IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Resolution of CIDs in clauses 3.1 (LB266) | | | | |
| Date: August 8, 2022 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| John Wullert  Subir Das | PERATON LABS |  |  | <jwullert@peratonlabs.com>  <sdas@peratonlabs.com> |
| An Nguyen  Frank Suraci | DHS/CISA/ECD |  |  | (an.p.nguyen, frank.suraci) @cisa.dhs.gov |

Abstract

This submission proposes resolutions for the following 19 CIDs received for TGbe LB266 in clause 3.1:

10510, 11082, 11083, 10511, 10512, 11172, 10184, 10186, 10185, 10187, 11473, 11474, 11475, 10188, 10189, 10190, 10513, 11476, 11477

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.***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Section** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 10510 | 3.1 | 47.04 | The definition of "AP reachability" and reference to this term in the standard (such as that in Neighbor Report element) needs to be updated to cover the case where non-AP MLD is able to exchange preauthentication messages with the target AP MLD. | As in comment | Revised  Agree in principle. Appended MLD-level definition of reachability.  **TGbe editor please implement changes labelled as #10510 in document 802.11-22-1255r0.** |
| 11083 | 3.1 | 47.05 | We need to modify the definiton of association for MLD. | Change the definition of association from "association: The service used to establish a mapping between an access point (AP) or personal basic service set (PBSS) control point (PCP), and a station (STA) and enable STA invocation of the distribution system services (DSSs) " to "association: The service used to establish a mapping between an access point (AP) or personal basic service set (PBSS) control point (PCP), and a station (STA) and enable STA invocation of the distribution system services (DSSs) or to establish a mapping between an access point (AP) multi-link device (MLD) and a non-AP MLD and enable non-AP MLD invocation of the DSSs." | Accepted |
| 11082 | 3.1 | 47.05 | We need to modify the definiton of authentication for MLD. | Change the definition of authentication from "authentication: The service used to establish the identity of one station (STA) as a member of the set of STAs authorized to associate with another STA." to "authentication: The service used to establish the identity of one station (STA) as a member of the set of STAs authorized to associate with another STA or to establish the identify of one multi-link device (MLD) as a member of the set of MLDs authorized to associate with another MLD." | Accepted |
| 10512 | 3.1 | 47.15 | Definition of BSS Transition in baseline spec needs to be updated to be consistent with the description on pg 57 line 43 of TGbe spec.  Same goes for definition of Fast BSS Transition and Reassociation Service.  Please check and update other definitions in baseline spec to include MLD | As in comment | Revised  Agree in principle. Modified definition to include MLD  **TGbe editor please implement changes labelled as #10512 in document 802.11-22-1255r0.** |
| 10511 | 3.1 | 47.14 | Do we need a definition for MLD Max Idle Period to be consistent with BSS Max Idle Period definition in baseline spec? | Provide a definition for MLD Max Idle Period | Revised  Added definition of MLD max idle period based on definition of *basic service set (BSS) max idle period*.  **TGbe editor please implement changes labelled as #10511 in document 802.11-22-1255r0.** |
| 11172 | 3.1 | 47.22 | 802.11me D1.3 consistently uses "non-access-point" to spell out non-AP. 802.11be uses "non-access point", the 802.11be amendment should align with the 802.11me baseline. Change all instances of "non-access point" to be "non-access-point". There are 12 locations in the amendment. | Change: "non-access point" To: "non-access-point" in all 12 locations: 47.22, 47.27, 51.22, 51.28, 51.34, 51.40, 52.1, 52.49, 52.60, 53.11, 54.5, 54.8. | Accepted |
| 10184 | 3.1 | 50.65 | Defintion of reported access point contains extraneous "or". | Revise definition as "An AP that is describedidentified in an element such as a Neighbor Report element, a Reduced Neighbor Report element, or Basic Multi-Link element." | Revised  Agree in principle. Modified definition to address comment  **TGbe editor please implement changes labelled as #10184 in document 802.11-22-1255r0.** |
| 10186 | 3.1 | 51.66 | Defintion of reporting access point contains extraneous "or". | Revise definition as "An AP that is transmitting an element, such as a Neighbor Report element, a Reduced Neighbor Report element, or Basic Multi-Link element, describing a reported AP." | Revised  Agree in principle. Modified definition to address comment  **TGbe editor please implement changes labelled as #10186 in document 802.11-22-1255r0.** |
