IEEE P802.11  
Wireless LANs

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| Resolution for comments received for CC on D0.1 for subclause 37.11.2 | | | | |
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Abstract

This document contains proposed resolutions to comments received on 802.11bn D0.1.

1601 2037 3069 3268 3219 3213 240 241 242 3211 3954 3776 3777 2200 637 1067 2156 2405 2408 2588 628 2426 2589 2590 3190 3690 886 3063 3210 3216 2489 2490 2491 2591 2592 3392 1069 3657 3691 3660 3208 3064 3065 2191 2193 2196 2492 2593 3716 3764 2594 2595 3209 2596 3658 3692 2229 3066 3067 3215 2597 504 648 1884 1885 2454 3951 3693 3694 887 3068 3659 3695 3696 3195 3070 1835 3072 3073 3426 425 629 638 722 1840 1903 1927 1971 2157 2427 2493 2598 3145 3393 3427 3697 3074 3717 1912 3076 3075 236 723 3077 1839 1886 2599 1913 738 3428 3698 3078 724 1285 2494 2496 2600 3079 3080 3699 3214 103 657 739 799 1286 1887 2495 2601 3082 3700 3765 1844 3081 509 102 2198 2602 3083 1287 2497 2603 3661 3701 658 800 3084 508 649 725 2195 2199 2604 3218 2605 1914 1915 2230 3143 3144 3217 2606 3766 1563 3205 651 1751

237 650 1894 101 656 797 798 100 3212

R2: some editorial fixes during presentation in 11bn MAC

R3:

* Resolve new CIDs and included offline comments since presentation in 11bn (Changes in green)

R4

* More comments received offline (changes in blue)

