IEEE P802.11
Wireless LANs

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| Resolution for Miscellaneous CIDs related to Clause 35.3.18 (CC36) |
| Date: Jan 24, 2022 |
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 Abstract

This submission proposes resolutions for following comments received for TGbe CC36:

4081, 5067, 5268, 4082, 5699, 6966, 4210, 6407, 6501, 4211, 4212, 4213, 6328, 6500, 8211, 7424, 7425, 7426, 4206, 4207

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: update based on offline discussions.
* Rev 2: update based on conf call comments.
* Rev 3: update based on offline discussions.
* Rev 4: update based on conf call comments.
* Rev 5: Changed the note that an NSTR Mobile AP MLD might switch the channel associated with any link. It means that the designation of primary link and non-primary link will keep unchanged.
* Changed “the reporting AP operating on the primary link” to “the AP operating on the primary link” to make it clear that the timing fields for the non-primary link in the Channel Switch Announcement element, etc. shall always be applied in reference to the most recent TBTT and BI indicated by the AP operating on the primary link no matter which link the element is carried.
* Rev 6: Removed the redundant descriptions

***TGbe editor: Please note Baseline is REVmd D8.0, 11ax D8.0, and 11be D1.3***

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.***

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| **CID** | **Commenter** | **Clause**  | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
|  |  |  |  |  |  |  |
| 4081 | Abhishek Patil | 35.3.17.1 | 284.28 | Transmission on the nonprimary link cannot go by itself. Therefore, authentication, association and 4-way handshake xchange needs to occur on the primary link. | Clarify that all frame exchanges during multi-link setup (Authentication, Association, 4-way handshake) are performed only on the primary link. | RevisedAgree with the commenter in principle. TGbe editor to make the changes shown in doc 21/1786r1 under CID 4081, 5067, 5268. |
| 5067 | Gaurang Naik | 35.3.17.1 | 284.28 | Association and Authentication with a softAP MLD should be allowed only on the primary link. The spec does not provide clarifications on the topic. | Clarify that a non-AP MLD shall perform the ML Setup procedure with a softAP MLD only on the primary link. | RevisedAgree with the commenter in principle. TGbe editor to make the changes shown in doc 21/1786r1 under CID 4081, 5067, 5268. |
| 5268 | Insun Jang | 35.3.17.1 | 284.24 | What about any behavior in nonprimary link? Need to specify it. For example, in nonprimary link, any MGMT frames such as Beacon are not transmitted | As in comment. | RevisedAgree with the commenter in principle.TGbe editor to make the changes shown in doc 21/1786r1 under CID 4081, 5067, 5268. |
| 4082 | Abhishek Ptil | 35.3.17.1 | 284.28 | An nSTR SoftAP MLD does not beacon on the nonprimary link. What is the timing (TBTT) reference when the AP MLD wants to perform channel switch or quiet period operation for the nonprimary link? | Provide details on the timing reference for the nonprimary link. | RevisedAgree with the commenter in principle.A subclause ’35.3.18.4 NSTR Mobile AP MLD Multi-link procedures for channel switching, extended channel switching, and channel quieting’ is added.TGbe editor to make the changes shown in doc 21/1786r1 under CID 4082, 5699, 6966. |
| 5699 | Kaiying Lu | 35.3.17.1 | 284.06 | for NSTR soft AP MLO, the reference to timing fields in the Channel Switch Announcement element, the Enhanced Channel Switch Announcement element, the Quiet element, and the Quiet Channel element for non-primary link shall be defined. | As in comment | RevisedAgree with the commenter in principle.A subclause ’35.3.18.4 NSTR Mobile AP MLD Multi-link procedures for channel switching, extended channel switching, and channel quieting’ is added.TGbe editor to make the changes shown in doc 21/1786r6 under CID 4082, 5699, 6966. |
| 6966 | Sanghyun Kim | 35.3.17.1 | 284.25 | Channel switch operation of a BSS is performed using Beacon frame that including channel switcing element.In the case of nonprimary link BSS, it is unclear how the BSS switch operating channel without Beacon frame on the nonprimary link. | It is recommended to provide an operating channel switching method for the BSS of the nonprimary link AP. | RevisedAgree with the commenter in principle.A subclause ’35.3.18.4 NSTR Mobile AP MLD Multi-link procedures for channel switching, extended channel switching, and channel quieting’ is added.TGbe editor to make the changes shown in doc 21/1786r2 under CID 4082, 5699, 6966. |
|  |  |  |  |  |  |  |
| 4210 | Alfred Asterjadhi | 35.3.17.1 | 284.22 | This last bullet I think should be redundant because all Aps of an AP MLD have different MAC address, id est Soft AP MLDs as well Either a note is fine or just explicitly say all things shall be inherited from an AP MLD except the following. | As in comment | RevisedAgree with the commenter in principle.Change the text to a note.TGbe editor to make the changes shown in doc 21/1786r1 under CID 4210, 6407 and 6501. |
