IEEE P802.11
Wireless LANs

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| Proposed Draft TextNS/EP Priority Access |
| Date: 2020-9-08 |
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Abstract

This submission proposes draft text to be included in 802.11be Draft 0.1 for the following Topic:

* Priority access support for NS/EP services

This contribution addresses the following motions:

* [Motion 50]
	+ The 802.11be amendment shall define mechanism(s) in support of priority access to a non-AP STA for national security (NS)/emergency preparedness (EP) Priority Service

NOTE – A non-AP STA for NS/EP Priority Service is a regular non-AP STA authorized to NS/EP service.

* [Motion 126, #SP90]
	+ The NS/EP Priority Service if supported by a non-AP STA, shall use an action frame to indicate the need for priority access to its associated AP STA and to be included in Release 1 specification.
* [Motion 131, #SP 207]
	+ The Priority Service Information shall be defined in EHT MAC Capability Information Element to exchange the NS/EP Priority Service capability information between AP STA and non-AP STA

This document is based on IEEE P802.11-REVmd (D4.0).

Revisions:

* Rev 0: Initial version of the document
* Rev 1: Incorporated comments from Editor, Broadcom, Ericsson and Huawei

3. Definitions, Acronyms, and Abbreviations

3.1 Definitions

***TGbe editor: Add a new definition in the appropriate location within subclause 3.1 Definitions, as shown:***

**NSEP Priority Access:** On-demand capability that provides priority treatment of traffic to and from the authorized STAs.

**3.4 Abbreviations and acronyms**

***TGbe editor: Add a new definition in the appropriate location within subclause 3.4 Definitions specific to IEEE Std 802.11, as shown:***

NSEP National Security and Emergency Preparedness

4.5 Overview of the Services

***TGbe editor: Add a new subclause 4.5.x NSEP Priority Access within section 4.5 as follows:***

4.5.x NSEP Priority Access

Existing national security and emergency preparedness (NSEP) communications services in multiple countries provide priority for voice and data exchanges on public networks. The ubiquity and ease of use of Wi-Fi networks makes it desirable to support such NSEP priority communications on these networks as well. NSEP Priority Access is intended to provide capabilities to support such Priority Services on Wi-Fi-based networks.

NSEP Priority Access provides priority to system resource access for authorized users to enhance their probability of successful communication during periods of network congestion. Priority access involves preferential treatment in obtaining channel access and in allocation of network resources. The service is only available to designated, authorized individuals or devices who normally represent a small fraction of the overall user base.

APs that have NSEP Priority Access activated advertise this capability in Beacon and Probe Response frames. Non-AP STAs with NSEP Priority Access activated query APs that advertise NSEP Priority Access to gain additional details prior to association. During Association, APs verify the authority of non-AP STAs to use NSEP Priority Access. This could be accomplished using a subscription service provider’s authorization infrastructure via an SSPN interface. The AP might store the results of this authorization process locally to enable subsequent verification. AP might also use this information to confirm authority during (re)Association.

NSEP Priority Access is not an always-on function, but rather operates in an on-demand fashion. When an authorized user or the managed service provider detects the need for priority, it invokes NSEP Priority Access via a higher layer function within the STA. (Note: Detecting the need for priority is outside the scope of this Standard.)

The non-AP STA requests NSEP Priority Access by sending a request to the AP. The AP confirms the authority of the non-AP STA to use NSEP Priority Access, e.g., using the locally stored verification information or reaching out to NSEP Service Provider via the SSPN interface, and sends a response to the requesting non-AP STA. Alternatively, the AP can enable NSEP Priority Access by sending an unsolicited request to a non-AP STA, and the non-AP STA confirms the request by sending a response. (Note: The means by with the AP determines the need for priority is outside the scope of this Standard.) While NSEP Priority Access is enabled, all traffic to and from the non-AP is provided with preferential treatment. Either the AP or the non-AP STA can disable NSEP Priority Access by sending another request. A STA can use NSEP Priority Access when transmitting an NSEP Priority Access Request and Response frames.

