IEEE P802.11  
Wireless LANs

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| Response to comments on IEEE 802.11ax-2021 in *60-day ballot* using the ISO/IEEE SA PSDO agreement | | |
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Abstract

Five NBs provided comments during the *60-day ballot* on IEEE 802.11ax-2021 under the ISO/IEEE SA PSDO agreement. This document proposes responses to those comments.

R2: updates after IEEE 802 JTC1 SC meeting on 14 Sep 2021, with suggested refinements to the text from multiple contributors, and particularly from IEEE SA staff

R3: added reference to 802.11md liaison to SC6

## This Liasion Statement responds to comments during *60-day ballot* on IEEE 802.11ax-2021

ISO/IEC JTC1/SC6 held a *60-day ballot*, closing on 10 August 2021, on IEEE 802.11ax-2021 as the first part of an approval process defined by the PSDO agreement between IEEE SA and ISO. The results of the *60-day ballot* are documented in 6N17559.

The two questions asked both received majority support from those *National Bodies* (NB) voting *yes* or *no*, and so the *60-day ballot* passed:

* *Do you support the need for an ISO International Standard on the subject?*
  + Approved 10/0/9
* *Do you support the submission of this proposal for FDIS ballot?*
  + Approved 6/4/9

Comments were received from the following five NBs:

* China NB
* Sweden NB
* Finland NB
* Germany NB
* Japan NB (associated with a *yes* vote on both questions)

This liaison statement from IEEE 802 to ISO/IEC JTC1/SC6 provides resolutions to all the comments received during the *60-day ballot* on IEEE 802.11ax-2021.

## Response to comment CN1-003

### CN1-003 comment

*IEEE 802.11ax-2021 is an amendment to IEEE 802.11-2020. China voted against IEEE 802.11- 2020 with technical comments (see SC6N17516). At present, China's comments on IEEE 802.11-2020 have not been properly handled. For many of these comments also apply to IEEE 802.11ax, China disapprove IEEE 802.11ax submitting to the next stage*

### CN1-003 proposed change

*It is recommended to postpone the subsequent ballot on IEEE 802.11 and IEEE 802.11ax in ISO/IEC until the discovered design flaws are sufficiently resolved.*

### IEEE response to CN1-003

*Reject*

As noted by the China NB, comment CN1 is essentially a reiteration of various comments submitted by the China NB during the *60-day ballot* on IEEE 802.11-2020, and documented in SC6N17516. IEEE 802 notes that responses to all these comments were provided in a previous *Liasion Statement* to ISO/IEC JTC1/SC6 (See N17600).

## Response to comment CN2-006

### CN2-006 comment

*In 2019, Mathy Vanhoef published a paper “Dragonblood: Analyzing the Dragonfly Handshake of WPA3 and EAP-pwd” in IEEE Symposium on Security and Privacy on 18-20 May 2020 in Oakland (San Francisco). (It’s free for downloading from the Internet.) This paper presents design flaws in the 802.11 standard. The design flaws can be divided in two categories. The first category consists of downgrade attacks against SAE-capable devices, and the second category consists of weaknesses in the Dragonfly handshake of recover the password of the WLAN network, launch resource consumption attacks, and force devices into using weaker security groups.*

### CN2-006 proposed change

*It is recommended to postpone the subsequent ballot on IEEE 802.11 and IEEE 802.11ax in ISO/IEC until the discovered design flaws are sufficiently resolved.*

### IEEE response to CN2-006

*Reject*

The IEEE 802.11 standard was modified in 2019 (see [11-19/1173r15](https://mentor.ieee.org/802.11/dcn/19/11-19-1173-15-000m-pwe-in-constant-time.docx) for more details) to produce a constant-time generation of the *secret* used in SAE as well as to prevent downgrade attack. The changes resulting from that modification make SAE resistant to the *Dragonblood* attacks described in the referenced 2020 paper. These changes are already part of the IEEE 802.11-2020 standard and are therefore included the IEEE 802.11ax-2021 amendment considered in the *60-day ballot*. There is no reason to delay any balloting as the so called "design flaws" have already been addressed.

## Response to comments SE-001/FI-002/JP1-004/DE-005

### Comments

Please refer to SE-001, FI-002, JP1-004 and DE-005 in SC6N17559 for the text of the comments from the Sweden, Finland, Japan and Germany NBs.

