

## **802.1 WG Comments on the proposed P802.11bi and P802.11bh PARS**

802.1 appreciates the clear intent (as captured in the Scope and Need of the PARs for both proposed projects) to facilitate improvements in user privacy.

802.1 also appreciates the clear indication of the difficulties (already discussed) that both projects will face in improving user privacy, and in particular the possibility of unacceptable service disruption or limitation when an STA's MAC address is changed.

802.1 has the following comments on the text of the PARs:

1. 802.1's interpretation of the Scope of both PARs is that incorporation of additional information elements in 802.11 that could further diminish user privacy (to, for example, facilitate continued user identification in the absence of a permanent STA to MAC address association) is Out of Scope. Please amend the Scope to state explicitly what new user tracking capabilities are within or excluded from the Scope of the PAR.

2. 802.1 is concerned that both Scope and Need of P802.11bh appear to explicitly limit consideration of disruption, and the need for session continuity, to 802.11 mechanisms. Important 802.1Q TSN capabilities, such as bandwidth allocation, depend on flow identification that span both the wired and wireless networks. [Our comments on the CSDs point out that Technical Feasibility appears to be based, at least in part, on erroneous information about the scope of 802.1 in general and 802.1Q in particular]. Please amend the Scope to explicitly indicate that the mechanisms to enable session continuity to recognize the fact that sessions extend to the LAN beyond the medium supported by 802.11.

3. The use of 802.11 technology is expected to play an important and increasing role in environments that are tightly controlled, e.g., in flexible factories <<https://mentor.ieee.org/802.1/dcn/20/1-20-0026-00-1Cne-ieee-802-nendica-report-flexible-factory-iot-use-cases-and-communication-requirements-for-wired-and-wireless-bridged-networks.pdf>>. 802.1 is concerned that P802.11bh could restrict the use of some 802.11 devices in these environments, and thus reduce the use of low latency and prioritization capabilities discussed in the context of 802.11be with TSN. Please amend the Scope to indicate that a conformant 802.11 device should be configurable to operate without address randomization.

4. The project title indicates a change in MAC address would be only by randomization. The scope discussed changing addresses. Additionally, this amendment does not enhance the service, but rather preserves the service while addressing privacy concerns with MAC addresses. Change the title of the amendment to, "Service preservation with randomized or changing MAC addresses"

802.1 has the following comments on the CSDs:

5. The association between each CSD and its PAR is not entirely clear. One CSD is entitled “CSD Draft for Privacy Amendment of RCM Study Group” and the other “RCM SG Proposed CSD Draft for 802.11 RCM Project”. The association between a CSD and a PAR needs to be clear now and 5 years hence when the CSD is being confirmed for project progression to SA Ballot and RevCom. After 5 years many will have forgotten subtle distinctions that accompanied the initial discussion and might not even be sure that a CSD belongs to either project. Include the project designation P802.11bi/P802.11bh and amendment title in the CSD.

6. The P802.11bi CSD (20/1346r2) states under 1.2.4 Technical Feasibility that:

“The IEEE 802.11 Wireless Next Generation (WNG) Standing Committee (SC) and RCM Topic Interest Group (TIG)/Study Group (SG) have reviewed many presentations indicating that enhancements are technically feasible. These contributions outlined techniques related to privacy to enhance current use cases and enable new ones.”

However, none of these presentations appear to be referenced in the CSD, and we have not identified them in the RCM study group files on Mentor. The CSD references evaluations of the difficulties faced in improving user privacy (19/588r2, 19/1313r2, 19/1314r2). It is not at present clear that it will be possible to materially improve privacy in the face of a determined attacker who is prepared to correlate information from multiple information elements and other characteristics of device behaviour. It is not clear that these improvements will outweigh attendant difficulties in service provision. 802.1 understands that some proprietary attempts to improve privacy related behaviour have been beta tested and withdrawn. 802.1 does appreciate that the technical challenges faced in demonstrating feasibility in large scale deployment might not be reasonably addressed within the limited lifetime of a Study Group. However, that is no reason to overstate Technical Feasibility in the CSD. Provide credible references and demonstrate Technical Feasibility. The current set of references do not meet that criteria.

7. The CSDs for both PARs claim compliance with 802.1Q, without qualification. However, this appears to be based on an incomplete understanding of the scope of 802.1Q. The referenced presentation (19-0851-00, P802.1CQ MAC Address Assignment Requirements) states:

“P802.1CQ is currently the only 802.1 project dealing with end-station behaviour ... Formerly, protocols for end-stations were out of scope for 802.1”.

This is not the case and has not been the case for many years. 802.1Q includes end station requirements for participation in the MMRP, MVRP, MSRP, CFM, and other protocols. These protocols are important in Time-Sensitive Networking environments requiring reliable and

timely frame delivery (such as industrial and professional audio networks) and in service-provider networks. The reference to 19-0851-00 is misleading. A more complete analysis of the interaction of 802.1 protocols is in an informative annex (following IEEE Std 802E recommendations) “Privacy in Bridged Networks” to P802.1AEdk/D0.5 (also in first task group ballot).

Remove the 19-0851-00 presentation from the list of CSD references. A more detailed response to the 802.1Q compliance question is required. Use of a fixed STA/MAC relationship needs to remain possible throughout the duration of an association.

8. It is unclear why the presentations 19-0884-00, 19-1027-01, 19-1320-00 are in either, much less both CSDs.

8a. P802.11bi concerns privacy exposures beyond the use of persistent source MAC Address, and these presentations are very much focused on MAC Address assignment.

8b. The presentations reflect the different and contested views on 802.11aq and 802c on the extent of the randomly chosen MAC address space, but their bearing on the feasibility or otherwise of the proposed PARs is nowhere made clear. Since they promote opposing views it is not clear what conclusion the reader of the CSDs is meant to draw.

Remove these three presentations from the references list of both CSDs.

9. The CSD templates used appear to be out of date, as they refer to “balanced costs”. Use the current CSD template that can be retrieved from <https://www.ieee802.org/devdocs.shtml>.