IEEE P802.11
Wireless LANs

|  |
| --- |
| PDT MAC Coordinated Beamforming |
| Date: Dec. 3, 2024 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Jason Yuchen Guo | Huawei |  |  | guoyuchen@huawei.com |
| Alice Chen | Qualcomm |  |  | alicel@qti.qualcomm.com |
| Insik Jung | LG |  |  | insik0618.jung@LGE.COM |
| Pei Zhou | TCL |  |  | zhoupei36@GMAIL.COM |
| Arik Klein | Huawei |  |  | arik.klein@huawei.com |
| Leonardo Lanante | Ofinno |  |  | llanante@ofinno.com |
| Kaiying Lu | Mediatek |  |  | Kaiying.Lu@mediatek.com |
| Mahmoud Kamel | InterDigital |  |  | mahmoud.kamel@interdigital.com |
| Tianyu Wu | Apple |  |  | tianyu@apple.com |
| Fangxin Xu | Longsailing Semiconductor |  |  | fzxy002763@GMAIL.COM |
| Qinglai Liu | Panasonic |  |  | qinglai.liu@SG.PANASONIC.COM |
| Yaoshen Cui | TP-Link |  |  |  |
| Yusuke Tanaka | Sony |  |  | Yusuke.YT.Tanaka@sony.com |
| Genadiy Tsodik | Huawei |  |  | genadiy.tsodik@huawei.com |
| Qisheng Huang | ZTE |  |  | huang.qisheng@ZTE.COM.CN |
| Daniel Verenzuela | Sony |  |  | Daniel.Verenzuela@sony.com |
| Dana Ciochina | Sony |  |  | Dana.Ciochina@sony.com |
| Yongho Seok | Apple |  |  | y\_seok@apple.com |
| Sindhu Verma | Broadcom |  |  | sindhu.verma@broadcom.com |
| Okan Mutgan | Nokia |  |  | okan.mutgan@nokia.com |
| Kosuke Aio | Sony |  |  | Kosuke.Aio@sony.com |
| Anand Jee | Samsung |  |  | anandjee7@GMAIL.COM |
| Alfred Asterjadhi | Qualcomm |  |  | asterjadhi@GMAIL.COM |
| Abhishek Patil | Qualcomm |  |  | appatil@qti.qualcomm.com |
| Aiguo Yan | Samsung |  |  | aiguo.yan@samsung.com |
| Sherief Helwa | Qualcomm |  |  | shelwa@qti.qualcomm.com |
| You-Wei Chen | Mediatek |  |  | You-Wei.Chen@mediatek.com |
| Wei Dong | OPPO |  |  |  |
| Hui Che | Ruijie |  |  | chehui@RUIJIE.COM.CN |
| Juan Fang | Intel |  |  | juan.fang@intel.com |
| Lyutianyang Zhang | Huawei |  |  | zhanglyutianyang@huawei.com |
| Yanjun Sun | Apple |  |  | yanjun.sun@apple.com |
| Zigui Yang | Samsung |  |  |  |
| Jiayi Zhang | Ofinno |  |  | jzhang@OFINNO.COM |
| Dibakar Das | Intel |  |  | dibakar.das@intel.com |
| Rubayet Shafin | Samsung |  |  | r.shafin@SAMSUNG.COM |
| Vishnu Ratnam | Samsung |  |  | vishnu.r@samsung.com |
| Lei Zhou | H3C |  |  | zhou.leiH@H3C.COM |
| Gaurang Naik | Qualcomm |  |  | gnaik@qti.qualcomm.com |
| Peshal Nayak | Samsung |  |  | p.nayak@samsung.com |
| Eunsung Jeon | Samsung |  |  | eunsung.jeon@samsung.com |
| Sigurd Schelstraete | Maxlinear |  |  | sschelstraete@maxlinear.com |
| Mahmoud Hasabelnaby | Huawei |  |  | mahmoud.hasabelnaby@huawei.com |
| Youhan Kim | Qualcomm |  |  | youhank@qti.qualcomm.com |
| George Cherian | Qualcomm |  |  | gcherian@qti.qualcomm.com |
| Yanchun Li | Huawei |  |  | liyanchun@huawei.com |
| Ron Porat | Broadcom |  |  | ron.porat@broadcom.com |
| Shimi Shilo | Huawei |  |  | Shimi.Shilo@huawei.com |
| Sameer Vermani | Qualcomm |  |  | svverman@qti.qualcomm.com |
| Shengquan Hu | Mediatek |  |  | Shengquan.hu@mediatek.com |
| Ross Jian Yu | Huawei |  |  | ross.yujian@huawei.com |
| Insun Jang | LG |  |  | insun.jang@LGE.COM |
| Rui Yang | InterDigital |  |  | Rui.Yang@InterDigital.com |
| Liuming Lu | OPPO |  |  | luliuming@oppo.com |
| Ying Wang | InterDigital |  |  | Ying.Wang@interdigital.com |
| Aniruddh Kabbinale | Samsung |  |  | aniruddh.kabbinale@IEEE.ORG |
| Yeon-Geun Lim | Newracom |  |  | chaind3@gmail.com |
| Mario Costa | Nokia |  |  | mario.costa@nokia.com |
| Juhyung Lee | Nokia |  |  | juhyung.lee@nokia.com |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

