IEEE P802.11  
Wireless LANs

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| IEEE 802.11 Task Group AY  January 2016 Atlanta Meeting Minutes | | | | |
| Date: 2016-1-17 | | | | |
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Abstract

Task Group AY meeting minutes from the IEEE 802.11 Atlanta, Georgia session, January 17-22, 2016.

**IEEE 802.11 Task Group AY**

**January 2016 Atlanta Meeting**

**January 17-22, 2016**

**Monday, January 17, 2016, AM1 Session (10:30-12:30)**

1. The IEEE 802.11ay task group meeting was called to order at 10:30by the Chair, Edward Au (Huawei).
2. Chair introduced himself and secretary, Jeorge Hurtarte (Teradyne).
3. Agenda Doc. IEEE 802.11-15/1472r2
4. Chair reviewed the IEEE-SA patent policy, logistics, and reminders on Task Group rules, including meeting guidelines and attendance recording procedures.
   1. Chair asked if anyone has any questions about the IEEE-SA patent policy, logistics or reminders. No questions.
   2. Chair asked if anybody has any disclosures related to the patent policy. None.
   3. Chair asked if there were any questions on any of the above items. None.
   4. Chair reminded all to record their attendance.
   5. Chair reminded all to upload their presentations.
5. Chair introduced the leadership of the AY TG (slide 11)
6. Chair reviewed the meeting time slots, locations and agenda items for the week (see slides12 and 13of the agenda document).
7. Chair proceeded to discuss the agenda items for the Monday January17, 2016AM2 meeting.
8. Motion #15: Motion to approve the November 2015 Dallas Texas minutes
   1. Move: Carlos Cordeiro (Intel)
   2. Second: Yan Xin (Huawei)
   3. No objections noted. Unanimous consent.
   4. The November 2015 Dallas, Texas minutes were approved.
9. Chair reviewed the timeline of the AY TG (slide 18) and progress on Task Group documents.
10. Chair reviewed the list of presentations submitted (slides 19-23) and schedule for presenting those during the week.
    1. Chair asked if there were any additional presentations submissions
11. Chair reviewed the selection procedure for contributions (slide 25).
12. Presentations
    1. Presentation by Alecsander Eitan (Qualcomm), PHY Frame Format proposal for 11ay, Doc. IEEE 11-16/0061r0. Key points reviewed:
       1. Proposal to reuse the same, proven mixed mode PHY format as used in other 802.11 amendments (11n/ac)
       2. A flexible PHY format to support various mechanisms, including channel bonding and MIMO
       3. Opened the floor for discussion.
       4. Straw Poll #1, PPDU Format, and discussion on this proposal (slide 8)
          1. Yes: 32
          2. No: 0
          3. Abstain: 13
       5. Straw Poll #2, Structure of the L-Header Field, and discussion on this proposal (slide 9)
          1. Yes: 32
          2. No: 0
          3. Abstain: 13
    2. Presentation by James Wang (MediaTek), Scalable Beamforming for 11ay, Doc. IEEE 11-16/0099r0. Key points reviewed:
       1. Scalable training utilizes the antenna pattern reciprocity to allow for multiple devices to perform BF training simultaneously.
       2. Applications:
          1. To train a large number of STAs in BSS simultaneously
          2. Efficient MU-MIMO SLS.
       3. Detailed waveform and protocol are TBD
       4. Opened the floor for discussion.
       5. Straw Poll #1, Beamforming Training, and discussion on this proposal
          1. Yes: 35
          2. No: 0
          3. Abstain: 7
    3. Presentation by James Wang (MediaTek), 11ay MIMO BF Training Enhancements, Doc. IEEE 11-16/0100r0. Key points reviewed:
       1. An overview of 11ad and 11ay BF Training operation was provided.
       2. BF training enhancements for 11ay were introduced.
          1. Simultaneous RX antenna training
          2. TX-Sector Down-Selection
          3. RX-Sector Down-Selection for device with antenna pattern reciprocity
       3. Noted that other BF Training enhancements are possible
       4. Opened the floor for discussion.
       5. Straw Poll #1, 11ay BF Training shall support using simultaneous RX antenna training
          1. Yes: 36
          2. No: 0
          3. Abstain: 4
       6. Straw Poll #2, 11ay shall provide means to enable TX-Sector Down-Selection in the BF training
          1. Yes: 32
          2. No: 0
          3. Abstain: 9
       7. Straw Poll #3, 11ay should support RX-Sector Down-Selection in BF training
          1. Yes: 35
          2. No: 0
          3. Abstain: 7
    4. Presentation by Thomas Handte (Sony), Performance of Non-Uniform Constellations in Presence of Phase Noise, Doc. IEEE 11-16/0072r0. Key points reviewed:
       1. Investigation of NUC performance in presence of phase noise
       2. Why NUCs are a promising technology for .11ay
       3. Opened the floor for discussion.
          1. Will resume discussion on Tuesday AM1
13. Meeting recessed at 12:30 and will resume on Tuesday AM1.