| 6407 | Muhammad Kumail Haider | 35.3.17.1 | 284.22 | "Each AP affiliated to a soft AP MLD has different MAC address". This is not a restriction as "The MAC address of each AP affiliated with an AP MLD shall be different from each other(35.3.3 Multi-link device addressing)" in general. | Remove the corresponding bullet. | RevisedAgree with the commenter in principle.Change the text to a note.TGbe editor to make the changes shown in doc 21/1786r6 under CID 4210, 6407 and 6501. |
| 6501 | Pascal VIGER | 35.3.17.1 | 284.10 | First paragraph is not clear as it intends to describe a NSTR soft AP, but some definitions of soft AP are tentatively introduced in the list (whereas targeted to be limited to the NSTR specificity). The restrictions seem not be restrictions, as example for MAC address of each affiliated AP) | Describe first what is a soft AP, and second what are the specificities of a NSTR soft AP (compared to soft AP, and compared to AP MLD described in other sections of the specification). | RevisedAgree with the commenter in principle.Change the text to a note.TGbe editor to make the changes shown in doc 21/1786r6 under CID 4210, 6407 and 6501. |
| 4211 | Alfred Asterjadhi | 35.3.17.1 | 284.30 | Replace . with :  | As in comment | Revised.TGbe editor to make the changes shown in doc 21/1786r1 under CID 4211. |
| 4212 | Alfred Asterjadhi | 35.3.17.1 | 284.24 | Declarative statements…please convert into normative requirements, like shall schedule for transmission Beacons, etc in the primary link and shall not schedule for transmission Beacons in the nonprimary link or smth. | As in comment | RevisedTgbe editor to make the changes shown in doc 21/1786r6 under CID 4212. |
| 4213 | Alfred Asterjadhi | 35.3.17.1 | 284.31 | Arent these two bullets saying the same thing for the AP and non-AP counterpart? If yes then would it help to merge? | As in comment | Rejected.The group prefers to keep the descriptions for the two entities separate. |
| 6328 | Ming Gan | 35.3.17.1 | 284.06 | Change "affiliated to" to "affliated with" | as in the comment | RevisedTgbe editor to make the changes shown in doc 21/1786r6 under CID 6328. |
| 6500 | Pascal VIGER | 35.3.17.1 | 284.06 | The term "soft AP" is never introduced | Please describe what is a Soft AP | RevisedChanged “soft AP” to “mobile AP”. “NSTR Mobile AP MLD” has been accepted to replace “NSTR Soft AP MLD” in doc 11-21/1180r2 (https://mentor.ieee.org/802.11/dcn/21/11-21-1180-02-00be-cc36-cr-for-5386.docx) tagged as 5386.TGbe editor to make the changes shown in doc 21/1786r6. |
| 8211 | Yunbo Li | 35.3.17.1 | 284.10 | There is no definition of NSTR MLD, please modify the name of NSTR soft AP MLD. | as in comment | Revised“NSTR Mobile AP MLD” has been accepted to replace “NSTR Soft AP MLD” in doc 11-21/1180r6 (https://mentor.ieee.org/802.11/dcn/21/11-21-1180-02-00be-cc36-cr-for-5386.docx) tagged as 5386.The “NSTR Mobile AP MLD” is defined as an AP MLD which sets dot11MobileAPMLDImplemented to true and has one NSTR pair of links with some restrictions in 35.3.18.1 General.TGbe editor to make the changes shown in doc 21/1786r6. |
| 7424 | SunHee Baek | 35.3.17.1 | 284.11 | An NSTR soft AP MLD has only one NSTR pair of links or at least one NSTR pair of links? | Please clarify it. | RejectedIt is stated that “If dot11EHTBaseLineFeaturesImplementedOnly is equal to true, an NSTR mobile AP MLD shall set the Maximum Number of Simultaneous Links subfield of the (#6700)Basic Multi-Link element carried in transmitted Management frames to 1” in subclause 35.3.15.2 Multi-link device capability signaling. |
| 7425 | SunHee Baek | 35.3.17.1 | 284.33 | If "the STA affiliated with the same MLD" is different with "a STA affiliated with the non-AP MLD" in front of the sentence, the STA is modified to "the other STA" to distinguish between them. | Please change to "only if the other STA affiliated with the same MLD in the primary link" | Accepted.TGbe editor to make the changes shown in doc 21/1786r6 under CID 7425. |
| 7426 | SunHee Baek | 35.3.17.1 | 284.37 | If "the AP affiliated with the same NSTR soft AP MLD" is different with "a AP affiliated with the NSTR soft AP MLD" in front of the sentence, the AP is modified to "the other AP" to distinguish between them. | Please change to "only if the other AP affiliated with the same NSTR soft AP MLD in the primary link". | Accepted.TGbe editor to make the changes shown in doc 21/1786r6 under CID 7426. |
| 4207 | Alfred Asterjadhi | 35.3.17.1 | 284.11 | All these declarative statements need to be normative, such as an NSTR Soft AP MLD shall be an AP MLD that sets dot11blabla to true. The NSTR soft AP MLD shall have one pair of NSTR links and shall follow the restrictions below:" Also it seems that there is only one pair of links total. In which case good to call it out? | As in comment | RevisedAgree with the commenter in principle.Changed the statement to be normative. TGbe editor to make the changes shown in doc 21/1786r1 under CID 4207. |
| 4206 | Alfred Asterjadhi | 35.3.17.1 | 284.11 | This is part of EHT is my guess. So add EHT to the dot11"EHT"SoftAPMLDImplemented. Also please define this MIB variable in Annex C. And add respective entry to Annex B. | As in comment. | RevisedAgree with the commenter in principle.Add a new MIB object in Annex C. TGbe editor to make the changes shown in doc 21/1786r6 under CID 4206. |