R5: - more changes in Blue

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| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 1601 | Michail Koundourakis | 37.11.2 | 0.00 | Restricting DUO mode to non-AP unavailability fails to solve other use cases, e.g Mobile AP. | Enhance DUO mode to cover non-periodic unavailability for AP, Mobile AP and other use cases. | Reject – such enhancements have been discussed in the group and didn’t reach sufficient support. |
| 2037 | Michail Koundourakis | 37.11.2 | 0.00 | The STA should be allowed to communicate unavailability which starts very short after the ICR is sent. Ideally, this should be combined with some sort of acknowledge from the TXOP holder, which might not be to sent any of the PPDUs it was planning to send to the STA after the ICR (not enough time). The subsequent PPDU would have been used as an implicit ack that the unavailability in the ICR was received. Instead, an explicit ack may be needed; e.g. using a unicast Ack or a CF-End (which signals end of TXOP). Consider using signalling similar to power management mode. | As per comment, define behaviour and procedure to allow a STA to safely enter unavailability shortly after the ICR. | Revised – this is exactly the behavior defined in 37.11.2. |
| 3069 | Mark RISON | 37.11.2 | 0.00 | Is it "ICR" or "ICR frame"? This page has both | Pick one and stick to it | Revised – ICR frame makes more sense. Apply the changes accordingly in this subclause as shown in this document with tag [#3069]. |
| 3268 | GEORGE CHERIAN | 37.11.2 | 0.00 | Clarify which Request frames match with which Response frames | As in the comment | Revised – apply the changes marked as #3069 in this document |
| 3219 | Qi Wang | 37.11.2 | 0.00 | "When an AP considers a non-AP STA as being unavailable during a period of time after having received unavailability information as described in this subclause, the AP should not schedule for transmission PPDUs containing frames addressed to the STA that overlap with its unavailability period of time and if the AP still transmits, the STA is not expected to receive the PPDUs." What is the behavior if the unavailability both starts and ends during the TXOP originally planned by an DUO AP? Can the AP transmit to the STA after the end of its unavailability duration in such a scenario? | As in comment. | Revised – the requirement is just that the AP doesn’t transmit to the STA during the unavailability period so it may very well transmit at the end of the TxOP to the STA if the STA becomes available again. Apply the changes marked as #3213 to clarify the interaction between unavailability and power modes/states. |
| 3213 | Qi Wang | 37.11.2 | 80.57 | What is the requirement, if any, on the power management setting for a STA during unavailability? | Please provide specification on the behavior as indicated in the comment. | Revised – clarify that the unavailability supersedes power management and power states of the STA and is orthogonal to it. Apply the changes marked as #3213 in this document. |
| 240 | Pei Zhou | 37.11.2 | 81.08 | Currently, we only defined DUO info exchange between DUO non-AP STA and its associated DUO Supporting AP. (AP's and/or its associated STAs') DUO info should be also exchanged between APs in multi-AP scenarios. In this way, the other AP can select/initiate suitable multi-AP mode considering OBSS AP and/or non-AP STA's unavailability. | Define the procedure that one AP can exchange unavailability report (e.g., of its associated DUO non-AP STAs) with the other AP in multi-AP scenarios. | Reject – for this amendment, the scope is limited to the current BSS. |
| 241 | Pei Zhou | 37.11.2 | 81.08 | Currently, we only defined DUO/PUO info exchange between DUO/PUO non-AP STA and its associated Supporting AP. In P2P scenario, if DUO/PUO non-AP STA can report its peer STA's DUO/PUO info to their associated AP when reporting its own DUO/PUO info, then the peer STA can avoid reporting it again. The DUO/PUO Supporting AP can use the DUO/PUO info from the P2P pair to schedule a P2P transmission duration that satisfies both STAs. | Define the procedure that a DUO/PUO non-AP STA can send its peer STA's unavailability report to associated AP. | Reject - for this amendment, the scope is limited to the current BSS. |
| 242 | Pei Zhou | 37.11.2 | 81.08 | Considering a device with multiple wireless systems, the time use by each wireless system can be coordinated by high level/layer function or OS. Therefore, modifiable unavailability report can be define to realize harmonious coexistence between different wireless systems. A better wifi expernence can also benefits from this feature. | Define new rule that supports modifiable/negotiatable unavailability report. When DUO Supporting AP receives multiple DUO non-AP STAs' unavailability report, it can modify or recommand new unavailability schedules to these DUO non-AP STAs. | Revised – clarify that when receiving a new unavailability report, this report replaces the previous one.  Apply the changes marked as #242 in this document |
| 3211 | Qi Wang | 37.11.2 | 81.08 | The multi-user operation for solicited DUO is missing in the spec and needs to be added. | As in comment. | Revised – MU operation for DUO is not disallowed in the spec and is therefore allowed. |
| 3954 | Binita Gupta | 37.11.2 | 81.09 | During IDC, when the non-AP MLD indicates its unavailability for a link, it can become active on another link such that AP can continue to serve its traffic and not impact QoS for that STA. Hence, it is desirable to define a mechanism that enables an AP to request a non-AP MLD to come out of PS on another link during IDC. | Define a mechanism for AP to announce policy for STA to come out of PS on another link when it indicates DUO or PUO unavailability on one of the links. The AP can also request the non-AP STA to come out of PS on another link for specific unavailability reporting (either PUO or DUO). | Reject – Unavailability is independent from power save and as such, the proposal seems out of scope. |
| 3776 | Yongho Seok | 37.11.2 | 81.10 | When the BSRP Trigger frame is used for ICF, the NAV resetting should be updated. Since the ICR has a variable length and is significantly longer than the CTS, the NAVTimeout value should be set to a large value. Additionally, retransmission should also allow the NAV reset, even if the PHY-RXSTART.indication is issued before the NAVTimeout. | As in the comment | Revised – agree with the commenter. Apply the changes marked as #3776 in this document. |
| 3777 | Yongho Seok | 37.11.2 | 81.10 | The NAV update procedure should be defined to address the fairness issue. An incremental NAV update procedure can be defined for the BSRP Trigger soliciting the non-HT response. | As in the comment | Revised – agree with the commenter. Apply the changes marked as #3776 in this document. |
| 651 | Jaheon Gu | 37.11.2 | 81.11 | Currently DUO mode allows a STA to report unavailability due to Co-Ex. However, it is possible that the STA may not be able to report the unavailability due to Co-Ex in time. Consequently, there can be scenarios where a PPDU reception at the STA may suffer due to Co-Ex issue. The STA should be allowed to inform the AP that a particular PPDU recepition suffered from Co-Ex issue. This can ensure that the AP does not take into account the failed reception of the frames contained in that PPDU for its rate selection algorithm. A modified BA frame can carry information that the transmission suffered from Co-Ex issues and hence some frames were in error. | Spec should support the signaling necessary to address the scenario described in the comment. | Revised – agree with the commenter. Apply the changes marked as #1751 in this document |
| 2200 | Brian Hart | 37.11.2 | 81.11 | PUO mode is vastly more efficient than DUO mode, in terms of frames sent, TXOPs initiated, and power consumed; and its use should be preferentially encouraged | Condition support for DUO on support for PUO. | Reject – there are 2 separate mechanisms that have separate capabilities. |
| 637 | Jaheon Gu | 37.11.2 | 81.12 | Suggest to rename "DUO Supported" field with "DUO Support". Some fields in the Capability element are using "xxx Supported" while some use "xxx Support", suggest to unify the notation. | As in comment. | Accept |
| 1067 | Matthew Fischer | 37.11.2 | 81.12 | missing DUO supported field in UHR MAC Capabilities Information | A non-AP STA that has dot11DUOOptionImplemented equal to 1 supports DUO, is called a DUO non-AP STA and shall set the DUO Supported field of the UHR MAC Capabilities Information field of the UHR Capabilities element to 1 - DUO Supported field is missing in 9.4.2.aa2.2 | Revised – agree with the commenter. Same thing for the other capability bits in 37.11. Apply the changes marked as #1067 in this document. |
| 2156 | Vishnu Ratnam | 37.11.2 | 81.12 | Suggest to rename "DUO Supported" field with "DUO Support". Some fields in the Capability element are using "xxx Supported" while some use "xxx Support", suggest to unify the notation. | As in comment. | Accept |
| 2405 | Yuki Fujimori | 37.11.2 | 81.12 | DUO Supported field of the UHR MAC Capabilities Information field doesn't exist in the Figure 9-aa5 --UHR MAC Capabilities Information field format. | Please add the field into the figure. | Accept |
| 2408 | Yuki Fujimori | 37.11.2 | 81.12 | "DUO Supported" field should be "DUO Support" field. "Support" field is usually used to indicate a support of a feature. | As in the comment. | Accept |
| 2588 | Minyoung Park | 37.11.2 | 81.12 | The DUO Supported field is missing in the UHR MAC Capabilities Information field of the UHR Capabilities element. | Add the DUO Supported field in the UHR MAC Capabilities Information field (Figure 9-aa5) and the definition in Table 9-130a. | Revised – agree with the commenter. Same thing for the other capability bits in 37.11. Apply the changes marked as #1067 in this document. |
| 628 | Jaheon Gu | 37.11.2 | 81.13 | A common DUO Support Field is used to mean two different things for a non-AP STA and an AP. In Non-AP STA it means it is a DUO Non-AP STA, while in an AP it is DUO Supporting AP. It is recommended to use two separate fields to denote DUO support and DUO assistance (Similar concept in DPS also) | Consider adding a new field to distinguish AP side assistance for DUO and AP side support for DUO as it is still TBD for a Mobile-AP. It needs to be reflected in UHR MAC Capabilities Information field as well. | Revised – use the term DUO assisting AP, as for DPS. Apply the changes marked as #3690 in this document. |
| 2426 | Manasi Ekkundi | 37.11.2 | 81.13 | A common DUO Support Field is used to mean two different things for a non-AP STA and an AP. In Non-AP STA it means it is a DUO Non-AP STA, while in an AP it is DUO Supporting AP. It is recommended to use two separate fields to denote DUO Support and DUO Assistance (Similar concept is in use for DPS also) | Consider adding a new field to distinguish AP side assistance for DUO and AP side support for DUO as it is still TBD for a Mobile-AP. It needs to be reflected in UHR MAC Capabilities Information field as well. | Revised – use the term DUO assisting AP, as for DPS. Apply the changes marked as #3690 in this document. |
| 2589 | Minyoung Park | 37.11.2 | 81.13 | AP STA' should be just 'AP'. | As in the comment | Accept |
| 2590 | Minyoung Park | 37.11.2 | 81.13 | This MIB variable should be boolean. Change 1 to true | As in the comment | Accept |
| 3190 | Yunbo Li | 37.11.2 | 81.13 | "AP STA" --> "AP" | as in comment. | Accept |
| 3690 | Sherief Helwa | 37.11.2 | 81.14 | It may be a good idea to unify terminology with the DPS subclause (37.9.1) where the term "Assisting" is used in stead of "Supporting". Also, "Supporting" might give inaccurate impression that this AP supports DUO and can itself operate in the DUO mode. | Explained in the comment | Revised – agree with the commenter. Propose to use DUO assisting AP. Apply the changes marked as #3690 in this document. |
| 886 | John Wullert | 37.11.2 | 81.17 | The text prior to the bullets is written in a form that indicates that the bullets will describe behavior of the DUO non-AP STA, but only the first bullet does. The other two describe AP behavior. | Convert bullets into paragraph text. First bullet should be included with pre-bullet text to create one sentence and second and third bullets should be separate sentences. | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 3063 | Mark RISON | 37.11.2 | 81.17 | "To enable DUO mode with its associated DUO Supporting AP:" does not work because one of the bullets is about the AP and so "its" is wrong. Ditto line 28 | Delete "with its associated DUO Supporting AP" | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 3210 | Qi Wang | 37.11.2 | 81.18 | "To enable DUO mode with its associated DUO Supporting AP: -- The DUO non-AP STA shall transmit to the AP an TBD Request frame (TBD) with the DUO Mode subfield in the frame set to 1". To enable solicited DUO, a STA transmits a request frame. However, the STA's use of unsolicited DUO doesn't need this procedure, and it should be enabled based on a capability indication at the association time. Please revise the spec to separate the enablement procedure for solicited DUO and unsolicited DUO. | As in comment. | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 3216 | Qi Wang | 37.11.2 | 81.18 | "To enable DUO mode with its associated DUO Supporting AP:...". The enablement procedure should support the DUO enablement on multiple links. Please specify the multilink DUO enablement procedure. | As in comment. | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 2489 | Laurent Cariou | 37.11.2 | 81.19 | add all IDC capabilities to UHR MAC Capabilities (9.4.2.aa2.2) | as in comment | Revised – apply the changes marked as #1067 in this document. |
