IEEE P802.11
Wireless LANs

|  |
| --- |
| IEEE 802.11bf – Teleconference Minutes July-September 2021  |
| Date: 2021-08-24 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Leif Wilhelmsson | Ericsson AB | Mobilvägen 1, 22632 Lund, Sweden | +46-706-216956 | leif.r.wilhelmsson@ericsson.com |

Abstract

This document contains minutes for the TG 802.11bf teleconferences in July-September 2021.

Rev 0: Minutes for TG 802.11bf teleconference on the 27th of July.

Rev 1: Minutes for TG 802.11bf teleconference on the 17th of August added.

Rev 2: Minutes for TG 802.11bf teleconference on the 24th of August added.

**Tuesday, July 27, 2021, 10:00-12:00 am (ET)**

**Meeting Agenda:**

The meeting agenda is shown below, and published in the agenda document:

<https://mentor.ieee.org/802.11/dcn/21/11-21-1202-01-00bf-tgbf-meeting-agenda-2021-07-09.pptx>

1. Call the meeting to order
2. Patent policy and logistics
3. TGbf Timeline
4. Call for contribution
5. Teleconference Times
6. Presentation of submissions
7. Any other business
8. Adjourn
9. The vice chair, Assaf Kasher, calls the meeting to order at 10:06am (about 55 persons are on the call after a few minutes of the meeting). The chair, Tony Han, has some issues to be on the call but will try to join as soon as possible.
10. The vice chair goes through “Meeting Protocol, Attendance, Voting & Documentation Status” (slide 4), “Participants have a duty to inform the IEEE” (slide 6), and “Ways to inform IEEE” (slide 7).

The vice chair makes a Call for Potentially Essential Patents. No potentially essential patents reported, and no questions asked.

The chair goes through “Other Guideline for IEEE WG meetings” (slide 8), “Patent-related information” (slide 9), “ IEEE SA Copyright Policy” (slides 10 and 11), “Participant behavior in IEEE-SA activities is guided by the IEEE Codes of Ethics & Conduct” (slide 12), “Participants in the IEEE-SA “individual process” shall act independently of others, including employers”(slide 13), and “IEEE-SA standards activities shall allow the fair & equitable consideration of all viewpoints” (slide 14), and “Required notices” (slide 15).

The chair goes through the agenda (slide 16) and asks if there are any questions or comments on the agenda. Dongguk suggests changing the order of the presentations so that 1015 is presented before 990. There is no objection from the group to this change.

The chair asks if there is any objection to approve the modified agenda. No objection from the group so the agenda is approved.

1. The Chair presents the TGbf timeline (slide 17).
2. The Chair presents slide 18, Call for contributions.
3. The Chair presents the teleconference times (slide 19).

The chair, Tony Han, announces that he now is on the call.

1. Presentations:

**11-21/0504r2, “Specification Framework for TGbf”, Claudio da Silva (Intel):** Claudio explains how the motions in document 1874r15 have been used to update the SFD and go through the document. Claudio reminds the group that D0.1 is targeted to be released in January 2022.

**11-21/1015r1, “Non-TB and TB measurement procedure
for WLAN sensing”, Dongguk Lim (LGE):**  The contribution has been presented earlier and based on some off-line discussions SP2 and SP3 have been updated.

After some discussions on the terminology used the straw polls, both SP2 and SP3 are slightly updated.

**Straw Poll 2:**

Do you agree to add the following into 11bf SFD?

* 11bf supports an NDPA/NDP-based measurement procedure in which:
	+ The measurement is initiated by an NDP Announcement frame.
	+ The transmitter shall transmit an NDP SIFS after the NDP Announcement frame.
	+ The detailed definition of the NDP Announcement frame is TBD.
	+ The process to validate the STA(s) participation is TBD

**Y/N/A:** 28/1/9

**Straw Poll 3:**

Do you agree to add the following into 11bf SFD?

* 11bf supports an Trigger/NDP-based measurement procedure in which:
	+ A Trigger frame is used to solicit the NDP transmission(s).
	+ The transmitter(s) shall transmit an NDP SIFS after the Trigger frame.
	+ The detailed definition of the Trigger frame is TBD.
	+ The process to validate the STA(s) participation is TBD.