**Tuesday, January19, 201s, AM1 Session (08:00-10:00)**

1. The meeting was called to order at 08:00by the Chair, Edward Au (Huawei).
2. Agenda Doc.IEEE 802.11-15/1472r3
3. Chair reviewed the IEEE-SA patent policy, logistics, email reflector logistics, and reminders on Task Group rules.
   1. Chair asked if anybody has any disclosures related to the patent policy. None.
   2. Chair asked if anyone has any questions about the IEEE-SA patent policy, logistics or reminders. No questions.
   3. Chair reminded all to record their attendance.
4. Presentation by Thomas Handte (Sony), Performance of Non-Uniform Constellations in Presence of Phase Noise, Doc. IEEE 11-16/0072r0 (continued from yesterday). Key points reviewed:
   * 1. Investigation of NUC performance in presence of phase noise
     2. Why NUCs are a promising technology for .11ay
     3. Opened the floor for discussion.
5. Presentation by Carlos Cordeiro (Intel), 11ay Features and Design Principles, Doc. IEEE 11-16/0076r0 (continued from yesterday). Key points reviewed:
   1. Outlined the proposed key features for 11ay, design principles and assumptions to guide future submissions on such topics
   2. Opened the floor for discussion
   3. Straw Poll #1, Insert the following in section 7.2.4 of the SFD “The channelization used by EDMG STAs is shown in Figure 2 (see slide 4). The circumstances in which a channel can be used in a regulatory domain is determined by local regulatory rules and any additional rules prescribed by the 11ay specification.”
      1. Yes: 30
      2. No: 0
      3. Abstain: 1
   4. Straw Poll #2, Insert the following in section 4 of the SFD “To enable backward compatibility with DMG STAs, in an EDMG BSS the BTI, A-BFT and ATI is always present on the primary channel of the BSS. The channel width of the primary channel of an EDMG BSS is 2.16 GHz.”
      1. Yes: 27
      2. No: 0
      3. Abstain: 5
   5. Straw Poll #3, Insert the following in section 6.1 of the SFD “The 11ay specification shall support:
      1. SU-MIMO
      2. Downlink MU-MIMO
      3. Channel bonding of at least two 2.16 GHz channels”
      4. Yes: 31
      5. No: 0
      6. Abstain: 3
   6. Straw Poll #4, Insert the following in section 4 of the SFD “An EMDG STA shall be able to determine the primary channel and occupied bandwidth from any EDMG PPDU it receives.”
      1. Yes: 13
      2. No: 0
      3. Abstain: 4
6. Presentation by Rui Yang (InterDigital), On the Channel Model for Short Range Communications, Doc. IEEE 11-16/0075r0. Key points reviewed:
   * 1. This study shows that the directions of the rays departing from [arriving to] different PAAs, particularly the ones on the LOS paths, should not be assumed the same when the link distance is short.
     2. For Configuration #3 and Configuration #4 in [2], the SU-MIMO channel models should be updated to capture the impact of the physical separation of the PAAs at the devices accurately.
     3. Opened the floor for discussion
7. Presentation by Thomas Handte (Sony) on behalf of Felix Fellhauer (University of Stuttgart), On Modeling of Spatial Separation in the 11ay Channel Model, Doc. IEEE 11-16/0073r1. Key points reviewed:
   1. This contribution summarizes the existing proposal for the extension of legacy IEEE 802.11ad channel models to cover future MIMO use cases in 802.11ay. Further concepts are proposed for modeling spatial separation of phased array antennas (PAA).
      1. Opened the floor for discussion
8. Presentation by Alexander Maltsev (Intel), Channel models for IEEE 802 11ay, Doc. IEEE 11-15/1150r2. Key points reviewed:
   * 1. Section 4 and 5 added, introducing Quasi-Deterministic (Q-D) channel model development methodology and describing new channel models for large scale environments.
     2. Opened the floor for discussion
9. Chair reviewed the agenda setting (slide 24).
   1. Chair asked if it is okay to resume meeting until Wednesday AM1
   2. Chair asked if there is any objections to cancel the Tuesday PM3 session
      1. No objections
10. Meeting recessed at 10:00 and will resume on Wednesday AM1.