| 2490 | Laurent Cariou | 37.11.2 | 81.19 | Enablement/disablement procedure has to be defined. Should be a generic enablement method for DUO, DPS, DSO and NPCA and should be kept as simple as possible following the example of eMLSR enablement in 11be. PDT document included already a UHR Operating Mode Notification frame and related protocol. Let's reuse this. | as in comment | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 2491 | Laurent Cariou | 37.11.2 | 81.19 | An AP shall always accept a Request to enable DPS, DSO, NPCA, DUO. | as in comment | Revised – the non-AP STA needs to be in control of enablement/disablement for all these features. Resolving it for DUO with this CID as there are other CIDs for the other features. |
| 2591 | Minyoung Park | 37.11.2 | 81.19 | The DUO Mode subfield is not defined. | Define the DUO Mode subfield in a frame that enables/disables the DUO Mode. |  |
| 2592 | Minyoung Park | 37.11.2 | 81.19 | Resolve TBDs in this paragraph for DUO mode enablement procedure. | Define a frame that enables/disables DUO mode that is similar to the EMLSR operation. For example, UHR Mode Enablement Notification frame. | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 3392 | Zhenpeng Shi | 37.11.2 | 81.19 | "an TBD Request frame" should be "a TBD Request frame". Similarily, "an TBD Response frame" should be "a TBD Response frame" in the next bullet. | As in comment. | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 1069 | Matthew Fischer | 37.11.2 | 81.20 | There are many TBDs here | Either delete the TBDs and associated text, or provide actual usable text to replace the TBDs. | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 3657 | Alfred Asterjadhi | 37.11.2 | 81.20 | Similar commment on these TBD Request frames, and TBD response frames. Suggest defining a harmonized protocol that is flexible and applicable to all newly defined modes and allows cross link and potentially multi link updates/negoations. | As in comment. | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 3691 | Sherief Helwa | 37.11.2 | 81.20 | Proposal to reuse the Link Reconfiguration signaling framework for Request and Response frames. It is good to take leverage of signaling frameworks that are already in the spec. Additionally, using the ML Reconfiguration signaling framework for DUO enablement /disablement allows us to to do so for multiple STAs that are affiliated with the same MLD in the same frame exchange since DUO is defined per STA and not per MLD. Please consider this comment for other similar instances. | Explained in the comment | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 3660 | Alfred Asterjadhi | 37.11.2 | 81.21 | I think we have a motion that defines this TBD User Info field. I believe it is "Feebdack" User info field or smth like that. Fix the TBD aligned with motion | As in comment. | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 3208 | Qi Wang | 37.11.2 | 81.22 | "The AP shall transmit an TBD Response frame, after the AP is ready to serve the non-AP STA in DUO operation, as a response to the received TBD Request frame, to the non-AP STA." Upon receiving a request from a STA to enable DUO, the DUO operation shall start after a time period communicated between the AP and STA as a priori. | As in comment. | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 3064 | Mark RISON | 37.11.2 | 81.23 | ", as a response to the received TBD Request frame," yes, well, obviously. Similarly at line 33 | Delete the cited text | Accept |
| 3065 | Mark RISON | 37.11.2 | 81.23 | ", to the non-AP STA" -- move this to after "transmit" (without the comma), as for the previous bullet. Similarly at lines 31 and 33 | As it says in the comment | Accept |
| 2191 | Brian Hart | 37.11.2 | 81.25 | AP needs to be able to enable/disable its DUO IDC service - BSS wide (e.g., during an active P2P-related breach, banking, defense, automated warehousing and manufacturing, etc) - Per STA (e.g. can serve N coex sessions, so needs to be able to reject N+1th request without disabling Coex for the whole BSS / disassociating the client) (e.g., or if a STA sending too much DUO unavailability spam - see P82L38) (e.g., reject absurd/unachievable requests - e.g., TWT allows a request to be sent with 1 usec gaps between unavailabiilty windows) | Define how an AP advertises a) BSS-wide DUO policy (DUO IDC service is enabled / disabled). Define how an AP may accept/reject/counter an DUO request (likely with a reason code and/or a counter offer that would be acceptable to the AP). The counter offer might be to require priority signaling / no DUO spam, etc. See 25/0076 for extra insights into the problem and its solutions. | Revised – a motion has been approved that an AP that supports DUO shall accept a request to enable DUO. Apply the changes marked as #2491 |
| 2193 | Brian Hart | 37.11.2 | 81.25 | Expecting an IDC service at APs enables non-AP devices to externalize their costs, and thence incentivizes a race to the bottom (e.g., different radios using the same antennas and no filtering and no hope of simultaneous operation). This is an unwise choice for 802.11 use cases. | Define how an AP advertises a) BSS-wide DUO policy that the AP only provides DUO service on at most N-1 of the non-AP STA's N active links (or similar) and/or b) AP can cancel DUO service for a non-AP STA if the non-AP STA's use of DUO is degrading 802.11 performance (e.g., AP is challenged to meet the agreed SCS(QC) SLA, etc). Likely a reason code should be part of the cancel message. See 25/0076 for extra insights into the problem and its solutions. | Revised – a motion has been approved that an AP that supports DUO shall accept a request to enable DUO. Apply the changes marked as #2491 |
| 2196 | Brian Hart | 37.11.2 | 81.25 | AP may have a policy of not accepting a DUO request unless it positively knows that the related emissions do not create extra / unknown interference to the AP's BSS, but a) cannot disclose this policy and b) may not be informed of the IDC channel or (if the same channel as the AP) the STA's intent to use TXOP Sharing for its IDC traffic. | Allow an AP to indicate it has a IDC policy that must be met before an assoc STA can benefit from the AP's IDC service: disallowed / allowed under constraints / allowed without constraints. If set to allowed under constraints, enable an initial DUO request for IDC service in which, in relation to its IDC traffic, the STA can indicate a) conformance to Channel Usage elements sent by the AP for its (typically) off-channel resources, or not, and/or b) its commitment to solicit (almost?) all on-channel resources via TXS. Related, the STA request should be defined to allow the STA to report its IDC operating channels. | Revised – a motion has been approved that an AP that supports DUO shall accept a request to enable DUO. Apply the changes marked as #2491 |
| 2492 | Laurent Cariou | 37.11.2 | 81.25 | An AP shall always accept a Request to enable DUO. | as in comment | Accept |
| 2593 | Minyoung Park | 37.11.2 | 81.25 | An AP to have the unavailability information from a STA is always beneficial to the AP since it provides additional information that it can utilize for rate selection or scheduling. It doesn't seem to make sense to disallow a STA to provide such information when there is no mandatory behavior at the AP side based on the information. | Delete this sentence | Accept |
| 3716 | Li-Hsiang Sun | 37.11.2 | 81.25 | DUO supporting AP should not reject STA's request to enable DUO | as in comment | Accept |
| 3764 | Yongho Seok | 37.11.2 | 81.25 | "It is TBD whether the AP can reject the request to enable the DUO mode at the STA side and the enablement procedure is TBD." The AP must accept the request to enable DUO mode if it is a DUO-supporting AP. | As in the comment | Accept |
| 2594 | Minyoung Park | 37.11.2 | 81.28 | Resolve TBDs in this paragraph for DUO mode disablement procedure. | Define a frame that enables/disables DUO mode that is similar to the EMLSR operation. For example, UHR Mode Enablement Notification frame. | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 2595 | Minyoung Park | 37.11.2 | 81.30 | The DUO Mode subfield is not defined. | Define the DUO Mode subfield in a frame that enables/disables the DUO Mode. | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 3209 | Qi Wang | 37.11.2 | 81.33 | "The associated AP shall transmit a TBD Response frame, after the AP is no longer serving the non- AP STA in the DUO mode, as a response to the received TBD Request frame, to the non-AP STA." Upon receiving a request from a STA to disable DUO, the DUO operation shall start after a time period communicated between the AP and STA as a priori. | As in comment. | Revised – agree with the commenter. Apply the changes marked as #2592 in this document. |
| 2596 | Minyoung Park | 37.11.2 | 81.36 | There is a disablement procedure for the DUO mode defined in the above paragraph. | Delete this sentence. | Accept |
| 3658 | Alfred Asterjadhi | 37.11.2 | 81.36 | Disablement procedure is defined above. So not certain what is TBD. If there are missing rules please add them and remove the TBD. | As in comment. | Revised – agree with the commenter. Remove the sentence and make the changes marked as #2596 in this document |
| 3692 | Sherief Helwa | 37.11.2 | 81.36 | What does this mean? | Explained in the comment | Revised – apply the changes marked as #2491 in this document |
| 2229 | Dana Ciochina | 37.11.2 | 81.39 | It is not clear to which frame exchanges to individually addressed STAs this applies. Is it to all, during the interval in which the mode is enabled? | add clarifying text | Revised – apply the changes marked as #2229 in this document |
| 3066 | Mark RISON | 37.11.2 | 81.40 | "The associated AP that initiates" should be "An ..." | As it says in the comment | Revised – specify the AP in the previous sentence. Apply the changes marked as #3066 in this document |
| 3067 | Mark RISON | 37.11.2 | 81.40 | "frame exchanges that are neither group addressed Data nor group addressed Management frames" -- a frame exchange is not a frame | Change to "frame exchanges that do not consist of group addressed Data or group addressed Management frames" | Accept |
| 3215 | Qi Wang | 37.11.2 | 81.40 | "The associated AP that initiates frame exchanges that are neither group addressed Data nor group addressed Management frames with the non-AP STA shall begin the frame exchanges by transmit- ting an initial Control frame (ICF) allowed for DUO mode to the non-AP STA." How is the group addressed frames delivered to non-AP solicited DUO STAs? | Please clarify the behavior. | Reject – nothing changes for group addressed frames transmissions whether the STA is a DUO STA or not. |
| 2597 | Minyoung Park | 37.11.2 | 81.43 | In the sentence below this sentence, the ICF allowed for DUO shall be a BSRP Trigger frame with certain conditions.  Change the sentence from 'by transmitting an intial Control frame (ICF) allowed for DUO mode' to 'by transmitting a BSRP Trigger frame' | As in the comment | Revised – agree with the commenter. Merge the 2 paragraph. Apply the changes marked as #2597 in this document. |
| 504 | Peshal Nayak | 37.11.2 | 81.44 | In baseline, when a STA receives a BSRP trigger frame, it understands that the AP is fetching a BSR. If a UHR STA is operating in DUO mode and receives a BSRP trigger frame, how does the STA know if the AP wants it to report a BSR along with the DUO feedback? It would be efficient if an indication is provided in the BSRP frame on how the STA is expected to respond i.e., just with DUO feedback or with BSR as well. Leaving this decision to the STA can be a little inefficient as the STA may chose to not send the BSR when the AP in fact is expecting it. Mandating that the STA send a BSR each time can result in higher overhead especially if AP does not need it and is just intending to fetch DUO feedback. | There should be an indication in the BSRP trigger frame to inform the STA if it is expected to send a BSR along with the multi-STA BA. | Reject – one trigger frame requests BSR (BSRP Trigger frame) and the other trigger frame (BSRP GI3 TF) doesn’t request BSR. No need for another field. |
