### **IEEE P802.11 Wireless LANs**

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| PDT Sensing NDPA Frame Format | | |
| Date: 2022-09-29 | | |
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**Introduction**

This document provides proposed draft text for IEEE 802.11bf D0.3.

The following Straw-polls in 22/1654r1 apply to this PDT:

(Straw-poll 1-1) Do you agree to indicate the TX Power Control in the TB case of the Special STA Info Field with AID 2045 of Sensing NDPA ? - R2I NDP Target RSSI subfield is Reserved

Unanimously supported

(Straw-poll 1-2) How many bits do you prefer for the Measurement Set-up ID?

* Option 1: 3 bits
* Option 2: 4 bits
* Option 3: 1 byte

Option 1: 12

Option 2: 7

Option 3: 1

Abs: 7

No answer: 6

(Straw-poll 1-3) Do you agree to indicate the Measurement Set-up (MS) ID and Sensing indications in the Special STA Info Field of Sensing NDPA for sub-7 GHz?

* + B28 to B30 are used for the indication of Measurement Set-up ID
  + B31 is used to indicate the Sensing NDPA
  + AID for Special STA Info Field is 2045
  + The length of MS ID in the MS Request Frame will be aligned later

Unanimously supported

(Straw-poll 3) Which one of the followings do you prefer?

* + Option 1: Disallow the Partial BW Feedback in the Sensing NDPA
    - The Operation BW of each responder should be aligned with the BW of EHT NDP PPDU (which is 320 MHz)
    - LTF Offset subfield of Ranging NDPA shall be set to “Reserved”
  + Option 2: Allow only the same Partial BW Feedback patterns for 320 MHz of the EHT NDPA in the Sensing NDPA
    - LTF Offset subfield of Ranging NDPA shall be repurposed for the Partial BW Feedback
    - B11 to B16 of the STA Info Field are used for this indication

Option 1 : 14

Option 2 : 12

Remaining votes are Abs

***TGbf editor: Please change Clause 9.3.1.19 as follows:***

*Change the title of the subclause 9.3.1.19 as follows:*

* + - 1. HT/HE/Ranging/Sensing/EHT NDP Announcement frame format

*Change the following paragraph as follows:*

The NDP Announcement frame has four variants, the VHT NDP Announcement frame, the HE NDP Announcement frame, the Ranging/Sensing NDP Announcement frame, and the EHT NDP Announcement frame. The four formats are distinguished by the setting of the NDP Announcement Variant subfield in the Sounding Dialog Token field. The Ranging and Sensing NDP Announcement frames are distinguished by an additional indication in the Special STA Info field. The Special STA Info field is always present in a Sensing NDP Announcement frame and its AID11 subfield is equal to 2045, while the NDP Announcement frame with the Special STA Info field is not sent in the TB Ranging exchange. The Special STA Info field shall be placed at the start of the list of STA Info fields in a Sensing NDP Announcement frame.

*Change the following paragraph as follows:*

The Duration field is set as defined in 9.2.5 (Duration/ID field (QoS STA)).

The NDP Announcement frame contains at least one STA Info field. If the NDP Announcement frame contains only one STA Info field with AID/RSID equal or less than 2007, then in the case of VHT, HE or EHT NDP Announcement frames the RA field is set to the address of the STA that can provide feedback (see 10.37.5.2 (Rules for VHT sounding protocol sequences), 26.7 (HE sounding operation), 35.7 (EHT sounding operation)), In the case of Ranging/Sensing NDP Announcement frames, the RA address is set to the address of the RSTA or ISTA that is the intended recipient of the frame. If the NDP Announcement frame contains more than one STA Info field with AID/RSID equal or less than 2007, then the RA field is set to the broadcast address.

The TA field is set to the address of the STA transmitting the NDP Announcement frame or the bandwidth signaling TA of the STA transmitting the NDP Announcement frame. In an EHT NDP Announcement frame transmitted by an EHT STA that is a STA 6G with 320 MHz bandwidth support in a non-HT or non-HT duplicate format and where the scrambling sequence and SERVICE field carry the TXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT, the TA field is set to a bandwidth signaling TA. In an NDP Announcement frame transmitted by a VHT STA, a HE STA, an EHT STA that is not a STA 6G or an EHT STA that is a STA 6G without 320 MHz bandwidth support in a non-HT or non-HT duplicate format and where the scrambling sequence carries the TXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT, the TA field is set to a bandwidth signaling TA. If a Ranging/Sensing NDP Announcement frame is addressed to a set of ISTAs/sensing responders in which at least two ISTAs/sensing responders have a TB ranging/sensing measurement exchange with a different BSSID in the Multiple BSSID set of the RSTA/sensing initiator then the TA field is the transmitted BSSID.

*Change the following Table as below:*

The setting of the NDP Announcement Variant subfield in the Sounding Dialog Token field identifies the variant of the NDP Announcement frame, refer to Table 9-42a (NDP Announcement frame variant encoding).