**Wednesday, January 20, 2016, AM1 Session (08:00-10:00)**

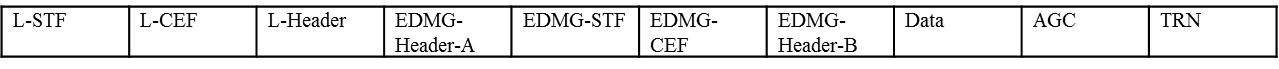
1. The meeting was called to order at 08:00by the Chair, Edward Au (Huawei).
2. Agenda Doc. IEEE 802.11-15/1472r4
3. Chair reminded all about the IEEE-SA patent policy, logistics, and reminders on Task Group rules.
   1. Chair asked if anybody has any disclosures related to the patent policy. None.
   2. Chair reminded all to record their attendance.
4. Presentations
   1. Presentation by Sakamoto Takenori (Panasonic), Aggregation based channel bonding, Doc. IEEE 11-16/0074r0. Key points reviewed:
      1. The proposed channel bonding framework for NG60 framework includes contiguous (wideband) bonding mode and carrier (channel) aggregation mode.
      2. In this presentation, it is proposed an abstract carrier aggregation scheme and a text proposal of carrier aggregation for 11ay SFD.
      3. It is proposed to enable contiguous and non-contiguous channel aggregation for 11ay.
      4. Opened the floor for discussion
      5. Straw Poll #1, Do you agree to insert the following in section 6.1 of the SFD:“The 11ay specification shall support contiguous and non-contiguous channel aggregation of at least two 2.16GHz channels.“
         1. Yes: 29
         2. No: 0
         3. Abstain: 6
   2. Presentation by Assaf Kasher (Intel), Channel bonding proposals, Doc. IEEE 11-16/0098r0. Key points reviewed:
      1. Summarized the basic principles of channel bonding so that they can be formally captured in the SFD
      2. Proposed MAC concepts to enable channel bonding while keeping backward compatibility with DMG operation
      3. Proposed a channel bonding wakeup mechanism to allow for better power saving
      4. Opened the floor for discussion
      5. Straw Poll #1, Do you agree to Insert the following in the SFD: “For 11ay channel bonding, the following apply: 1) Full carrier sense (physical and virtual) shall be maintained on primary channel,2) An EDMG STA may transmit a frame to a peer EDMG STA to indicate intent to perform channel bonding transmission to the peer STA. This allows an EDMG STA to choose to operate over multiple channels only after receiving such a frame, thus saving power.”
         1. Yes: 33
         2. No: 0
         3. Abstain: 5
   3. Presentation by Laurent Cariou (Intel), SU-MIMO and MU-MIMO link access, Doc. IEEE 11-16/0078r0. Key points reviewed:
      1. Need solutions to:
         1. Ensure protection of a SU-MIMO and DL MU-MIMO PPDU transmission
         2. Provide ways to inform multiple destination STAs of an upcoming MU-MIMO PPDU ahead of the MU-MIMO PPDU transmission, in order to give them time to set their Rx antennas in the best Rx sector
         3. Provide ways to inform destination STAs of an upcoming SU-MIMO PPDU ahead of the transmission, to switch from SISO to SU-MIMO
      2. Proposed:
         1. A MIMO setup frame, that may solicit CTS feedbacks
         2. A frame that sets a multi-STA rendez-vous point for MU-MIMO transmission
      3. Opened the floor for discussion
      4. Straw Poll #1, Do you agree to add the following in section 5 of the SFD: “An EDMG STA may transmit a “MIMO Setup frame” prior to the transmission of a SU or MU MIMO PPDU. The “MIMO Setup frame” indicates the destination STA(s) addressed by the PPDU.”
         1. Yes: 33
         2. No: 0
         3. Abstain: 5
      5. Straw Poll #2, Do you agree to insert the following in section 5 of the SFD:“A "MIMO Setup frame" transmission may trigger a response (e.g., DMG CTS or Ack) from destination STA(s)”
         1. Yes: 33
         2. No: 0
         3. Abstain: 4
      6. Straw Poll #3, Do you agree to insert the following in section 5 of the SFD: “An EDMG STA may transmit a frame to one or more EDMG STAs to indicate a target time in which the transmitting STA intends to contend for the channel to send a MIMO PPDU to the STA(s)”
         1. Yes: 33
         2. No: 0
         3. Abstain: 5
   4. Presentation by SangHyun Chang (Samsung), The Ultra-Short Range (USR) Opportunity, Doc. IEEE 11-16/0084r0. Key points reviewed:
      1. Ultra-Short Range (USR) wireless docking usage model as a candidate mobile phone application.
      2. Opened the floor for discussion
   5. Presentation by Laurent Cariou (Intel), TGay evaluation methodology, Doc. IEEE 11-15/0866r2. Key points reviewed:
      1. Overview of Updates/Edits to the document related to the inclusion of SLS scenarios
   6. Opened the floor for discussion
5. Chair asked if anyone would like to present today ahead of schedule. None
6. Meeting recessed at 9:43 and will resume on Thursday AM1.

