IEEE P802.11  
Wireless LANs

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| IEEE 802.11 Task Group AY  November 2016 San Antonio Meeting Minutes | | | | |
| Date: 2016-11-11 | | | | |
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Abstract

Task Group AY meeting minutes from the IEEE 802.11 San Antonio session, November 6-11, 2016.

**IEEE 802.11 Task Group AY**

**November 2016 San Antonio Plenary**

**November 6-11, 2016**

**Tuesday, November 8, 2016, AM1 Session (08:00-10:00)**

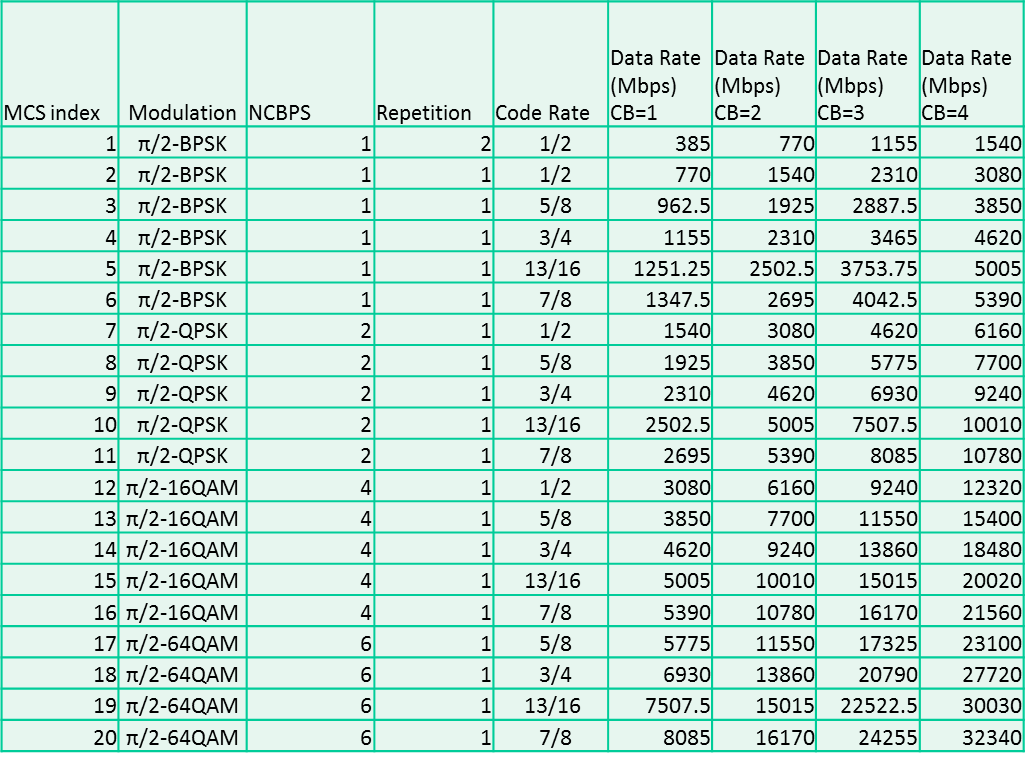
1. The IEEE 802.11ay task group meeting was called to order at 08:00 by the Chair, Edward Au (Huawei).
2. Agenda Doc. IEEE 802.11-16/1288r2.
3. Chair noted that Jeorge Hurtarte (Teradyne), Task Group Secretary, is absent for the plenary. Chair took notes by himself for the week.
4. Chair reviewed the 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 Task Group (slide 11).
6. Chair reviewed the meeting time slots, locations and agenda items for the week (see slides 12-13 of the agenda document).
7. Chair proceeded to discuss the agenda items for the Tuesday, November 8, 2016, Tuesday AM1 session (slide 15).
8. Chair reviewed the progress of the Task Group AY and related documents (slides 16-17).
9. Motion #110: Motion to approve the September 2016 interim meeting minutes
   1. Move: Edward Au (Huawei)
   2. Second: Alecsander Eitan (Qualcomm)
   3. No objections noted. Unanimous consent.
   4. The September 2016 interim meeting minutes were approved.
10. Chair reviewed Task Group Documents (slide 18).
11. Chair reviewed the list of presentations submitted (slides 19-24) and schedule for presenting those during the week.
    1. Chair asked if there were any additional presentations submissions or changes to the agenda items. None.
12. Chair reviewed the agenda setting for the week (slide 24).
13. Chair reviewed the timeline the task group approved in May 2015, and the revised timeline proposal proposed by Carlos Cordeiro (Intel), Doc. IEEE-16/1278r1.
    1. Chair asked if there were any comment or question. None.
14. Motion #111: Move to accept the proposed timeline presented in 16/1278r1 as the timeline for Task Group AY.
    1. Move: Carlos Cordeiro (Intel)
    2. Second: Alecsander Eitan (Qualcomm)
    3. No objections noted. Unanimous consent.
    4. The revised timeline was approved.
15. Presentations
    1. Presentation by Claudio Da Silva (Intel), TRN field transmission for channel bonding, Doc. IEEE 11-16/1364r1.
       1. Opened the floor for discussion.
       2. Straw Poll #1. Do you agree to insert the following in the SFD? The BRP protocol shall be extended to support operation over channels with 4.32 GHz, 6.48 GHz and 8.64 GHz of bandwidth. If BRP is performed on such a channel, the AGC and TRN fields sent as part of the BRP shall be transmitted over the entire signal bandwidth of the channel.
          1. Yes: 22
          2. No: 0