**Y/N/A:** 29/0/7

**11-21/0990r2, “Discussion on sensing measurement flows”, Cheng Chen (Intel):** The contribution proposes a unified sensing measurement flow for AP initiated scenarios as well as proposals for non-AP initiated measurements.

**Straw Poll 1:**

Do you agree with the following?

* 11bf shall define a Trigger-based sensing measurement instance including the following:
	+ A polling process where an AP sends a Trigger frame to check the availability of STAs. If a STA is available, it responds with a CTS-to-self.
	+ An optional UL sounding where an AP sends a Trigger frame to solicit NDP transmission(s) from STA(s).
		- The UL sounding is present if at least one STA that is a sensing transmitter responds in the polling.
	+ An optional DL sounding where an AP sends NDPA frame followed by NDP to STA(s).
		- The DL sounding is present if at least one STA that is a sensing receiver responds in the polling.
	+ The order of the UL and DL sounding is TBD.
	+ The details of the format of the Trigger frame and the NDPA frame are TBD.

**Y/N/A:** 26/0/13

**11-21/1241r0, “Data Driving Hybrid Channel Model for WLAN Sensing”, Yi Lv (Huawei):** The benefits of hybrid channel modeling for sub-7 GHz are discussed in this contribution.

Q: The model assumes omni-directional antennas. How would you include antenna models?

A: This could be included as part of the channel as illustrated on page 9.

The chair asks about future plans related to this presentation. The presenter explains that the intention is to obtain feedback and comments on this presentation and based on this determine the next steps.

1. The Chair asks if there is any other business. No response from the group.
2. The meeting is adjourned without objection at 11:39 am (ET).

**List of Attendees:**

|  |  |  |  |
| --- | --- | --- | --- |
| Breakout | Timestamp | Name | Affiliation |
| TGbf | 7/27 | Aboulmagd, Osama | Huawei Technologies Co., Ltd |
| TGbf | 7/27 | Au, Oscar | Origin Wireless |
| TGbf | 7/27 | Aygul, Mehmet | VESTEL; IMU |
| TGbf | 7/27 | Beg, Chris | Cognitive Systems Corp. |
| TGbf | 7/27 | Bredewoud, Albert | Broadcom Corporation |
| TGbf | 7/27 | Carney, William | Sony Group Corporation |
| TGbf | 7/27 | Choi, Jinsoo | LG ELECTRONICS |
| TGbf | 7/27 | da Silva, Claudio | Intel Corporation |
| TGbf | 7/27 | Dong, Xiandong | Xiaomi Inc. |
| TGbf | 7/27 | Du, Rui | Huawei Technologies Co., Ltd |
| TGbf | 7/27 | feng, Shuling | MediaTek Inc. |
| TGbf | 7/27 | Hall, Robert | CONSULTANT |
| TGbf | 7/27 | HAN, Xiao | Huawei Technologies Co., Ltd |
| TGbf | 7/27 | Handte, Thomas | Sony Corporation |
| TGbf | 7/27 | Kamel, Mahmoud | InterDigital, Inc. |
| TGbf | 7/27 | Kim, Sang Gook | LG ELECTRONICS |
| TGbf | 7/27 | Lee, Hong Won | LG ELECTRONICS |
| TGbf | 7/27 | Lim, Dong Guk | LG ELECTRONICS |
| TGbf | 7/27 | Lumbatis, Kurt | CommScope, Inc. |
| TGbf | 7/27 | Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. |
| TGbf | 7/27 | Mirfakhraei, Khashayar | Zeku |
| TGbf | 7/27 | Ozbakis, Basak | Vestel Electronics Corp. |
| TGbf | 7/27 | Pushkarna, Rajat | Panasonic Asia Pacific Pte Ltd. |
| TGbf | 7/27 | Raissinia, Alireza | Qualcomm Incorporated |
| TGbf | 7/27 | Sahoo, Anirudha | National Institute of Standards and Technology |
| TGbf | 7/27 | Sand, Stephan | German Aerospace Center (DLR) |
| TGbf | 7/27 | Sarikaya, Behcet | IEEE Member / Self Employed |
| TGbf | 7/27 | Shellhammer, Stephen | Qualcomm Incorporated |
| TGbf | 7/27 | Sosack, Robert | Molex Incorporated |
| TGbf | 7/27 | SUH, JUNG HOON | Huawei Technologies Co., Ltd |
| TGbf | 7/27 | Sun, Bo | ZTE Corporation |
| TGbf | 7/27 | Trainin, Solomon | Qualcomm Incorporated |
| TGbf | 7/27 | Tsai, Tsung-Han | MediaTek Inc. |
| TGbf | 7/27 | Turkmen, Halise | IMU; Vestel |
| TGbf | 7/27 | Wang, Chao Chun | MediaTek Inc. |
| TGbf | 7/27 | Wang, Pu | Mitsubishi Electric Research Labs (MERL) |
| TGbf | 7/27 | Wei, Dong | NXP Semiconductors |
| TGbf | 7/27 | Xin, Yan | Huawei Technologies Co., Ltd |
| TGbf | 7/27 | Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) |
| TGbf | 7/27 | Zhang, Yuqiang | XGIMI Technology Co.Ltd |
| TGbf | 7/27 | Zhou, Pei | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |

**Tuesday, August 17, 2021, 10:00-12:00 am (ET)**

**Meeting Agenda:**

The meeting agenda is shown below, and published in the agenda document:

<https://mentor.ieee.org/802.11/dcn/21/11-21-1202-02-00bf-tgbf-meeting-agenda-2021-07-09.pptx>

1. Call the meeting to order
2. Patent policy and logistics
3. TGbf Timeline
4. Call for contribution
5. Teleconference Times
6. Presentation of submissions
7. Motion
8. Any other business
9. Adjourn
10. The chair, Tony Xiao Han, calls the meeting to order at 10:00am (about 40 persons are on the call after a few minutes of the meeting).
11. The chair goes through “Meeting Protocol, Attendance, Voting & Documentation Status” (slide 4), “Participants have a duty to inform the IEEE” (slide 6), and “Ways to inform IEEE” (slide 7).

The chair makes a Call for Potentially Essential Patents. No potentially essential patents reported, and no questions asked.

The chair goes through “Other Guideline for IEEE WG meetings” (slide 8), “Patent-related information” (slide 9), “ IEEE SA Copyright Policy” (slides 10 and 11), “Participant behavior in IEEE-SA activities is guided by the IEEE Codes of Ethics & Conduct” (slide 12), “Participants in the IEEE-SA “individual process” shall act independently of others, including employers”(slide 13), and “IEEE-SA standards activities shall allow the fair & equitable consideration of all viewpoints” (slide 14), and “Required notices” (slide 15).

The chair goes through the agenda (slide 17) and asks if there are any questions or comments on the agenda. Mengshi announces that he would like to defer his presentation. The agenda is updated accordingly.

The chair asks if there is any objection to approve the modified agenda. No objection from the group so the agenda is approved.

1. The Chair presents the TGbf timeline (slide 18).
2. The Chair presents slide 19, Call for contributions.
3. The Chair presents the teleconference times (slide 20).
4. Presentations:

**11-21/1365r0, “Data Driving Hybrid Channel Model for WLAN Sensing – 60 GHz”, Yi Lv (Huawei):** In a previous contribution the channel model for sub-7 GHz was presented. This is a corresponding contribution for 60 GHz.

The chair asks the presenter about future plans with respect to this presentation. The presenter explains that the idea is to consider the comments and improve the presentation.

**11-21/1321r0, “´WLAN Sensing procedure”, Solomon Trainin (Qualcomm):** The purpose of the presentation is to discuss and resolve what is believed to be contridictions in the current SFD.

Q: Is the measurement set-up ID unique or can several responders have the same ID?

A: Several responders may have the same ID.

Q: A responder may have several IDs?

A: Yes, the idea is that a responder may participate in several measurement set-ups.

It is also proposed to change the terminology in some places. This causes concern by some since it may then not be clear what the new terminology is properly defined and thus may be interpreted differently by different persons.