| 648 | Jaheon Gu | 37.11.2 | 81.44 | In baseline, when a STA receives a BSRP trigger frame, it understands that the AP is fetching a BSR. If a UHR STA is operating in DUO mode and receives a BSRP trigger frame, how does the STA know if the AP wants it to report a BSR along with the DUO feedback? It would be efficient if an indication is provided in the BSRP frame on how the STA is expected to respond i.e., just with DUO feedback or with BSR as well. Leaving this decision to the STA can be a little inefficient as the STA may chose to not send the BSR when the AP in fact is expecting it. Mandating that the STA send a BSR each time can result in higher overhead especially if AP does not need it and is just intending to fetch DUO feedback. | There should be an indication in the BSRP trigger frame to inform the STA if it is expected to send a BSR along with the multi-STA BA. | Reject – one trigger frame requests BSR (BSRP Trigger frame) and the other trigger frame (BSRP GI3 TF) doesn’t request BSR. No need for another field. |
| 1884 | Sanghyun Kim | 37.11.2 | 81.44 | The baseline specification restricts an AP from transmitting a Trigger frame to a STA that has set the UL MU Disabled subfield to 1. It is not clear that the restriction applies to BSRP Trigger frames requesting a Non-HT PPDU response. | Please clarify it. | Revised – agree with the commenter. Clarify that if UL MU Disable is set to 1, then BSRP shall solicit non-HT PPDU. Apply the changes marked as #1884 in this document. |
| 1885 | Sanghyun Kim | 37.11.2 | 81.44 | Including the Special User Info field in a BSRP Trigger frame that requests a non-HT PPDU response seems unnecessary, as most of the information indicated by this field is only relevant for TB PPDU responses. | Please restrict the inclusion of the Special User Info field in individually addressed BSRP Trigger frames requesting a non-HT PPDU response. | Reject – inclusion of the Special User Info field depend for instance on the BW of the transmission and is already regulated by previous amendments. |
| 2454 | Klaus Doppler | 37.11.2 | 81.44 | The ICF to start a frame exchange with a STA in DUO mode should not be limited to a BSRP frame | Allow also other ICF like (MU)-RTS or sending data frames to start a frame exchange with a STA in DUO.l | Reject – this restriction is captured in the 11bn SFD |
| 3212 | Qi Wang | 37.11.2 | 81.44 | "The ICF allowed for DUO shall be a BSRP Trigger frame that has either: \* A User Info field with the AID12 field set to the AID of the STA, and with the GI And HE/ UHR-LTF Type field set to 3 to solicit a non-HT (duplicate) PPDU. \* A User Info field with the AID12 field set to the AID of the STA, and with the GI And HE/ UHR-LTF Type field not set to 3 to solicit a TB PPDU." For single user solicited DUO, the BSRP shall solicited a non-HT (dup) PPDU as a response to ensure the TXOP protection. | As in comment. |  |
| 3951 | Binita Gupta | 37.11.2 | 81.44 | In 11bn, BSRP trigger frame is defined to be the ICF for DUO (Dynamic unavailability operation). The STA responds with a Multi-STA BA to provide its dynamic unavailability. If returning a TB PPDU, the STA can include Multi-STA BA and QoS Null frames with BSR in an A-MPDU. However, BSRP trigger frame can solicit a response in non-HT(dup) PPDU, and then QoS Null with BSR info can't be included. Hence, it is desired to define a way to carry BSR info in the Multi-STA BA. BSR info can be provided in Per AID TID Info field, similar to the DUO feedback. | Define extensions to Multi-STA BA to provide BSR information. | Reject – one trigger frame requests BSR (BSRP Trigger frame) and the other trigger frame (BSRP GI3 TF) doesn’t request BSR. There’s always a possibility for the AP to request and collect the BSR. |
| 3693 | Sherief Helwa | 37.11.2 | 81.45 | Better to explicitly call out that this is the legacy BSRP Trigger frame which can be a broadcast or unicast frame. | Explained in the comment | Revised – reformulate the sentences to clarify. Apply the changes marked as #3694 in this document |
| 3694 | Sherief Helwa | 37.11.2 | 81.45 | The way this is stated gives an impression that the GI And HE/UHR-LTF Type field is also in the User Info field while it is located in the Common Info field. Needs to be rephrased. | Explained in the comment | Revised – reformulate the sentences to clarify. Apply the changes marked as #3694 in this document |
| 887 | John Wullert | 37.11.2 | 81.48 | The phrase "the GI And HE-UHR-LTF Type field not set to 3" uses negation that could be confusing. | Revise as "...the GI And HE/UHR-LTF Type field set to a value other than 3..." | Accept |
| 3068 | Mark RISON | 37.11.2 | 81.48 | " A User Info field with the AID12 field set to the AID of the STA, and with the GI And HE/ UHR-LTF Type field not set to 3 to solicit a TB PPDU. " -- it's not clear what the possible values mean then | Give a xref | Revised – apply the changes marked as #887 in this document |
| 3659 | Alfred Asterjadhi | 37.11.2 | 81.48 | Bullets can be improved. Call out two separate ICFs, BSRP Trigger frame and BSRP GI3 Trigger frame and how everything is set for each of them, and what is solicited in return (as an ICR). Also call out how DUO can be included in M-BA sent in response to A-MPDUs (CRF). And last but not least also explicitly call out ICF/ICR contents when the DUO BSRP GI3 Trigger is sent by a DUO STA. | As in comment. | Revised – agree with the commenter. Apply the changes marked as #3694 in this document |
| 3695 | Sherief Helwa | 37.11.2 | 81.48 | Better to explicitly call out that this is the legacy BSRP GI3 Trigger (a better naming would might be needed) frame which only individually addressed | Explained in the comment | Revised – agree with the commenter. Apply the changes marked as #3694 in this document |
| 3696 | Sherief Helwa | 37.11.2 | 81.48 | The way this is stated gives an impression that the GI And HE/UHR-LTF Type field is also in the User Info field while it is located in the Common Info field. Needs to be rephrased. | Explained in the comment | Revised – agree with the commenter. Apply the changes marked as #3694 in this document |
| 100 | Xiangxin Gu | 37.11.2 | 81.51 | bullet 3 is only applied to TB PPDU as a response. | move bullet 3 to right place |  |
| 3195 | Yongsen Ma | 37.11.2 | 81.52 | "that is sent in response an initial control response frame (ICR)" is confusing, and "(ICR)" should be placed right after "initial control response" | Change to "that is sent in an initial control response (ICR) frame", or break the long sentence into short sentences. | Revised – apply the changes marked as #3070 in this document. |
| 3070 | Mark RISON | 37.11.2 | 81.54 | "The ICR frame that is allowed for DUO to include the unavailability information is a Multi-STA BlockAck frame." -- not clear what this is trying to say | Change to "The ICR [frame] used to indicate the unavailability information shall be a Multi-STA BlockAck frame." | Accept |
| 1835 | yajun CHENG | 37.11.2 | 81.55 | the "frame" after ICR is redundant. Please delete it. | As in comment | Revised – apply the changes marked as #3070 in this document |
| 3072 | Mark RISON | 37.11.2 | 81.61 | "that contains the 12 LSBs of the non-AP STA's AID in any of the User Info fields " seems over-specific. Maybe something like "that addresses the non-AP STA in a User Info field"? | As it says in the comment | Revised – agree with the commenter. Apply the changes marked as #3072 in this document. |
| 3073 | Mark RISON | 37.11.2 | 81.61 | I'm not sure this merits bulleting; it's simple enough to be in-line | As it says in the comment | Revised – agree with the commenter. Apply the changes marked as #3072 in this document. |
| 3426 | Yue Zhao | 37.11.2 | 81.81 | The DUO Supported field actually has different meanings for AP and non-AP. It is OK for now, but may cause confusion and trouble in extending DUO to AP side for future generations. | Suggest to make the bit different for AP and non-AP like what is done in PS. E.g., for AP, replace dot11DUOOptionImplemented with dot11DUOAssistingOptionImplemented, and replace DUO Supported field with DUO Assisting field, and replace DUO Supporting AP with DUO Assisting AP. | Revised – agree with the commenter. Apply the changes marked as #3426 in this document. |
| 425 | Shuang Fan | 37.11.2 | 82.01 | It should be 'DUO non-AP STA',not 'DUP non-AP STA' | as in comment | Accept |
| 629 | Jaheon Gu | 37.11.2 | 82.01 | Typo DUP instead of DUO | shall respond following the rules defined in 26.5.5 (Buffer status report operation), except that the DUO non- AP STA may also aggregate a Multi-STA BlockAck frame along with the one or more QoS Null frames that are required according to 26.5.5 (Buffer status report operation). | Same as #425 |
| 638 | Jaheon Gu | 37.11.2 | 82.01 | The current text reads: "... except that the DUP non-AP STA may also aggregate a Multi-STA BlockAck frame". Replace DUP with DUO. | As in comment. | Same as #425 |
| 722 | Chien-Fang Hsu | 37.11.2 | 82.01 | A typo in the respond rules for DUO non-AP STA: "...except that the DUP non-AP STA..." | Change "DUP" to "DUO" | Same as #425 |
| 1840 | Tong Xiao | 37.11.2 | 82.01 | Typo, change "DUP non-AP STA" to "DUO non-AP STA" | As in comment | Same as #425 |
| 1903 | Hyeonjun Sung | 37.11.2 | 82.01 | Typo "DUP" | Change "DUP" to "DUO" | Same as #425 |
| 1927 | Yingqiao Quan | 37.11.2 | 82.01 | "DUP" should be "DUO". | Change "DUP" to "DUO", or explain what is "DUP". | Same as #425 |
| 1971 | Michael Grigat | 37.11.2 | 82.01 | typo "DUP" | DUO | Same as #425 |
| 2157 | Vishnu Ratnam | 37.11.2 | 82.01 | The current text reads: "... except that the DUP non-AP STA may also aggregate a Multi-STA BlockAck frame". Replace DUP with DUO. | As in comment. | Same as #425 |
| 2427 | Manasi Ekkundi | 37.11.2 | 82.01 | Type DUP instead of DUO | As in comment | Same as #425 |
| 2493 | Laurent Cariou | 37.11.2 | 82.01 | DUP should be DUO | as in comment | Same as #425 |
| 2598 | Minyoung Park | 37.11.2 | 82.01 | Typo: DUP should be DUO | As in the comment | Same as #425 |
| 3145 | Jeongki Kim | 37.11.2 | 82.01 | Change "DUP" to "DUO" | as per comment | Same as #425 |
| 3393 | Zhenpeng Shi | 37.11.2 | 82.01 | Typo: "DUP" should be "DUO". | As in comment. | Same as #425 |
| 3427 | Yue Zhao | 37.11.2 | 82.01 | typo "DUP non-AP STA" | change to "DUO non-AP STA" | Same as #425 |
| 3697 | Sherief Helwa | 37.11.2 | 82.01 | Typo. Should be DUO. | Explained in the comment | Same as #425 |
| 3074 | Mark RISON | 37.11.2 | 82.05 | "A DUO non-AP STA that is operating in the DUO mode and that receives, from its associated DUO Supporting AP, a BSRP Trigger frame that is individually addressed to the STA and solicits a response in non-HT (duplicate) PPDU format shall respond subject to the rules defined in 26.5.2.5 UL MU CS mechanism, and the response shall be in non-HT (duplicate) PPDU format and shall include a Multi-STA BlockAck frame." -- the "include" is not clear, since if it's non-HT (dup) format it can only include one Control frame | Change to "... the response shall be a xxx frame sent in yyy format" | Revised – agree with the commenter. Also modify the paragraph with the new name BSRP GI3 TF. Apply the changes marked a #3074 in this document. |
| 101 | Xiangxin Gu | 37.11.2 | 82.06 | how to set "UL Length subfield" in the BSRP frame? | Please clarify it. |  |
| 656 | Jaheon Gu | 37.11.2 | 82.06 | It is necessary to clarify when a DUO supporting UHR AP needs to transmit an individually addressed ICF soliciting a non-HT duplicate format PPDU instead of TB PPDU format to DUO non-AP UHR STA. | Suggest adding usecases and/or conditions of this operation |  |
| 797 | Seongho Byeon | 37.11.2 | 82.06 | Currently, when a non-AP STA transmits an M-STA BlockAck in a non-HT (duplicate) PPDU format, it cannot include a BSR, even after receiving BSRP Trigger frame. We need a machanism to send BSR through the Multi-STA BlockAck of non-HT (dup) PPDU format. | The commentor will bring a contribution to resolve the issue. |  |
| 798 | Seongho Byeon | 37.11.2 | 82.06 | It is necessary to clarify when a DUO supporting UHR AP needs to transmit an individually addressed ICF soliciting a non-HT duplicate format PPDU instead of TB PPDU format to DUO non-AP UHR STA. | Suggest adding usecases and/or conditions of this operation |  |
| 1894 | Sanghyun Kim | 37.11.2 | 82.08 | If a DUO non-AP STA determines whether to respond based on the rules in 26.5.2.5 after receiving an individually addressed BSRP Trigger frame, it will be unable to respond even when only part of the requested BW is unavailable for a non-HT duplicate PPDU response.  This rule would cause an AP transmitting an individually addressed BSRP Trigger frame as an ICF to experience TXOP acquisition failures more frequently compared to when it transmits other types of ICF (e.g., RTS frame). | Please allow a DUO non-AP STA that receives an individually addressed BSRP Trigger frame to respond with a dynamic BW non-HT (duplicate) PPDU. |  |
| 3717 | Li-Hsiang Sun | 37.11.2 | 82.08 | What is the NAV setting for the response in non-HT PPDU? | suggest the STA sets NAV that ends before the min(Unavailability Target Start time, the end of TXOP indicated in BSRP trigger), such that NPCA STA can switch back at correct time | Revised – define new behavior for the new BSRP GI3 trigger for setting the NAV. Apply the changes marked as #3776 in this document |