          3. Abstain: 9
          4. Straw poll passed
       3. Straw Poll #2. Do you agree to insert the following in the SFD: “Except for the AGC and TRN fields, all the fields of a control mode PPDU transmitted by an EDMG STA over a 4.32GHz, 6.48GHz or 8.64GHz channel shall be duplicated.”?
          1. Yes: 22
          2. No: 0
          3. Abstain: 7
          4. Straw poll passed
    2. Presentation by Yutaka Murakami (Panasonic), EDMG PHY headers for open loop spatial multiplexing in SU-MIMO, Doc. IEEE 11-16/1444r0.
       1. Opened the floor for discussion.
       2. Straw Poll #1. Do you agree to add the following fields in the EDMG-header-A of an OFDM EDMG SU PPDU to the SFD? Phase hopping field (1 bit): Reserved if either TX or RX does not support phase hopping. Open loop precoding field (1 bit): Reserved if phase hopping field is “0”. Reserved if either TX or RX does not support phase hopping.
          1. Yes: 17
          2. No: 0
          3. Abstain: 3
          4. Straw poll passed
    3. Presentation by Carlos Cordeiro (Intel), MU MIMO beamforming protocol proposal, Doc. IEEE 11-16/1365r0.
       1. Opened the floor for discussion.
       2. Straw Poll #1. Do you agree to insert the following in section 3.4 of the SFD? The 11ay MU MIMO beamforming protocol shall comprise the following phases: SISO phase, MIMO phase. The SISO phase is as specified in <slides 5-9 of 16/1365r0>. The MIMO phase is as specified in <slides 11-20 of 16.1365r0>.
          1. Yes: 32
          2. No: 0
          3. Abstain: 1
          4. Straw poll passed.
    4. Presentation by Kome Oteri (InterDigital), Further details on multi-stage, multi-resolution beamforming training in 802.11ay, Doc. IEEE 11-16/1447r1.
       1. Opened the floor for discussion.
       2. Straw Poll #1. Do you agree to add the following text into the 802.11ay SFD? 11ay should update the 802.11ad BRP procedure to improve the efficiency of Beam Refinement.
          1. Kome Oteri withdrew this straw poll.
       3. Straw Poll #2. Do you agree to add the following text into the 802.11ay SFD? 11ay BRP protocol should allow negotiation of the value of aBRPminSCblocks <=18.
          1. Yes: 10
          2. No: 0
          3. Abstain: 26
          4. Straw poll passed.
       4. Straw Poll #3. Do you agree to add the following text into the 802.11ay SFD? 11ay BRP protocol should allow negotiation of the value of the BRPIFS parameter for specific modes.
          1. Yes: 6
          2. No: 4
          3. Abstain: Many
          4. Straw poll passed.
       5. Straw Poll #4. Do you agree to add the following text into the 802.11ay SFD? 11ay should allow for grouping and signaling of a set of beams of a desired resolution. The specific signaling is TBD.
          1. Yes: 4
          2. No: 11
          3. Abstain: Many
          4. Straw poll failed.
16. Meeting recessed at 10:03 and will resume on Tuesday PM3.