 Abstract

This document contains Proposed Draft Text (PDT) for the MAC portion of the coordinated beamforming feature of the TGbn (UHR, Ultra High Reliability) amendment to the 802.11 standard.

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: add more co-authors; text change on the definition. Change subclause number
* Rev 2: text change on the definition
* Rev 3: editorial changes
* Rev 4: corrected typo
* Rev 5: update the text to clarify that the essential for CBF is to use the CSI of the channel between the AP and the STAs associated with the other AP, we don’t force the AP to use the CSI of the channel between the AP and its own associated STAs
* Rev 6: modify the definition based on the comments during the meeting
* Rev 7: further polish the text of the definition
* Rev 8: add “recipient” before “STA(s) in the OBSS” in the definition
* **Introduction**

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGbn Draft. The abstract, revision information, introduction, explanation of the proposed changes and references sections are not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbn Draft (i.e., they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

**Explanation of the proposed changes:**

The proposed changes to the 802.11 TGbn draft within this document are based on the following motions adopted by the TGbn task group:

**Relevant passed motions:**

[Motion #29]

**TGbn defines multi-AP Coordinated Beamforming (Co-BF).**

 [Motion #99]

**The Coordinated beamforming (Co-BF) transmission phase in 802.11bn shall be limited to 2 APs.**

[Motion #114]

**In a Co-BF transmission, the maximum number of spatial streams given to one user will be 2.**

# Text to be adopted begins here:

**3.2 Definitions specific to IEEE Std 802.11 [M#29]**

**Coordinated beamforming:** [Co-BF] A multi-AP technique where multiple APs coordinate to acquire CSI from OBSS STA(s) and apply beamforming vectors to perform concurrent transmissions to each AP’s associated STA(s) while minimizing interference to the recipient STA(s) in the OBSS(s).

**37.7.2 Coordinated beamforming**

**37.7.2.1 General**

**[M#29]**The objective of coordinated beamforming (Co-BF) is to allow more efficient medium usage by enabling concurrent transmissions of two APs with multiple antennas to each AP’s associated STAs while minimizing interference to OBSS STAs by using the CSI of the channels between each AP and the recipient STAs of the other AP of the Co-BF transmission. **[M#99]**The number of participating APs in a Co-BF transmission shall be 2. **[M#114]**The maximum number of spatial streams for each recipient STA of the Co-BF transmission shall be 2. The sounding procedure needed for obtaining the CSI for performing the Co-BF transmission is described in 37.6 (UHR sounding operation).