IEEE P802.11  
Wireless LANs

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| TGad Conference Call Minutes | | | | |
| Date: 2011-08-18 | | | | |
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Abstract

TGad conference call minutes for 2011.

# Conference Call Times

|  |  |  |
| --- | --- | --- |
| **Date** | **Start Time** | **End Time** |
| January 6, 2011 | 10 AM Eastern Time | 12 PM Eastern Time |
| January 13, 2011 | 8 PM Eastern Time | 10 PM Eastern Time |
| January 27, 2011 | 10 AM Eastern Time | 12 PM Eastern Time |
| February 3, 2011 | 8 PM Eastern Time | 10 PM Eastern Time |
| February 10, 2011 | 10 AM Eastern Time | 12 PM Eastern Time |
| February 17, 2011 | 8 PM Eastern Time | 10 PM Eastern Time |
| February 24, 2011 | 10 AM Eastern Time | 12 PM Eastern Time |
| March 31, 2011 | 10 AM Eastern Time | 12 PM Eastern Time |
| April 7, 2011 | 8 PM Eastern Time | 10 PM Eastern Time |
| April 14, 2011 | 10 AM Eastern Time | 12 PM Eastern Time |
| April 21, 2011 | 8 PM Eastern Time | 10 PM Eastern Time |
| April 28, 2011 | 10 AM Eastern Time | 12 PM Eastern Time |
| May 5, 2011 | 10 AM Eastern Time | 12 PM Eastern Time |
| June 9, 2011 | 10 AM Eastern Time | 12 PM Eastern Time |
| June 16, 2011 | 8 PM Eastern Time | 10 PM Eastern Time |
| June 23, 2011 | 10 AM Eastern Time | 12 PM Eastern Time |
| June 30, 2011 | 8 PM Eastern Time | 10 PM Eastern Time |
| July 7, 2011 | 10 AM Eastern Time | 12 PM Eastern Time |
| Aug 11, 2011 | 10 AM Eastern Time | 12 PM Eastern Time |
| Aug 18, 2011 | 8 PM Eastern Time | 10 PM Eastern Time |
|  |  |  |

# Minutes from January 5, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* D1.0 Relay Operation Related Comment Resolution, 11/0001r0, Kapseok Chang
* Comment resolution, 10/1220r10, Carlos Cordeiro

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/0001r0

* Addressing CID 142
  + No objection to resolution
* 648
  + No objection to resolution
* 965
  + Refer to CID 652, which will include all of clause 10 resolutions
  + No objection to resolution
* 968
  + No objection to resolution
* 969
  + No objection to resolution
* 1076
  + Change to agree in principle
  + No objection to resolution
* 1078
  + No objection to resolution
* 1134
  + No objection to resolution
* 1135
  + Request for example from 802.11
    - In DLS
  + Defer, discuss next conference call
* 1136
  + No objection to resolution
* 1137
  + How is time predetermined?
  + Is there mechanism to share this?
    - Defined as constant value
    - See CID 71
  + No objection to resolution
* 1138
  + Defer, discuss next conference call

Will post r1 to server

## 10/1220r10

* CID 32
  + No objection to resolution
* 943
  + No objection to resolution
* 1113
  + No objection to resolution
* 531
  + Brief discussion
  + No objection to resolution
* 636
  + No objection to resolution
* 959
  + No objection to resolution
* 960
  + No objection to resolution
* 962
  + No objection to resolution
* 439
  + Question regarding the suggested value of MCS is in field, why need to change to decrease or increase
  + Remove modification for MCS, just for transmit power
  + No objection to resolution
* 967
  + No objection to resolution
* 18
  + No objection to resolution
* 1216
  + No objection to resolution
* 126
  + Duplicate of 1216
  + No objection to resolution
* 131
  + No objection to resolution
* 130
  + No objection to resolution
* 178
  + No objection to resolution
* 179
  + No objection to resolution
* 109
  + No objection to resolution
* 110
  + No objection to resolution
* 111
  + No objection to resolution
* 642
  + No objection to resolution
* 971
  + No objection to resolution
* 973
  + No objection to resolution
* 976
  + No objection to resolution
* 146
  + No objection to resolution
* 984
  + No objection to resolution
* 462
  + No objection to resolution
* 463
  + No objection to resolution
* 464
  + No objection to resolution
* 465
  + No objection to resolution
* 466
  + No objection to resolution
* 600
  + No objection to resolution
* 474
  + No objection to resolution
* 24
  + No objection to resolution
* 479
  + discussion whether SLS part of text should be a should or shall
  + No objection to resolution

# Minutes from January 13, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* MAC-QAB comment resolution, 11/0038r0, Zhou Lan
* D1.0 Relay Operation Related Comment Resolution, 11/0001r2, Kapseok Chang
* Comment resolution, 10/1220r11, Carlos Cordeiro

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/0038r0

* Addressing CID 966
  + No objection to resolution
* 1125
  + No objection to resolution
* 1126
  + No objection to resolution
* 1127
  + No objection to resolution
* 1128
  + No objection to resolution
* 1129
  + Discussion:
    - Can’t the token be used to distinguish between requester and responder AP? Not sure address is necessary.
  + No objection to resolution

## 11/0001r2

* CID 1135
  + No objection to resolution
* CID 1138
  + No objection to resolution