10. MAC sublayer functional description

***TGbe editor: Add a new subclause 10.x.y NSEP Priority Access within section 10 as follows:***

10.x.y NSEP Priority Access

A STA with a value of true for dot11NSEPPriorityAccessActivated shall set to 1 the NSEP Priority Access field of Extended Capabilities elements that it transmits and is called an NSEP STA. If the STA is an AP, the AP is called an NSEP AP.

During the (re) Association process, the AP shall obtain information describing the authority of the non-AP STA to use NSEP Priority Access. This authorization information may be retrieved from a NSEP Service Provider via an SSPN interface. Other methods of obtaining this authorization information are TBD.

An NSEP non-AP STA shall request the use of NSEP Priority Access by transmitting an NSEP Priority Access Request frame [9.6.x.2] with a value of Enable in the Request Type field to an associated NSEP AP when instructed to do so by a higher-layer function. The AP verifies the authority of the non-AP STA to use NSEP Priority Access (Note: The mechanism by which the AP verifies the authority to use NSEP Priority Access is outside the scope of this Standard). If the requesting non-AP STA is verified for NSEP Priority Access, the NSEP AP responds to the request by transmitting an NSEP Priority Access Response Action frame [9.6.x.3] with a value of SUCCESS in the Status Code field. Alternatively, the NSEP AP may instruct the non-AP STA to enable NSEP Priority Access by transmitting an NSEP Priority Access Request frame [9.6.x.2] with the value of Enable in the Request Type field to the STA. (Note: The method by which the AP recognizes that NSEP Priority Access should be enabled for an associated STA is a higher-layer function and is beyond the scope of this Standard). The non-AP STA shall confirm receipt of the NSEP Priority Access Request frame by transmitting an NSEP Priority Access Response frame [9.6.x.3] with a value of SUCCESS in the Status Code field.

If the NSEP Priority Access Response frame transmitted by the AP or the non-AP STA contained a Status Code of SUCCESS, then the AP and non-AP STA shall apply NSEP Priority Access to all MPDUs exchanged between the AP and the non-AP STA. NSEP Priority Access is achieved by transmitting each MPDU using the EDCA category of AC\_VO. APs should give priority to frames transmitted between itself and NSEP non-AP STAs compared to AC\_VO traffic to or from other non-NSEP STAs. Priority Access shall remain in effect until disabled by either the AP or the non-AP STA.

To disable NSEP Priority Access, a non-AP STA shall send an NSEP Priority Access Request frame [9.6.x.2] with the value of DISABLE in the Request Type field to the AP. An AP that receives an NSEP Priority Access Request frame from an associated STA shall transmit an NSEP Priority Access Response frame to the STA. To disable NSEP Priority Access, an AP shall send a Request Action frame [9.6.x.2] with the value of DISABLE in the Request Type field to the non-AP STA. A non-AP STA that received an NSEP Priority Access Request frame shall transmit an NSEP Priority Access Response frame to the AP.

A STA may use NSEP Priority Access when transmitting an NSEP Priority Access Request and Response frames.

* Frame formats
* Status Code field

***TGbe Editor: Add new values to the Status code field in Table 9-50 – Status codes found in subclause 9.4.1.9 Status Code field.***

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| Table 9-50 – Status codes  |
| Status code | Name | Meaning |
|  |  |  |
| <ANA>. | NSEP\_DENIED\_NO\_ASSOCIATION\_EXISTS | NSEP Priority Access denied due to inability to confirm that association exists. |
| <ANA>. | NSEP\_DENIED\_UNAUTHORIZED | NSEP Priority Access denied because the non-AP STA is not authorized to use the service.  |
| <ANA>. | NSEP\_DENIED\_OTHER\_REASON | NSEP Priority Access denied due to reason outside the scope of this standard. |