| 1912 | Hyeonjun Sung | 37.11.2 | 82.13 | According to the text, Multi-STA BlockAck frame can include DUO non-AP STA's unavailability feedback when responding. However, it seems that the text does not fully cover Motion #146. There is a lack of clarity regarding whether the frame should still be transmitted in situations where sending a Multi-STA BlockAck frame is not possible.  In subclause 26.4.4 (Pre-PPDU acknowledgment selection rules), the recipient shall respond with Compressed BA frame when the received A-MPDU does not include a tagged MPDU but does include one or more untagged MPDUs that are QoS Data frames belonging to the same block ack agreement and with the Ack Policy Indicator subfield equal to Implicit BAR for at least one MPDU unless all the MPDUs carried in the eliciting A-MPDU were received | Please clarify the conditions of responding a Multi-STA BlockAck frame with unavailability feedback from DUO STA | Revised – apply the changes marked as #1285 in this document |
| 3076 | Mark RISON | 37.11.2 | 82.13 | "may indicate, in a response Multi-STA BlockAck frame, whether the non-AP STA will be unavailable" but above it is required to do so in some situation | Change "may indicate" to "indicates" or "can indicate" | Revised – propose to use “indicates”. Apply the changes marked as #3076 in this document. |
| 3075 | Mark RISON | 37.11.2 | 82.14 | "response Multi-STA BlockAck frame" -- term not defined | Delete "response " | Accept |
| 236 | Pei Zhou | 37.11.2 | 82.15 | A STA may become temporarily unavailable in certain frequency band / channel / link due to coex with other system (e.g., BT), so frequency domain parameters should be included in the DUO response frame. | As in comment. | Reject – Frequency domain unavailability is covered in the LOM mechanism. |
| 723 | Chien-Fang Hsu | 37.11.2 | 82.15 | Add "field" to Unavailability Target Start Time and Unavailability Duration. | Change to "...contains an Unavailability Target Start Time field and an Unavailability Duration field." | Accept |
| 3077 | Mark RISON | 37.11.2 | 82.15 | "an Unavailability Target Start Time and Unavailability Duration " missing 2x "field" | As it says in the comment | Accept |
| 1839 | yajun CHENG | 37.11.2 | 82.16 | It should be "an Unavailability Target Start Time field and an Unavailability Duration field" instead of "an Unavailability Target Start Time and Unavailability Duration". Please change it. The same issue in P82L23. | As in comment | Accept |
| 1886 | Sanghyun Kim | 37.11.2 | 82.16 | Typo. Please delete hyphen between Per and AID (Per-AID => Per AID) | As in comment | Accept |
| 2599 | Minyoung Park | 37.11.2 | 82.16 | Clarify these are two separate fields by changing to "the Unavailability Target Start Time subfield and the Unavailability Duration subfield" | As in the comment | Same comment as above |
| 1913 | Hyeonjun Sung | 37.11.2 | 82.18 | There is no mechanism to indicate the absence of unavailability feedback in response Multi-STA BlockAck frame when a certain frame solicits a response with Multi-STA BlockAck frame.  In subclause 37.11.2, DUO non-AP STA that is operating in the DUO mode and that receives, from its associated DUO Supporting AP, a BSRP Trigger frame that is individually addressed to the STA and solicits a response in non-HT (dup) PPDU format shall respond with non-HT (dup) PPDU format that includes a Multi-STA BlockAck frame | Please define a mechanism to indicate the absence of unavailability feedback. | Revised – agree with the commenter. Define specific fields values to indicate availability. Apply the changes marked as #1913 in this document. |
| 738 | Junbin Chen | 37.11.2 | 82.19 | A DUO non-AP STA that is a TXOP holder may indicate in a BSRP trigger frame whether the non-AP STA will be unavailable after a specific point in time. Apparently, the BSRP trigger here is different with that already defined in baseline, but the it has not been defined in 9.3.1.22.12 yet. | please clarify it | Revised – apply the changes marked as #1067 in this document |
| 3428 | Yue Zhao | 37.11.2 | 82.19 | Enabling both solicited DUO and unsolicited DUO is redundant. Unsolicited DUO makes more sense and is more useful. In most cases, there is no need to enable both. | Suggest to include a mechanism which allows seperately enabling solicited DUO and unsolicited DUO. | Reject – the group converged in using the same capability. |
| 3698 | Sherief Helwa | 37.11.2 | 82.19 | Need to indicate that this BSRP Trigger frame solicits a non-HT (dup) PPDU response by setting the value of the GI And HE/UHR-LTF Type field to 3. | Explained in the comment | Revised – use the new terminology BSRP GI3. Apply the changes marked as #3698 |
| 3078 | Mark RISON | 37.11.2 | 82.20 | "whether the non-AP STA will be unavailable" should be "whether it will be unavailable" | As it says in the comment | Accept |
| 724 | Chien-Fang Hsu | 37.11.2 | 82.21 | Add "field" to Unavailability Target Start Time and Unavailability Duration. | Change to "...contains an Unavailability Target Start Time field and an Unavailability Duration field." | Accept |
| 1285 | Hong Won Lee | 37.11.2 | 82.21 | TBD should be resolved | Changed from "TBD User Info field" to "Special User Info field with AID12 set to 2008" based on the Motion 261 | Revised – define a Feedback User Info field that can include the Unavailability Start Time and Unavailability Duration fields. Apply the changes marked as #1285 in this document |
| 2494 | Laurent Cariou | 37.11.2 | 82.21 | Define how to include Unavailability information in Trigger frame | as in comment | Revised – define a Feedback User Info field that can include the Unavailability Start Time and Unavailability Duration fields. Apply the changes marked as #1285 in this document |
| 2496 | Laurent Cariou | 37.11.2 | 82.21 | Allow Unavailability to be included in a M-STA BA sent in response to data frame | as in comment | Revised – agree with the commenter. Apply the changes marked as #2496 in this document |
| 2600 | Minyoung Park | 37.11.2 | 82.21 | Motion#261 was passed with the definition of a new Special User Info field with AID12=2008 of the BSRP Trigger frame, B12-B15 set to 0 (a feedback type field) to indicate this special User Info field carries unavailability information. Resolve the TBD. | Update the spec based on the motion by replacing 'a TBD User Info field' to 'a Feedback User Info field' and define the Feedback User Info field in Clause 9 that includes the start time/duration information. | Same as previous comment |
| 3079 | Mark RISON | 37.11.2 | 82.21 | "an Unavailability Target Start Time and Unavailability Duration" 2x missing "field" | As it says in the comment | Same as previous comment |
| 3080 | Mark RISON | 37.11.2 | 82.22 | "The DUO non-AP STA may transmit this BSRP Trigger frame only if certain TBD conditions are true." ambiguous | Change to "... shall not transmit unless ..." | Accept |
| 3699 | Sherief Helwa | 37.11.2 | 82.22 | Need to fill in the details as per Motion 261.  Motion 261: Move to add to the TGbn SFD the following: Include the CoEx unavailability information in a new "Special User Info" field with AID12 set to 2008 of the BSRP Trigger frame when used as an ICF to report CoEx unavailability information A feedback type field (name TBD) (4 bits field - B12 to B15 of the "Special User Info" field) which is set to 0 to indicate that the "Special User Info" field is carrying CoEx unavailability information CoEx unavailability information includes two parameters: Unavailability Target Start Time and Unavailability Duration (these fields are already defined) | Explained in the comment | Revised – apply the changes marked as #1067 in this document |
| 3214 | Qi Wang | 37.11.2 | 82.23 | "The DUO non-AP STA may transmit this BSRP Trigger frame only if certain TBD conditions are true." A STA supporting unsolicited DUO should be allowed to announce its unavailability information when there is an upcoming unavailability. Please resolve the TBD accordingly, or delete the text on the "TBD" conditions. | As in comment. | Revised – define conditions to transmit the BSRP GI3. Apply the changes marked as #3214 in this document. |
| 103 | Xiangxin Gu | 37.11.2 | 82.24 | no motion for the response is multi-STA BA frame | change to TBD | Reject – there are several motions that point to the MSTA BA as the container for the feedbacks. |
| 657 | Jaheon Gu | 37.11.2 | 82.24 | According to the current text, when a DUO non-AP STA transmits a BSRP TF unsolicitedly to inform its unavailability, the DUO supporting AP should respond it with an Multi-STA BlockAck. In this case, the internal structure of the Multi-STA BlockAck, including the Per AID TID field, needs to be described. In other words, it is necessary to describe how to fill in the Multi-STA BlockAck in what context. Suggest adding: "... Multi-STA BlockAck frame in non-HT (duplicate) PPDU format including a Per-AID TID Info field that contains TBD" | As in comment. | Revised – apply the changes marked as #2496 in this document |
| 739 | Junbin Chen | 37.11.2 | 82.24 | The content of the M-STA BA from a DUO supporting AP in response to a unsolicited BSRP from a DUO non-AP STA is unclear. Generally, a BA frame is used to acknowledge the successful transmission of data frames, but here it is a ack to BSRP trigger, which is a control frame. | please clarify it | Revised – clarify that the MSTA BA is sending an Ack with TID15 AckType 1. Apply the changes marked as #739 |
| 799 | Seongho Byeon | 37.11.2 | 82.24 | According to the current text, when a DUO non-AP STA transmits a BSRP TF unsolicitedly to inform its unavailability, the DUO supporting AP should respond it with an Multi-STA BlockAck. In this case, the internal structure of the Multi-STA BlockAck, including the Per AID TID field, needs to be described. In other words, it is necessary to describe how to fill in the Multi-STA BlockAck in what context. Suggest adding: "... Multi-STA BlockAck frame in non-HT (duplicate) PPDU format including a Per-AID TID Info field that contains TBD" | As in comment. | Revised –Apply the changes marked as #739 in this document. |
| 1286 | Hong Won Lee | 37.11.2 | 82.24 | The conditions to transmit BSRP Trigger frame should be defined | As in the comment | Revised – define conditions to transmit the BSRP GI3. Apply the changes marked as #3214 in this document. |
| 1887 | Sanghyun Kim | 37.11.2 | 82.24 | Please specify the conditions under which the transmission of a BSRP trigger frame is permitted | As in comment | Revised – define conditions to transmit the BSRP GI3. Apply the changes marked as #3214 in this document. |
| 2495 | Laurent Cariou | 37.11.2 | 82.24 | Define the conditions to be allowed to include Unavailaiblity information in an unsolicited manner in BSRP TF | as in comment | Revised – define conditions to transmit the BSRP GI3. Apply the changes marked as #3214 in this document. |
| 2601 | Minyoung Park | 37.11.2 | 82.24 | Please resolve this TBD by either remove this condition or provide the detailed conditions. | As in the comment | Revised – define conditions to transmit the BSRP GI3. Apply the changes marked as #3214 in this document. |
| 3082 | Mark RISON | 37.11.2 | 82.24 | "The response frame to such a BSRP Trigger frame is a Multi-STA BlockAck frame in non-HT (duplicate) PPDU format." -- this needs to be a "shall" | As it says in the comment | Accept |
| 3700 | Sherief Helwa | 37.11.2 | 82.24 | Conditions need to be defined. | Explained in the comment | Revised – define conditions to transmit the BSRP GI3. Apply the changes marked as #3214 in this document. |
| 3765 | Yongho Seok | 37.11.2 | 82.24 | "The DUO non-AP STA may transmit this BSRP Trigger frame only if certain TBD conditions are true." Please clarify the TBD conditions. Whenever the non-AP STA has an unavailability period, it should be allowed to report it. | As in the comment | Revised – define conditions to transmit the BSRP GI3. Apply the changes marked as #3214 in this document. |
| 1844 | yajun CHENG | 37.11.2 | 82.25 | The crucial parameters/fields seeting of the Multi-STA BlockACK frame transmitted by an AP as aresponse to the BSRP Trigger frame should be listed here. | As in comment. | Revised –Apply the changes marked as #739 in this document. |
| 3081 | Mark RISON | 37.11.2 | 82.25 | "frame in non-HT (duplicate) PPDU format" -- frames are not really in PPDU formats | Change to "frame in a non-HT (duplicate) PPDU" | Accept |
| 102 | Xiangxin Gu | 37.11.2 | 82.28 | unavailability info can be carried by BSRP frame also | Add BSRP frame after Multi-AP BA frame | Comment covered already |
| 2198 | Brian Hart | 37.11.2 | 82.30 | "shall" statement is not conditioned on AP accepting the DUO request | Condition this behavior on an accepted DUO agreement between AP and non-AP STA | Reject – sentence already says that this applies when the DUO mode is enabled. |
| 2602 | Minyoung Park | 37.11.2 | 82.30 | An Unavailability Duration field is missing after Unavailability Target Start Time field | Change to "that includes an Unavailability Target Start Time subfield and an Unavailability Duration subfield" | Accept |
| 3083 | Mark RISON | 37.11.2 | 82.31 | "from the future target time indicated in the Unavailability Target Start Time field," -- what if this time was really soon after the BA frame, and is now in the past? | Delete "future" | Accept |
| 1287 | Hong Won Lee | 37.11.2 | 82.34 | TBD should be resolved in case the unavailability duration is unknown | As in the comment | Revised – agree with the commenter. Apply the changes marked as #3213 |