## 10/1220r11

* CID 459
  + No objection to resolution
* 1186
  + No objection to resolution
* 949
  + No objection to resolution
* 952
  + No objection to resolution
* 103
  + No objection to resolution
* 13
  + No objection to resolution
* 1184
  + No objection to resolution
* 409
  + No objection to resolution
* 981
  + No objection to resolution
* 477
  + No objection to resolution
* 1003
  + No objection to resolution
* 446
  + No objection to resolution
* 449
  + No objection to resolution
* 1181
  + No objection to resolution
* 1013
  + No objection to resolution
* 1017
  + No objection to resolution
* 1020
  + No objection to resolution
* 601
  + No objection to resolution
* 425
  + No objection to resolution
* 502
  + No objection to resolution
* 1033
  + No objection to resolution
* 283
  + No objection to resolution
* 31
  + No objection to resolution
* 207
  + No objection to resolution
* 208
  + No objection to resolution
* 222
  + No objection to resolution
* 224
  + No objection to resolution
* 226
  + No objection to resolution
* 236
  + No objection to resolution
* 241
  + No objection to resolution
* 243
  + No objection to resolution
* 244
  + No objection to resolution
* 245
  + No objection to resolution
* 629
  + No objection to resolution
* 174
  + No objection to resolution
* 162
  + No objection to resolution
* 1041
  + No objection to resolution
* 1052
  + No objection to resolution
* 1058
  + No objection to resolution
* 328
  + No objection to resolution
* 329
  + No objection to resolution
* 330
  + No objection to resolution
* 331
  + No objection to resolution
* 332
  + No objection to resolution
* 333
  + No objection to resolution
* 334
  + No objection to resolution
* 335
  + No objection to resolution
* 337
  + No objection to resolution
* 338
  + No objection to resolution

# Minutes from January 27, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* Comment resolution, 10/1220r16, Carlos Cordeiro

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 10/1220r16

No objection to the resolution of the following CIDs: 1104, 633, 1224, 1112, 961, 15, 513, 963, 1117, 140, 141, 594, 596, 440, 993, 995, 996, 1000, 511, 1002, 480, 1004, 1005, 447, 1014, 1015, 1016, 495, 496, 1018, 414, 1019, 415, 438, 1023, 1024, 1025, 1026, 1027

# Minutes from February 3, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* CA Doc comment resolution, 11/0219r0, Eldad Perahia
* CA Doc modifications, 10/1025r4, Eldad Perahia
* Comment Resolution, 11/0212r0, Carlos Cordeiro
* Comment resolution, 10/1220r17, Carlos Cordeiro

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/0219r0 & 10/1025r4

* 11/0219r0 addresses CID 134 and 627
  + Discussion on link/power level analysis versus MAC mechanisms
  + Modified resolution to reference 15-09/0022r9 section 3 page 12 line 31 “We expect that the impact on 802.11 TGad devices would be similar.”
  + will be uploaded as r1
  + No objection to resolution
* 10/1025r4
  + No objection to changes to CA doc

## 11/0212r0

* CID 937
  + No objection to resolution
* 1105
  + No objection to resolution
* 7, 8, 1106
  + No objection to resolution
* 588
  + No objection to resolution
* 954
  + No objection to resolution
* 11 (in r1, typo in CID # in r0)
  + No objection to resolution
* Upload r1 to server

## 10/1220r17

* 426
  + Modified resolution such that PBSS is a service
  + No objection to resolution
* 491
  + No objection to resolution
* 1031
  + No objection to resolution
* 1032, 264
  + No objection to resolution
* 267
  + No objection to resolution
* 269
  + No objection to resolution
* 270
  + No objection to resolution
* 271
  + No objection to resolution
* 272
  + No objection to resolution
* 273
  + Modified resolution to refer to 271
  + No objection to resolution
* 274
  + No objection to resolution
* 277
  + No objection to resolution
* 278
  + No objection to resolution
* 279
  + No objection to resolution
* 280
  + No objection to resolution
* 119
  + No objection to resolution
* 184
  + No objection to resolution

# Minutes from February 10, 2011 Conference Call

## Agenda

* Vinko Erceg chair
* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* DTP, 11/0236r1, ChaoChun Wang
* Comment resolution, 10/1220r18, Carlos Cordeiro

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/0236r1

* 11/0219r0 addresses CID 1030 and 421
* CID 421 Reject
* CID 1030 Agree in principle.
  + Discussion regarding “should” or “shall” statement.
    - John Barr: if there is “should” why is specific time needed?
    - Carlos: time is needed to the transmitter state, regarding retransmission.
    - “Should” statement remains, with some text changes.
* Revision 2 of the document will be uploaded to the server.

## 10/1220r18

* CID 186 Agree in principle (see CID 189)
* CID 1034 Disagree
* CID 1035 Agree in Principle
* CID 188 Agree in Principle
* CID 525 Disagree
* CID 527 Disagree
* CID 526 Disagree
* CID 192 Agree in Principle
* CID 196 Disagree
* CID 1036 Agree in Principle
* CID 69 Disagree
* CID 203 Agree, modified resolution
* CID 240 Agree in principle
* CID 1061 Agree in principle
* CID 301 Agree
* CID 380 Agree in Principle
* CID 150 Disagree
* CID 395 Agree in Principle
* CID 388 Agree
* CID 389 Agree in Principle
* CID 392 Agree in Principle
* CID 400 Disagree
* CID 397 Disagree
* CID 1069 Disagree
* CID 1072 Agree

## Remaining CIDS

All CIDs but 6 are now addressed. Sai has a submission on one of them. 3 CIDs are assigned to Brian and 2 CIDs to James. All resolutions will be likely resolved by the Feb24 conference call.

Conference call adjourned at 8:50am PST.

