IEEE P802.11
Wireless LANs

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| Proposed Draft Text for NSEP Priority Access  |
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**Abstract**

**This document proposes text to address the following TBDs from Clause 35.10.3 in Draft D0.3**

If the negotiation to enable NSEP priority access between an AP STA and a non-AP STA is successful, then both the AP STA and the non-AP STA shall apply NSEP priority access to NSEP traffic using a TBD procedure. The AP shall ensure that only authorized non-AP STAs can invoke NSEP priority access. An AP STA may apply NSEP priority access to NSEP traffic using the same TBD procedure prior to completion of the negotiation to enable NSEP priority access.

Additional details regarding NSEP priority access operation between non-AP MLD and AP MLD is TBD.

Revisions:

- Rev 0: Initial version of the document.

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGbe Draft. This introduction is not part of the adopted material.

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

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

**35.10.3 NSEP priority access procedure**

***TGbe Editor: Please modify the text as shown.***

If the negotiation to enable NSEP priority access between an AP MLD and a non-AP MLD or EHT non-AP STA is successful, then both the AP MLD and the non-AP MLD or EHT non-AP STA shall apply NSEP priority access to NSEP traffic using ~~a TBD~~ the procedure described below. While an AP MLD or non-AP MLD is enabling NSEP priority access, the AP MLD or non-AP MLD shall perform the procedure described below with each of its affiliated APs or EHT non-AP STAs, respectively.

The AP MLD shall ensure that only authorized non-AP MLDs or EHT non-AP STAs can invoke NSEP priority access. An AP MLD ~~STA~~ may apply NSEP priority access to NSEP traffic using the ~~same~~ ~~TBD~~ procedure described below prior to completion of the negotiation to enable NSEP priority access.

An NSEP AP MLD is an AP MLD where the affiliated APs have a value of true for dot11EHTNSEPPriorityAccessActivated.

An NSEP EHT non-AP STA is an EHT non-AP STA, whether or not affiliated with an MLD, which has a value of true for dot11EHTNSEPPriorityAccessActivated.

**35.10.3.1 EDCA Operation using NSEP EDCA parameters**

When NSEP priority access is not enabled, APs affiliated with NSEP AP MLDs and NSEP EHT non-AP STAs use the baseline EDCA parameters for channel access.

As part of the NSEP priority access procedure, an AP affiliated with an NSEP AP MLD or an NSEP EHT non-AP STA shall manage their EDCA Parameter Sets as follows:

* During the process of enabling NSEP priority access, an AP affiliated with an NSEP AP MLD or an NSEP EHT non-AP STA shall update its CWmin[AC], CWmax[AC], AIFSN[AC] and TXOP[AC] state variables to the values contained in dot11NSEPEDCATable.
* While NSEP priority access is enabled, if MU EDCA (see 26.2.7 (EDCA Operation using MU EDCA parameters)) is triggered at an NSEP EHT non-AP STA, the NSEP EHT non-AP STA shall update its CWmin[AC], CWmax[AC], AIFSN[AC] and MUEDCATimer[AC] state variables to the values contained in dot11NSEPMUEDCATable for all the ACs from which at least one QoS Data frame was transmitted successfully in an EHT TB PPDU in response to the Trigger frame.
	+ If an MU EDCA Timer [AC] expires or is reset while NSEP priority access is enabled, the NSEP EHT non-AP STA shall change the CWmin[AC], CWmax[AC], AIFSN[AC], and TXOP[AC] state variables to the values contained in dot11NSEPEDCATable.
* During the process of disabling NSEP priority access, an AP affiliated with an NSEP AP MLD or an NSEP EHT non-AP STA shall update its CWmin[AC], CWmax[AC], AIFSN[AC] and TXOP[AC] state variables to the values from dot11EDCATable.

