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.

## 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 N??????).

## 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 comments from Sweden, Finland, Japan and Germany NBs.

### Proposed changes

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

### IEEE response

*Reject*

Four *National Bodies* (Germany, Sweden, Finland and Japan) 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 has fulfilled this responsibility.

* IEEE SA is aware of three negative *Letters of Assurance* that were submitted to IEEE SA in relation to 802.11ax. All three *Letters of Assurance* asserted 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 three letters identify any specific *Patent Claims* or how they might be or become *Essential Patent Claims*.
* It is possible that the authors of the three *Letters of Assurance* may, at some future time, identify specific *Patent Claims* and assert how they are *Essential Patent Claims* in relation to IEEE Std 802.11ax-2021. Even if this were to occur, IEEE SA would be unable to conclude the specific *Patent Claims* represented patent rights that covered any element of IEEE Std 802.11ax-2021 because legal authorities, not IEEE SA, are responsible for determining the validity, essentiality, or interpretation of any *Patent Claims*.

The *JTC1 Directives* specify (see clause 2.14.3) that further consideration by ISO is required if patent rights that “*appear”* to cover elements of IEEE Std 802.11ax-2021 cannot be obtained on *RAND* terms. This rule does not apply in the case of IEEE Std 802.11ax-2021 at this time because the three negative *Letters of Assurance* mentioned above do not assert 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, the portion of the standard affected by the patent and a description of how the patent affects the standard. Without this additional information, there is no basis on which 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 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 authors of the three negative *Letters of Assurance* that further assertions they have any relevant or valid *Essential Patent Claims* in relation to IEEE Std 802.11ax-2021. If ISO is concerned about the possibility that the three companies might have valid *Essential Patent Claims* relevant to IEEE Std 802.11ax-2021then one possibility to resolve any concerns is for ISO to invite the three companies 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.