# Minutes from February 17, 2011 Conference Call

## Agenda

* Vinko Erceg chair
* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* 802.15 PSC PAR & 5C’s review, 15-10-0635r5 & 15-10-0636r5
* Comment resolution, 11/0250r0, Brian Hart
* Handover and SFS, 11/246r0, James Yee
* Comment resolution, 10/1220r19, Carlos Cordeiro

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 802.15 PSC PAR & 5C’s review

* PAR comments
  + Section 5.2, first sentence
    - 1) If the target data rate is less than 50Mbps, why not amend the 802.15.3 standard (or even upgrade the 802.15.4 standard) for this purpose?
    - 2) All the ongoing activities in 60GHz in the IEEE 802 as well as throughout the industry have focused on multi-Gbps wireless communication. As an example, this is the case with both 802.15.3c and 802.11ad. The reason for this is that the 60GHz band is ideally suited for such high performing networks due to the large swath of available spectrum worldwide. Therefore, creating a new standard in this band to provide data rates < 50Mbps would severely compromise QoS sensitive applications such as wireless display, wireless docking, sync&go, etc., that depend on the multi-Gbps speeds of 60GHz. We suggest to explicity exclude 60 GHz from the PAR, so as to not polute the spectrum with low data rate applications that are well suited by other bands.
    - 3) Even though 802.15.3c and 802.11ad are being developed in different WGs, a significant amount of work has been jontly done by both groups to ensure adequate coexistence between these technologies. For example, they use the same channelization, sampling frequency, similar preamble structure, and so on. If any new activity is to be formed under IEEE 802 in the 60GHz band, it must strongly consider adopting the same common parameters as to ensure proper coexistence between all the technologies in this band.
    - 4) The wording seems to imply that the scope covers ALL unlicensed bands. As one example, how does the task group plan on addressing 5 GHz radar detection with the type of applications it highlighted. Other examples include the TVWS bands, etc.
    - 5) Need to better explain how this is any different from 802.11and/or BT in 2.4 GHz, and why we need yet another interfering system in an already crowded band.
  + 5.2, second sentence
    - 1) Apparently, all the features mentioned above can be provided by existing specifications such as 802.15.3c and 802.11ad in the 60GHz band, and 802.15.3 and 802.11 in the 2.4GHz band. It is not clear why a new task group is needed to address these commonly found features.]
    - 2) Coverage extension seems counter to “personal space” and would allow the task group to create a specification that covers any range, further overlapping with existing standards.
    - 3) It is not clear what “group communication” means, please explain.
  + 5.4
    - 1. This is no different than a piconet in 802.15 terms and a PBSS in 802.11 terms. This can already be addressed by existing technologies.
    - 2. It is not clear what “automatically configured” has to do with a MAC/PHY Specification. Automatically configuring multiple devices surrounding a person would be handled by a higher layer in the protocol stack.
  + 5.5, first two sentences
    - 1. This is not a convincing argument. The market and wireless industry today has already fully embraced the multi-radio era. Laptops, netbooks, smartphones, desktops, tablets, TVs, etc., they all come with a plethora of wireless technologies ranging from Bluetooth, 802.11, 2G, 3G, HSPA, 4G, etc. There is no evidence whatsoever that there is a need in the market to “to have a new solution with one technology” for the applications listed in this PAR. In fact, the PAR seems to be largely trying to “reinvent the wheel”, so to speak.]
    - 2. The best case scenario of this activity would be an extra radio appended to existing combo chips
  + 5.6
    - These stakeholders are exactly the same that are well served by existing 802.11 and 802.15 technologies.
  + 7.1
    - Yes, all of 802.11 and 802.15 already address these type of applications.
  + 8.1a
    - 1. So far, this is no different than a piconet in 802.15 terms and a PBSS in 802.11 terms.
    - 2. Please explain what is meant by virtual space
  + 8.1b
    - All these applications can be readily addressed by existing technologies such as 802.15.4, 802.15.3, 802.11, etc. Also, given their low throughput (< 50Mbps), there is no reasoning provided as to why they need to be done over the 60GHz band.
* 5C comments
  + Section 1a, first three sentences
    - This PAR is limited to 50Mbps, how does this address the higher speed that is discussed
  + 1a, fourth and fifth sentences
    - Seems to imply that the standard will address network connectivity (e.g. cellular, wifi), which is well beyond the apparent scope of personal space.
  + 1a, sixth sentence
    - This is not true. As described, 802.11 and 802.15 address these applications.
  + 1a, last sentence
    - All these features are addressed by existing standards. The issue of whether it needs to be addressed by a single standard is debatable since combo chips are very successful in the market place.
  + 3a
    - This is not a convincing argument. The market and wireless industry today has already fully embraced the multi-radio era. Laptops, netbooks, smartphones, desktops, tablets, TVs, etc., they all come with a plethora of wireless technologies ranging from Bluetooth, 802.11, 2G, 3G, HSPA, 4G, etc. There is no evidence whatsoever that there is a need in the market to “to have a new solution with one technology” for the applications listed in this PAR. In fact, the PAR seems to be largely trying to “reinvent the wheel”, so to speak.
  + 4a
    - No references are provided of a demonstration of this technology, however we believe any such simulations, test results, and demonstrations would be redundant because we believe BT and Wi-Fi already provide real world examples of feasibility.

