

# **IEEE 802.11 TGbd Update for ITU-T CITS**

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**IEEE 802.11 TGbd Chair**

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# Background

- **In the ITU-T CITS conference in Mar 2019, IEEE 802.11bd was firstly introduced to the group.**
  - [https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20190308-Geneva/10\\_IEEE%20802.11-TGbd-Introduction.pdf](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20190308-Geneva/10_IEEE%20802.11-TGbd-Introduction.pdf)
- **In the ITU-T CITS conference in Oct 2019, the progress of IEEE 802.11bd was updated**
  - [https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20191028-e-meeting/13\\_IEEE802.11-TGbd\\_update\\_for\\_CITS.pdf](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20191028-e-meeting/13_IEEE802.11-TGbd_update_for_CITS.pdf)
- **In the ITU-T CITS conference in Mar 2020, the progress of IEEE 802.11bd was updated**
  - [https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20200306-Geneva/09\\_IEEE%20802.11-TGbd\\_Status-Report.pdf](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20200306-Geneva/09_IEEE%20802.11-TGbd_Status-Report.pdf)
- **In the ITU-T CITS conference in Mar 2021, the progress of IEEE 802.11bd was updated**
  - [https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/08\\_IEEE\\_802-11\\_TGbd\\_report.pdf](https://www.itu.int/en/ITU-T/extcoop/cits/Documents/Meeting-20210326-e-meeting/08_IEEE_802-11_TGbd_report.pdf)
- **No progress report for ITU-T CITS conference in Oct 2020 and Oct 2021 respectively due to conflicting schedules**
- **This document provide the update information of the IEEE 802.11bd progress since the latest update.**
- **All information in this document can be obtained from public sources and this document should be understood with the author’s personal view.**

*Note: “At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position, explanation, or interpretation of the IEEE.” IEEE-SA Standards Board Operation Manual (subclause 5.9.3)*

# Re-cap of IEEE 802.11bd

- **Formed in Dec 2018**
- **Leadership:**
  - Chair: Bo Sun;
  - Vice Chair: Hongyuan Zhang; Joseph Levy
  - Tech Editor: Yujin Noh (Ex-Tech Editor: Bahar Sadeghi)
  - Secretary: Yan Zhang (Ex-Secretary: James Lepp)
- **Target:**
  - Develop IEEE P802.11bd amendment standard
- **PAR:** [https://www.ieee802.org/11/PARs/P802\\_11bd\\_PAR\\_Detail.pdf](https://www.ieee802.org/11/PARs/P802_11bd_PAR_Detail.pdf)
- **CSD:** <https://mentor.ieee.org/802-ec/dcn/18/ec-18-0251-00-ACSD-p802-11bd.pdf>
- **First meeting: Jan 2019, St. Louis, USA; latest meeting: Mar 2022, online (no f2f meeting since Mar 2020).**
- **Public website:** [http://www.ieee802.org/11/Reports/tgbd\\_update.htm](http://www.ieee802.org/11/Reports/tgbd_update.htm)
- **Public contributions server:** [https://mentor.ieee.org/802.11/documents?is\\_group=00bd](https://mentor.ieee.org/802.11/documents?is_group=00bd)

# Key Technology Features

- **PHY Layer**

- Re-use 11ac PHY as much as possible.
- Support backward compatibility with 11p, e.g. keeping 10 MHz L-STF, L-LTF and L-SIG.
- Support 10 MHz and 20 MHz bandwidth, e.g. 2x down-clock of IEEE 802.11ac 20 MHz and 40 MHz signal.
- Support LDPC and DCM
- Support Midamble
- Support MCS up to 256 QAM.
- Support Round-Trip-Time Ranging
- Support 60 GHz PHY based on 11ay

- **MAC Layer.**

- Modification adaptive to new NGV PHY.
- Backward compatible and co-exist with 11p
- Support 10 MHz and 20 MHz channel access
- Improve SAP interface with upper layer protocols.
- Support of A-MPDU and A-MSDU
- Support ranging based on FTM and 11az

# Key Progress

- **No f2f meeting was arranged since Mar 2020. Instead, virtual IEEE 802.11 plenary/interim meeting and weekly teleconferences were arranged to manage the progress of the 11bd project.**
- **IEEE P802.11bd were in WG LB recirculation from D1.0 to D3.0. In 2022 Mar IEEE 802.11 virtual plenary meeting, TGbd approved resolutions to all comments for LB 259 and WG11 approved the generation of D4.0.**
- **D4.0 was released on Mar 15 and a 15-day WG LB recirculation for D4.0 started immediately**
- **IEEE 802.11 WG has approved a motion to request IEEE-SA 802 EC to conditionally approve forwarding P802.11bd to SA Ballot**
- **The TGbd has updated its timeline as in next slide to accommodate the potential milestone change in the future.**
- **The TGbd has appointed Yujin Noh as Tech Editor after Bahar Sadeghi stepped down.**