**9.4.1.11 Action field**

***TGbe editor: Add a new value to the Category field in Table 9-51 – Category values found in subclause 9.4.1.11 Action field.***

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| Table 9-53 – Category values |
| Code | Meaning | See subclause | Robust | Group addressed privacy |
| <ANA>. | NSEP Priority Access | 9.6.x (NSEP Priority Access Action frame details) | Yes |  No  |

***TGbe editor: Add a new bit in the Extended Capabilities element in Table 9-153 – Extended Capabilities field within subclause 9.4.2.26 Extended Capabilities element, as shown, noting that the header row is shown for reference only:***

**9.4.2.26 Extended Capabilities element**

|  |  |  |
| --- | --- | --- |
| **Bit** | **Information** | **Notes** |
| <ANA> | NSEP Priority Access | The STA sets the NSEP Priority Access field to 1 when dot11NSEPPriorityAccessActivated is true, and sets it to 0 otherwise. See 10.x.y (NSEP Priority Access). |

***TGbe editor: Add a new subclause 9.6.x NSEP Priority Access Action frame details within section 9.6 as follows:***

9.6.x NSEP Priority Access Action frame details

**9.6.x.1 General**

Two Action frame formats are defined for NSEP Priority Access. These frames are identified by the single-Octet NSEP Action field, which follows immediately after the Category field. The values of the NSEP Action field are defined in Table 9-XX1 (NSEP Priority Access Action field values).

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| Table 9-XX1 – NSEP Action field values |
| QoS Action fieldvalue | Meaning |
| 0 | Reserved |
| 1 | NSEP Priority Access Request |
| 2 | NSEP Priority Access Response |
| 3-255 | Reserved |

9.6.x.2 NSEP Priority Access Request frame format

The NSEP Priority Access Request frame is transmitted by a requesting STA to request a priority-access related action from another STA. The format of the NSEP Priority Access Request frame Action field is shown in Table 9-XX2 (NSEP Priority Access Request frame Action field format).

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| Table 9-XX2 – NSEP Priority Access Request frame Action field format |
| Order  | Information |
| 1 | Category |
| 2 | NSEP Action |
| 3 | Dialog Token |
| 4 | Request Type |

The Category field is defined in 9.4.1.11 (Action field).

The NSEP Action field is defined in 9.6.x.1 (NSEP Priority Access Action frame details).

The Dialog Token field is defined in 9.4.1.12 (Dialog Token field) and set by the requesting STA.

The NSEP Request Type field specifies the particular action sought by the requesting STA. The format of the NSEP Request Type field is shown in Figure 9-YYY (NSEP Request Type element format). The defined NSEP Request Type values are shown in Table 9-XX3 (NSEP Request Type definitions).

|  |  |
| --- | --- |
|  | NSEP Request Type |
| Octets: | 1 |
| Figure 9-YYY – NSEP Request Type element format |
| Table 9-XX3 – NSEP Request Type definitions |
| Name | Value |
| Reserved | 0 |
| Enable | 1 |
| Disable | 2 |
| Reserved | 3-255 |

9.6.x.3 NSEP Priority Access Response frame format

The NSEP Priority Access Response frame is transmitted in response to a NSEP Priority Access Request frame. The format of the NSEP Priority Access Response frame Action field is shown in Table 9-XX4 (NSEP Priority Access Response frame Action field format).

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| TABLE 9-XX4 – NSEP Priority Access Response frame Action field format  |
| Order  | Information |
| 1 | Category |
| 2 | NSEP Action |
| 3 | Dialog Token |
| 4 | Status Code |

The Category field is defined in 9.4.1.11 (Action field).

The NSEP Action field is defined in 9.6.x.1 (NSEP Priority Access Action frame details).

The Dialog Token field value is copied from the Dialog Token field in the corresponding NSEP Priority Access Request frame.

The Status Code values are defined in Table 9-52 (Status codes).