| 10185 | 3.1 | 51.14 | Defintion mixes singular and plural references to non-AP STAs in a confusing manner. | Revise defintion as "An extended power save mode for non-access-pointnon-access point (non-AP) stations (STAs) and non-AP multi-link devices (MLDs) whereby a non-AP STA or the STAs affiliated with a non-AP MLD need not listen for every delivery traffic indication map (DTIM) Beacon frame and does not perform group temporal key/integrity group temporal key/beacon integrity group temporal key (GTK/IGTK/BIGTK) updates. | Revised  Agree in principle. Modified definition to address comment  **TGbe editor please implement changes labelled as #10185 in document 802.11-22-1255r0.** |
| 10187 | 3.1 | 52.39 | First two clauses of definition seem redundant and thus do not provide desired clarity. Also, construct of "has one medium access ... to the logical link control" is not clear. | Revise defintion as "A logical entity that is capable of supporting more than one affiliated station (STA) and is operating using one or more of those affiliated STAs and that exposes one medium access control (MAC) data service and a single MAC service access point (SAP) to the logical link control (LLC) sublayer" | Revised  Agree in principle. Resolved in conjunction with CID 11473, 11474, 11475  **TGbe editor please implement changes labelled as #10187 in document 802.11-22-1255r0.** |
| 11473 | 3.1 | 52.40 | It is unlcear what "supporting more than one affiliated STA" means, does it mean support the association of multiple affiliated STAs, since "affliated STA" only means STAs operating within a MLD according to definition? Suggest to change to "operate" or change to "support more than one STAs affiliated with itself" to make things clear. | as in comment | Revised  Agree in principle. Resolved in conjunction with CID 10187, 11474, 11475  **TGbe editor please implement changes labelled as #10187 in document 802.11-22-1255r0.** |
| 11474 | 3.1 | 52.41 | since "more than one affiliated STA" has already been covered in the first part of the sentence, then "can also operate using one or more affiliated STAs" should cover the case of just one STA, change "can also operate using one or more affiliated STAs" to "can also operate using one affiliated STA". | as in comment | Revised  Agree in principle. Resolved in conjunction with CIDs 10187, 11473, 11475  **TGbe editor please implement changes labelled as #10187 in document 802.11-22-1255r0.** |
| 11475 | 3.1 | 52.41 | It is unclear when an MLD contains only one affiliated AP, is that considered as a MLD or just an EHT AP? Neither the definition of the AP MLD or definitoin of MLD make this clear. | as in comment; please clarify | Revised  Agree in principle. Resolved in conjunction with CIDs 10187, 11473, 11474  **TGbe editor please implement changes labelled as #10187 in document 802.11-22-1255r0.** |
| 10188 | 3.1 | 52.44 | Definition of "multi-link operation" is really only a pointer to another clause, which is not particularly useful. | Revise defintion to be "A mode of operation that allows a non-access point (non-AP) multi-link device (MLD) to discover, authenticate, associate, and exchange traffic over multiple links with an AP MLD." | Accepted |
| 10189 | 3.1 | 52.50 | Definitions in base spec do not contain references to clauses | Remove the following text "as defined in 35.3.4.2 (Use of Multi-Link probe request and response)" | Accepted |
| 10190 | 3.1 | 52.57 | Definitions in base spec do not contain references to clauses | Remove the following text "as defined in 35.3.4.2 (Use of Multi-Link probe request and response)" | Accepted |
| 10513 | 3.1 | 53.04 | Change 'of the' to 'affiliated with an' | As in comment | Accepted |
| 11476 | 3.1 | 53.07 | "concurrent" should be "concurrently" | change as in comments | Revised  Corrected issue twice in the note.  **TGbe editor please implement changes labelled as #11476 in document 802.11-22-1255r0.** |
| 11477 | 3.1 | 53.16 | a PPDU cannot consist of RUs | change "which consists" to "which is transmitted on" | Revised  Agree in principle. Revised definition to reflect change.  **TGbe editor please implement changes labelled as #11477 in document 802.11-22-1255r0.** |

***TGbe editor: Please note baseline is 11be D2.1 or definitions taken from*** ***802.11‐2020***

**3.1 Definitions**

***TGbe editor: Incorporate following definitions from*** ***802.11‐2020 and revise as shown:***

**access point (AP) reachability:** An AP is reachable by a station (STA) if preauthentication messages can be exchanged between the STA and the target AP via the distribution system (DS). [10510] An AP MLD is reachable by a non-AP MLD if preauthentication messages can be exchanged between a STA affiliated with the non-AP MLD and an AP affiliated with the target AP MLD via the DS.

