IEEE P802.11
Wireless LANs

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| LB272 Enhancements for SBP procedure |
| Date: 2023-06-xx |
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**Abstract**

This document proposes a technical change to 11bf spec to fix a bug that is related to the SBP setup procedure.

R0: initial version on June 29, 2023.

R1: revised version on July 8, 2023, made the added field reserved in SBP Response frame.

R2: revised version on July 12, 2023, made changes to discussions and proposed draft texts.

**Discussions**

* The current design in the SBP procedure makes every sensing responder transmitter, or receiver, or both transmitter and receiver, which is a strong constraint that might limit the possible use cases.



* The physical characteristics of the channel in the uplink and downlink are different, and the hardware designs of the AP and the non-AP STA also capture different CSIs. In a normal TB case, the AP, can suggest the role of each sensing responder individually to satisfy the application demands. In the SBP case, the SBP initiator can have the knowledge (e.g., MAC addresses, capabilities) of sensing responders it prefers to satisfy the application, using some of out-of-the-scope approach. It also makes sense that the SBP initiator can suggest different roles of sensing responders to satisfy the application.
* Instead of having multiple independent SBP sessions, where SBP initiator might need to reserve resources and maintain separate state machines, having this feature requires one SBP request/response and one measurement session request/response to do the setup.

So, during ad-hoc discussions, some of TGbf members think it might be useful for the SBP initiator to suggest transmitter/receiver roles for sensing responders if the SBP initiator provides the MAC addresses of sensing responders in the SBP request. (This means that the SBP initiator has prior knowledge that the sensing responders should be able to fulfill the suggested roles.)

1. **Suggested resolutions:**
	1. **SBP initiator can indicate the transmitter/receiver roles for sensing responders in the provided responder list for the sounding between the AP and the sensing responder(s), i.e., for SR2SI sounding and NDPA sounding.**
		1. The Sensing Transmitter field and the Sensing Receiver field in the Sensing Measurement Parameter element in the SBP request are reserved.

**Modifications:**

**9.4.2.321 SBP Parameters element**

***To TGbf Editor: Please modify Figure 9-1002bd in D1.2 as follows.***

The SBP Parameters element indicates operational parameters associated with a requested SBP procedure. The format of the SBP Parameters element is defined in Figure 9-1002bd (SBP Parameters element format).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Element ID | Length | Element ID Extension | SBP Parameters Control | Sensing Responder Addresses | Sensing Responder IDs | Sensing Responder Role Bitmap |
| Octets: | 1 | 1 | 1 | 3 | n or  | 0 or variable | 0 or variable |

Figure 9-1002bd – SBP Parameters element format

…

***To TGbf Editor: Please modify Figure 9-1002be in D1.2 as follows.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 B4 | B5  | B6 B9 | B10 | B11 |
|  | SBP Request | SBP Procedure Expiry Exponent | Sensing Responder | Number of Sensing Responders | Mandatory Number of Responders | Preferred Responder List |
| Bits: | 1 | 4 | 1 | 4 | 1 | 1 |
|  | B12 B15 | B16 | B17  | B18 | B19 B23 |  |
|  | Number of Preferred Responders | Mandatory Preferred Responder | SR2SR Sounding Request | Preferred Responder Role Bitmap Present | Reserved |  |
| Bits | 4 | 1 | 1 | 1 | 5 |  |

Figure 9-1002be – SBP Parameters Control field format

***To TGbf Editor: Please add the following text after P77L33 in D1.2.***

If the SBP Request field is equal to 1(\*0626),

…

* The Preferred Responder Role Bitmap Present field is set to 1 to indicate that the Preferred Responder Role Bitmap field is present. Otherwise, it is set to 0. It is reserved if the Preferred Responder List field is set to 0.
* …

***To TGbf Editor: Please add the following text and table after P77L38 in D1.2.***

* The Preferred Responder Role Bitmap field is present only if the Preferred Responder Role Bitmap Present field is set to 1. The Preferred Responder Role Bitmap field indicates the sensing transmitter and/or sensing receiver role for preferred sensing responders whose MAC addresses are included in the Sensing Responder Addresses field. The Preferred Responder Role Bitmap field uses 2 bits to indicate the sensing transmitter and/or sensing receiver role for preferred sensing responders. The sensing transmitter and/or sensing receiver role for each preferred sensing responder is encoded by 2 bits. The sensing transmitter and/or sensing receiver roles suggested for preferred sensing responders are listed in the same order as the corresponding MAC addresses in the Sensing Responder Addresses field. The encoding of the sensing transmitter and/or sensing receiver role is given in Table 9-xxxx (Sensing transmitter and/or sensing receiver role encoding).

Table 9-xxxx – Sensing transmitter and/or sensing receiver role encoding

|  |  |
| --- | --- |
| **Encoding** | **Meaning** |
| 00 | Reserved |
| 01 | Sensing receiver |
| 10 | Sensing transmitter |
| 11 | Sensing transmitter and sensing receiver |

***To TGbf Editor: Please add the following text after P78L9 in D1.2.***

If the SBP Request field is equal to 0(\*0626),

…

* The Preferred Responder Role Bitmap Present field is set to 0 to indicate that the Preferred Responder Role Bitmap field is not present.

…

***To TGbf Editor: Please add the following text after P78L33 in D1.2.***

* The Preferred Responder Role Bitmap field is not present.

**9.4.2.319 Sensing Measurement Parameters element**

***To TGbf Editor: Please modify the following text on P70L1-L6 in D1.2.***

The Sensing Transmitter field is set to 1 to indicate a sensing transmitter role for the sensing responder; and is set to 0 otherwise. When the Sensing Measurement Parameters element is included in an SBP Request frame, it is reserved if the Preferred Responder Role Bitmap field is present in the SBP Parameters element in the same SBP Request frame.

The Sensing Receiver field is set to 1 to indicate a sensing receiver role for the sensing responder; and is set to 0 otherwise. When the Sensing Measurement Parameters element is included in an SBP Request frame, it is reserved if the Preferred Responder Role Bitmap field is present in the SBP Parameters element in the same SBP Request frame.

**11.55.2.2 Setup exchange**

***To TGbf Editor: Please add the following text to P156L30 in D1.2.***

If the Preferred Responder Role Bitmap Present field within the SBPParameters parameter of the MLME-SBP. request primitive is set to 1, both the Sensing Transmitter and the Sensing Receiver fields within the SensingMeasurementParameters parameter of MLME-SBP.request primitive shall be set to reserved values.

If the Preferred Responder Role Bitmap Present field within the SBPParameters parameter of the MLME-SBP. indication primitive is set to 1, and if the StatusCode parameter within the MLME-SBP.response primitive is equal to SUCCESS, the SBP responder shall set the Sensing Transmitter and the Sensing Receiver fields in the SensingMeasurementParameters parameter within the MLME-SENSMSMTSESSION.request primitive issued to initiate a sensing procedure to satisfy the SBP request according to the Preferred Responder Role Bitmap field within the SBPParameters parameter of the corresponding MLME-SBP. request primitive.

The Preferred Responder Role Bitmap Present field within the SBPParameters parameter of the MLME-SBP. response primitive or the MLME-SBPTERMINATION.request primitive shall always be set to 0.

SP:

Do you agree to include the proposed draft text in 1171r2 in the latest 11bf Draft?

Y/N/A