| 2497 | Laurent Cariou | 37.11.2 | 82.34 | When a non-AP STA indicates an unavailability with a start but with an unknown duration, we need to define how to indicate to the AP that it is back in the available state. A good way would be to send a BSRP TF including the Unavailability Report configured to indicate that the STA is now available. | as in comment | Revised – agree with the commenter. Apply the changes marked as #3213 |
| 2603 | Minyoung Park | 37.11.2 | 82.34 | Replace TBD with 'indefinite duration', and remove the paranthesis, and replace 'unknown' with 'unknown or indefinite' | As in the comment | Revised – agree with the commenter. Apply the changes marked as #3213 |
| 3661 | Alfred Asterjadhi | 37.11.2 | 82.34 | Not sure what until TBD if unknown... if unknown then you don't know the duration. Also remove the parenthesis text. If this targets covering how unavailability is cancelled then the next sentence should cover it no? | As in comment. | Revised – agree with the commenter. Apply the changes marked as #3213 |
| 3701 | Sherief Helwa | 37.11.2 | 82.34 | I propose the following to resolve the TBD:  "Until the DUO non-AP STA send updated unavailability information either included in a BSRP GI3 Trigger frame sent unsolicitedly or in a Multi-STA BA frame sent in response to a BSRP (GI3) Trigger." | Explained in the comment | Revised – agree with the commenter. Apply the changes marked as #3213 |
| 658 | Jaheon Gu | 37.11.2 | 82.37 | Suggest changing text from "DUO STA" to "DUO non-AP" STA, because it is never used or defiend. | As in comment. | Accept |
| 800 | Seongho Byeon | 37.11.2 | 82.37 | Suggest changing text from "DUO STA" to "DUO non-AP" STA, because it is never used or defiend. | As in comment. | Accept |
| 3084 | Mark RISON | 37.11.2 | 82.37 | "unavailability report " -- term not defined | As it says in the comment | Revised – agree with the commenter. Apply the changes marked as #3084 |
| 508 | Peshal Nayak | 37.11.2 | 82.38 | The current text states that the DUO supporting AP shall maintain up to one unavailability report per DUO STA and that unavailability report corresponds to the most recently received unavailability report. This is very inefficient. Consider a scenario where a STA has a Co-Ex/unavailability event starting at t=0 and a duration of 10ms and another Co-Ex/unavailability event starting at t = 15ms and duration of 10ms. Then the STA has to wait until the first Co-Ex/unavailability event is over to inform the AP about the second one? The STA may not have enough time after the first Co-Ex event to provide information about the second Co-Ex event. | Allow the STA to update its Co-Ex information at the AP to report following Co-Ex events. | Revised – it is possible to send an unavailability report to modify the previous one. Apply the changes marked as #242 in this document |
| 649 | Jaheon Gu | 37.11.2 | 82.38 | The current text states that the DUO supporting AP shall maintain up to one unavailability report per DUO STA and that unavailability report corresponds to the most recently received unavailability report. This is very inefficient. Consider a scenario where a STA has a Co-Ex/unavailability event starting at t=0 and a duration of 10ms and another Co-Ex/unavailability event starting at t = 15ms and duration of 10ms. Then the STA has to wait until the first Co-Ex/unavailability event is over to inform the AP about the second one? The STA may not have enough time after the first Co-Ex event to provide information about the second Co-Ex event. | Allow the STA to update its Co-Ex information at the AP to report following Co-Ex events. | Revised – it is possible to send an unavailability report to modify the previous one. Apply the changes marked as #242 in this document |
| 725 | Chien-Fang Hsu | 37.11.2 | 82.38 | "per DUO STA" should be "per DUO non-AP STA" | as the comment | Revised – agree with the commenter. Apply the changes marked as #800 |
| 2195 | Brian Hart | 37.11.2 | 82.38 | Each UL TXOP comes with a tremendous cost, and this allows (and then encourages, especially in ill-considered implementations) a non-AP STA to send a new unavailability report every time the STA learns something new about an upcoming unavailability period; aka DUO unavailability spam. | AP needs to be able to discourage DUO unavailability spam: AP needs to be able to publish its policy in UHR Operation element, such as "AP processes all unavailability updates / AP discards subsequent reports while an earlier report has not yet completed". Also, to deal with spammy clients, allow AP to apply to policy per STA too. | Revised – define conditions to send unsolicited unavailability report. Apply the changes marked as #3214 |
| 2199 | Brian Hart | 37.11.2 | 82.38 | "shall" statement is not conditioned on AP accepting the DUO request | Condition this behavior on an accepted DUO agreement between AP and non-AP STA | Revised – it is when the STA operates in DUO mode. Apply the changes marked as #2199 in this document. |
| 2604 | Minyoung Park | 37.11.2 | 82.38 | It is not clear what 'unavailability report' means here. Please clarify or replace with the Unavailability Target Start Time and the Unavailability Duration' | As in the comment | Revised – agree with the commenter. Apply the changes marked as #3084 |
| 3218 | Qi Wang | 37.11.2 | 82.38 | "A DUO Supporting AP shall maintain up to one unavailability report per DUO STA, and that unavailability report corresponds to the most recently received unavailability report (if any)." The spec text detailing a non-AP DUO STA's updating unavailability is needed. | As in comment. | Revised – it is possible to send an unavailability report to modify the previous one. Apply the changes marked as #242 in this document |
| 2605 | Minyoung Park | 37.11.2 | 82.39 | Replace '(if any)' to , if any. | As in the comment | Accept |
| 1914 | Hyeonjun Sung | 37.11.2 | 82.40 | Need to clarify the previous indicated unavailability feedback update  There is no mechanism to indicate the event when the previous indicated unavailability feedback by a DUO non-AP STA is revoked. | As in comment | Revised – it is possible to send an unavailability report to modify the previous one. Apply the changes marked as #242 in this document |
| 1915 | Hyeonjun Sung | 37.11.2 | 82.40 | Since a dynamic unavailability feedback cannot be predictable by DUO STA, the DUO Supporting AP shall give an opportunity to the DUO STA to indicate its unavailability feedback during a TXOP. | Please define an ack policy setting rule from DUO Supporting AP for soliciting the unavailability feedback with DUO non-AP STA except when the DUO Supporting AP transmits last PPDU at the end of TXOP: | Rejected – there is already a requirement for the UL Length to allow to include unavailability feedback. |
| 2230 | Dana Ciochina | 37.11.2 | 82.41 | "The AP should not schedule for transmission PPDUs containing frames to STAs that overlap with unavailability period of time:" Rules for the edca channel access when the AP transmits to a non-AP STA with DUO should also be included | add clarifying text | Reject – it’s not a question of channel access rules, but about queuing for transmissions the frames addressed to the STA. |
| 3143 | Jeongki Kim | 37.11.2 | 82.41 | DUO STA may end its unavailable period earlier than the period indicated by the STA. For example, when the co-ex event finished earlier. In that case, if the AP receives low latency data during the unavailability duration, the AP need to deliver the low latency traffic to DUO STA as soon as possible. The spec need to provide such the mechanism | Define the mechanism for AP to deliver a low latency traffic to DUO non-AP STA during unavailability period indicated by the DUO non-AP STA when the AP received the low latency traffic for the DUO non-AP STA. | Reject – if the STA is unavailable, it can not receive |
| 3144 | Jeongki Kim | 37.11.2 | 82.41 | PUO STA may end its unavailable period earlier than the period indicated by the STA. For example, when the co-ex event finished earlier. In that case, if the AP receives low latency data during the unavailability duration, the AP need to deliver the low latency traffic to PUO STA as soon as possible. The spec need to provide such the mechanism | Define the mechanism for AP to deliver a low latency traffic to PUO non-AP STA during unavailability period indicated by the PUO non-AP STA when the AP received the low latency traffic for the PUO non-AP STA. | Reject – if the STA is unavailable, it can not receive |
| 3217 | Qi Wang | 37.11.2 | 82.41 | "When an AP considers a non-AP STA as being unavailable during a period of time after having received unavailability information as described in this subclause, the AP should not schedule for transmission PPDUs containing frames addressed to the STA that overlap with its unavailability period of time and if the AP still transmits, the STA is not expected to receive the PPDUs." If a DUO AP transmits during the unavailability time announced by a non-AP DUO, the AP should avoid retry of failed packet during the unavailability time. | Please specify the packet retry behavior for DUO. | Comment: Seems covered already in Note |
| 237 | Pei Zhou | 37.11.2 | 82.42 | The behaviors of DUO Supporting AP and DUO non-AP STA are not enough to cover various cases. More detailed bahavior definations should be added to make the DUO procedure complete. | The behavior includes but not limit to the following: 1) If the end time of unavailability (t0) larger than the end time of the current TXOP (t1), the DUO non-AP STA as TXOP holder may terminate current TXOP before Unavailability Target Start Time and initiate backoff after t0. The DUO Supporting AP as TXOP responder may initiate backoff after the Unavailability Target Start Time. 2) If the end time of unavailability (t0) earlier than the end time of the current TXOP (t1), the DUO non-AP STA as TXOP holder should maintain current TXOP and initiate TX at t0. The DUO Supporting AP as TXOP responder may wait for the TXOP holder's frame after t0, or define new rules that DUO Supporting AP can take over current TXOP and communicate with other STAs during the Unavailability Duration. 3) If the Unavailability Duration is unknown and the end time of unavailability (t0) earlier than the end time of the current TXOP (t1), the DUO non-AP STA as TXOP responder may unsolicitedly send a ICF immediately after t0 to TXOP holder to inform its availability. 4) If the Unavailability Duration is unknown and the end time of unavailability (t0) larger than the end time of the current TXOP (t1), the DUO non-AP STA as TXOP responder may initiate backoff after t0. The DUO Supporting AP as TXOP holder may choose to transmit to another STA if there is no response from the DUO non-AP STA for a certain time duration (e.g., PIFS, DIFS) start at the Unavailability Target Start Time. |  |
| 2606 | Minyoung Park | 37.11.2 | 82.43 | Replace 'transmission PPDUs' with 'transmission of PPDUs' | As in the comment | Revised – scheduled for transmission is the baseline wording, but the language is confusing. Rephrase it to avoid the confusion. Apply the changes marked as #2606 in this document. |
| 3766 | Yongho Seok | 37.11.2 | 82.43 | "the AP should not schedule for transmission PPDUs containing frames addressed to the STA that overlap with its unavailability period of time and if the AP still transmits, the STA is not expected to receive the PPDUs." The AP should not schedule the transmission of PPDUs that solicit a response PPDU (including TB PPDU) from the STA if they overlap with its unavailability period. | As in the comment | Revised – apply the changes marked as #3766 in this document |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 3205 | Qi Wang | 35.61 | M-STA BA is the response frame to the BSRP when the BSRP contains the unsolicited unavailability report. However, the corresponding frame design of such of M-STA BA still needs to be specified in 11bn. | As in comment. | Revised – apply the changes marked as #739 in this document |
| 1563 | Michail Koundourakis | 0.00 | Unavailability Duration should have a value that means "INDEFINITE". Also, it is unclear if the Feedback subfield specifies enough information to cover different unavailability use cases, such as in-device coex for STA and AP. | Define a new value for indefinite unavailability and enhance subfield to cover unavailability beyond the non-AP STA cases. | Revised – agree with the commenter. Apply the changes marked as #1913 in this document |
|  |  |  |  |  |  |
| 1751 |  |  | Improve feedback in BlockAck frames, to help recipient's link adaptation decisions. | Add a "parity errors count" subfield to feed back that the receiver of the A-MPDU experienced a number of parity errors. This tells the transmitter of the A-MPDU that the recipient tried to receive the MPDUs (as opposed to , it was not available to try to receive, which is typical for coex). | Revised –  Agree in principle with the comment. Proposed resolution is to define a field that indicates whether there has been any errors due to interference.  TGbn editor to make the changes shown in 11-25/xxxxr0 under all headings that include CID 1751. |