## 11/0250r0

* CID 413
  + No objection to resolution
* 416
  + No objection to resolution
* 238
  + No objection to resolution

## 11/0246r0

* CID 1066
  + No objection to resolution
* 342
  + Discussion about beacon and information in handover IE
  + Proposal to add BSSID of previous PCP to handover IE
  + Comment that Dot11MaxLostBeacons of 16 too large, change to 8
  + Will update resolution and present next call

## 10/1220r19

* All editorial comments resolved
* People should review resolutions

# Minutes from February 24, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* GCMP, 11/0258r1, Sai Nandagopalan
* Handover and SFS, 11/246r1, James Yee

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/0258r1

* addresses CID 1163
* no objection to resolution

## 11/0246r1

* Continuation of discussion of CID 342
* Couple corrections to resolution text, r2 will be uploaded to server
* no objection to resolution

-Completed comment resolution

-Cancel next two calls

-1220r20 will be ready tomorrow

-Speculative edit with have all resolutions, ready next week

-Plan to run motions for CIDs, CA doc, and recirculation ballot on Monday in Singapore

-Joint meeting with CWPAN confirmed, email will be sent with details (March 19, 9am – 1:30pm at IIR facility)

# Minutes from March 31, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* Fast Session Transfer Session Setup in TVWS, 11/0090r1, Ganesh Venkatesan

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/0091r1

* Discussion
  + Questions about roles of Mode 1/2 devices and DFS owner when switching to 5 GHz
  + What happens when both devices are Mode 1?
    - Cannot operate in TVWS
  + How to achieve “peer devices know of each other capabilities” in TDLS?
    - Need to augment TDLS capability exchange
  + Can be used to switch from 11n/2.4ghz to 11ac/5ghz?
    - Yes. IE of new bamd/channel included to FST exchange
  + Need to coordinate with 11af to make sure regulations are addressed
  + TDLS needs to be investigated more
  + Follow up with Normative text in comment resolution

# Minutes from April 7, 2011 Conference Call

Meeting called to order at 8:04PM Eastern. James Yee (MediaTek) is chair in Eldad’s (Intel) absence.

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* Carlos (Intel) - LB174 results - <https://mentor.ieee.org/802.11/dcn/11/11-11-0508-00-00ad-lb174-comment-database.xlsx> (5min)
* Chris Hansen (Broadcom) - 11-11-0507-00-00ad-cid-2039-mac-phy-bug-fixes (15min?)
* James Wang (MediaTek) - 11-11-0509-01-00ad-lb174-last-rssi-range-cid2289 (15min?)
* Sai (Tensorcom) –11-11-0512-00-00ad-resolution-to-comment-in-cid-2039 (5min?)
* Carlos - LB174 Comment Resolutions

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## LB174 results: 11/0508r0

James Yee summarizes the results of LB174:

* Recirc LB174 ended April 5, 2011
* 175 affirmative votes, 25 negative votes, 25 abstain votes: 80.9% valid returns.
* 87.5% affirmative meets the 75% affirmation requirement, so motion passes.
* A total of 330 comments were received.
* Congratulations to everyone.

Carlos summarizes

* 198 technical comments, ~130 editorial comments
* Explain comment groups
  + 20 PHY comments but 9 duplicates
  + 5 BF comments
  + ~170 MAC comments
* Some assignments have been made to give ownership to comments but anyone is open to volunteer and resolve comments.
* Any questions? No.

## 11/0507r0

Chris (Broadcom):

* Presents resolution to CID#2039 in 11/0507
* There were no questions.
* There were no objections to the proposed resolutions.

## 11/0509r1

James Wang:

* Proposes resolution to CID#2289, 2301, 2294, 2302, 2290, 2295, 2303, 2296, 2291, 2297, 2304, 2292.
* The resolution status of these comments in 11/0508 is Accepted.
* James asked if 10 comments are resolved by this presentation. Carlos said there should be 12 as described in r1 of the document.
* There were no additional questions.
* There were no objections to the proposed resolutions.

## 11/0512r0

Sai:

* Presents partial resolution to CID#2039 to address 802.11ad PHY BRP padding for Low Power SC PHY.
* There were no questions.
* There were no objections to the proposed resolutions.

## LB174 Comment Resolutions

Carlos presents some additional proposed resolutions to comments.

* CID#2061 (BF) : proposes to Agree in Principle
* CID#2305 (empty comment): Proposes to Reject.
* CID#2040 (General): proposes to Agree with rebasing to TGmb D8.0
* CID#2011 (General): proposes to Agree
* CID#2010 (General): proposes to Agree
* CID#2005 (General): proposes to Agree
* CID#2120 (General): proposes to Agree
* CID#2104 (General): proposes to Agree
* CID#2097, 2119, 2116, 2050 (General): proposes to Agree, see CID2040
* CID#2263 (MAC-Channel Access): proposes to Agree
* CID#2264 (MAC-Channel Access): proposes to Agree
* CID#2087 (MAC-Channel Access): proposes to Disagree
* CID#2051 (MAC-Clause 5): proposes to Agree in Principle
* CID#2000 (MAC-Clause 5): proposes to Agree in Principle, see CID#2051
* CID#2181 (MAC-Clause 5): proposes to Disagree
* CID#2128 (MAC-Clause 5): proposes to Disagree, duplicate of CID#2181
* CID#2252 (MAC-Clause 5): proposes to Agree
* CID#2131 (MAC-Clause 5): proposes to Agree in Principle
* CID#2184 (MAC-Clause 5): proposes to Agree in Principle, duplicate of CID#2131
* CID#2130 (MAC-Clause 5): proposes to Disagree
* CID#2129 (MAC-Clause 5): proposes to Disagree, duplicate of CID#2130
* CID#2183 (MAC-Clause 5): proposes to Disagree, duplicate of CID#2130
* CID#2182 (MAC-Clause 5): proposes to Disagree

There were no objections to the proposed resolutions to the above CIDs.