***TGbe editor: Please modify the following subclause 35.3.18.1 as follows:***

**35.3.18 NSTR mobile AP MLD operation**

**35.3.18.1 General**

***TGbe editor: Please change “dot11MobileAPMLDImplemented” to “dot11EHTNSTRMobileAPMLDImplemented” throughout the spec.***

(#4206)(#4207)An NSTR mobile AP MLD shall be an AP MLD which sets dot11EHTNSTRMobileAPMLDImplemented to true. If dot11EHTBaseLineFeaturesImplementedOnly is equal to true, an NSTR mobile AP MLD shall have one NSTR pair of links and shall follow the restrictions below:

* Each AP affiliated with a mobile AP MLD is not required to support all the EHT AP mandatory features

• Support of MU operation is optional for the APs affiliated with a mobile AP MLD

• Support of two or more spatial streams is optional for the APs affiliated with a mobile AP MLD

* (#4212)(#5268)The mobile AP MLD is in a mobile device that is typically battery powered

(#4210, 6407, 6501, 6328)NOTE-- Each AP affiliated with a mobile AP MLD has different MAC address

An NSTR mobile AP MLD shall designate one link of an NSTR link pair as the primary link. The other link of the NSTR link pair is the non-primary link. (#4212)(#5268)The NSTR mobile AP MLD shall schedule for transmissions of Beacon and Probe Response frames and group addressed data frames only on the primary link.