Introduction

***TGbn editor: please add the following subclause 37.x Coexistence mechanisms in 802.11bn D0.1:***

37.x Unavailability reporting and parameter updates

37.x.1 General

The unavailability reporting and parameter updates subclause describes a set of mechanisms that allow a STA to inform a peer STA of its unavailabilities. Subclause 37.x.2 (Dynamic unavailability operation mode) describes how a non-AP STA can indicate unavailability in certain Control frames, where the unavailability might overlap with the ongoing TXOP. Subclause 37.x.3 (Periodic unavailability indication) describes how a non-AP STA can inform its associated AP about periodic service periods where the STA will be unavailable. Subclause 37.x.4 (AP Periodic Unavailability Operation mode) describes how and under which conditions an AP can operate its BSS with periodic service period(s) during which the AP will be unavailable. Finally, Subclause 37.x.5 (Non-AP STA Parameter Update mechanism) describes a parameter update mechanism that allows a non-AP STA to limit its operation capabilities when experiencing in-device coexistence issues.

37.11.2 Dynamic Unavailability Operation (DUO) mode

A non-AP STA that has dot11DUOOptionImplemented equal to true [#2590] supports dynamic unavailability operation (DUO), is called a DUO non-AP STA and shall set the DUO Support field [#637] of the UHR MAC Capabilities Information field of the UHR Capabilities element to 1. An AP [#2589] that has [#3426]dot11DUOAssistingOptionImplemented equal to true [#2590] supports dynamic unavailability operation (DUO), is called a DUO assisting [#3690] AP and shall set the DUO Support field of the UHR MAC Capabilities Information field of the UHR Capabilities element to 1.

[#2592 – all changes in the paragraph, except the ones that are tagged]To enable DUO mode with its associated DUO assisting [#3690] AP,the DUO non-AP MLD shall notify its associated AP MLD that it is enabling DUO for a non-AP STA on an enabled link by transmiting to the AP MLD a Link Reconfiguration Request frame with the DUO Mode subfield in the frame set to 1 for the corresponding enabled link. The AP MLD shall accept the request and shall transmit to the non-AP MLD a Link Reconfiguration Notify frame that does not contain a Reconfiguration Multi-Link element and that has the Dialog Token field set to the the value of the Dialog Token field from the corresponding Link Reconfiguration Request frame, [#3065] after the affiliated AP is ready to serve the non-AP STA in DUO mode [#3064].

[#2491, #2492, #2593, #3716, #3764]

[#2592 – all changes in the paragraph, except the ones that are tagged] To disable DUO mode of a non-AP STA affiliated with a non-AP MLD [#3690] the DUO non-AP MLD shall transmit to its associated AP MLD a Link Reconfiguration Request frame with the DUO Mode subfield in the frame set to 0 for the corresponding enabled link.The associated AP MLD shall accept the request and shall transmit to the non-AP MLD a Link Reconfiguration Notify frame[#3064] that does not contain a Reconfiguration Multi-Link element and that has the Dialog Token field set to the the value of the Dialog Token field from the corresponding Link Reconfiguration Request frame, after the AP is no longer serving the non-AP STA in the DUO mode, as a response to the received TBD Request frame, to the non-AP STA.

[#2491, #2596]

When a DUO non-AP STA is operating in the DUO mode with a DUO assisting AP [#3066], then:

* The [#3066]AP that initiates frame exchanges [#2229]with the non-AP STA that consists of neither [#3067] group addressed Data nor group addressed Management frames with the non-AP STA shall initiate the frame exchanges by transmitting to the non-AP STA [#2597] an initial Control frame (ICF) [#2597] which is either[#3694]:
  + [#3694] An individually addressed BSRP NTB Trigger frame that includes a User Info field with the AID12 field set to the AID of the STA, and has the GI And HE/EHT/UHR-LTF Type field, in the Common Info field, set to 3 to solicit a non-HT PPDU or a non-HT duplicate PPDU
  + [#3694] An individual or group addressed BSRP Trigger frame, that includes a User Info field with the AID12 field set to the AID of the STA, and that has the GI And HE/EHT/UHR-LTF Type field, in the Common Info field, set to a value other than [#887] 3 to solicit a TB PPDU
* The BSRP Trigger frame shall have the UL Length field set to a value that is sufficiently large to allow the DUO non-AP STA to respond to the BSRP Trigger frame with a PPDU that contains a Multi-STA BlockAck frame with the unavailability feedback. [#3069]. The ICR frame used to indicate the unavailability information shall be a Multi-STA BlockAck frameand the non-AP STA that sends the Multi-STA BlockAck frame shall not include Per AID TID Info fields that follow 26.4.2 (Acknowledgment context in a Multi-STA Block Ack frame). [#3070]

A DUO non-AP STA that is operating in the DUO mode that receives a BSRP Trigger frame from its associated DUO assisting [#3690] AP and that addresses the non-AP STA in a User Info field of the BSRP Trigger frame [#3072] shall respond with a TB PPDU following the rules defined in 26.5.5 (Buffer status report operation), except that the DUO [#425] non-AP STA shall also aggregate a Multi-STA BlockAck frame that may contain the unavailability feedback along with the one or more QoS Null frames that are required according to 26.5.5 (Buffer status report operation).

[#3074 – all changes in the paragraph, except the ones that are tagged A DUO non-AP STA that is operating in the DUO mode and that receives, from its associated DUO assisting [#3690] AP, a BSRP NTB Trigger framethat addresses the non-AP STA in a User Info field of the BSRP NTB Trigger frame shall respond subject to the rules defined in 26.5.2.5 UL MU CS mechanism, and the response shall be a Multi-STA BlockAck frame that may contain the unavailability feedback and that is sent in non-HT PPDU or non-HT duplicate PPDU format.

A DUO non-AP STA that is operating in the DUO mode and that is a TXOP responder indicates [#3076], in a [#3075] Multi-STA BlockAck frame, whether the non-AP STA will be unavailable after a specific point in time and, if known, for how long, by including a Per AID TID Info field that contains an Unavailability feedback [#723, #3077, #1839] [#723, #3077, #1839] in the Multi-STA BlockAck frame (see 9.3.1.8.6)) (Multi-STA BlockAck variant). The Unavailability Duration field of the unavailability feedback shall be set to 1023 only if the unavailability duration is unknown and the Unavailability Duration field of the unavailability feedback shall be set to 0 only if the DUO STA is available. [#1913] The Multi-STA BlockAck frame that may contain the unavailability feedback shall be sent:

* in response to a BSRP (NTB) Trigger frame or a BSRP Trigger frame
* [#2496] or in response to a PPDU that solicits an immediate response from the DUO STA (see 35.4 (EHT acknowledgment procedure), 26.4.2 (Acknowledgment context in a Multi-STA Block Ack frame))
  + This Multi-STA BlockAck frame shall contain one or more Per AID TID Info subfields with Block Ack Bitmap as in Figure 9-60 (Per AID TID Info subfield format with Block Ack Bitmap) required by 35.4 (EHT acknowledgment procedure) and 26.4.2 (Acknowledgment context in a Multi-STA Block Ack frame), that are followed by one or more Per AID TID Info subfields with feedback as in Figure 9-60a (Per AID TID Info subfield format with Feedback).

[#1285] A DUO non-AP STA that is operating in the DUO mode and that is a TXOP holder may indicate in a BSRP NTB [#3698] Trigger frame addressed to the DUO assisting AP whether it [#3078] will be unavailable after a specific point in time, and, if known, for how long, by including a Feedback User Info field (see 9.3.1.22.7 Feedback User Info field) that has a Feedback Type field set to 0 and that contains both an Unavailability Target Start Time field [#724] and an Unavailability Duration field [#724] (see 9.3.1.22 (Trigger frame format)). The DUO non-AP STA may transmit this BSRP NTB Trigger frame addressed to the DUO assisting AP and that indicates unavailability without restriction if this frame is sent in a TXOP that includes at least one QoS Data frame transmitted by the non-AP STA. The DUO non-AP STA shall not transmit a BSRP NTB Trigger frame that indicates unavailability more than MaxStandaloneDuoBSRP number of times every beacon interval where MaxStandaloneDuoBSRP is a non-zero value, if the BSRP NTB Trigger frame is sent in a TXOP that includes no QoS Data frame transmitted by the non-AP STA. [#3214] The response frame to such a BSRP NTB Trigger frame shall be [#3082] a Multi-STA BlockAck frame with no Per AID TID Info field [#739] in a non-HT (duplicate) PPDU [#3081].

When a DUO assisting [#3690] AP receives from a DUO non-AP STA operating in DUO mode a Multi-STA BlockAck frame or a BSRP NTB Trigger frame addressed to the AP that includes an Unavailability Target Start Time field and an Unavailability Duration field [#2602], the UHR AP shall consider the STA as being unavailable:

* from the [#3083]target time indicated in the Unavailability Target Start Time field,
* for a duration indicated in the Unavailability Duration field, if the unavailability duration is between 1 and 1022, otherwise, if the unavailability duration is set to 1023, for an undetermined duration, until the non-AP STA sends an explicit indication that it will transition back to being available. if the unavailability duration is unknown. [#3213, #1285]

[#3213] NOTE - As described in 11.2.1 (General), the unavailability status of a non-AP STA does not change its power management mode or its power state and, if a non-AP STA is unavailable, it can not receive PPDUs.

[#3213] A non-AP STA that intends to transition from unavailable to available immediately shall transmit a BSRP NTB Trigger frame that includes a Feedback User Info field with Feedback Type field set to 0 and with the Unavailability Duration field set to 0.

A DUO assisting [#3690] AP shall maintain up to one unavailability feedback, consisting of an unavailability start time and an unavailability duration [#3084] per DUO non-AP [#658, #800] STA operating in the DUO mode [#2199], and that unavailability feedback corresponds to the most recently received unavailability report, if any,[#2605] in a BSRP NTB Trigger frame or a Multi-STA BlockAck frame.[#3084] [#242]An AP disregards the previous unavailability feedback for a non-AP STA when it receives a new unavailability feedback from the same non-AP STA.

[#242]NOTE – A non-AP STA might send an unavailability feedback while it is unavailable to modify the unavailability duration.

When an AP considers a non-AP STA as being unavailable during a time window after having received unavailability information as described in this subclause, the AP should not schedule for transmission any PPDU [#2606] containing frames addressed to the STA if the PPDU and the solicited PPDU triggered by those frames[#3766] would overlap with the STA’s[#3766] unavailability time window and if the AP still transmits such a PPDU, the non-AP STA is not expected to receive the PPDUs.