* CID#2298 (MAC-Channel Access) on Guard Time: proposes to Disagree, but changed to Open after discussion.
  + Discussion between: James Wang (JW), Carlos, Sai, Chris.
  + From the perspective of the PCP/AP the value of the DriftInterval needs clarification.
  + Assigned to JW. Also changed proposed resolution to duplicate CID 2293.

# Minutes from April 14, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* 11/0533r0 & 11/0534, Brian Hart
* 11/0529r0, James Wang
* 11/0508r1, Carlos Cordeiro

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/0533r0 & 11/0534r0

* CID 2076
* Centralized clustering
* No questions/comments
* No objection to resolution

## 11/0529r0

* CID 2293, 2298
* No questions/comments
* No objection to resolution

## 11/0508r1

* CID 2248
  + No objection to resolution
* 2001
  + Changed to “will consider”
  + No objection to resolution
* 2101
  + No objection to resolution
* 2102
  + No objection to resolution
* 2099
  + No objection to resolution
* 2060
  + No objection to resolution
* 2318
  + No objection to resolution
* 2306
  + No objection to resolution
* 2310
  + No objection to resolution
* 2133
  + No objection to resolution
* 2013
  + No objection to resolution
* 2186
  + No objection to resolution
* 2017
  + No objection to resolution
* 2100
  + No objection to resolution
* 2253
  + No objection to resolution
* 2187
  + No objection to resolution
* 2134
  + No objection to resolution

# Minutes from April 21, 2011 Conference Call

## Agenda

* Meeting chaired by Vinko Erceg
* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* 11/0508r2, Carlos Cordeiro

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/0508r2

* CID 2241   Accept - No objections
* CID 2077   Disagree – No objections
* CID 2140   Agree in Principle – No objections
* CID 2255   Agree in Principle – No objections
* CID 2196   Agree in Principle – No objections
  + Brian: 2.4 GHz and 5 GHz devices have different MAC addresses, same would be for 60 GHz.
  + Carlos: I suspect that there may be some mechanism that would hide this.
  + Brian: Ok, I am ok with your proposal.
* CID 2143   Duplicate of CID 2196
* CID 2094   Agree – No objections
  + Sai: just to confirm that WPS is not used in IEEE.
  + Carlos: Correct
* CID 2148   Disagree – No objections
* CID 2147   Agree in principle – No objections
  + Brian: better to skip coma, and instead of “this” better to say “Data Field”
  + Carlos: ok, accepted.
* CID 2201   Disagree – No objections
* CID 2200   Duplicate of 2147
* CID 2149   Agree in Principle – No objections
* CID 2202   Duplicate of 2149
* CID 2258   Agree – No objections
* CID 2150   Agree – No objections
* CID 2203   Duplicate of 2150
* CID 2208   Agree – No objections
* CID 2155   Duplicate of 2208
* CID 2156   Agree in Principle – No objections
* CID 2209   Duplicate of 2156
* **CID 2014   Not resolved**
  + Brian: still reading this section, quite complicated. My suggestion would be to include IEs, to make it more accessible where rules are.
  + Carlos: include all of them in our table? Maybe 50? Maybe add more relevant ones.
  + Sai: I am open to status quo, but I am also open to what Brian says.
  + Carlos: I am going to leave this CID open. Identify the most important IEs to be includes in the frames.
  + Sai: I am open to beacons.
* CID 2048   Agree – No objections
* CID 2259   Agree in Principle – No objections
* CID 2064   Agree in Principle – No objections
* CID 2098   Disagree – No objections
* CID 2270   Agree – No objections
* CID 2295   Agree – No objections
* CID 2055   Agree in Principle – No objections
* CID 2056   Agree – No objections
* CID 2042   Disagree – No objections
* CID 2043   Agree – No objections
* CID 2044   Agree – No objections
* CID 2049   Disagree – No objections
* CID 2045   Agree – No objections
* CID 2046   Agree – No objections
* CID 2019   Agree in Principle – No objections
* CID 2078   Disagree – No objections
* CID 2021   Disagree – No objections
* CID 2111   Agree – No objections
* CID 2020   Agree in Principle – No objections
* CID 2300   Agree in principle – No objections
  + Lots of discussion, may need some clarification. Include a reference to Clause 9.25.1.1.
* Conference call adjourned at 21:57pm EDT.

# Minutes from April 28, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* 11/0592r0 PHY, Assaf Kasher
* 11/0580r0 QAB, Zhou Lan
* 11/0594 Relay, Yongsun Kim
* 11/0584r0 Security, Yong Liu
* 11/0508r3, Carlos Cordeiro

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/0592r0

* CID 2088
  + Modify discussion
  + No objection to resolution
* 2083
  + Withdrawn by commenter
* 2084
  + No objection to resolution
* 2080
  + No objection to resolution
* 2081
  + No objection to resolution
* 2085
  + Discussion on what happens with SIFS if implementation is split between MAC and PHY.
  + Look at 11n text – states implementation dependent for PLCP Delay
  + No objection to resolution
* 2231
  + No objection to resolution
* 2082
  + No objection to resolution
* 2089
  + Equation used to compute numbers: Preamble length + header length + 1usec
  + No objection to resolution

## 11/0580r0

* CID 2229
  + Add QAB (Quieting adjacent BSS) to clause 10
  + Clause 10 is old clause 10
  + Clause 8 is old clause 7
  + No objection to resolution

## 11/0594r0

* CIDs related to Relay operation
* CID 2086
  + No objection to resolution
* 2121
  + No objection to resolution
* 2223
  + No objection to resolution