**Tuesday, November 8, 2016, PM3 Session (19:30-21:30)**

1. The meeting was called to order at 19:30 by the Chair, Edward Au (Huawei).
2. Agenda Doc. IEEE 802.11-16/1288r3.
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.
   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. Presentations
   1. Presentation by James Wang (MediaTek), Antenna polarization capability format, Doc. IEEE 11-16/1433r3.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to add the format of Antenna Polarization Capability Field as defined in slides 6 - 9 of 16/1433r3 into the 11ay SFD?
         1. Yes: 26
         2. No: 0
         3. Abstain: 2
         4. Straw poll passed.
   2. Presentation by Sang Kim (LG Electronics), On the implementation of dynamic load balancing for A-BFT channel, Doc. IEEE 11-16/1483r0.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to add the following text into SFD? The EDMG Operation element includes signaling of RSSBackoff and RSSRetryLimit.
         1. Yes: 22
         2. No: 0
         3. Abstain: 8
         4. Straw poll passed.
      3. Straw Poll #2. Do you agree to add the following text into SFD? EDMG operation element shall define signaling for dynamic load balancing for A-BFT channel as shown and described in slides 4 - 5 of 16/1483r0.
         1. Yes: 20
         2. No: 0
         3. Abstain: 9
         4. Straw poll passed.
   3. Presentation by Jinmin Kim (LG Electronics), EDMG-Header-A contents, Doc. IEEE 11-16/1485r0.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to insert the following text into the SFD? If NSS <= 4, the MCS field in EDMG-Header-A for SU is defined as: 4 MCS fields (20bits): Each MCS field (5 bits) is for each spatial stream. If NSS > 4, the MCS field in EDMG-Header-A for SU is defined as: Base MCS field (5bits): this indicates the lowest MCS index across all spatial streams. 8 differential MCS fields (16bits): Each MCS field (2bits) for each spatial stream is interpreted as follows: ‘00’ indicates the same MCS with the base MCS, ‘01’ indicates the one-step higher order modulation than the base MCS with the same code rate, ‘10’ indicates the two-step higher order modulation than the base MCS with the same code rate, ‘11’ indicates the three-step higher order modulation than the base MCS with the same code rate.
         1. Yes: 24
         2. No: 0
         3. Abstain: 10
         4. Straw poll passed.
      3. Straw Poll #2. Do you agree to insert the following text into the SFD? The total number of MCS subfields in the EDMG-Header-A field shall be constant whether or not channel aggregation is used. Therefore, if channel aggregation is used, the number of MCSs assigned to each channel in the aggregate shall be N/2, where N is the total number of MCS subfields.
         1. Yes: 24
         2. No: 0
         3. Abstain: 11
         4. Straw poll passed.
      4. Straw Poll #3. Do you agree to insert the following text into the SFD? The maximum number of spatial stream in each aggregated channel is four in channel aggregation. The different number of spatial stream can be allocated to each aggregated channel in channel aggregation.
         1. Yes: 22
         2. No: 0
         3. Abstain: 5
         4. Straw poll passed.
      5. Straw Poll #4. Do you agree to add the following field to the EDMG-Header A for MU? MU-MIMO / FDMA indication (1bit).
         1. Yes: 20
         2. No: 0
         3. Abstain: 13
         4. Straw poll passed.
      6. Straw Poll #5. Do you agree to add the following fields to the EDMG Header-A when the PPDU is for FDMA? 4 Channel Descriptors, each of which has AID (8bits), NSS (1 bits), Beamformed (1bit).
         1. Yes: 16
         2. No: 0
         3. Abstain: 10
         4. Straw poll passed.
   4. Presentation by Kyungtae Jo (LG Electronics), Multi-BF procedure for 11ay, Doc. IEEE 11-16/1484r1.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to modify the current SFD text “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.” as follows? “The 11ay beamforming protocol supports multi-beamforming for multiple array antennas. Multi-beamforming means that a transmitter sends a SSW frame simultaneously in same sectors through polarized antennas.”
         1. Yes: 23
         2. No: 0
         3. Abstain: 9
         4. Straw poll passed.
      3. Straw Poll #2. Do you agree to add the following text into SFD? 11ay shall define the Multi-BF capabilities using EDMG Capabilities element to perform the Multi-BF.
         1. Yes: 13
         2. No: 0
         3. Abstain: 16
         4. Straw poll passed.
   5. Presentation by SungJin Park (LG Electronics), Carrier sense for multi-channel allocation, Doc. IEEE 11-16/1482r1.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to add the following text to the SFD? For CBAP allocation that does not include the primary channel, full carrier sense (physical and virtual) shall be performed during the allocation.
         1. Yes: 20
         2. No: 0
         3. Abstain: 10
         4. Straw poll passed.
   6. Presentation by Dzevdan Kapetanovic (Ericsson), Comparing DL/UL training overhead for hybrid beamforming, Doc. IEEE 11-16/1514r0.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you believe UL training for DL MU-MIMO shall be included as an optional feature in the 802.11ay SFD?
         1. Yes: 1
         2. No: 1
         3. Abstain: Many
         4. Straw poll failed.
   7. Presentation by Tao Wu (Huawei), DCM SQPSK for Channel Aggregation in 11ay, Doc. IEEE 11-16/1490r0.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to add the following text to the SFD?
      3. In the Single Carrier mode in 11ay, DCM SQPSK signals transmitted over two aggregated channels presented in slide 6 of 16/1490r0 may be supported.
         1. Yes: 22
         2. No: 0
         3. Abstain: 6
         4. Straw poll passed.
5. Meeting recessed at 21:20 and will resume on Wednesday AM1.

**Wednesday, November 9, 2016, 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 802.11-16/1288r4.
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 Li-Hsiang Sun (InterDigital), GI and phase impairments impact on open-loop SU-MIMO, Doc. IEEE 11-16/1385r0.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to add the following block format in 11ay SFD? (32 GI,480 data) symbols per SC block for a 2.16GHz channel is an option for SC PHY in QPSK/BPSK MCS.
         1. Yes: 8
         2. No: 0
         3. Abstain: 15
         4. Straw poll passed.
   2. Presentation by Kome Oteri (InterDigital), Closed loop SU-MIMO performance with quantized feedback, Doc. IEEE 11-16/1446r0.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to insert the following in clause 7 of the SFD? The 11ay specification shall support SU-MIMO with matrices derived from channel feedback.
         1. Yes: 14
         2. No: 0
         3. Abstain: 14
         4. Straw poll passed.
   3. Presentation by Rui Yang (InterDigital), On the single carrier waveforms for 11ay, Doc. IEEE 11-16/1455r0.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree that the TGay should further study the feasibility of including GI DFT-s-OFDM or UW DFT-s-OFDM as an alternative SC waveform for 11ay?
         1. Yes: 11
         2. No: 0
         3. Abstain: 17
         4. Straw poll passed.
   4. Presentation by Alecsander Eitan (Qualcomm), Packet structure for SC EDMG PPDU for each GI length, Doc. IEEE 11-16/1394r1.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to add to the SFD? SC SISO to use 11ad Ga64, and derives, for CB=1 without additional EDMG STF & CEF, as in slides 7-9, for Short and Long GI cases. SC CB>1 Frame Format to be as in slides 11 and 13 of 16/1394r1.
         1. Yes: 29
         2. No: 0
         3. Abstain: 5
         4. Straw poll passed.
   5. Presentation by Alecsander Eitan (Qualcomm), MCS table for SC EDMG, Doc. IEEE 11-16/1401r1.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to include in the SFD the MCS table for SC, as follows?



* + - 1. Yes: 30
      2. No: 0
      3. Abstain: 5
      4. Straw poll passed.

1. Meeting recessed at 10:02 and will resume on Wednesday PM2.

**Wednesday, November 9, 2016, PM2 Session (16:00-18:00)**

1. The meeting was called to order at 16:00 by the Chair, Edward Au (Huawei).
2. Agenda Doc. IEEE 802.11-16/1288r6.
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 Camillo Gentile (NIST), A quasi-deterministic channel model for a server room at 60 GHz, Doc. IEEE 11-16/1432r1.
      1. Opened the floor for discussion.
   2. Presentation by Yaroslav Gagiev (Intel), Implementation of channel models for IEEE 802.11ay, Doc. IEEE 11-16/1388r0.
      1. Opened the floor for discussion.
   3. Presentation by Robert Muller (Ilmenau University of Technology), Channel measurement summary of outdoor indoor scenarios for 11ay, Doc. IEEE 11-16/1497r0.
      1. Opened the floor for discussion.
   4. Presentation by Tao Wu (Huawei), DCM QPSK for channel aggregation in 11ay, Doc. IEEE 11-16/1488r1.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to add the following text to the SFD? In the 11ay single carrier mode, two DCM QPSK signals transmitted over two aggregated channels presented in page 7 may be supported?
         1. Yes: 10
         2. No: 0
         3. Abstain: 17
         4. Straw poll passed.
   5. Presentation by Hiroyuki Motozuka (Panasonic), L-Header spoofing and bit reuse, Doc. IEEE 11-16/1422r0.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to add the following to the SFD? The maximum PPDU duration of EDMG PPDU is 2ms.
         1. Yes: 25
         2. No: 0
         3. Abstain: 5
         4. Straw poll passed.
   6. Presentation by Artyom Lomayev (Intel), Symbol blocking and guard interval definition for SC MIMO in 11ay, Doc. IEEE 11-16/1429r0.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to add the following to the SFD? The 11ay specification should define the symbol blocking structure and GI definition for SU-MIMO, MU-MIMO, CB = 1, 2, 3, 4 for SC PHY provided on slides 5 - 17 of 16/1429r0
         1. Yes: 22
         2. No: 0
         3. Abstain: 2
         4. Straw poll passed.
5. Meeting recessed at 17:54 and will resume on Thursday PM2.

**Thursday, September 15, 2016, PM2 Session (16:00-18:00)**

1. The meeting was called to order at 16:00 by the Chair, Edward Au (Huawei).
2. Agenda Doc. IEEE 802.11-16/1288r6.
3. Chair reminded all about the IEEE-SA patent policy, logistics, and reminders on Task Group rules.
   1. Chair asked if anybody has any additional presentations for the meeting. None.
   2. Chair reminded all to record their attendance.
4. Presentations
   1. Presentation by Yan Xin (Huawei), Rate-7/8 LDPC code for 11ay, Doc. IEEE 11-16/1495r1.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to include the parity check matrix shown in slide 8 of 16/1495r1 for the rate 7/8 LDPC code of length 672 in the IEEE 802.11ay SFD?
         1. Yes: 31
         2. No: 0
         3. Abstain: 5
         4. Straw poll passed.
   2. Presentation by Alecsander Eitan (Qualcomm), EDMG Header-A fields preview in L-Header, Doc. IEEE 11-16/1395r1.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to add to the SFD? In EDMG PPDU frames the lower 4 bits of the Length field and the LastRSSI field, of the L-Header, should be set according to the values detailed in slides 9 and 7 of 16/1395r1. In addition, bit 5 of the Length field to be set to 0 (reserved).
         1. Yes: 31
         2. No: 0
         3. Abstain: 3
         4. Straw poll passed.
   3. Presentation by Oren Kedem (Intel), ACK and BA transmission in bonded channels, Doc. IEEE 11-16/1428r2.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to add to the SFD? An ACK or BA frame shall be sent over a bandwidth equal to the bandwidth of the frame the ACK or BA are sent in response to.
         1. Yes: 24
         2. No: 0
         3. Abstain: 5
         4. Straw poll passed.
      3. Straw Poll #2. Do you agree to add to the SFD? An ACK or BA frame sent in duplicated mode in response to a 4.32 GHz, 6.48 GHz, or 8.64 GHz PPDU received with an MCS higher than MCS4 shall be sent with MCS1.
         1. Yes: 26
         2. No: 0
         3. Abstain: 6
         4. Straw poll passed.
      4. Straw Poll #3. Do you agree to add to the SFD? An ACK or BA frame transmitted in response to a 4.32 GHz, 6.48 GHz or 8.64 GHz PPDU received with an MCS lower than or equal to MCS4 may be sent in non-duplicated mode with the same bandwidth of the PPDU the frame is sent in response to, and with an MCS that is equal or lower than the MCS of the PPDU that the ACK and BA are sent in response to and that provides the shortest response frame length.
         1. Yes: 26
         2. No: 0
         3. Abstain: 7
         4. Straw poll passed.
   4. Presentation by Ou Yang (Intel), Reverse direction for DL MU MIMO, Doc. IEEE 11-16/1502r3.
      1. Opened the floor for discussion.
      2. Straw Poll #1. Do you agree to add to the SFD? The reverse direction protocol shall be extended to support DL MU-MIMO.
         1. Yes: 34
         2. No: 0
         3. Abstain: 2
         4. Straw poll passed.
      3. Straw Poll #2. Do you agree to add to the SFD? 11ay shall adopt the BlockACK mechanism defined in 11ac for DL MU-MIMO.
         1. Yes: 34
         2. No: 0
         3. Abstain: 1
         4. Straw poll passed.
      4. Straw Poll #3. Do you agree to add to the SFD? DL MU-MIMO transmission shall support RD accordingly to the rules described in slides 6, 7 and 8 of 16/1502r3.
         1. Yes: 30
         2. No: 0
         3. Abstain: 4
         4. Straw poll passed.
5. Editor presented a spreadsheet that he will use for draft creation. Doc. IEEE 11-16/1412r0.
6. Motion #112. Do you agree to insert the following in the SFD?

* The BRP protocol shall be extended to support operation over channels with 4.32 GHz, 6.48 GHz and 8.64 GHz of bandwidth.
* If BRP is performed on such a channel, the AGC and TRN fields sent as part of the BRP shall be transmitted over the entire signal bandwidth of the channel.
  1. Move: Carlos Cordeiro
  2. Second: Ou Yang
  3. Result: The motion is passed (32 Yes; 0 No; 5 Abstain).

1. Motion #113. Do you agree to insert the following in the SFD?

* Except for the AGC and TRN fields, all the fields of a control mode PPDU transmitted by an EDMG STA over a 4.32GHz, 6.48GHz or 8.64GHz channel shall be duplicated.”?
  1. Move: Carlos Cordeiro
  2. Second: Ou Yang
  3. Result: The motion is passed with unanimous consent.

1. Motion #114. Do you agree to add the following fields in the EDMG-header-A of an OFDM EDMG SU PPDU to the SFD?

* Phase hopping field (1 bit): Reserved if either TX or RX does not support phase hopping.
* Open loop precoding field (1 bit): Reserved if phase hopping field is “0”. Reserved if either TX or RX does not support phase hopping.
  1. Move: Yutaka Murakami
  2. Second: Lei Huang
  3. Result: The motion is passed with unanimous consent.

1. Motion #115. Do you agree to insert the following in section 3.4 of the SFD?

* The 11ay MU MIMO beamforming protocol shall comprise the following phases:
  + SISO phase
  + MIMO phase
* The SISO phase is as specified in <slides 5-9 of 16/1365r0>. The MIMO phase is as specified in <slides 11-20 of 16.1365r0>.
  1. Move: Carlos Cordeiro
  2. Second: Alecsander Eitan
  3. Result: The motion is passed with unanimous consent.

1. Motion #116. Do you agree to add the following text into the 802.11ay SFD?

* 11ay BRP protocol should allow negotiation of the value of aBRPminSCblocks <=18.
  1. Move: Kome Oteri
  2. Second: Rui Yang
  3. Result: The motion is passed with unanimous consent.

1. Motion #117. Do you agree to add the format of Antenna Polarization Capability Field as defined in slides 6 - 9 of 16/1433r3 into the 11ay SFD?
   1. Move: Edward Au
   2. Second: Lei Huang
   3. Result: The motion is passed with unanimous consent.
2. Motion #118. Do you agree to add the following text into SFD?

* The EDMG Operation element includes signaling of RSSBackoff and RSSRetryLimit.
  1. Move: Sang Kim
  2. Second: HanGyu Cho
  3. Result: The motion is passed with unanimous consent.

1. Motion #119. Do you agree to add the following text into SFD?

* EDMG operation element shall define signaling for dynamic load balancing for A-BFT channel as shown and described in slides 4 - 5 of 16/1483r0.
  1. Move: Sang Kim
  2. Second: Kyungtae Jo
  3. Result: The motion is passed with unanimous consent.

1. Motion #120. Do you agree to insert the following text into the SFD?

* If NSS <= 4, the MCS field in EDMG-Header-A for SU is defined as:
  + 4 MCS fields (20bits):
    - Each MCS field (5 bits) is for each spatial stream
* If NSS > 4, the MCS field in EDMG-Header-A for SU is defined as:
  + Base MCS field (5bits):
    - this indicates the lowest MCS index across all spatial streams
  + 8 differential MCS fields (16bits)
    - Each MCS field (2bits) for each spatial stream is interpreted as follows:
      * ‘00’ indicates the same MCS with the base MCS
      * ‘01’ indicates the one-step higher order modulation than the base MCS with the same code rate
      * ‘10’ indicates the two-step higher order modulation than the base MCS with the same code rate
      * ‘11’ indicates the three-step higher order modulation than the base MCS with the same code rate
  1. Move: Jinmin Kim
  2. Second: HanGyu Cho
  3. Result: The motion is passed with unanimous consent.

1. Motion #121. Do you agree to insert the following text into the SFD?

* The total number of MCS subfields in the EDMG-Header-A field shall be constant whether or not channel aggregation is used. Therefore, if channel aggregation is used, the number of MCSs assigned to each channel in the aggregate shall be N/2, where N is the total number of MCS subfields.
  1. Move: Jinmin Kim
  2. Second: HanGyu Cho
  3. Result: The motion is passed with unanimous consent.

1. Motion #122. Do you agree to insert the following text into the SFD?

* The maximum number of spatial stream in each aggregated channel is four in channel aggregation.
* The different number of spatial stream can be allocated to each aggregated channel in channel aggregation.
  1. Move: Jinmin Kim
  2. Second: HanGyu Cho
  3. Result: The motion is passed with unanimous consent.

1. Motion #123. Do you agree to add the following field to the EDMG-Header A for MU?

* MU-MIMO / FDMA indication (1bit)
  1. Move: Jinmin Kim
  2. Second: Sang Kim
  3. Result: The motion is passed with unanimous consent.

1. Motion #124. Do you agree to add the following fields to the EDMG Header-A when the PPDU is for FDMA?

* 4 Channel Descriptors, each of which has
  + AID (8bits)
  + NSS (1 bits)
  + Beamformed (1bit)
  1. Move: Jinmin Kim
  2. Second: Sang Kim
  3. Result: The motion is passed with unanimous consent.

1. Motion #125. Do you agree to modify the current SFD text “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.” as follows?

* “The 11ay beamforming protocol supports multi-beamforming for multiple array antennas. Multi-beamforming means that a transmitter sends a SSW frame simultaneously in same sectors through polarized antennas.”
  1. Move: Kyungtae Jo
  2. Second: HanGyu Cho
  3. Result: The motion is passed with unanimous consent.

1. Motion #126. Do you agree to add the following text into SFD?

* 11ay shall define the Multi-BF capabilities using EDMG Capabilities element to perform the Multi-BF.
  1. Move: Kyungtae Jo
  2. Second: HanGyu Cho
  3. Result: The motion is passed with unanimous consent.

1. Motion #127. Do you agree to add the following text to the SFD?

* For CBAP allocation that does not include the primary channel, full carrier sense (physical and virtual) shall be performed during the allocation.
  1. Move: SungJin Park
  2. Second: Sang Kim
  3. Result: The motion is passed with unanimous consent.

1. Motion #128. Do you agree to add the following text to the SFD?

* In the Single Carrier mode in 11ay, DCM SQPSK signals transmitted over two aggregated channels presented in slide 6 of 16/1490r0 may be supported.
  1. Move: Tao Wu
  2. Second: George Calcev
  3. Result: The motion is passed with unanimous consent.

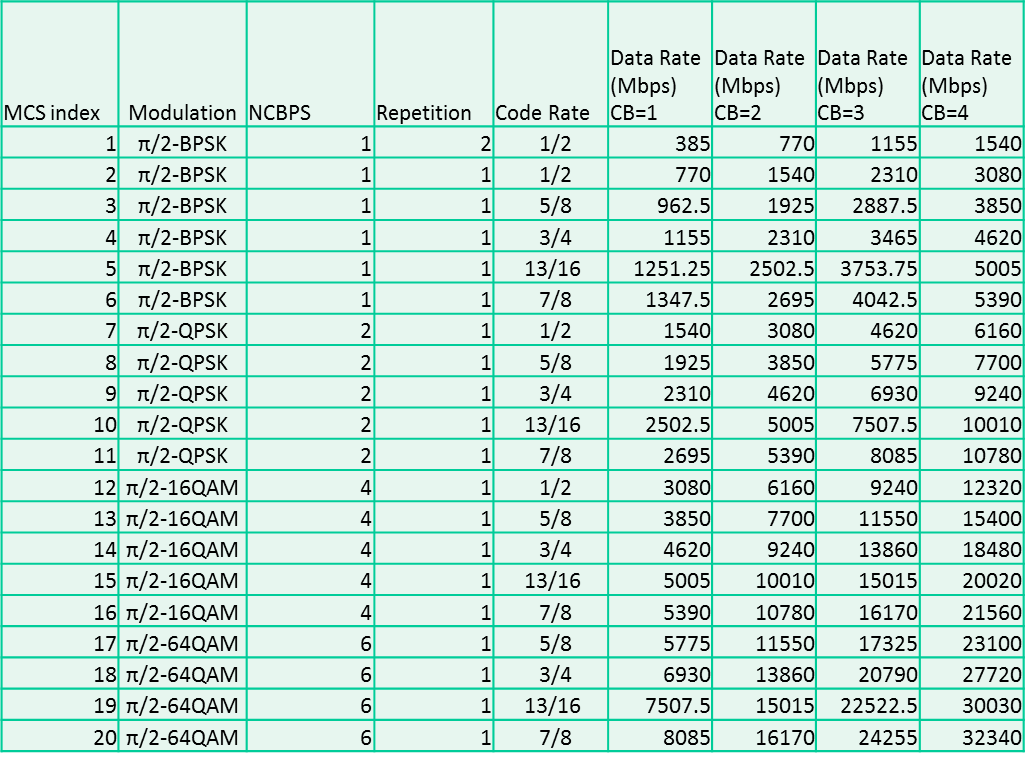
1. Motion #129. Do you agree to insert the following in clause 7 of the SFD?

* The 11ay specification shall support SU-MIMO with matrices derived from channel feedback.
  1. Move: Kome Oteri
  2. Second: Carlos Cordeiro
  3. Result: The motion is passed with unanimous consent.

1. Motion #130. Do you agree to add to the SFD?

* SC SISO to use 11ad Ga64, and derives, for CB=1 without additional EDMG STF & CEF, as in slides 7-9, for Short and Long GI cases
* SC CB>1 Frame Format to be as in slides 11 and 13 of 16/1394r1.
  1. Move: Alecsander Eitan
  2. Second: Sang Kim
  3. Result: The motion is passed with unanimous consent.

1. Motion #131. Do you agree to include in the SFD the MCS table for SC, as follows?



* 1. Move: Alecsander Eitan
  2. Second: Ou Yang
  3. Result: The motion is passed with unanimous consent.

1. Motion #132. Do you agree to add the following to the SFD?

* The maximum PPDU duration of EDMG PPDU is 2ms.
  1. Move: Hiroyuki Motozuka
  2. Second: Lei Huang
  3. Result: The motion is passed with unanimous consent.

1. Motion #133. Do you agree to add the following to the SFD?

* The 11ay specification should define the symbol blocking structure and GI definition for SU-MIMO, MU-MIMO, CB = 1, 2, 3, 4 for SC PHY provided on slides 5 - 17 of 16/1429r0.
  1. Move: Artyom Lomayev
  2. Second: Alecsander Eitan
  3. Result: The motion is passed with unanimous consent.

1. Motion #134. Do you agree to include the parity check matrix shown in slide 8 of 16/1495r1 for the rate 7/8 LDPC code of length 672 in the IEEE 802.11ay SFD?
   1. Move: Yan Xin
   2. Second: Rob Sun
   3. Result: The motion is passed with unanimous consent.
2. Motion #135. Do you agree to add to the SFD?

* In EDMG PPDU frames the lower 4 bits of the Length field and the LastRSSI field, of the L-Header, should be set according to the values detailed in slides 9 and 7 of 16/1395r1. In addition, bit 5 of the Length field to be set to 0 (reserved).
  1. Move: Alecsander Eitan
  2. Second: Carlos Cordeiro
  3. Result: The motion is passed with unanimous consent.

1. Motion #136. Do you agree to add to the SFD?

* An ACK or BA frame shall be sent over a bandwidth equal to the bandwidth of the frame the ACK or BA are sent in response to.
  1. Move: Oren Kedem
  2. Second: Ou Yang
  3. Result: The motion is passed with unanimous consent.

1. Motion #137. Do you agree to add to the SFD?

* An ACK or BA frame sent in duplicated mode in response to a 4.32 GHz, 6.48 GHz, or 8.64 GHz PPDU received with an MCS higher than MCS4 shall be sent with MCS1.
  1. Move: Oren Kedem
  2. Second: Ou Yang
  3. Result: The motion is passed with unanimous consent.

1. Motion #138. Do you agree to add to the SFD?

* An ACK or BA frame transmitted in response to a 4.32 GHz, 6.48 GHz or 8.64 GHz PPDU received with an MCS lower than or equal to MCS4 may be sent in non-duplicated mode with the same bandwidth of the PPDU the frame is sent in response to, and with an MCS that is equal or lower than the MCS of the PPDU that the ACK and BA are sent in response to and that provides the shortest response frame length.
  1. Move: Oren Kedem
  2. Second: Ou Yang
  3. Result: The motion is passed with unanimous consent.

1. Motion #139. Do you agree to add to the SFD?

* The reverse direction protocol shall be extended to support DL MU-MIMO.
  1. Move: Ou Yang
  2. Second: Oren Kedem
  3. Result: The motion is passed with unanimous consent.

1. Motion #140. Do you agree to add to the SFD?

* 11ay shall adopt the BlockACK mechanism defined in 11ac for DL MU-MIMO.
  1. Move: Ou Yang
  2. Second: Oren Kedem
  3. Result: The motion is passed with unanimous consent.

1. Motion #141. Do you agree to add to the SFD?

* DL MU-MIMO transmission shall support RD accordingly to the rules described in slides 6, 7 and 8 of 16/1502r3.
  1. Move: Ou Yang
  2. Second: Oren Kedem
  3. Result: The motion is passed with unanimous consent.

1. Chair reviewed the goals for the January 2017 wireless interim meeting.
2. Chair reviewed the teleconference schedule, which is January 4 (Wednesday), 10:00am ET – 11:00am ET. No objections noted.
3. The Task Group AY San Antonio meeting was adjourned on November 10, 2016 at 17:55**.**