IEEE P802.11
Wireless LANs

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| Proposed Draft Text for D0.1: Threshold-based Sensing Procedure |
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Abstract

This submission provides the proposed draft text on **threshold-based sensing procedure** for 802.11bf D0.1.

**Version history:**

Rev 0: Initial PDT

Rev 1: Editorial changes

Rev 2: Editorial changes

Rev 3 & 4: The updated information is shown in the next page.

# Introduction

The following Motions are reflected in this PDT:

[Motion 18] (Motion passed, See 11-20/1874r40)

**Move to add the following to 11bf SFD:**

The 11bf amendment defines an optional threshold-based measurement and reporting procedure in which

* The difference between the current measured CSI and the previous measured CSI is quantified. The difference is referred to as CSI variation.
* A threshold value to be used by the sensing receiver in the threshold-based procedure is defined.
* By comparing the CSI variation with the threshold, the sensing receiver can send a feedback resulting from the large CSI variation to the sensing transmitter.
* Whether the threshold is predefined, or defined by the sensing receiver, transmitter, initiator or responder is TBD.
* The threshold-based procedure is not always required (Procedure A in 21/0351r5 is not always required).

[Motion 33] (Motion passed, See 11-20/1874r40)

**Move to add the following to 11bf SFD:**

In the threshold-based measurement instance, the threshold for each responder to be compared with the CSI variation value is determined by the initiator.

# Discussion

[SP 3 in 11-21/1364r4 recorded by the Minutes 11-21/1674r5, Page 6] (SP result: Y/N/A: 23/7/16)

**Do you agree that in the threshold-based scheme:**

* The initiator sends the thresholds to the responders (Which frame transmits the threshold is TBD).
* The responders feed back the CSI variation to the initiator in the Feedback Response frame.
* The initiator shall not send a Feedback Trigger frame to a responder that reports a CSI variation that is less than the threshold.
* The initiator should send a Feedback Trigger frame to a responder that reports a CSI variation that is greater than or equal to the threshold.
* The above procedure is applicable to TB based sensing measurement instance.
* Incorporate the figure in slide 13 of 11-21/1364r5 into the SFD.
* Note: The “Feedback” frame shown in the figure should be “Measurement report” frame.

**NOTE:**

1. The words highlighted in blue in the proposed text are added to make the threshold-based sensing procedure reasonable and understandable.
2. The words without an additional color in the proposed text reflect the above two motions (Motion 18 and Motion 33).
3. The words highlighted in yellow in the proposed text indicate TBD.

***Editing instructions formatted like this are intended to be copied into the TGbf Draft (i.e., they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGbf Editor: Editing instructions preceded by “TGbf Editor” are instructions to the TGbf editor to modify existing material in the TGbf draft. As a result of adopting the changes, the TGbf editor will execute the instructions rather than copy them to the TGbf Draft.***

*Updates in r3 compared with r2:*

1. The subclause name is changed into “Threshold-based reporting phase”.
2. Change the name “selection procedure” into “CSI variation reporting subphase.
3. Change the name “measurement report procedure” into “measurement reporting subphase”.
4. The first paragraph is updated according to the above changes.
5. Add one sentence in the second paragraph: “whether the CSI variation feedback value is an immediate or delayed feedback value is TBD”. (This was suggested by some people)

*Updates in r4 compared with r3:*

* + - 1. Editorial change in the 4th paragraph. (Add “if” to combine the two separated sentences)

# Proposed Text for D0.1

***TGbf editor: Add a new subclause 11.21.x.y.z (Threshold-based reporting phase) under clause 11.21.x.y ((TB sensing measurement instance: Reporting)) as follows:***

11.21.x.y.z Threshold-based reporting phase

The threshold-based reporting is optional and applicable to the TB sensing measurement instance where a sensing initiator is a sensing transmitter (Whether the threshold-based reporting is applicable to other cases is TBD). The threshold-based reporting phase in a measurement instance includes a CSI variation reporting subphase and possibly a measurement reporting subphase. The measurement reporting subphase includes only the sensing receivers that report their CSI variation value greater than or equal to the CSI variation threshold assigned to them.

The CSI variation indicates the quantified difference between the current measured CSI and the previous measured CSI at a sensing receiver. The details of how to calculate and quantify the CSI variation at the sensing receivers are TBD. Whether the CSI variation feedback value is an immediate or delayed feedback value is TBD.

The threshold for each responder to be compared with the CSI variation value is determined by the sensing initiator, and is transmitted to each sensing receiver through a TBD frame. Different sensing receivers may have different threshold values set by the sensing initiator.

When negotiated, the AP initiator shall transmit a Sensing Trigger frame A in the CSI variation reporting subphase to the non-AP STA responder that supports the threshold-based reporting to obtain the CSI variation feedback value. The non-AP STA that supports the threshold-based reporting shall transmit a Frame B containing the CSI variation feedback value in the assigned RU in the CSI variation reporting subphase.

In the measurement reporting subphase, if the CSI variation feedback value received by the AP initiator from the non-AP STA is greater than or equal to the threshold, the AP should transmit a Sensing Trigger Frame C to the non-AP STA SIFS after the reception of the Frame B sent by the non-AP STA; otherwise, the AP initiator shall not send a Sensing Trigger Frame C to the non-AP STA. The non-AP STA that provided the CSI variation feedback value greater than or equal to the threshold shall transmit the Sensing Measurement Report frame to the AP initiator in the assigned RU when triggered by a Sensing Trigger Frame C sent by the AP initiator.

An example of the threshold-based reporting phase is shown in Figure xx1.



**Figure xx1. Threshold-based reporting phase in a sensing measurement instance (example)**

NOTE: The names of Sensing Trigger frame A, Frame B and Sensing Trigger frame C are TBD.