An AP affiliated with an NSEP AP MLD shall include NSEP EDCA Parameter Set element (see 9.4.2.XX1 (NSEP EDCA Parameter Set element)) and the NSEP MU EDCA Parameter Set element (see 9.4.2.XX2 (NSEP MU EDCA Parameter Set element)) in an Association Response frame sent to an NSEP EHT non-AP STA that is authorized for NSEP priority access, as described in 35.10 (NSEP priority access). An AP affiliated with an NSEP AP MLD may change the NSEP EDCA access parameters by changing the NSEP EDCA Parameter Set element or the NSEP MU EDCA Parameter Set element in the Beacon frame, Probe Response frame, and (Re)Association Response frame. However, an AP affiliated with an NSEP AP MLD should change them only rarely. An AP affiliated with an NSEP AP MLD shall include the NSEP EDCA Parameter Set element and the NSEP MU EDCA Parameter Set element in Beacon frames and Probe Response frames only when at least one NSEP EHT non-AP STA is associated with the AP affiliated with the NSEP AP MLD. An NSEP EHT non-AP STA shall use the EDCA Parameter Set Update Count Value subfield in the QoS Capability element of all Beacon frames to determine whether the NSEP EHT non-AP STA is using the current EDCA Parameter Values, including the NSEP EDCA access parameters. If the EDCA Parameter Set update count value in the QoS Capability element is different from the value that has been stored, the NSEP EHT non-AP STA shall query for the updated EDCA parameter values by sending a Probe Request frame to the AP affiliated with an NSEP AP MLD.

An NSEP EHT non-AP STA shall update the dot11NSEPEDCATable and dot11NSEPMUEDCATable that correspond to fields in an NSEP EDCA Parameter Set element or an NSEP MU EDCA Parameter Set element within an interval of time equal to one beacon interval after receiving an updated NSEP EDCA or NSEP MU EDCA parameter set from its associated AP. When updating its MIB attributes, an NSEP EHT non-AP STA stores the value of the EDCA Parameter Set Update Count subfield in the QoS Info field of the received NSEP EDCA Parameter Set element or NSEP MU EDCA Parameter Set element.

~~Additional details regarding NSEP priority access operation between non-AP MLD and AP MLD is TBD.~~

**9.3.3 Management frames**

**9.3.3.2 Beacon frame format**

***TGbe Editor: Change the following rows in Table 9-32 (Beacon frame body) maintaining row order:***

**Table 9-32—Beacon frame body**

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| 20  | QoS Capability | The QoS Capability element is present if dot11QosOptionImplementedis true, and dot11MeshActivated is false, and ~~neither~~ none of the following are present: the EDCA Parameter Set element, ~~nor~~ the MU EDCA Parameter Set element, the NSEP EDCA Parameter Set element or the NSEP MU EDCA Parameter Set element ~~are present~~; otherwise it is not present. |
| <ANA> | NSEP EDCA Parameter Set Element | The NSEP EDCA Parameter Set element is present if dot11EHTOptionImplemented is true, dot11MeshActivated is false, dot11EHTNSEPPriorityAccessActivatedis true, and the QoS Capability element is notpresent; otherwise it is not present |
| <ANA> | NSEP MU EDCA Parameter Set Element | The NSEP MU EDCA Parameter Set element is present if dot11EHTOptionImplemented is true, dot11MeshActivated is false, dot11EHTNSEPPriorityAccessActivatedis true, and the QoS Capability element is notpresent; otherwise it is not present |

***TGbe Editor: Add the following rows to Table 9-35 (Association Response frame body):***

**Table 9-35—Association Response frame body**

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| <ANA> | NSEP EDCA Parameter Set Element | The NSEP EDCA Parameter Set element is present if dot11EHTOptionImplemented is true,dot11EHTNSEPPriorityAccessActivatedis true; otherwise it is not present |
| <ANA> | NSEP MU EDCA Parameter Set Element | The NSEP MU EDCA Parameter Set element is present if dot11EHTOptionImplemented is true,dot11EHTNSEPPriorityAccessActivatedis true; otherwise it is not present |

***TGbe Editor: Add the following rows to Table 9-37 (Reassociation Response frame body):***

**Table 9-37—Reassociation Response frame body**

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| <ANA> | NSEP EDCA Parameter Set Element | The NSEP EDCA Parameter Set element is present if dot11EHTOptionImplemented is true,dot11EHTNSEPPriorityAccessActivatedis true; otherwise it is not present |
| <ANA> | NSEP MU EDCA Parameter Set Element | The NSEP MU EDCA Parameter Set element is present if dot11EHTOptionImplemented is true,dot11EHTNSEPPriorityAccessActivatedis true; otherwise it is not present |

***TGbe Editor: Add the following rows to Table 9-39 (Probe Response frame body):***

**Table 9-39—Probe Response frame body**

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| <ANA> | NSEP EDCA Parameter Set Element | The NSEP EDCA Parameter Set element is present if dot11EHTOptionImplemented is true,dot11EHTNSEPPriorityAccessActivatedis true; otherwise it is not present |
| <ANA> | NSEP MU EDCA Parameter Set Element | The NSEP MU EDCA Parameter Set element is present if dot11EHTOptionImplemented is true,dot11EHTNSEPPriorityAccessActivatedis true; otherwise it is not present |

**9.4.1.17 QoS Info field**

***TGbe Editor: Change the 3rd paragraph from 802.11ax as follows:***

The EDCA Parameter Set Update Count subfield indicates changes in ~~when~~ the EDCA parameters ~~and~~, for an HE BSS, the MU EDCA parameters ~~have changed~~ (see 10.2.3.2 (HCF contention based channel access (EDCA)), or for an EHT BSS the NSEP EDCA parameters or NSEP MU EDCA parameters (see 35.10.3 (NSEP priority access procedure)).

