in the session.
   3. Chair reminded people to do attendance.
3. Agenda for this session
   1. Thursday AM1
      1. Call Meeting to order
      2. Reminder
         1. IEEE 802 and 802.11 IPR Policy and procedure.
         2. Attendance
      3. Agenda Setting
      4. Presentations
         1. Jarrko’s presentation
         2. Simulation scenarios motions
         3. Yunchun
         4. Allan
         5. Guoqing
         6. Yukun
         7. Jiyong
      5. SFD Motions
      6. 11-15/0179
      7. Conference Calls Schedule
      8. Adjourn
   2. Chair asked if there are any modifications to the agenda.
   3. Agenda approved without objections.
4. Presentations
   1. Yarkko Kneckt (Nokia) presented “Power Save Calibration”, based on the submission 15/0103r0.
      1. Summary
         1. The submission provides results for power save calibration simulations.
         2. U-APSD and active mode are simulated with VoIP application.
         3. Power Save Mode transition and active mode are simulated with a single DL data frame transmission every 200ms.
         4. The percentages of PHY operation states operation should be measured for all simulations.
            1. The 11-14-1192r6 contains the simulation calibration results.
      2. Discussions
         1. No discussion.
      3. Motion
         1. **Move to include changes in document 11-15/0172r1 into the TG Simulation Scenarios document (11-14/0980r5).**
            1. **Moved by Lan Zhou, Seconded by Jarkko Kneckt**
            2. **Result: Motion accepted without objection.**
   2. Allan Jones (Activision) presented 15/0061r6 “FPS Network Traffic Model,” the updated version of what was presented on Monday evening.
      1. Summary
         1. Allan explained the motion on slide 18.
      2. Discussions
         1. A member asked why load of the game traffic is such low. The answer is that is the current situation.
         2. Another member asked if the value represents the today’s traffic or the traffic in the future. The answer is it will be effective for the next 3 or 4 years.
         3. There was a comment to add requirement on latency. To be considered in the future revision.
         4. Requirements on power save may also be added in the future revision.
      3. Motion
         1. **Move to include changes in document 11-15/0061r6 into the TG Simulation Scenarios document (11-14/0980r5)**
            1. **Moved by Allan Jones, Seconded by Lei Wang**
            2. **Result: Motion accepted with no objection.**
   3. Guoqing Li (Apple) presented “Clarification on calibration test cases”, based on the submission 15/0078r2.
      1. Summary
         1. Guoqing explained the document highlighting the changes from the previous version.
      2. Discussions
         1. No discussion.
      3. Motion
         1. **Move to include changes in document 11-15/0078r2 into the TG Simulation Scenarios document (11-14/0980r5)**
            1. **Moved by Guoqing Li, Seconded by Brian Hart**
            2. **Result: Motion accepted with no objection.**
   4. Yakun Sun (Marvell) presented “Text Update on PHY Abstraction and SP”, based on the submission 15/0093r4.
      1. Summary
         1. Yakun explained the changes from the previous version.
      2. Discussions
         1. No discussion.
      3. Motion
         1. **Move to include changes in document 11-15/0093r4 into the TG Evaluation Methodology document (11-14/0571r6)**
            1. **Moved by Yakun Sun, Seconded by Lei Wang**
            2. **Result: Motion accepted with no objection.**
   5. Jiyong Pang (Huawei Technologies) presented “Offline Discussion Minutes of SLS Calibration”, based on the submission 14/1523r5.
      1. Summary
         1. Jiyong explained the changes from the previous version.
      2. Discussions
         1. There was a discussion of how to proceed.
         2. The evaluation methodology document will be updated incorporating the simulation results.
5. SFD Motions
   1. **MU Motion #1 – deferred from Wednesday PM1 session.**
      1. **Motion to amend**
         1. **Move to amend MU Motion #1 to:**

**Move to include changes in document 11-15/0093r4 into the TG Evaluation Methodology document (11-14/0571r6)**

**- x.y.z The amendment shall define a mechanism for multiplexing DL acknowledgments sent in response to UL MU Transmissions**

* + - 1. **Moved by Tomoko Adachi, Seconded by Guido Hiertz**
      2. **Motion accepted with no objection.**
    1. **Main Motion**

**Move to include changes in document 11-15/0093r4 into the TG Evaluation Methodology document (11-14/0571r6)**

**- x.y.z The amendment shall define a mechanism for multiplexing DL acknowledgments sent in response to UL MU Transmissions**

* + - 1. **Moved by Tomoko Adachi, Seconded by Stuart Kerry**
      2. **Result: Motion accepted with no objection.**
  1. **MAC Motion #1**
     1. **Move to add to the Spec Framework:**

**- x.y.z The amendment shall define a mechanism to allow the AP to configure the use of RTS/CTS initiated by non-AP STA.**

* + - 1. **Moved by Sigurd Schelstraete, Seconded by Guido Hiertz**
      2. **Result: Y/N/A = 28/6/25, motion passes.**

Chair asked for 15 minutes extension to complete all agenda items. 🡪 No objection.

1. Presentation
   1. Chuck Lukaszewski (Aruba Networks) presented “Indoor Wall Propagation Loss Measurements,” based on the submission 15/0179r1.
      1. Summary
         1. Current Simulation Scenarios significantly understate propagation loss across walls.
         2. Results of field RF measurements using professional grade site survey tools presented.
         3. 5dB is an appropriate value for interior, non-insulated walls that subdivide an office, house or apartment (when framed walls are used)
         4. Recommend uniform loss value of 9 dB / wall in SS #1 and #2.
      2. Discussions
         1. A member commented that the effect of interference becomes small if we adopt 9dB wall penetration loss. It may not represent situation of the real world.
         2. Another member commented modeling is very important to consider the wall loss.
      3. Straw Poll
         1. **Do you agree that the penetration loss values in both SS#1 and SS#2 should be increased to 9 dB?**
            1. **Result: Y/N/A = 5/8/many**
      4. Further discussion
         1. A member encouraged the presenter to come back with more measurement results.
2. Motions – TG documents
   1. **Simulation Scenario**
      1. **Move to accept document 11-14/980r6 as the new revision of the TG Simulation Scenarios document.**
         1. **Moved by Simone Merlin, Seconded by Allan Jones**
         2. **Result: Motion accepted with no objection.**
   2. **Evaluation Methodology**
      1. **Move to accept document 11-14/0571r7 as the new revision of the TG Evaluation Methodology document.**
         1. **Moved by Ron Porat, Seconded by Allan Jones**
         2. **Result: Motion accepted with no objection.**
3. Plans for the march 2015 meeting
   1. Two slots are assigned to the ad hoc meetings 🡪 each ad hoc group will have one session.
      1. A member pointed out that all of the submission in a category may not be presented within one session. 🡪 TGax whole session can take care of them.
      2. Another member asked for the classification of submissions. Chair mentioned it will be helpful if the category is declared when requesting for the agenda time.
4. Teleconference planning
   1. Chair suggested one conference call.
      1. Conference call time: Thursday, February 26th, 2015, 10:00-12:00 (ET)
      2. No objection.
5. AOB
   1. Chair asked for if there is any other business. No response.
6. Adjournment
   1. TGax adjourned for the week @ 10:05.