## 11/0584r0

* Security related CIDs
* 2106
  + No objection to resolution
* 2069
  + No objection to resolution
* 2070
  + No objection to resolution
* 2071
  + No objection to resolution
* 2072
  + No objection to resolution
* 2105
  + No objection to resolution
* 2073
  + No objection to resolution
* 2075
  + No objection to resolution
* 2093
  + No objection to resolution

## 11/0508r3

* 2014
  + No objection to resolution
* 2096
  + No objection to resolution
* 2165
  + No objection to resolution
* 2107
  + No objection to resolution
* 2108
  + No objection to resolution
* 2054
  + Modify to add deauthentication
  + No objection to resolution
* 2246
  + Discussion on TID
  + No objection to resolution
* 2074
  + No objection to resolution
* 2166
  + No objection to resolution
* 2265
  + No objection to resolution

# Minutes from May 5, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* 11/0522r0 Clause 11.3, Adrian Stephens
* 11/0518r1 comment resolution, Solomon Trainin
* 11/0660r0 comment resolution, Solomon Trainin
* 11/0090r2, 11/0651r0 FST, Ganesh

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/0522r0

* CID 2218,  2115,  2117,  2244,  2057
* No comments
* No objections

## 11/0518r1

* CID 2284, 2285, 2286, 2287, 2067
* CID 2288 added in R2
* No comments
* No objections

## 11/0660r0

* CID 2191,  2103,  2138,  2052,  2139,  2142,  2193,  2195,  2192,  2053,  2230
* No comments
* No objections

## 11/0090r2, 11/0651r0

* CID 2079 (will be added to 651r1)
* 90r2 will be updated, on slide 6 no new status code needed in last bullet
* No comments
* No objections

# Minutes from June 9, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* Eldad chair for first half, Chris chair for second half of call
* Review LB177
  + Carlos review comments
* 11/859, 860, 853, Payam Torab, CID 3037
* 11/857,858, Liwen Chu, FST
* 11/856, Erik Lindskog, TXTIME

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## LB177 Review

* Final vote tally: 191 yes, 13 no
* With 93.6% approval, key hurdle to get to sponsor ballot is to get a specification that does not change.
* 133 technical comments, almost no PHY comments
* 80 editorial comments

## 11/0853r0

* Issues with join and service discovery
* CID 3037
* No comments
* No objections

## 11/0859r1

* More data bit
* CID 3037
* Discussion
  + Carlos – question on last sentence in the document – no “shall” is used.
  + Payam –I agree; stronger language is needed. I’ll change to “shall” in the r1 that I upload.
* No other comments or objections

## 11/0860r1

* SIFS response bit
* CID 3037
* No comments
* No objections

## 11/0857r0 & 11/0858r1

* FST Issues
* CID 3026
* Liwen Chu reviewed powerpoint presentation 11-857.
* Liwen Chu reviewed text changes in 11-858r1.
* No comments and no objections reported for 11-858r1.

## 11/856

* TXTIME
* There were no comments on the presentation. Since there is another presentation on this same topic, we will wait for that presentation on a future teleconference and then decide as a group on the appropriate changes to the draft.

Meeting adjourned at 11:32am EDT.

# Minutes from June 16, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* James Wang , 11/871
* James Wang, Mediatek, 11/870
* Brian Hart, Cisco 11/861r2
* Carlos Cordeiro, Intel, 11/866 and 11/850

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/871

* Power Saving in Beacon Beamfoming
* CID 3205, 3208
* No questions or comments.
* No objections to the changes

## 11/870

* BF Clarifications
* CID 3037
* No questions or comments.
* No objections to the changes

## 11/861r2

* CID 3027, 3028, 3034, 3153, 3154, 3156 and 3199
* No questions or comments.
* No objections to the changes

## 11/866

* MLME Interface for FST and Further Clarification of FST
* CID 3151, 3037
* No questions or comments.
* No objections to the changes

## 11/850

* comment database
* CIDs 3151, 3025, 3037, 3022, 3038, 3134, 3132, 3066, 3068, 3070, 3077, 3078, 3081, 3079, 3080, 3190, 3156, 3154, 3153, 3083, 3082, 3159, 3086, 3087, 3089, 3090, 3162, 3091, 3199, 3028, 3027, 3034, 3208, 3205
* No questions or comments
* No objections to the changes

# Minutes from June 23, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* 802.11-11/892r0 D3.0 PHY Clarifications by Assaf Kasher, Intel
* 802.11-11/893r0 D3.0 BF Clarifications by Assaf Kasher, Intel
* Carlos Cordeiro, Intel, 11/850

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/892r0

* PHY Clarifications
* CID 3037, 3164
* No questions on the document.
* No objections to bringing it to motion at the July Face to Face Meeting

## 11/893r0

* BF Clarifications
* CID 3037
* Editor to add a diagram to the draft for section 8.4a.3
* No questions on the document.
* No objections to bringing it to motion at the July Face to Face Meeting

## 11/850

* comment database
* CIDs 3037, 3001, 3000, 3002, 3003, 3005, 3004, 3006, 3007, 3051, 3167, 3166, 3010, 3011, 3029, 3030, 3141, 3012, 3013, 3018, 3032, 3135, 3133, 3184, 3106, 3183, 3180, 3182, 3178, 3186, 3196, 3107, 3198, 3187, 3111, 3157, 3112, 3113, 3115, 3120, 3119, 3122, 3206, 3121, 3209, 3210, 3207, 3147, 3123, 3124, 3125, 3126, 3127, 3020, 3128, 3164
* 3031
  + Editor to discuss with author since comment is a duplicate from previous letter ballot
  + *Email response from commenter after call, ok to reject*
* No questions or comments
* No objections to the changes

Editor reports 99 remaining (undiscussed) CIDs at the beginning of this call. 57 CIDs were discussed today. So, 42 remain. 3 conference calls remain before the next face to face meeting. Chair believes we are on track to finish comment resolution and do another recirculation ballot in July.