**Motion 25a**

* Move to add the following to 11bf SFD:
	+ 11bf shall define a Trigger-based sensing measurement instance including the following:
		- A polling process where an AP sends a Trigger frame to check the availability of STAs. If a STA is available, it responds with a CTS-to-self.
		- UL sounding, in which an AP sends a Trigger frame to solicit NDP transmission(s) from STA(s), shall be present if at least one STA that is a sensing transmitter responds in the polling.
		- DL sounding, in which an AP sends NDPA frame followed by NDP to STA(s), shall be present if at least one STA that is a sensing receiver responds in the polling.
		- The order of the UL and DL sounding is TBD.
		- The details of the format of the Trigger frame and the NDPA frame are TBD.
	+ Note: This is for HE/EHT STAs. Methods to support other STAs are TBD.

**Move:** Chen Chen

**Second:** Ali Rissinia

**Preliminary Result:** Y/N/A:

After some discussion it is suggested to amend the motion. The amendment relates to using the terms TF sounding and NDPA sounding instead of UL sounding and DL sounding, respectively.

**Motion 25b Motion to amend**

**Change the previous motion to:**

* Move to add the following to 11bf SFD:
	+ 11bf shall define a Trigger-based sensing measurement instance including the following:
		- A polling phase where an AP sends a Trigger frame to check the availability of STAs. If a STA is available, it responds with a CTS-to-self.
		- TF sounding, in which an AP sends a Trigger frame to solicit NDP transmission(s) from STA(s), shall be present if at least one STA that is a sensing transmitter responds in the polling.
		- NDPA sounding, in which an AP sends NDPA frame followed by NDP to STA(s), shall be present if at least one STA that is a sensing receiver responds in the polling.
		- The order of the TF sounding and NDPA sounding is TBD.
		- The details of the format of the Trigger frame and the NDPA frame are TBD.
	+ Note: This is for HE and/orEHT STAs. Methods to support other STAs are TBD.

**Move:** Chen Chen

**Second:** Junghoon Suh

**Result:** Passed by unanimous consent.

**Motion 25c**

* Move to add the following to 11bf SFD:
	+ 11bf shall define a Trigger-based sensing measurement instance including the following:
		- A polling phase where an AP sends a Trigger frame to check the availability of STAs. If a STA is available, it responds with a CTS-to-self.
		- TF sounding, in which an AP sends a Trigger frame to solicit NDP transmission(s) from STA(s), shall be present if at least one STA that is a sensing transmitter responds in the polling.
		- NDPA sounding, in which an AP sends NDPA frame followed by NDP to STA(s), shall be present if at least one STA that is a sensing receiver responds in the polling.
		- The order of the TF sounding and NDPA sounding is TBD.
		- The details of the format of the Trigger frame and the NDPA frame are TBD.
	+ Note: This is for HE and/orEHT STAs. Methods to support other STAs are TBD.

**Move:** Chen Chen

**Second:** Junghoon Suh

**Result:** Passed by unanimous consent.

**Note:**

* + - Related document 21/0990r2
		- SP Result: 26/0/13 (Y/ N/ A)
1. The Chair asks if there is any other business. No response from the group.
2. The meeting is adjourned without objection at 12:01 pm (ET).