**9.4.2 Elements**

**9.4.2.1 General**

***TGbe Editor: Insert the following rows into Table 9-92 (Element IDs) from 802.11ax and update Reserved rows as appropriate:***

**Table 9-92—Element IDs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Element** | **Element ID** | **Element ID Extension** | **Extensible** | **Fragmentable** |
| NSEP EDCA Parameter Set Element | 255 | <ANA> | Yes | No |
| NSEP MU EDCA Parameter Set Element | 255 | <ANA> | Yes | No |

**9.4.2.28 EDCA Parameter Set element**

***TGbe Editor: Change the note after the 4th paragraph in 802.11ax as follows:***

NOTE—The QoS Info field contains the EDCA Parameter Set Update Count subfield, which indicates when any of the EDCA parameters have changed, including the EDCA parameters ~~and~~, for an HE BSS, the MU EDCA parameters ~~have changed~~ (see 10.2.3.2 (HCF contention based channel access (EDCA))), and for EHT BSS, the NSEP EDCA parameters or the NSEP MU EDCA parameters (see 35.10.3 (NSEP priority access procedure)).

***TGbe Editor: Add the following two subclauses to clause 9.4.2 in 802.11ax***

**9.4.2.XX1 NSEP EDCA Parameter Set element**

An AP affiliated with an NSEP AP MLD uses the NSEP EDCA Parameter Set element to control the use of EDCA by EHT non-AP STAs when NSEP priority access is enabled, as defined in 35.10.3 (NSEP priority access procedure). The EHT non-AP STA uses the most recently received NSEP EDCA Parameter Set element to update the appropriate MIB values. The format of the NSEP EDCA Parameter Set element is defined in Figure 9-XXXa (NSEP EDCA Parameter Set element format).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Element ID | Length | Element ID Extension | QoS Info | NSEP AC\_BE Parameter Record | NSEP AC\_BK Parameter Record | NSEP AC\_VI Parameter Record | NSEP AC\_VO Parameter Record |
| 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 |

**Figure 9-XXXa—NSEP EDCA Parameter Set element format**

The Element ID, Length, and Element ID Extension fields are defined in 9.4.2.1 (General).

The format of the QoS Info field is defined in 9.4.1.17 (QoS Info field) when sent by an AP affiliated with an NSEP AP MLD.

NOTE—The QoS Info field contains the EDCA Parameter Set Update Count subfield, which indicates when any of the EDCA parameters have changed, including the EDCA parameters, for an HE BSS, the MU EDCA parameters (see 10.2.3.2 (HCF contention based channel access (EDCA))), and for EHT BSS the NSEP EDCA parameters or the NSEP MU EDCA parameters (see 35.10.3 (NSEP priority access procedure)).

The format of the NSEP AC\_BE, NSEP AC\_BK, NSEP AC\_VI, and NSEP AC\_VO Parameter Record fields are identical and defined in Figure 9-XXXb (NSEP AC Parameter Record field format).

|  |  |  |
| --- | --- | --- |
| ACI/AIFSN | ECWmin/ ECWmax | TXOP Limit |
| 1 | 1 | 2 |

**Figure 9-XXXb—NSEP AC Parameter Record field**

The format and definition of ACI/AIFSN, ECWmin/ ECWmax and TXOP Limit value are identical to those defined in 9.4.2.28 (EDCA Parameter Set element).

**9.4.2.XX2 NSEP MU EDCA Parameter Set element**

The NSEP MU EDCA Parameter Set element is used by an AP affiliated with an NSEP AP MLD to control the use of EDCA by EHT non-AP STAs that have NSEP priority access enabled following particular HE TB PPDU transmissions, as defined in 26.2.7 (EDCA operation using MU EDCA parameters). The most recent NSEP MU EDCA Parameter Set element received by an EHT non-AP STA is used to update the appropriate MIB values when NSEP priority access is enabled.