# Minutes from June 30, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* 11/0901r0, Gaius Wee
* 11/0911r0, Spectral Mask, Chris Hansen
* 11/913r0, Yongsun Kim
* 11/912r0, Payam Torab
* Carlos Cordeiro, Intel, 11/850r3

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/0901r0

* Duration Size
* CID 3037
* No questions on the document.
* No objections to bringing it to motion at the July Face to Face Meeting

## 11/0911r0

* Spectral mask definition
* CID 3037
* Questions:
  + Will it be a problem if DC is ignored if high?
    - There is already LO leakage spec to cover
  + What’s the difference between 11ad and other 802.11 PHYs that requires
    - Ratio between signal bandwidth to measurement bandwidth is much higher than 11a
* No objections to bringing it to motion at the July Face to Face Meeting

## 11/0913r0

* relay operation
* CID 3046, 3047, 3048, 3049, 3050, and 3054
* No questions on the document.
* No objections to bringing it to motion at the July Face to Face Meeting

## 11/0912r0

* allocation and flow management
* CID 3037
* No questions
* Will ask again for questions at face to face to give more time for review

## 11/850

* comment database
* CIDs 3211, 3212, 3014, 3129, 3131, 3130, 3053, 3016, 3033, 3035, 3036, 3055, 3204, 3024, 3056, 3177, 3170, 3176, 3057, 3058, 3061, 3059, 3062, 3063, 3043,
* No questions or comments
* No objections to the changes

# Minutes from July 7, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* 11/899r0, Solomon Trainin, broadcast grant frames,etc.
* 11/902r0, Solomon Trainin, response offset and poll frame transmission, etc.
* 11/925r0, Solomon Trainin, Response to document 11/0848
* 11/910r1, Solomon Trainin, multiple mac address resolution
* Carlos Cordeiro, Intel, 11/850r4

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## 11/0899r0

* Grant frame, BI, CW, BA clarification
* CID 3037
* Fixed typo, upload 899r1
* No objections to bringing it to motion at the July Face to Face Meeting

## 11/0902r0

* response offset, awake duration, RX start time, poll frame, timestamp clarification
* CIDs 3037, 3145
* No objections to bringing it to motion at the July Face to Face Meeting

## 11/0925r0 & 11/910r1

* multiple MAC addresses and MA-STA
* 11/0910r1 provides formal resolution to CIDS and editor instructions for CIDs 3052, 3161, 3191, 3040, 3088,
* 11/0925r0 contains response to 11/0848
* will contact Mark Hamilton and give him opportunity to present his document 11/848 in San Francisco if he so chooses

## 11/850r4

* comment database
* CIDs 3149, 3148, 3150, 3042, 3041
* No questions or comments
* No objections to the changes

Done with CIDs, cancel call next week.

# Minutes from August 11, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* LB 183 results
* Carlos Cordeiro, Intel, 11/1113r0

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## Letter Ballot 183 Results

94.7% yes

5.3% no

95 tech comments

70 editorial comments

If any tech comments result in changes, then we will be in “option 2” planning for conditional approval in Nov.

Distribution of comments:

~60 comments from one commenter

~65 comments from another commenter

Lots of comments in introductory Clause 4, which is not normative, its descriptive text

Grouping (rough numbers)

Definitions: 9 comments

General: 15

MAC channel access: 9

MAC clustering: 3

MAC frame formats: 19

MAC FST: 12

MAC MA: 5

Security: 3

PHY: 4

BF: 8

Assigned some comments to volunteers

New resolution key for comments:

A: Accept

V: Revise

J: Reject

## 11/1113r0

* CID 4108, 4024, 4110, 4109, 4115, 4114, 4026, 4029, 4031, 4037, 4035, 4043, 4042, 4040
* Minor change to resolutions of 4024, 4110, 4114, 4026, 4037, 4043, 4042, 4040
* No questions or comments to other comments
* No objections to the resolutions

# Minutes from August 18, 2011 Conference Call

## Agenda

* Check to see if anyone is not familiar with the IEEE patent policy <http://standards.ieee.org/board/pat/pat-slideset.pdf>
* Attendance by email
* Carlos Cordeiro, Intel, 11/1113r1

## Patent Policy

No one was not familiar with the IEEE patent policy.

No essential patent disclosure

## Scheduling of presentations

Solomon (MAC): Aug 25

Brian (Clustering) & Chris (Beamforming): Sept 1

Assaf (PHY): Sept 8

## 11/1113r1

* CID 4084 (Carlos & Liwen)
  + No objections to the resolution
* CID 4025, 4113, 4036, 4015, 4039, 4041, 4047, 4046, 4044, 4118, 4119, 4049, 4120, 4122, 4055, 4057, 4058, 4004, 4005, 4129, 4130, 4132, 4131, 4063, 4061, 4062, 4064, 4065, 4066, 4145, 4155, 4156, 4008, 4069, 4152, 4154, 4153, 4072, 4074, 4075, 4076, 4077, 4078, 4150, 4079, 4080, 4081, 4082, 4084, 4159, 4083
  + Minor change to resolutions of 4041, 4122, 4055, 4132, 4131, 4063, 4008
  + Changed 4145, 4074 to revised
  + No questions or comments to other comments
  + No objections to the resolutions