**Thursday, January 21, 2015, AM1 Session (08:00-10:00)**

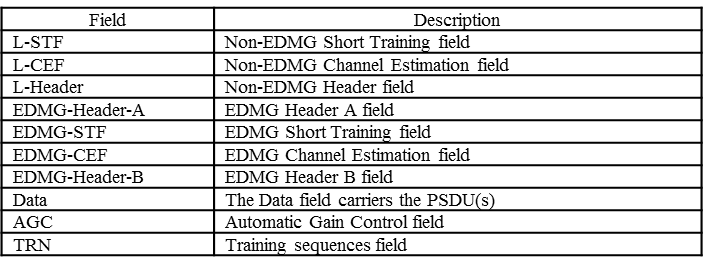
1. The meeting was called to order at 08:00 by the Chair, Edward Au (Huawei).
2. Agenda Doc. IEEE 802.11-15/1472r5
3. Chair reminded all about the IEEE-SA patent policy, logistics, and reminders on Task Group rules.
   1. Chair asked if anybody has any disclosures related to the patent policy. None.
   2. Chair reminded all to record their attendance.
4. Presentations
   1. Presentation by Kyungtae Jo (LG Electronics), Multi-Beamforming in Polarized Channels for 11ay, Doc. IEEE 11-16/092r1. Key points reviewed:
      1. In this contribution, multi-BF with dual polarization is proposed for 11ay.
      2. Multi-BF can be considered to reduce the time for BF operation.
      3. Also, it can support BF operation for multiple STAs regardless of antenna characteristics.
      4. The detailed protocol and field design are going to be implemented afterward (TBD).
      5. Opened the floor for discussion
      6. Straw Poll #1, Do you agree to Insert the following in the SFD:“The 11ay beamforming protocol supports multi-beamforming for multiple array antennas. Multi-beamforming means that a transmitter simultaneously sends SSW frames in multiple polarized directions.”
         1. Yes: 27
         2. No: 0
         3. Abstain: 5
   2. Presentation by SungJin Park (LG Electronics), Frequency Multiple Access in 11ay, Doc. IEEE 11-16/095r1. Key points reviewed:
      1. Proposing frequency multiple access as one of techniques to enhance performance in 11ay.
      2. Proposing the size of granularity is the size of channel for simplicity of implementation and compatibility with other techniques.
      3. Opened the floor for discussion
      4. Straw Poll #1, Do you agree to insert the following in section 6.1 of the SFD: “11ay supports that when using multiple channels, a PCP/AP can simultaneously transmit to multiple STAs allocated to different channels individually.”
         1. Yes: 21
         2. No: 0
         3. Abstain: 20
   3. Presentation by Assaf Kasher (Intel), Beamforming Training proposals, Doc. IEEE 11-16/0103r0. Key points reviewed:
      1. Proposed enhanced BRP supports:
         1. SU MIMO
         2. MU MIMO
         3. Orthogonal TRN sequences
         4. TX and RX antenna training within the same BRP frame
         5. Simultaneous training of multiple STAs
      2. One single framework to support all 11ay modes
      3. Performance of enhanced BRP far surpasses 11ad BRP
         1. Performance gap gets wider with increase in number of users and TRN (array) lengths
         2. Enhanced BRP shows to be scalable
      4. Opened the floor for discussion
      5. Straw Poll #1, Would you agree to insert the following in section 4 of the SFD: ”The 11ay SLS beamforming protocol shall enable feedback of one or more sectors per TX and RX antenna. The 11ay beamforming protocol shall enable TX and RX training using the same BRP frame. The 11ay beamforming protocol shall define orthogonal TRN sequences for simultaneous BF training across DMG antennas.”
         1. Yes: 28
         2. No: 0
         3. Abstain: 6
   4. Presentation by Yan Xin(Huawei), Channel Access in A-BFT over Multiple Channels, Doc. IEEE 11-16/0101r0. Key points reviewed:
   5. Proposed an efficient A-BFT procedure for RSS BF in 802.11ay. The new A-BFT procedure allows transmission of SSW frames sent from different STAs simultaneously over multiple channels for a dense deployment environment in 11ay.
      1. Opened the floor for discussion
      2. Straw Poll #1, Would you agree to include the following in the SFD: “11ay BF training should support simultaneous multi-STA RSS over multiple channels during A-BFT”?
         1. Yes: 29
         2. No: 0
         3. Abstain: 14
   6. Presentation by Carlos Cordeiro (Intel), Adding control trailer to control mode PPDUs, Doc. IEEE 11-16/0105r0. Key points reviewed:
      1. Proposed Control Trailer allows transmission of additional signaling in existing 11ad Control frames
      2. The proposal is backward compatible
      3. Legacy devices can correctly compute the duration of the frame through TXTIME() – see 21.12.3
      4. Legacy devices can correctly set the NAV on the basis of the received Duration field
      5. The proposal provides enough space to support usages of Control mode frames for EDMG STAs
      6. Opened the floor for discussion
      7. Straw Poll #1, Insert the following in the SFD “A Control Trailer may be used in Control mode PPDUs in place of TRN-Units to carry control data. The Control Trailer is encoded as Control mode LDPC code words. The presence of the Control Trailer is signaled in the Control mode header using the existing Training Length and Packet Type fields, and by setting reserved bits 22 and 23 both to 1”
         1. Yes: 35
         2. No: 0
         3. Abstain: 3
5. Meeting recessed at 9:35 and will resume on Thursday AM2.

**Thursday, January 21, 2015, AM2 Session (10:30-12:30)**

1. The meeting was called to order at 10:30 by the Chair, Edward Au (Huawei).
2. Agenda Doc. IEEE 802.11-15/1472r6
3. Chair reminded all about the IEEE-SA patent policy, logistics, and reminders on Task Group rules.
   1. Chair asked if anybody has any disclosures related to the patent policy. None.
   2. Chair reminded all to record their attendance.
4. Chair asked if there were any additional presentations or items to discuss. None
5. Chair proceeded with the agenda related to the motions. For each of the motions the chair asked who moves the motion, who seconds the motion, and if there were any further discussion required before voting the motion. Then each motion was voted by voting members either as Yes, No or Abstain.
   1. Motion #16: Move to insert the following in section 7.2.2 of the SFD: “A single PPDU format is defined for all EDMG PHYs: the EDMG PPDU format. Figure Y1 shows the EDMG PPDU format and all possible fields. Not all fields are transmitted in an EDMG PPDU. Fields are included depending on whether the PPDU is a SU PPDU or is a MU PPDU.



The fields of the EDMG PPDU format are summarized in Table T1.



The EDMG-Header-A, EDMG-STF, EDMG-CEF and EDMG-Header-B fields exist only in EDMG PPDUs.”

Move: Alecsander Eitan (Qualcomm)

Second: Carlos Cordeiro (Intel)

Result: The motion is passed (19 Yes, 0 No, 3 Abstain)

* 1. Motion #17: Move to insert the following in section 7.2.3.2 of the SFD:

“The structure of the L-Header field is defined as follows:

For a control mode PPDU, the L-Header field is the same as the DMG control mode header field (see Table 21-11) with the following change: the reserved bits 22 and 23 shall be both set to 1 to indicate the presence of the EDMG-Header-A field. This implies that the PPDU is an EDMG PPDU.

For a SC mode PPDU or an OFDM mode PPDU, the L-Header field is the same as the DMG SC mode PHY header (see Table 21-17) with the following change: the reserved bit 46 shall be set to 1 to indicate the presence of the EDMG-Header-A field. This implies that the PPDU is an EDMG PPDU.”

Move: Alecsander Eitan (Qualcomm)

Second: George Calcev (Huawei)

Result: The motion is passed (21 Yes, 0 No, 3 Abstain)

* 1. Motion #18: Move to insert the following in the SFD: “11ay shall support a mode of operation in which, in single phase, the initiator trains its transmit antennas/sectors and multiple responders train their receive antennas/sectors.”.

Move: Edward Au (Huawei)

Second: Carlos Cordeiro (Intel)

Result: The motion is passed (20 Yes, 0 No, 3 Abstain)

* 1. Motion #19: Move to insert the following in the SFD: “11ay BF Training shall support using simultaneous RX antenna training.”.

Move: Edward Au (Huawei)

Second: Sai Shankar Nandagopalan (Samsung)

Result: The motion is passed (26 Yes, 0 No, 2 Abstain)

* 1. Motion #20: Move to insert the following in the SFD: “11ay shall provide the means to enable TX-Sector Down-Selection in the BF training.”.

Move: George Calcev (Huawei)

Second: Majid Ghanbarinejad (Huawei)

Result: The motion is passed (23 Yes, 0 No, 3 Abstain)

* 1. Motion #21: Move to insert the following in the SFD: “11ay should support RX-Sector Down-Selection in BF training.”.

Move: Yan Xin (Huawei)

Second: Carlos Cordeiro (Intel)

Result: The motion is passed (20 Yes, 0 No, 4 Abstain)

* 1. Motion #22: Move to insert the following in section 7.2.4 of the SFD: “The channelization used by EDMG STAs is shown in Figure 2 (see slide 4). The circumstances in which a channel can be used in a regulatory domain is determined by local regulatory rules and any additional rules prescribed by the 11ay specification.”.

Move: Carlos Cordeiro (Intel)

Second: George Calcev (Huawei)

Result: The motion is passed (22 Yes, 0 No, 5 Abstain)

* 1. Motion #23: Move to insert the following in section 4 of the SFD: “To enable backward compatibility with DMG STAs, in an EDMG BSS the BTI, A-BFT and ATI are always present on the primary channel of the BSS. The channel width of the primary channel of an EDMG BSS is 2.16 GHz.”.

Move: Carlos Cordeiro (Intel)

Second: Sai Shankar Nandagopalan (Samsung)

Result: The motion is passed (20 Yes, 0 No, 2 Abstain)

* 1. Motion #24: Move to insert the following in section 6.1 of the SFD: “The 11ay specification shall support:

SU-MIMO

Downlink MU-MIMO

Channel bonding of at least two 2.16 GHz channels.”.

Move: Carlos Cordeiro (Intel)

Second: Yan Xin (Huawei)

Result: The motion is passed (24 Yes, 0 No, 3 Abstain)

* 1. Motion #25: Move to insert the following in section 4 of the SFD: “An EDMG STA shall be able to determine the primary channel and occupied bandwidth from any EDMG PPDU it receives.”.

Move: Carlos Cordeiro (Intel)

Second: Rob Sun (Huawei)

Result: The motion is passed (22 Yes, 0 No, 6 Abstain)

* 1. Motion #26: Move to insert the following in section 6.1 of the SFD: “The 11ay specification shall support contiguous and non-contiguous channel aggregation of at least two 2.16GHz channels.”.

