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IEEE P802.22 Wireless RANs

802.22 Response to 802.16 Comments on P802.22.1 PAR

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Author(s):

Name	Company	Address	Phone	email
Carl R. Stevenson	WK3C Wireless LLC	4991 Shimerville Road Emmaus, PA 18049-4955	+1 610-841-6180	wk3c@wk3c.com

Abstract

This document contains the response of 802.22 to the comments of 802.16 on our proposed P802.22.1 PAR/5C. 802.16's comments have been reproduced in a conversion from the supplied .pdf file to a MS Word .doc file and 802.22's responses have been inserted in context in [blue text](#).

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Comments of IEEE 802.16 Working Group on Proposed P802.22.1 PAR

Having reviewed the P802.22.1 PAR and Five Criteria and observed the corresponding Monday night tutorial, we have a number of fundamental questions on the proposed project. While we have many concerns about the detailed language, we are not submitting specific change requests at this time because we believe that too many basic issues remain undecided.

Until the PAR and Five Criteria are modified to indicate that these basic questions have been thoroughly considered, we do not believe it is worthwhile to draft the details.

802.22 will attempt to address your general comments to the best of our ability.

It is our current view that the appropriate venue for addressing these questions is a Study Group. However, we may review this opinion based on 802.22 responses to our questions.

The proposed P802.22.1 PAR was created by a Study Group within 802.22 that was authorized by the 802 Executive Committee. (approved by the EC 11-0-3 at the closing EC meeting in July)

The current 802.22 PAR is entitled “Cognitive Wireless RAN MAC and PHY specifications: Policies and procedures for operation in the TV Bands.” To our understanding, the proposed PAR work would fall within the context of the language “policies and procedures for operation in the TV bands.” The scope (“... the air interface... of fixed point-to-multipoint wireless regional area networks operating in the VHF/UHF TV broadcast bands ...”) also seems wide enough to accommodate the work. Moreover, the purpose statement of the 802.22 PAR talks about “preventing harmful interference to incumbent licensed services in the TV broadcast bands.” During drafting of the 802.22 PAR, the existence of the incumbent licensed status of Part 74 devices was well known. Therefore, it seems apparent to us that the 802.22 PAR already addresses the issue of preventing harmful interference to Part 74 devices. It appears that the scope of the proposed 802.22.1 PAR is wholly within the scope of the 802.22 PAR.

The proposed PAR is intended to accomplish work to enhance the ability of license-exempt systems including 802.22 systems to reliably detect and protect low power licensed devices, which obviously are somewhat more difficult to detect than high powered TV broadcast stations. While we believe that at this juncture we should not be presupposing specific technical solutions, it is possible that the work may result in the standardization of a new 802 device with its own simple PHY and MAC that would fall outside of the scope of the 802.22 standard's PAR and whose use would limited to authorized licensees.

We think it is bad policy for IEEE to maintain two projects covering the same material, even if both are drafted by the same Working Group. Eventually, the work would need to progress to Sponsor Ballot, where two different ballot groups could lead to two different results.

We are not proposing two projects covering the same material. The intent of the proposed PAR is to authorize a project that, while arguably related to 802.22, would serve the function of providing a greater degree of protection to low power licensed devices.

We also believe that the work proposed in the PAR will be completed either before, or concurrently with, the work on the 802.22 standard and have modified the proposed PAR accordingly.

We would like to understand why the 802.22 WG would propose a new PAR rather than conducting its work within its current project.

We understand that a Working Group may sometimes find it necessary to split work under a single PAR. In this case, the appropriate solution is to split the PAR. This would require modification of the original PAR to remove the split material from the scope.

The proposed PAR is not intended to “split work” from the 802.22 PAR, but to authorize additional work to create a separate, standalone standard.

The scope of the proposed PAR is: “This project will create a standard which specifies methods to provide enhanced protection to protected devices.” The word “methods” is not defined in the PAR. As we understand the term, “methods” as such are not standardized in IEEE 802. The IEEE 802 standards address network layers 1 and 2. It seems to us that a project in 802 specifying “methods” ought to be a Recommended Practice.

We would like to understand why the 802.22 WG has selected to identify the project as a Standard instead of a Recommended Practice.

Since the specific mechanism/technical solution has not been (and we believe should not have been) presupposed, the word “methods” seemed the most appropriate qualifier at the time the PAR was prepared and we identified the proposed work as the development of a standard because we believe that, whatever solution that results should be normative. (A document stressing the word “SHALL.”)