**association:** The service used to establish a mapping between an access point (AP) or personal basic service set (PBSS) control point (PCP), and a station (STA) and enable STA invocation of the distribution system services (DSSs) [11083] or to establish a mapping between an access point (AP) multi-link device (MLD) and a non-AP MLD and enable non-AP MLD invocation of the DSSs.

**authentication:** The service used to establish the identity of one station (STA) as a member of the set of STAs authorized to associate with another STA [11082] or to establish the identify of one multi-link device (MLD) as a member of the set of MLDs authorized to associate with another MLD.

**basic service set (BSS) transition:** Change of association by a station (STA) [10512] or non-AP MLD from one BSS to another BSS in the same extended service set (ESS).

**fast basic service set (BSS) transition:** Change of association by a station (STA) [10512] or non-AP MLD from one BSS in one extended service set (ESS) to another BSS in the same ESS and that minimizes the amount of time that the data connectivity is lost between the STA and the distribution system (DS).

**multicast-group address:** A medium access control (MAC) address associated by higher level convention with a group of logically related stations (STAs) [10512] or non-AP MLDs.

**service set transition:** A station (STA) [10512] or non-AP MLD movement from one basic service set (BSS) to another BSS, i.e., either a BSS transition or an extended service set (ESS) transition.

***TGbe editor: Add the following definition:***

**[10511] MLD max idle period:** A time period during which the access point (AP) multi-link device (MLD) does not disassociate a non-AP MLD due to nonreceipt of frames from any of the stations (STAs) affiliated with that non-AP MLD.

**3.2 Definitions specific to IEEE 802.11**

***TGbe editor: Modify the following definitions and note as shown:***

[10184] **reported access point (AP):** An AP that is ~~described~~identified in an element such as a Neighbor Report element, a Reduced Neighbor Report element, or Basic Multi-Link element.

[10186] **reporting access point (AP):** An AP that is transmitting an element, such as a Neighbor Report element, a Reduced Neighbor Report element or Basic Multi-Link element, describing a reported AP or set of affiliated APs.

[10185] **wireless network management (WNM) sleep mode:** An extended power save mode for ~~non-access-point~~non-access point (non-AP) stations (STAs) and non-AP multi-link devices (MLDs) whereby a non-AP STA or STAs affiliated with a non-AP MLD need not listen for every delivery traffic indication map (DTIM) Beacon frame and do not perform group temporal key/integrity group temporal key/beacon integrity group temporal key (GTK/IGTK/BIGTK) updates.

[10187] **multi-link device (MLD):** A logical entity that is capable of affiliating more than one station (STA) with itself and can operate using one or more of those affiliated STAs while exposing a single medium access control (MAC) data service and a single MAC service access point (SAP) to the logical link control (LLC) sublayer.

**multi-link operation (MLO):** [10188] A mode of operation that allows a non-access point (non-AP) multi-link device (MLD) to discover, authenticate, associate, and exchange traffic over multiple links with an AP MLD..

**nonsimultaneous transmit and receive (NSTR) link pair:** A pair of links within a multi-link device (an MLD) for which the receiver requirements specified in Clause 36 (Extremely high throughput (EHT) PHY specification) are not met on one of the links when a station (STA) [10513] affiliated with an MLD is transmitting on the other link. Each link of such a pair is a member of the NSTR link pair.

[11476] NOTE—If an MLD supports transmission on link 1 concurrently with reception on link 2, but cannot support transmission on link 2 concurrently with reception on link 1, this pair of links is NSTR for that MLD.

**non-orthogonal frequency division multiple access (non-OFDMA) extremely high throughput (EHT) physical layer (PHY) protocol data unit (PPDU):** An EHT PPDU [11477] which is transmitted using a single resource unit (RU) or a single multiple resource unit (MRU) that occupies all the nonpunctured 20 MHz channels within the PPDU bandwidth.