### Proposed changes

Please refer to SE-001, FI-002, JP1-004 and DE-005 in SC6N17559 for the text specifying the proposed changes from the Sweden, Finland, Japan and Germany NBs.

### IEEE response

*Reject*

Four *National Bodies* (Germany, Sweden, Finland and Japan NBs) highlighted various issues related to patent rights in the *60-day ballot* on IEEE Std 802.11ax-2021 that was conducted under the ISO/IEEE SA PSDO agreement. Generally, the comments require IEEE SA to draw attention to patent rights of which it is aware in relation to IEEE Std 802.11ax-2021. Some of the comments also assert that fast tracking under the ISO/IEEE PSDO agreement cannot proceed unless existing negative *Letters of Assurance* submitted to IEEE SA in relation to *802.11ax* are replaced with positive *Letters of Assurance.*

IEEE SA’s responsibility under the *JTC1 Directives* is to *draw the attention of the committee to any patent rights of which the proposer is aware and considers to cover any item of the proposal* [clause 2.14.2 a)]. IEEE SA believes it has fulfilled this responsibility in relation to the submission of IEEE Std 802.11ax-2021 for consideration under the ISO/IEEE SA PSDO agreement, as described below.

IEEE SA has publicly published the three negative *Letters of Assurance* that were submitted in relation to IEEE Std 802.11ax-2021. They are available for consideration by ISO and other interested parties via <https://standards.ieee.org/about/sasb/patcom/patents.html>. All three *Letters of Assurance* state that the submitter ***may*** *own, control, or have the ability to license Patent Claims that* ***might*** *be or become Essential Patent Claims* (emphasis added) in relation to *802.11ax*. None of the negative *Letters of Assurance* identify any specific *Patent Claims* or how they might be or become *Essential Patent Claims*. In addition, as noted in the *Letter of Assurance* form, *IEEE takes no position with respect to the validity or essentiality of Patent Claims.* IEEE SA’s policy in this respect is also documented in the *IEEE SA Standards Board Bylaws* [clause 6.2].

The *JTC1 Directives* specify [clause 2.14.3] that further consideration by ISO is required if patent rights that *appear* to cover elements of a proposed standard cannot be obtained on *RAND* terms. The three negative *Letters of Assurance* for IEEE 802.11ax-2021 do not declare any specific patent rights in a manner that is consistent with the requirements for an *ISO Type 3 Declaration* in the *Guidelines for Implementation of the Common Patent Policy for ITU-T/ITU-R/ISO/IEC*, i.e. by providing details of the patent, by specifying the portion of the standard affected by the patent and by providing a description of how the patent affects the standard. Without this additional information, there is no basis on which it is reasonable to conclude that any elements of IEEE Std 802.11ax-2021 *appear* to be covered by patent rights alluded to by the three negative *Letters of Assurance* submitted to IEEE SA*.*

Based on these responses (and noting both questions in the *60-day ballot* exceeded the required majority threshold), IEEE 802 believes there is no reason for the approval process for fast tracking of IEEE Std 802.11ax-2021 under the ISO/IEEE SA PSDO agreement not to proceed as normal. The next step in the normal approval process is an *FDIS ballot*.

IEEE 802 further notes that IEEE Std 802.11ax-2021 was approved as an IEEE standard in February 2021 and published in May 2021. Products based on draft versions of the standard have been available in various markets since early 2019 and have been certified by the *Wi-Fi Alliance* since August 2019. IEEE 802 is not aware of any actions by the submitters of the three negative *Letters of Assurance* supporting the notion that they own any relevant or valid *Essential Patent Claims* in relation to IEEE Std 802.11ax-2021. IEEE SA has not been apprised of, and is not aware of, any issues related to patent licensing or market implementation of IEEE Std 802.11ax-2021. If ISO is concerned about the possibility that the three submitters might have relevant and valid *Essential Patent Claims* relevant to IEEE Std 802.11ax-2021then one possibility to resolve these concerns is for ISO to invite the three submitters to make an IPR declaration under ISO’s IPR policies. This invitation could be sent in parallel to the FDIS ballot. Of course, whether or when ISO wants to issue such an invitation is a decision for ISO.