The Five Criteria document states that: “It is believed that these methods will, by extension be usable by, or readily adaptable to, other 802 and non-802 license-exempt devices that may be allowed access to the TV bands by the FCC and other regulatory agencies around the world in the future.” If the methods developed are to be applicable to 802 devices other than 802.22 devices, then it would appear that other Working Groups would have a direct interest in the project. It seems that the best venue might be in another WG or TAG, or in a new WG or TAG. We are not sure if the appropriate placement of this work, if split off from the 802.22 project, has been considered.

Since 802.22 is actively developing its standard for non-interfering use of unused TV channels and the interested incumbent licensees are actively and cooperatively participating in that work, we believe that the placement of this work in a Task Group in the 802.22 Working Group is the most appropriate and efficient placement. To split the work into a new Working Group or to place it in another Working Group that may not meet at the same times and in the same venues as 802.22 would most likely result in diminished participation by those parties. While we realize that the ultimate decision on where this work is placed is the purview of the Executives Committee, we recommend placement of this work in a Task Group within 802.22 (hence the P802.22.1 designation in the PAR) because the incumbent expertise currently lies in the 802.22 WG and we believe that body should have final WG approval authority to send a draft to sponsor ballot.

Is the intent to specify modifications of unlicensed devices so that they more easily detect licensed Part 74 devices, or is it to specify modifications of licensed Part 74 devices to make them more easily detectable by unlicensed devices?

In the PAR and Five Criteria, we cannot find an answer to this fundamental question. Unless this question can be answered, we would suggest that the thinking behind the project is not sufficiently mature.

The proposed PAR is intended to develop further coexistence methods so that unlicensed devices can more reliably and robustly operate without affecting the operation of Part 74 devices in the TV bands. The needed specifications for 802.22 devices will be covered under the work of the 802.22 WG but the implementation of methods and/or possible standards for a new class of devices to signal the presence of low power licensed devices is beyond the scope of the 802.22 PAR.

If the purpose is to enhance the operation of (non-802) Part 74 devices to make them more detectable, the work would appear to lie entirely outside the scope of IEEE 802. In this case, how do you justify placing the work in IEEE 802 rather than elsewhere?

The PAR does NOT propose to specify modifications to existing licensed Part 74 devices.

It appears that the methods developed in the new project may, to be useful, require operators and manufacturers of Part 74 devices to develop, purchase, and deploy additional equipment to protect the operation of their devices.

The “Part 74 beacon” suggested in the Five Criteria is a good example, and no other examples are provided of techniques that do not rely on such cooperative transmissions. It is not apparent from the Five Criteria why an operator or manufacturer of Part 74 devices would take such measures while, even without that extra expense, the regulatory onus is already on the WRAN operators to protect those devices.

Although the proposed PAR does not specify that beacons are the only solution, no other ideas are suggested, so we surmise that beacons are the primary candidate technology.

The approach of creating a specialized 802 standardized device that would operate under Part 74 is an approach that has been suggested by the manufacturers and operators of Part 74 devices who are actively participating in 802.22 as a possible (but not necessarily the only) solution.

The beacon concept is not presupposed – it is merely one technically feasible suggestion for a possible solution – one that originated, as stated before – in the Part 74 community – a suggestion that they have generously offered in a spirit of cooperation that goes beyond what is actually required of them.

The idea of beacons opens the door to the introduction of actively transmitting devices that by themselves can cause harmful interference to other users of the spectrum. Such devices could be used (legally by Part 74 users or illegally by rogue parties) to instigate on-going and insurmountable denial-of-service attacks on WRAN service throughout a given area. Have the implications of active methods been thoroughly considered? What measures can be taken against such misuse?

If a beacon device were, in fact, selected as the best solution, it will be designed to be non-interfering and would, as a licensed low power device only be usable by authorized licensees to provide a “bubble of protection” in a limited area around critical low power device operations. Considerations of security, access, etc. would be integral considerations in the development of a standard for these devices if that approach is ultimately selected.

We consider this problem to be complex from a technical, marketing, and placement point of view. It appears that the PAR and Five Criteria have substantial ambiguity and believe that a Study Group would have improved the quality and clarity of the PAR. Why was this step bypassed?

The proposed P802.22.1 PAR/5C are the product of a authorized Study Group.

We look forward to answers to these questions. For the time being, we suggest that the IEEE 802.22 Working Group consider withdrawing this PAR proposal and instead propose the initiation of an appropriate Study Group.

The Study Group has concluded its work, met the requirements for delivering the proposed PAR/5C to the EC more than 30 days prior to the start of this plenary session, and the proposed PAR/5C were reviewed and approved by the 802.22 WG