# 802.11 WG Letter Ballot Results – P802.11bd

Ballot ID	Ballot Close Date	Title	Ballot Type	Pool	Return	%Return	Abstain	%Abstain	Approve	Disapprove	%Approve
LB251	18 Nov, 2020	Technical Letter Ballot for IEEE P802.11bd D1.0	Technical	340	273	69%	21	6%	174	39	82%
LB254	01 Aug, 2021	1 <sup>st</sup> Recirculation Ballot for IEEE P802.11bd D2.0	Recirculation	340	259	75%	28	8%	200	26	88%
LB259	16 Dec, 2021	2 <sup>nd</sup> Recirculation Ballot for IEEE P802.11bd D3.0	Recirculation	340	273	79%	29	8%	223	15	94%
LB259.1		Post ballot vote change		340	273	79%	29	8%	235	3	99%

# TGbd Documents

TG Documents	Latest Revision
Definition and requirements	11-19/0202r1
Selection Procedure document	11-19/0030r6
Functional Requirement document	11-19/0495r3
Spec Framework document	11-19/0497r7
Liaison response to IEEE VT/ITS 1609 WG	11-19/0437r3
Liaison response to ITU-T CITS	11-19/0843r0
TBbd FRD/SFD Motion Booklet	11-19/0514r14
TGbd Use Case document	11-19/1342r1
Teleconference Agenda	11-20/0774r10, 11-20/1164r7, 11-20/1352r9, 11-20/1561r7, 11-20/1806r2, 11-20/1891r0, 11-20/1923r11, 11-21/0177r2, 11-21/0207r8, 11-21/0595r3, 11-21/0597r7, 11-21/0904r1, 11-21/0941r2, 11-21/1303r4, 11-21/1326r8, 11-21/1622r4, 11-21/1623r4, 11-21/1998r2, 11-21/1999r3, 11-21/2000r4, 11-22/0283r3, <a href="#">11-22/0284r3</a>
Teleconference Minutes	11-20/0276r11, 11-20/1105r8, 11-20/1489r1, 11-20/1655r3, 11-20/1775r1, 11-20/1907r1, 11-21/0068r0, 11-21/0117r0, 11-21/0327r0, 11-21/0453r0, 11-21/0454r0, 11-21/0565r0, 11-21/0655r0, 11-21/0806r0, 11-21/0889r0, 11-21/1138r0, 11-21/1468r0, 11-21/1544r0, 11-21/1769r0, 11-21/1863r0, 11-22/0167r0, 11-22/0416r0
Tech Editor Report	<a href="#">11-19/2045r16 (D3.0)</a>
Comment Database	11-20/0701r7 (D0.3), 11-20/1887r12 (LB251), 11-21/1296r7 (LB254), <a href="#">11-21/2018r7 (LB259)</a>
Coexistence Assurance Document	11-20/1564r5
MDR Report	<a href="#">11-22/0021r14</a>

# IEEE 802.11bd Timeline

- PAR approved Dec 2018
- First TG meeting Jan 2019
- D0.1 Nov 2019
- D1.0 Letter Ballot Oct 2020
- D2.0 LB recirculation Jul 2021
- Form SA Ballot Pool Nov 1 to Nov 30, 2021
- D3.0 LB recirculation Dec 2021
- D4.0 LB recirculation Mar 2022
- D4.0 LB unchanged recirculation Mar 2022 → Apr 2022
- Initial SA Ballot (D4.0) Mar 2022 → Apr 2022
- Final 802.11 WG approval Sep 2022 → Nov 2022
- 802 EC approval Oct 2022 → Nov 2022
- RevCom and SASB approval Dec 2022



## **Future IEEE 802.11 Meeting in 2022**

- **IEEE 802.11 #193, WG11 Interim meeting, May 8~13, Warsaw, Poland, Hybrid**
- **IEEE 802.11 #194, WG11 Plenary meeting, Jul 10~15, Montreal, Canada, Hybrid**
- **IEEE 802.11 #195, WG11 Interim meeting, Sep 11~16, Waikoloa, Kona, HI, USA**
- **IEEE 802.11 #196, WG11 Plenary meeting, Nov 13~18, Bangkok, Thailand**

## Future IEEE 802.11bd Teleconference Plan

- **Apr 1<sup>st</sup>, 2022, 10:00am ~ 11:59am, ET; Webex**
- **Apr 5<sup>th</sup>, 2022, 9:00am ~ 11:00am, ET; Webex**

*Thank You and Welcome to IEEE 802.11 TGbd!*