**List of Attendees:**

|  |  |  |  |
| --- | --- | --- | --- |
| Breakout | Timestamp  | Name | Affiliation |
| TGbf | 8/17  | Au, Oscar | Origin Wireless |
| TGbf | 8/17 | Aygul, Mehmet | VESTEL; IMU |
| TGbf | 8/17 | Beg, Chris | Cognitive Systems Corp. |
| TGbf | 8/17 | Carney, William | Sony Group Corporation |
| TGbf | 8/17 | da Silva, Claudio | Intel Corporation |
| TGbf | 8/17 | Dong, Xiandong | Xiaomi Inc. |
| TGbf | 8/17 | Du, Rui | Huawei Technologies Co., Ltd |
| TGbf | 8/17 | Gao, Ning | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| TGbf | 8/17 | HAN, Xiao | Huawei Technologies Co., Ltd |
| TGbf | 8/17 | Jang, Insun | LG ELECTRONICS |
| TGbf | 8/17 | Kadampot, Ishaque Ashar | Qualcomm Incorporated |
| TGbf | 8/17 | Kamel, Mahmoud | InterDigital, Inc. |
| TGbf | 8/17 | katla, satyanarayana | InterDigital, Inc. |
| TGbf | 8/17 | Kim, Sang Gook | LG ELECTRONICS |
| TGbf | 8/17 | Lim, Dong Guk | LG ELECTRONICS |
| TGbf | 8/17 | Lin, Zinan | InterDigital, Inc. |
| TGbf | 8/17 | Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. |
| TGbf | 8/17 | Mirfakhraei, Khashayar | Zeku |
| TGbf | 8/17 | Ozbakis, Basak | Vestel Electronics Corp. |
| TGbf | 8/17 | Pushkarna, Rajat | Panasonic Asia Pacific Pte Ltd. |
| TGbf | 8/17 | Raissinia, Alireza | Qualcomm Incorporated |
| TGbf | 8/17 | Sahoo, Anirudha | National Institute of Standards and Technology |
| TGbf | 8/17 | Sarikaya, Behcet | IEEE Member / Self Employed |
| TGbf | 8/17 | Shellhammer, Stephen | Qualcomm Incorporated |
| TGbf | 8/17 | Stavridis, Athanasios | Ericsson AB |
| TGbf | 8/17 | SUH, JUNG HOON | Huawei Technologies Co., Ltd |
| TGbf | 8/17 | Tsai, Tsung-Han | MediaTek Inc. |
| TGbf | 8/17 | Wang, Chao Chun | MediaTek Inc. |
| TGbf | 8/17 | Wei, Dong | NXP Semiconductors |
| TGbf | 8/17 | Wilhelmsson, Leif | Ericsson AB |
| TGbf | 8/17 | YANG, RUI | InterDigital, Inc. |
| TGbf | 8/17 | Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) |
| TGbf | 8/17 | Zhang, Yuqiang | XGIMI Technology Co.Ltd |
| TGbf | 8/17 | Zhou, Pei | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |

**Tuesday, August 24, 2021, 10:00-12:00 am (ET)**

**Meeting Agenda:**

The meeting agenda is shown below, and published in the agenda document:

<https://mentor.ieee.org/802.11/dcn/21/11-21-1202-04-00bf-tgbf-meeting-agenda-2021-07-09.pptx>

1. Call the meeting to order
2. Patent policy and logistics
3. TGbf Timeline
4. Call for contribution
5. Teleconference Times
6. Presentation of submissions
7. Motion
8. Any other business
9. Adjourn
10. The chair, Tony Xiao Han, calls the meeting to order at 10:00am (about 45 persons are on the call after a few minutes of the meeting).
11. The chair goes through “Meeting Protocol, Attendance, Voting & Documentation Status” (slide 4), “Participants have a duty to inform the IEEE” (slide 6), and “Ways to inform IEEE” (slide 7).

The chair makes a Call for Potentially Essential Patents. No potentially essential patents reported, and no questions asked.

The chair goes through “Other Guideline for IEEE WG meetings” (slide 8), “Patent related information” (slide 9), “ IEEE SA Copyright Policy” (slides 10 and 11), “Participant behavior in IEEE-SA activities is guided by the IEEE Codes of Ethics & Conduct” (slide 12), “Participants in the IEEE-SA “individual process” shall act independently of others, including employers”(slide 13), and “IEEE-SA standards activities shall allow the fair & equitable consideration of all viewpoints” (slide 14), and “Required notices” (slide 15).

The chair goes through the agenda (slide 24) and asks if there are any questions or comments on the agenda. Mengshi announces that he would like to defer his presentation also this time. The agenda is updated accordingly.

The chair asks if there is any objection to approve the modified agenda. No objection from the group so the agenda is approved.

1. The Chair presents the TGbf timeline (slide 25).
2. The Chair presents slide 26, Call for contributions.
3. The Chair presents the teleconference times (slide 27).
4. Presentations:

**11-21/1322r1, “´WLAN Sensing procedure”, Solomon Trainin (Qualcomm):** This is the word document corresponding to presentation 11-21/1321 presented last time. The document suggests modifications to the SFD text. Solomon goes through the proposed changes in detail.

Some discussion how to proceed with this document. Claudio refers to that there is a selection procedure and how to modify the SFD.

What is your plan? To get as much feedback as possible and to make sure all understand what this is about and then run the straw poll.

**11-21/1331r0, “Further consideration on sensing measurement flow for non-AP initiator”, Yuqiang Zhang (XGIMI):** This contribution is concerned with the situation when a non-AP STA initiates the sensing, but the AP is still the coordinator and other non-AP STAs act as responders.

We run out of time before the contribution has been discussed. The Chair announces that he will allocate some time for discussing this in the next meeting.

1. The Chair asks if there is any other business. No response from the group.
2. The meeting is adjourned without objection at 11:58 am (ET).

**List of Attendees:**

|  |  |  |  |
| --- | --- | --- | --- |
| Breakout | Timestamp | Name | Affiliation |
| TGbf | 8/24 | Aboulmagd, Osama | Huawei Technologies Co., Ltd |
| TGbf | 8/24 | Au, Oscar | Origin Wireless |
| TGbf | 8/24 | Aygul, Mehmet | VESTEL; IMU |
| TGbf | 8/24 | Beg, Chris | Cognitive Systems Corp. |
| TGbf | 8/24 | Bredewoud, Albert | Broadcom Corporation |
| TGbf | 8/24 | Carney, William | Sony Group Corporation |
| TGbf | 8/24 | Choi, Jinsoo | LG ELECTRONICS |
| TGbf | 8/24 | Dash, Debashis | Apple Inc. |
| TGbf | 8/24 | da Silva, Claudio | Facebook |
| TGbf | 8/24 | Dong, Xiandong | Xiaomi Inc. |
| TGbf | 8/24 | Du, Rui | Huawei Technologies Co., Ltd |
| TGbf | 8/24 | feng, Shuling | MediaTek Inc. |
| TGbf | 8/24 | Gao, Ning | Guangdong OPPO Mobile Telecommunications Corp.,Ltd |
| TGbf | 8/24 | HAN, Xiao | Huawei Technologies Co., Ltd |
| TGbf | 8/24 | Kadampot, Ishaque Ashar | Qualcomm Incorporated |
| TGbf | 8/24 | Kasher, Assaf | Qualcomm Incorporated |
| TGbf | 8/24 | katla, satyanarayana | InterDigital, Inc. |
| TGbf | 8/24 | Kim, Sang Gook | LG ELECTRONICS |
| TGbf | 8/24 | Lim, Dong Guk | LG ELECTRONICS |
| TGbf | 8/24 | Luo, Chaoming | Beijing OPPO telecommunications corp., ltd. |
| TGbf | 8/24 | NANDAGOPALAN, SAI SHANKAR | Infineon Technologies |
| TGbf | 8/24 | Ozbakis, Basak | Vestel Electronics Corp. |
| TGbf | 8/24 | Pushkarna, Rajat | Panasonic Asia Pacific Pte Ltd. |
| TGbf | 8/24 | Raissinia, Alireza | Qualcomm Incorporated |
| TGbf | 8/24 | Sahoo, Anirudha | National Institute of Standards and Technology |
| TGbf | 8/24 | Sarikaya, Behcet | IEEE Member / Self Employed |
| TGbf | 8/24 | Shellhammer, Stephen | Qualcomm Incorporated |
| TGbf | 8/24 | Stavridis, Athanasios | Ericsson AB |
| TGbf | 8/24 | SUH, JUNG HOON | Huawei Technologies Co., Ltd |
| TGbf | 8/24 | Trainin, Solomon | Qualcomm Incorporated |
| TGbf | 8/24 | Tsai, Tsung-Han | MediaTek Inc. |
| TGbf | 8/24 | Turkmen, Halise | IMU; Vestel |
| TGbf | 8/24 | Varshney, Neeraj | National Institute of Standards and Technology |
| TGbf | 8/24 | Wang, Chao Chun | MediaTek Inc. |
| TGbf | 8/24 | Wilhelmsson, Leif | Ericsson AB |
| TGbf | 8/24 | Yano, Kazuto | Advanced Telecommunications Research Institute International (ATR) |
| TGbf | 8/24 | Zhang, Meihong | Huawei Technologies Co., Ltd |
| TGbf | 8/24 | Zhang, Yuqiang | XGIMI Technology Co.Ltd |