# Attendance

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **Participant** | **Jan 6** | **Jan 13** | **Jan 27** | **Feb 3** | **Feb 10** | **Feb 17** | **Feb 24** | **Mar 31** | **Apr 7** | **Apr 14** | **Apr 21** | **Apr 28** | **May 5** | **June 9** | **June 16** | **June 23** | **June 30** |
| John Barr (NICT) |  | **x** | **X** | **x** | **x** |  | **x** |  |  |  |  | **x** |  |  |  |  |  |
| Ted Booth (Sony) | **x** |  | **X** | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| George Bumiller (RIM) |  | **x** |  | **x** |  |  | **x** | **x** |  | **x** |  | **x** | **x** | **x** |  |  | **x** |
| Kapseok Chang (ETRI) | **x** | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Liwen Chu (ST) |  |  |  |  |  |  |  | **x** |  |  |  |  |  | **x** |  |  |  |
| Carlos Cordeiro (Intel) | **x** | **x** | **X** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Vinko Erceg (Broadcom) |  |  |  |  | **x** |  |  |  |  |  | **x** |  |  |  |  |  |  |
| Sudheer Grandhi (InterDigital) | **x** | **x** | **X** | **x** | **x** |  | **x** | **x** | **x** |  |  |  |  |  |  |  |  |
| Mark Hamilton (Polycom) |  |  |  |  |  |  |  |  |  |  |  |  | **x** |  |  |  |  |
| Christopher Hansen (Broadcom) |  |  | **X** | **x** |  |  |  | **x** | **x** |  | **x** |  | **x** | **X** | **x** | **x** | **x** |
| Brian Hart (Cisco) |  |  | **X** |  |  | **x** |  | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |
| Assaf Kasher (Intel) |  |  |  |  |  |  | **x** |  |  |  |  | **x** | **x** |  |  | **x** |  |
| Yongsun Kim (ETRI) |  | **x** |  |  |  |  |  |  |  |  | **x** | **x** |  |  |  |  | **x** |
| Zhou Lan (NICT) |  |  |  |  |  |  |  |  |  |  |  | **x** |  |  |  |  |  |
| Hoosung Lee (ETRI) |  |  |  |  |  |  |  |  |  |  | **x** |  |  |  |  |  |  |
| Eric Lindskog (CSR) |  |  |  |  |  |  |  | **x** | **x** |  |  |  |  | **x** | **x** |  | **x** |
| Yong Liu (Marvell) |  |  |  |  |  |  |  |  |  |  |  | **x** |  |  |  |  |  |
| Brad Lynch (Peraso) |  |  |  |  |  |  |  | **x** |  |  |  |  |  |  |  |  |  |
| Jeff Marker () | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Murat Mese (Broadcom) |  |  |  |  |  |  |  |  |  |  | **x** |  |  |  |  |  |  |
| Sai Nandagopalan (Tensorcom) | **x** |  | **X** | **x** | **x** |  | **x** |  | **x** | **x** | **x** | **x** |  |  | **x** |  |  |
| Knut Odman (Broadcom) |  |  |  |  |  |  |  |  |  |  |  | **x** |  |  |  |  |  |
| Eldad Perahia (Intel) | **x** | **x** |  | **x** |  | **x** | **x** | **x** |  | **x** |  | **x** | **x** | **x** |  | **x** | **x** |
| Changwoo Pyo (NICT) |  | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Adrian Stephens (Intel) |  |  |  |  |  |  |  |  |  |  |  |  | **x** |  |  |  |  |
| Payam Torab (Broadcom) |  |  |  |  |  |  |  |  |  |  |  |  |  | **x** |  |  | **x** |
| Ichihiko Toyoda (NTT) | **x** | **x** | **X** | **x** |  | **x** |  |  |  |  |  |  |  |  |  |  |  |
| Solomon Trainin (Intel) |  |  |  |  |  |  |  |  |  |  |  |  | **x** |  |  |  |  |
| Ganesh Venkatesan (Intel) |  |  |  |  |  |  |  | **x** |  |  |  |  | **x** |  |  |  |  |
| Chao-Chun Wang (MediaTek) | **x** |  |  | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |  |  | **x** | **x** | **x** |  |
| Gaius Wee (Panasonic) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **x** |
| James Yee (Mediatek) |  | **x** |  |  | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |  |
| Chanho Yoon (ETRI) |  |  |  |  |  |  |  |  |  |  | **x** |  |  |  |  |  |  |
| James Wang (MediaTek) |  |  |  |  |  |  |  |  | **x** | **x** | **x** |  | **x** |  | **x** |  | **x** |

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| **Participant** | **July 7** | **Aug 11** | **Aug 18** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Liwen Chu (ST) |  |  | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Carlos Cordeiro (Intel) | **x** | **x** | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Christopher Hansen (Broadcom) | **x** | **x** | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Brian Hart (Cisco) | **x** |  | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Jerome Henry () | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Reza Hedayat (Cisco) |  | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Assaf Kasher (Intel) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Eric Lindskog (CSR) | **x** | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sai Nandagopalan (Tensorcom) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Eldad Perahia (Intel) | **x** | **x** | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Adrian Stephens (Intel) | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Solomon Trainin (Intel) | **x** | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Chao-Chun Wang (MediaTek) | **x** | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| James Wang (MediaTek) | **x** | **x** | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| James Yee (Mediatek) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Chanho Yoon (ETRI) |  |  | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |