**IEEE P802.11
Wireless LANs**

|  |
| --- |
| 11bn PDT MAC Dynamic Bandwidth Expansion (DBE) |
| **Date**: March 19, 2025  |
| **Author(s):** |
| **Name** | **Affiliation** | **Address** | **Phone** | **email** |
| Binita Gupta | Cisco Systems |  |  | binitag@cisco.com |
| Malcolm Smith | Cisco Systems |  |  | mmsmith@cisco.com |
| Brian Hart | Cisco Systems |  |  | brianh@cisco.com |
| Gaurang Naik | Qualcomm |  |  |  |
| Abhishek Patil | Qualcomm |  |  |  |
| Mark Rison | Samsung |  |  | m.rison@samsung.com |

 **Abstract**

This document contains Proposed Draft Text (PDT) for the Dynamic Bandwidth Expansion (DBE) feature of 11bn/UHR amendment to the 802.11 standard.

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Revisions based on comments from Mark.

**Introduction**

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. The abstract, revision information, introduction, explanation of the proposed changes and references sections are 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).***

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

**Relevant passing motions:**

[Motion #334, [1]]

**Move to add to the TGbn SFD the following:**

* 11bn defines a mechanism for dynamic bandwidth expansion (DBE) that enables a UHR AP to modify (expand/reset) its Dynamic UHR operating BSS bandwidth for UHR STAs that support the DBE operation
	+ The dynamic bandwidth change is signaled using management frames and is announced for multiple beacon intervals in advance, and the AP shall stay on the expanded bandwidth until a subsequent dynamic bandwidth change occurs
	+ The primary channel does not change as part of the dynamic BW expansion.
	+ TBD on DBE signaling details

**Text to be adopted begins here.**

* UHR Capabilities element
* General
* UHR MAC Capabilities Information field

***TGbn editor: Please update UHR MAC Capabilities in 11bn D0.1 to add DBE Support field as below***

The format of the UHR MAC Capabilities Information field is defined in Figure 9-aa5 (UHR MAC Capabilities Information field format). [TBD]

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B4 | B5 |  B6 | B7 Bx |
|  | DPS Support | DPS Assisting Support | Multi-Link Power Management | NPCA Supported | BSR Enhancement Support | DBE Support | Reserved |
| Bits: | 1 | 1 | 1 | 1 | 1 | 1 | x |
|  | * UHR MAC Capabilities Information field format
 |

|  |
| --- |
| * Subfields of the UHR MAC Capabilities Information field (continued)
 |
| Subfield | Definition | Encoding |
| … | … | … |
| DBE Support | Indicates whether or not DBE is supported | Set to 1 if dot11DBEOptionImplemented is true (see 37.x (Dynamic bandwidth expansion (DBE))).Set to 0 otherwise. |

***TGbn editor: Please add the following new subclause 37.x Dynamic Bandwidth Expansion (DBE) to the 802.11bn draft***

37. Ultra high reliability (UHR) MAC specification

**37.x Dynamic bandwidth expansion (DBE)**

Dynamic bandwidth expansion (DBE) is a mode of operation that allows a UHR AP to operate with an operating bandwidth that is greater than the BSS bandwidth. The DBE enables a UHR AP to expand and make changes to its operating bandwidth for the UHR STAs that support DBE and enables resetting operating bandwidth to BSS bandwidth for DBE supporting UHR STAs. When operating in DBE mode with an expanded operating bandwidth, other STAs that do not support DBE continue to operate within the BSS bandwidth.

﻿An AP that supports DBE operation has dot11DBEOptionImplemented equal to true, shall set the DBE Support field of the UHR MAC Capabilities Information field of the UHR Capabilities element to 1, and is called a DBE AP. A non-AP STA that supports DBE operation has dot11DBEOptionImplemented equal to true, shall set the DBE Support field of the UHR MAC Capabilities Information field of the UHR Capabilities element to 1, and is called a DBE non-AP STA.

A DBE AP announces a change to its operating bandwidth using TBD Management frames. The bandwidth change is announced for multiple beacon intervals before the bandwidth change takes effect. After a bandwidth change, the DBE AP continues operating with the updated bandwidth until a subsequent bandwidth change occurs. While an AP is operating in DBE mode, AP’s operating bandwidth is wider than the BSS bandwidth.

﻿**Annex C**

**C.3 MIB Detail**

***TGbn editor: Please add the following new MIB variable***

dot11DBEOptionImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the STA implementation supports DBE operation. If the attribute is false, it indicates that the STA implementation does not support DBE operation”

::= { dot11UHRStationConfigEntry <ana> }

**Text to be adopted ends here.**

**References:**

1. [11-25-0014r13](https://mentor.ieee.org/802.11/dcn/25/11-25-0014-13-00bn-tgbn-motions-list-part-2.pptx): 11-25-0014-13-00bn-tgbn-motions-list-part-2, Alfred Asterjadhi (Qualcomm Inc.)
2. [11-24-0088r1](https://mentor.ieee.org/802.11/dcn/24/11-24-0088-01-00bn-maximizing-channel-bandwidth-in-dense-ap-deployments.pptx): “Maximizing channel bandwidth in dense AP deployments”,Malcolm Smith *et al* (Cisco Systems)
3. [11-24-0815r1](https://mentor.ieee.org/802.11/dcn/24/11-24-0815-01-00bn-dynamic-bandwidth-selection-signaling-details.pptx): “Dynamic Bandwidth Selection Signaling Details”, Binita Gupta *et al* (Cisco Systems)