Move: Sakamoto Takenori (Panasonic)

Second: Rob Sun (Huawei)

Result: The motion is passed (22 Yes, 0 No, 5 Abstain)

* 1. Motion #27: Move to insert the following in the SFD: “For 11ay channel bonding, the following apply:

Full carrier sense (physical and virtual) shall be maintained on the primary channel

An EDMG STA may transmit a frame to a peer EDMG STA to indicate its intent to perform channel bonding transmission to the peer STA. This allows an EDMG STA to choose to operate over multiple channels only after receiving such a frame, thus saving power.”.

Move: Carlos Cordeiro (Intel)

Second: Majid Ghanbarinejad (Huawei0

Result: The motion is passed (21 Yes, 0 No, 4 Abstain)

* 1. Motion #28: Move to insert the following in section 5 of the SFD: “An EDMG STA may transmit a “MIMO Setup frame” prior to the transmission of a SU or MU MIMO PPDU. The “MIMO Setup frame” indicates the destination STA(s) addressed by the PPDU.”.

Move: Carlos Cordeiro (Intel)

Second: Rob Sun (Huawei)

Result: The motion is passed (21 Yes, 0 No, 4 Abstain)

* 1. Motion #29: Move to insert the following in section 5 of the SFD: “A "MIMO Setup frame" transmission may trigger a response (e.g., DMG CTS or Ack) from the destination STA(s).”.

Move: Rob Sun (Huawei)

Second: Sai Shankar Nandagopalan (Samsung)

Result: The motion is passed (21 Yes, 0 No, 3 Abstain)

* 1. Motion #30: Move to insert the following in section 5 of the SFD: “An EDMG STA may transmit a frame to one or more EDMG STAs to indicate a target time in which the transmitting STA intends to contend for the channel to send a MIMO PPDU to the STA(s).”.

Move: Carlos Cordeiro (Intel)

Second: George Calcev (Huawei)

Result: The motion is passed (18 Yes, 0 No, 5 Abstain)

* 1. Motion #31: Move to insert the following in the SFD: “The 11ay beamforming protocol supports multi-beamforming for multiple array antennas. Multi-beamforming means that a transmitter simultaneously sends SSW frames in multiple polarized directions.”.

Move: Kyungtae Jo (LG Electronics)

Second: SungJin Park (LG Electronics)

Result: The motion is passed (20 Yes, 0 No, 5 Abstain)

* 1. Motion #32: Move to insert the following in section 6.1 of the SFD: “11ay supports that when using multiple channels, a PCP/AP can simultaneously transmit to multiple STAs allocated to different channels individually.”.

Move: SungJin Park (LG Electronics)

Second: Yan Xin (Huawei)

Result: The motion is passed (20 Yes, 1 No, 3 Abstain)

* 1. Motion #33: Move to insert the following in section 4 of the SFD: “

The 11ay SLS beamforming protocol shall enable feedback of one or more sectors per TX and RX antenna.

The 11ay beamforming protocol shall enable TX and RX training using the same BRP frame

The 11ay beamforming protocol shall define orthogonal TRN sequences for simultaneous BF training across DMG antennas.”.

Move: Sai Shankar Nandagopalan (Samsung)

Second: Yan Xin (Huawei)

Result: The motion is passed (15 Yes, 0 No, 4 Abstain)

* 1. Motion #34: Move to insert the following in the SFD: “11ay BF training should support simultaneous multi-STA RSS over multiple channels during the A-BFT.”.

Move: Yan Xin (Huawei)

Second: Majid Ghanbarinejad (Huawei)

Result: The motion is passed (21 Yes, 0 No, 5 Abstain)

* 1. Motion #35: Move to insert the following in the SFD “A Control Trailer may be used in Control mode PPDUs in place of TRN-Units to carry control data. The Control Trailer is encoded as Control mode LDPC codewords. The presence of the Control Trailer is signaled in the Control mode header using the existing Training Length and Packet Type fields, and by setting reserved bits 22 and 23 both to 1”

Move: Carlos Cordeiro (Intel)

Second: George Calcev (Huawei)

Result: The motion is passed (20 Yes, 0 No, 5 Abstain)

1. Chair proceed to discuss the next conference call schedule for February 16, 2016 at 10:00 AM-11:00 AM ET. No objection.
2. Chair asked if there were any objections to adjourn the Atlanta, Georgia meeting. None.
3. The Task Group AY Atlanta meeting was adjourned on January 19, 2016 at 11:15.