Table 9-42a—NDP Announcement frame variant encoding

|  |  |  |
| --- | --- | --- |
| NDP Announcement Variant subfield | | NDP Announcement frame variant |
| B1 | B0 |
| 0 | 0 | VHT NDP Announcement frame |
| 0 | 1 | Ranging/Sensing NDP Announcement frame |
| 1 | 0 | HE NDP Announcement frame |
| 1 | 1 | EHT NDP Announcement frame |

*Change the following paragraph as follows:*

The Ranging/Sensing NDP Announcement frame uses the same Frame Control subtype as the VHT NDP Announcement frame. The frame format of the Ranging NDP Announcement frame is the same as the HE NDP Announcement frame shown in Figure 9.61a (HE NDP Announcement frame format). The frame format of the Sensing NDP Announcement frame follows the format of the Ranging NDP Announcement frame in principle except for a Special STA Info field whose AID11 subfield is equal to 2045, always being present in the Sensing NDP Announcement frame.

*Change the following paragraph as follows:*

The Sounding Dialog Token Number subfield in the Sounding Dialog Token (SDT) field contains a value in the range of 0 to 63, which identifies the Measurement Sounding phase that this transmitted Ranging/Sensing NDP Announcement frame is part of; see 11.21.6.4.3 (TB ranging measurement exchange), ~~and~~ 11.21.6.4.4 (Non-TB ranging measurement exchange), TBD (TB sensing measurement instance), and TBD (Non-TB sensing measurement instance).

The format of the STA Info field in a Ranging/Sensing NDP Announcement frame, when the AID11 subfield is equal to or less than 2007, is defined in Figure 9-61da (STA Info field format in a Ranging/Sensing NDP Announcement frame when the AID11 subfield is equal to or less than 2007). The LTF Offset subfield in Figure 9-61da is set to Reserved (TBD) in a Sensing NDP Announcement frame.

*Change the following figure for Figure 9-61da (STA Info field format in a Ranging/Sensing NDP Announcement frame when the AID11 subfield is equal to or less than 2007).*

AID11

Disambig

-uation

B0

B11

B31

B10

B16

B19

B26

B27

11

6

1

3

1

B17

B20

B22

B23

B25

B28

B30

LTF Offset /

Reserved

3

3

3

1

R2I NSTS /

SR2SI NSTS

R2I Rep /

SR2SI Rep

I2R NSTS /

SI2SR NSTS

Reserved

Reserved

I2R Rep /

SI2SR Rep

Bits:

I*nsert the following figure after Figure 9-61da – STA Info field format in a Ranging NDP Announcement frame when the AID11 subfield is equal to or less than 2007:*

B0

B11

B10

B16

B19

B26

B27

B28

B30

SI2SR NSTS

Reserved

SI2SR Rep

SR2SI Rep

SR2SI NSTS

Reserved

AID11

Disambig

-uation

B31

B17

B20

B22

B23

B25

Reserved

11

6

1

3

1

3

3

3

1

Bits:

Figure 9-xx STA Info field format in a Sensing NDP Announcement frame when the AID11 subfield is equal to or less than 2007

*Change the following paragraph as follows:*

A Ranging/Sensing NDP Announcement frame contains one STA Info field with an AID11 subfield equal to or less than 2007 per STA that is addressed to receive this frame.

In the case of the non-TB ranging measurement exchange, see 11.22.6.4.4 (Non-TB ranging measurement exchange) and for the non-TB sensing measurement instance, see TBD (Non-TB sensing measurement instance). There is always only one intended receiver and the RA field is set to the address of that STA.

In the case of the TB ranging measurement exchange, see 11.22.6.4.3 (TB ranging measurement exchange) and for the TB sensing measurement instance, see TBD (TB sensing measurement instance), the RA field is set to the broadcast address if more than one STA is addressed to receive this frame; otherwise the RA field is set to the address of the STA that is addressed to receive this frame.

If the AID11 subfield is equal to or less than 2007, it identifies a STA that is addressed to receive this frame and assigns the parameters within this STA Info field to this STA. In case of the TB ranging measurement exchange, see 11.22.6.4.3 (TB ranging measurement exchange) and for the TB sensing measurement instance, see TBD (TB sensing measurement instance), the AID11 subfield contains the 11 least significant bits of the AID of an associated STA, or the RSID of an unassociated STA, when it is expected to process the following NDP. In the case of the non-TB ranging measurement exchange, see 11.22.6.4.4 (Non-TB ranging measurement exchange) and for the non-TB sensing measurement instance, see TBD (Non-TB sensing measurement instance), the intended receiver is identified by the RA field and the AID11 subfield is set to 0.

When used as part of the TB ranging measurement exchange, see 11.21.6.4.3 (TB ranging measurement exchange), the LTF Offset, R2I NSTS and R2I Rep subfields are used to indicate the following R2I NDP’s HE-LTF configuration; see 27.3.18a.1 (HE Ranging NDP); While the I2R NSTS and the I2R Rep subfields are reserved. When used as part of the TB sensing measurement instance, see TBD (TB sensing measurement instance), for the Bandwidth of NDP Announcement frame less than or equal to 160 MHz, the SI2SR NSTS and SI2SR Rep subfields are used to indicate the following SI2SR NDP’s HE-LTF configuration; see TBD (HE Ranging/Sensing NDP); while the SR2SI NSTS and the SR2SI Rep subfields are reserved. For the Bandwidth of NDP Announcement equal to 320 MHz, the SI2SR NSTS subfield is used to indicate the following SI2SR NDP’s number of spatial streams; The SI2SR Rep, the SR2SI NSTS and the SR2SI Rep subfields are set to Reserved.

