IEEE P802.11
Wireless LANs

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| “TGme Resolution to CIDs 1125, 1126 on Spatial Reuse”  |
| Date: 2021-12 |
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Abstract

Resolution of CIDs 1125 and 1126

**CID 1125, Clause 26.2.3 P4127.14**

Comment

This clause deals with the identification of an SRG PPDU. It appears that an SRG PPDU is also an inter-BSS PPDU but it seems to be describing that not all inter-BSS PPDUs and SRG PPDUs. But we also read that "An HE AP that has not transmitted a Spatial Reuse Parameter Set element with a value of 1 in the SRG Information Present subfield may classify received PPDUs as SRG PPDUs using information that it has not transmitted" (4127.60).

At this point one wonders what is different about an SRG PPDU and an inter-BSS PPDU. The only result, I think, is whether the SRG PD level ot the non-SRG PD level may be used. Furthermore, there is no description that I can find where how STAs make any decisions as to who is in the secret club (the SRG) or why. There is no reasoning provided as to why the differentiation. I would love to see some explaination(s) as to how this SRG is worth all the extra effort above inter-BSS and how STAs or APs decide or what criteria they could use to know if placing these STAs in an SRG really helps with spatial reuse above the "simple" color idea for inter-BSS.

Proposed Change

As it says in the comment. What is magic about the SRG and who decides who maybe or is in the club? There is nothing here that would encourage any STA to implement this. Either add some text that clearly explains how the SRGs are formed, and how this is better than inter-BSS.

**CID 1126, Clause 26.10.2.4 P4235.1**

Comment

"If using OBSS PD-based spatial reuse, an HE STA shall maintain an OBSS PD level and may adjust this OBSS PD level in conjunction with its transmit power and a value, PPDU\_BW, derived from the received PPDU. The adjustment shall be made in accordance with Equation (26-5)."

 If an HE STA did this, then it is instantly at a disadvantage to any other non HE STA, let alone HE STAs not doing it. Dropping the TX power means that the chance of the packet being received over an OBSS packet is reduced. Also dropping the TX power drops the received signal strength, not a good idea when the purpose is to use higher data rates. What is needed is a scheme that is not dependent upon every STA in the area to be an HE STA (even if this was a good idea given that situation). Several analyses have shown that this is a bad idea and in all probability it will not be used. The usual answer is that it improves "fairness", but it does so to the detriment of the STA that is doing it.

Proposed Change

Delete this TX power link. Better still take the entire HE Spatial reuse section out of the Standard and form a separate TG to do it properly.

**Discussion**

**CID 1125**

*“The formation of SRGs is out of the amendment's scope.”*

*“…more aggressive channel access policies can be used for transmissions within the same SRG, in case that the nodes of the same SRG could support higher levels of interference. Alternatively, it could be the other way around.”\**

The observation in CID 1125 is valid in that how to implement SRG is a mystery and left open, so how interoperability or fairnesss can be assessed is also a mystery.

**CID 1126**

*“The SR operation has been introduced as a mechanism to increase the number of transmissions held in an OBSS, and thus spectral effciency.* ***Nevertheless, little is known about the actual potential of SR”\****

*“If a node reduces its transmission power by applying the TPC, that will promote the neighboring transmissions because they are no more bothered by the transmissions of that node. Consequently, the other nodes will benefit directly and not the node that applied the TPC.”\*\**

The use of TPC with the OBSS\_PD seems a good idea until you consider legacy STAs, or HE STAs not doing it. Similarly, there is no specified method of when and how to apply the thresholds. Similar to SRG, the hooks are there but if implmentations simply do it differently, presumeably to favor themselves, no actual gain will result. Hence, there is some validity to the Comment.

**Proposed Resolution discussion:**

The proposed resolution is to reject both CIDs. The SR clauses were passed with virtually no simulation support, however, they are there and experience has shown that no amount of contradictory work or analysis will get it removed or changed.

It has been proposed that SR should be looked at anew and certainly there is a lot of academic work that has been carried out into the subject, most, if not all of which, declare that more work is needed. Not sure if there is the will to do it however.

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*\* “Spatial Reuse in IEEE 802.11ax WLANs”, Wilhelmi, Munoz, Cano, Selinis Bellalta, wireless Networks Research Group, Barcelona, and Institute for Communications Systems, UK., March 3, 2021.)*

*\*\*Imad Jamil. Improving spatial reuse in future dense high efficiency Wireless Local Area Networks. Networking*

*and Internet Architecture [cs.NI]. INSA de Rennes, 2015. English. <NNT : 2015ISAR0033>.*

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**Proposed Resolution for CIDs 1125 and 1126**

**REJECT**

Despite valid points being made in the comments, consensus will never be reached to remove or change the SR clauses significantly.

Commentor did not provide sufficient information for the resolving of the CID. (i.e., Commentor is not going to waste his time preparing more submissions over the ones written during 11ax and subsequently suppressed).