(#4081)(#5067)(#5268)A non-AP MLD shall perform frame exchanges during the Authentication, (Re)Association and 4-way handshake procedures only on the primary link.

NOTE– Any frames including management frames are disallowed to be transmitted on the non-primary link alone through EDCA channel access.

STAs affiliated with a non-AP MLD that is associated with an NSTR mobile AP MLD and APs affiliated with an NSTR mobile AP MLD shall follow the procedure defined in 35.3.15.6 (Start time sync PPDUs medium access) when intending to transmit in the nonprimary link with the following additional constraints: (#4211)

* A STA affiliated with the non-AP MLD may initiate a PPDU transmission to its associated AP affiliated with the NSTR mobile AP MLD in the nonprimary link only if the (#7425) other STA affiliated with the same MLD in the primary link is also initiating the PPDU as a TXOP holder with the same start time.
* An AP affiliated with the NSTR mobile AP MLD may initiate a PPDU transmission to its associated non-AP STA in the nonprimary link only if the (#7426) other AP affiliated with the same NSTR mobile AP MLD in the primary link is also initiating the PPDU as a TXOP holder with the same start time.

***TGbe editor: Please insert the following subclause 35.3.18.4 as follows:***

**35.3.18.4 NSTR Mobile AP MLD Multi-link procedures for channel switching, extended channel switching, and channel quieting** (#4082, 5699, 6966)

Multi-link procedures for channel switching, extended channel switching, and channel quieting for an NSTR Mobile AP MLD follow the same rules defined in 35.3.10.2 (Channel switching, extended channel switching, and channel quieting) with the following exceptions:

* .
* The timing fields in the Channel Switch Announcement element, the Extended Channel Switch Announcement element, the Quiet element, and the Quiet Channel element shall be applied in reference to the most recent TBTT and BI indicated in the corresponding element(s) of the ~~reporting~~ AP operating on the primary link.

***TGbe editor: Please modify the following Annex C as follows:***

**Annex C**

(normative)

**ASN.1 encoding of the MAC and PHY MIB**

**C.3 MIB Detail**

***Editor’s Note: The following is a list of new MIB objects introduced in the main text:***

—dot11AAROptionImplemented

—dot11EHTEMLSROptionImplemented

—dot11EHTEMLMROptionImplemented

—dot11EHTOMIOptionImplemented

—dot11MLDAssociationSAQueryMaximumTimeout

—dot11MultiLinkActivated

—dot11RestrictedTWTOptionImplemented

—dot11SCSActivated

—dot11EHTNSTRMobileAPMLDImplemented (#4206)

—dot11SRSOptionImplemented

—dot11SupportedEMLMRRxNSS

—dot11SupportedEMLMRTxNSS

Dot11StationConfigEntry ::= SEQUENCE

{ dot11StationID MacAddress,

 …

 dot11BSSMaxIdlePeriodIndicationByNonAPSTA, TruthValue,

 (#1004)(#2246)dot11EHTOptionImplemented, TruthValue,

 (#3173)dot11EHTBaseLineFeaturesImplementedOnly, TruthValue,

 dot11EHTNSEPPriorityAccessActivated, TruthValue,

 (#4183)dot11EHTTXOPSharingTFOptionImplemented TruthValue,

 (#4206)dot11EHTNSTRMobileAPMLDImplemented TruthValue

}

dot11EHTNSTRMobileAPMLDImplemented OBJECT-TYPE(#4206)

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 the ability of the EHT STA to support NSTR mobile AP multi-link operation. If the attribute is false, the EHT STA does not support NSTR mobile AP multi-link operation.

"

::= { dot11StationConfigEntry <Last assigned+1} > }

**Straw Poll: Do you support to incorporate the proposed draft text in this document 11-21/1786r6 to the next revision of TGbe Draft?**

**Result: Yes/No/Abstain**