The format of the NSEP MU EDCA Parameter Set element is defined in Figure 9-XXXc (NSEP MU EDCA Parameter Set element format).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Element ID | Length | Element ID Extension | QoS Info | NSEP MU AC\_BE Parameter Record | NSEP MU AC\_BK Parameter Record | NSEP MU AC\_VI Parameter Record | NSEP MU AC\_VO Parameter Record |
| 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 |

***Figure 9-XXXc—NSEP MU EDCA Parameter Set element format***

The Element ID, Length, and Element ID Extension fields are defined in 9.4.2.1 (General).

The format of the QoS Info field is defined in 9.4.1.17 (QoS Info field) when sent by the AP affiliated with an MLD.

NOTE—The QoS Info field contains the EDCA Parameter Set Update Count subfield, which indicates when any of the EDCA parameters have changed, including the EDCA parameters, for an HE BSS, the MU EDCA parameters (see 10.2.3.2 (HCF contention based channel access (EDCA))), and for EHT BSS the NSEP EDCA parameters or the NSEP MU EDCA parameters (see 35.10.3 (NSEP priority access procedure)).

The format of the NSEP MU AC\_BE, NSEP MU AC\_BK, NSEP MU AC\_VI, and NSEP MU AC\_VO Parameter Record fields are identical and defined in Figure 9-XXXd (NSEP MU AC Parameter Record field format).

|  |  |  |
| --- | --- | --- |
| ACI/AIFSN | ECWmin/ ECWmax | MU EDCA Timer |
| 1 | 1 | 2 |

**Figure 9-XXXd—NSEP MU AC Parameter Record field**

The format and definition of ACI/AIFSN, ECWmin/ ECWmax and MU EDCA Timer value are identical to those defined in 9.4.2.251 (MU EDCA Parameter Set element).

**10.2.3.2 HCF contention based channel access (EDCA)**

***TGbe Editor: Extend the fifth paragraph in 802.11ax as shown:***

An HE AP can additionally provide MU EDCA parameters for non-AP HE STAs as defined in 26.2.7 (EDCA operation using MU EDCA parameters). An AP affiliated with an NSEP AP MLD can optionally provide NSEP EDCA parameters and NSEP MU EDCA parameters for non-AP STAs as defined in 35.10.3.1 (EDCA Operation using NSEP EDCA parameters).

**10.23.2.2 EDCA backoff procedure**

***TGbe Editor: Extend the Note at the end of the sub clause in 802.11ax as follows:***

NOTE—An HE STA updates its local MIB variables related to CWmin and CWmax as defined in 26.2.7 (EDCA operation using MU EDCA parameters). An EHT non-AP STA with NSEP priority access enabled updates its local MIB variables related to CWmin and CWmax as defined in 35.10.3 (NSEP priority access procedure).

**11.1.4.3.11 Enhanced FILS active scanning to preferred AP**

***TGbe Editor: Add the following to the bulleted list before “Vendor Specific element” in 802.11ax.***

* NSEP EDCA Parameter Set element
* NSEP MU EDCA Parameter Set element

**11.2.3.15 TIM Broadcast**

***TGbe Editor: Add the following to the end of the list after the third paragraph in 802.11ax:***

 s) Modification of the NSEP EDCA Parameter Set element

 t) Modification of the NSEP MU EDCA Parameter Set element

**26.8.2 Individual TWT agreements**

***TGbe Editor: Please revise the following NOTE in 802.11ax as shown:***

NOTE—The TWT requesting STA decides which frames to transmit within or outside a TWT SP and while it is recommended that the TWT requesting STA not transmit using EDCA within or outside TWT SPs the TWT requesting STA might still do so. If the STA decides to transmit then the STA might contend for access to the medium as defined in 10.23.2 (HCF contention based channel access (EDCA)), ~~and in~~ 26.2.7 (EDCA operation using MU EDCA parameters), and 35.10.3 (NSEP priority access procedure).

**26.8.3.3 Rules for TWT scheduled STA**

***TGbe Editor: Please revise the following NOTE in 802.11ax as shown:***

NOTE—The TWT scheduled STA decides which frames to transmit within or outside a TWT SP and while it is recommended that the TWT scheduled STA not transmit using EDCA within or outside TWT SPs, the TWT scheduled STA might still do so. If the STA decides to transmit then the STA might contend for accessing the medium as defined in 10.23.2 (HCF contention based channel access (EDCA)), ~~and in~~ 26.2.7 (EDCA operation using MU EDCA parameters), and 35.10.3 (NSEP priority access procedure).