NOTE - If the AP transmits PPDUs containing frames addressed to the STA during the STA’s unavailability time window, then the expectation is that the AP does not take into account the failed reception of the frames contained in the PPDUs for the AP’s rate selection algorithm nor for the AP’s EDCA function for the AC used to transmit these frames, unless required by regulatory rules.

A DUO non-AP STA that is operating in the DUO mode and that is a TXOP responder may indicate, in a Multi-STA Block Ack frame that is sent in response to a PPDU containing frame(s) requiring an immediate response, whether the non-AP STA experienced any in-device errors during the reception of the PPDU following the rules below:

* If the STA reports in the Multi-STA Block Ack frame that all the frame(s) requiring an immediate response are successfully received, then the STA shall set the In-Device Error Flag subfield to 0.
* If the STA reports in the Multi-STA Block Ack frame that at least one of the frames requiring an immediate response is not successfully received, then the STA shall set the In-Device Error Flag subfield to:
  + 1 if at least one of the unsuccessful receptions is due to an in-device error that occurred during the reception of the PPDU containing these frame(s)
  + 0 if either none of the unsuccessful receptions is due to an in-device error or the source of the error is unknown.

NOTE 1 — An in-device error might be due to internal in-device coexistence, internal or external interference, or due to other internal limitations.

NOTE 2 — If the AP receives an indication from the DUO STA that an in-device error has occurred during the reception of the soliciting PPDU, then the expectation is that the AP does not consider the failed reception of any of the frames that solicited an immediate response and contained in the soliciting PPDU as an input to the AP’s rate selection algorithm, which is by itself out of scope of the standard.*[#1751]*

***TGbn editor: please change subclause 11.2.1 as follows*** [#3213]

**11.2.1 General**

A non-AP STA can be in one of two power management modes:

* Active mode: The STA receives and transmits frames at any time if the STA is in awake state. A non-HE STA remains in the awake state. An HE STA remains in the awake state, unless the STA is unavailable. A STA that is unavailable is not capable of receiving PPDUs. A STA is permitted to be unavailable as described in 26.14.3 (Opportunistic power save), 26.14.1 (Intra-PPDU power save for non-AP HE STAs), 26.8.4.4 (TWT Information frame exchange for flexible wake time) and 37.11 (Unavailability reporting and parameter updates).
* Power save (PS) mode: The STA enters the awake state to receive or transmit frames. The STA remains in the doze state otherwise. A STA that is unavailable is not capable of receiving PPDUs, even if the STA is in the awake state, and the unavailability status of the STA does not change the power state of the STA.

A STA in PS mode can be in one of two power states:

— Awake: STA is fully powered, except if the STA is unavailable, in which case it is not capable of receiving PPDUs.

— Doze: STA is not able to transmit or receive (11ba)non-WUR PPDUs and consumes very low

power.

**9.4.2.aa2.2 UHR MAC Capabilities Information field**

***TGbn editor: please add a DUO Support field, a PUO Support field, a PUO Assisting field, an OM Control UL MU Data Disable RX Support field in Figure 9-aa5 —UHR MAC Capabilities Information field format and add the following rows in table 9-130a (Table 9-130a— Subfields of the UHR MAC Capabilities Information field). [#1067]***

|  |  |  |
| --- | --- | --- |
| * Subfields of the UHR MAC Capabilities Information field | | |
| Subfield | Definition | Encoding |
| DUO Support | Indicates whether or not DUO is supported | For a non-AP STA, set to 1 if dot11DUOOptionImplemented is true (see 37.11.2 (Dynamic Unavailability Operation (DUO) mode)) and set to 0 otherwise.  For an AP, set to 1 if dot11DUOAssistingOptionImplemented is true (see 37.11.2 (Dynamic Unavailability Operation (DUO) mode)) and set to 0 otherwise. |
| PUO Support | Indicates whether or not PUO is supported for a non-AP STA | For a non-AP STA, set to 1 if dot11PUOOptionImplemented is true (see 37.11.3 (Non-AP STA periodic unavailability operation (PUO) mode)0 and set to 0 otherwise.  For an AP, reserved. |
| PUO Assisting | Indicates whether or not PUO is supported for an AP | For an AP, set to 1 if the AP supports being a PUO Assisting AP (see 37.11.3 (Non-AP STA periodic unavailability operation (PUO) mode)0 and set to 0 otherwise.  For an non-AP STA, reserved. |
| OM Control UL MU Data Disable RX Support | Indicats whether OM Control UL MU Data Disable Rx is supported for an AP | For an AP, set to 1 if the AP supports interpretation of the UL MU Data Disable subfield of the OM Control subfield as described in 26.5.2 (UL MU operation), and set to 0 otherwise.  For a non-AP STA, reserved. |

***TGbn editor: please add a new subclause 9.3.1.22.7 Feedback User Info field as follows right before subclause for Intermediate FCS[#1067]***

* + - * 1. Feedback User Info field

The Feedback User Info field is a User Info field that does not carry user specific information but carries feedback common information.

The Feedback User Info field is identified by an AID12 value of 2008 and is optionally present in a BSRP Trigger frame or a BSRP NTB Trigger frame that is generated by a UHR non-AP STA.

NOTE 1-An UHR AP does not use the value 2008 as an AID for any STA associated to it (see 35.15.1 (Basic EHT BSS operation) and 37.4 (UHR BSS operation)).

The format of the Special User Info field is defined in Figure 9-xxx (Feedback User Info field format).

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0   B11 | B12  B15 | B16    B39 |
|  | AID12 | Feedback Type | Feedback Information |
| Bits: | 12 | 4 | 24 |

**Figure 9-xxx—Feedback User Info field format**

If the Feedback Type field is set to 0 for Unavailability Feedback, then the format of the Feedback Information field is defined in Figure 9-xxx (Feedback Information field if the Feedback Type is set to 0). Other values are reserved.

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0   B9 | B10  B19 | B20 B23 |
|  | Unavailability Target Start Time | Unavailability Duration | Reserved |
| Bits: | 10 | 10 | 4 |

**Figure 9-xxx— Feedback Information field format if the Feedback Type is set to 0**

The Unavailability Target Start Time field indicates the value of TSF[15:6] at the time when the STA transmitting the Multi-STA BlockAck frame becomes unavailable (see 11.2.1 (General)), except that this field is reserved (i.e., invalid and to be ignored by the recipient) if the Unavailability Duration subfield is equal to 0 [#1913]. The Unavailability Duration field indicates the duration in units of 64 µs over which the STA transmitting the Multi-STA BA is unavailable, except that the value 0 indicates that the STA is available, and the value 1023 indicates that the STA is unavailable for an indefinite duration of time.

**37.4 UHR BSS operation**

**37.4.1 Basic UHR BSS operation**

***TGbn editor: please add the following paragraph at the end of subclause 37.4.1 (Basic UHR BSS operation) [#1884]***

A UHR AP shall set the OM Control UL MU Data Disable RX Support field in the UHR

Capabilities element to 1 if the UHR AP has at least one of dot11EHTEMLSROptionActivated, dot11DPSOptionImplemented and dot11DUOOptionImplemented is true.

A UHR STA shall follow the procedure defined in 26.9 (Operating mode indication), except for the following:

* If a non-AP UHR STA has received the OM Control UL MU Data Disable RX Support field in the HE Capabilities element set to 0 and the OM Control UL MU Data Disable RX Support field in the UHR Capabilities element set to 1, then the non-AP UHR STA, acting as an OMI initiator, may set the UL MU Disable subfield to 0 and the UL MU Data Disable subfield to 1 to indicate that only UL MU Data frame transmission is suspended.
* If an HE AP has set the OM Control UL MU Data Disable RX Support field in the HE Capabilities element
* it transmits to 0 and has set the OM Control UL MU Data Disable RX Support field in the UHR Capabilities element it transmits to 1, an associated UHR STA may set the UL MU Data Disable subfield in the OM Control field to 1.
* An OMI responder that has transmitted the OM Control UL MU Data Disable RX Support subfield set to 1 in either the HE Capabilities element or the UHR Capabilities element shall regard an OMI initiator as capable of participating in UL MU operation, except for UL MU Data frame if the UL MU Disable subfield is equal to 0 and the UL MU Data Disable subfield is equal to 1 in the most recently received OM Control subfield from that OMI initiator.

***TGbn editor: please add the following subclause: 37.2 UHR channel access [#3776]***

**37.2 UHR channel access**

**37.2.1 Setting and resetting the NAV with BSRP Trigger frame**

A UHR STA shall follow the rules defined in 10.3.2.4 (Setting and resetting the NAV), and the additional following rules:

* A STA that used information from an BSRP Trigger frame or a BSRP NTB Trigger frame as the most recent basis to update its NAV setting is permitted to reset its NAV if no (#3038)PHY-RXEARLYSIG.indication or PHYRXSTART.indication primitive is received from the PHY during a BSRPNAVTimeout period starting when the MAC receives a PHY-RXEND.indication primitive corresponding to the detection of the BSRP Trigger frame or BSRP NTB Trigger frame. The BSRPNAVTimeout period is equal to (2 × aSIFSTime) + T\_PREAMBLE + T\_SIGNAL + UL\_Length + aRxPHYStartDelay + (2 × aSlotTime). (see Table 17-5—Timing-related parameters)
  + - * 1. **Overview**

***TGbn editor: Please change the figure below as follows [#1751]:***

The BA Control field is defined in Figure 9-53 (BA Control field format(11ax)(11ay)).

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | | B1 B4 | B5 B6 | B7 | B8 | B9 | B10 | B11 | B12 B15 |
|  | Reserved | | BA Type | Reserved | In-Device Error Flag | Reserved | No Memory Kept | Memory Configuration Tag | Management Ack | TID\_INFO |
| Bits: | 1 | | 4 | 2 | 1 | 1 | 1 | 1 | 1 | 4 |
|  | | * BA Control field format(11ax)(11ay) | | | | | | | | |

The GCR BlockAck frame is used in response to a GCR BlockAckReq frame, and the GLK-GCR BlockAck frame is used in response to a GLK-GCR BlockAckReq frame.(11ax)

***TGbn editor: Please insert a new paragraph below as follows [#1751]:***

The In-Device Error Flag indicates whether an in-device error has occurred during the reception of the PPDU that solicited the Multi-STA Block Ack frame. The In-Device Error Flag subfield is set to 1 to indicate that an in-device error occurred during the reception of the soliciting PPDU and is set to 0 to indicate that no in-device errors occurred during the reception of the soliciting PPDU or that the source of the error is unknown. The In-Device Error Flag is reserved in other variants of the Block Ack frame.*[#1751]*