When used as part of the non-TB ranging measurement exchange, the I2R NSTS and I2R Rep subfields are used to indicate the following I2R NDP’s HE-LTF configuration, 27.3.18a.1 (HE Ranging NDP), while the R2I NSTS and R2I Rep subfields indicate the HE-LTF configuration of the R2I NDP sent in response by the RSTA, see 11.21.6.4.4 (Non-TB ranging measurement exchange). When used as part of the non-TB sensing measurement instance, for the Bandwidth of NDP Announcement frame less than or equal to 160 MHz, the SI2SR NSTS and SI2SR Rep subfields are used to indicate the following SI2SR NDP’s HE-LTF configuration, 27.3.18a.1 (HE Ranging/Sensing NDP), while the SR2SI NSTS and SR2SI Rep subfields indicate the HE-LTF configuration of the SR2SI NDP sent in response by the RSTA/sensing responder, see 11.21.6.4.4 (Non-TB ranging/sensing measurement exchange). ~~For the Bandwidth of NDP Announcement frame equal to 320 MHz, when used as part of the non-TB sensing measurement instance, the SI2SR NSTS subfield is used to indicate the following SI2SR NDP’s number of spatial streams, while the SR2SI NSTS indicates the number of spatial streams of the SR2SI NDP sent in response by the sensing responder. The SI2SR Rep subfield or the SR2SI Rep subfield is reserved for the Bandwidth of NDP Announcement frame equal to 320 MHz.~~

*Change the following paragraph as follows:*

The R2I Rep and I2R Rep subfields are set to the number of HE-LTF repetitions of the corresponding HE Ranging NDP minus 1; see 27.3.18a.1 (HE Ranging NDP). If the I2R and R2I Rep subfields have a value equal to 0, then there is no HE-LTF repetition in the I2R and R2I NDP respectively. For the Bandwidth of NDP Announcement frame less than or equal to 160 MHz, the SR2SI Rep and SI2SR Rep subfields are set to the number of HE-LTF repetitions of the corresponding HE Ranging/Sensing NDP minus 1; see 27.3.18a.1 (HE Ranging/Sensing NDP). If the SI2SR and SR2SI Rep subfields have a value equal to 0, then there is no HE-LTF repetition in the SI2SR and SR2SI NDP subfields respectively. When used as part of the TB sensing measurement instance, for the bandwidth of NDP Announcement frame equal to 320 MHz, both the SI2SR Rep and the SR2SI Rep subfields are reserved.

*Change the following paragraph as follows:*

The format of the STA Info field with AID11 subfield equal to 2045 is shown in Figure 9-61dd (STA Info field format in a Ranging/Sensing NDP Announcement frame if the AID subfield is 2045).

I*nsert the following figure after Figure 9-61dd – STA Info field in a Ranging NDP Announcement frame if the AID11 subfield is 2045:*

AID:

2045

SI2SR NDP

TX Power

SR2SI NDP

Target RSSI

Disambiguation

Measurement

Set-up ID

B0

B11

B31

B10

B18

B19

B26

B27

B28

Bits:

11

8

8

1

B30

Sensing

3

1

Figure 9-xx Special STA Info field in a Sensing NDP Announcement frame if the AID11 subfield is equal to 2045

*Change the following paragraph as follows:*

The Special STA Info field with AID11 subfield equal to 2045, is used in the non-TB ranging measurement exchange, 11.21.6.4.4 (Non-TB ranging measurement exchange) and in the non-TB sensing measurement instance, TBD (Non-TB sensing measurement instance), to carry the SI2SR NDP Tx Power and SR2SI NDP Target RSSI subfields.

The Special STA Info field with AID11 subfield equal to 2045, is used in the TB sensing measurement instance, TBD (TB sensing measurement instance) to carry the SI2SR NDP Tx Power, while the SR2SI NDP Target RSSI subfield is reserved.

The Special STA Info field with AID11 subfield equal to 2045, is always present in the Sensing NDP Announcement frame.

In the Special STA Info field with AID11 subfield equal to 2045, B28 to B30 are set to the Measurement Set-up ID in the Sensing NDP Announcement frame (Figure xxx special AID 2045 for Sensing NDP Announcement frame), otherwise set to reserved when sent in the Ranging NDP Announcement frame (Figure xxx special AID 2045 for Ranging NDP Announcement frame) and Bit B31 is set to 1 to indicate the presence of Sensing NDP Announcement frame (Figure xxx special AID 2045 for Sensing NDP Announcement frame) and is set to 0 to indicate the presence of Ranging NDP Announcement frame ((Figure xxx special AID 2045 for Ranging NDP Announcement frame)).