IEEE P802.11  
Wireless LANs

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| Submission  CR NSTR limited | | | | |
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Abstract

This submission proposes resolutions to TGbe CC36 CIDs as listed:

4271 4272 4351 4751 5232 5290 4220 5641 5656 5896 6104 6157 6405 6650 6935 6971 7382 7383 7384 7484 7500 7555 7711 7777 7778 7874 7887 8301 8302

Related to the subject: NSTR limited definition and other items related to NSTR.

Revisions:

* R0: Initial version of the document.
* R1:
  + CID 5232, 6935, 7777, 8301 modify resolution and add text with changes
  + CID 5641, editorial change to resolution

***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.***

**CIDs**

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| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution (Proposed)** |
| 4271 | Alfred Asterjadhi | 10.3.2.11 | 167.47 | Shouldn't the STA transmit an Ack/BA nevertheless? I.e., the transmission was successfully received so ack it. Suggest keeping the same rule as before for Ack BA. | As in comment. | Reject – the existing text already allows what the commenter is suggesting. One might argue about the difference between “should” and “may”, but the reality is that “should” can only exist if “may” exists somewhere else because nothing is allowed unless it is explicitly stated that it is allowed. With “may” in place, one could consider adding a companion “should” statement, but then what would be the condition when one “should” vs when one “should not”? Let each implementation make its own decision regarding ACKing something already received vs potentially destroying some other ongoing reception, based on the net outcome of whatever combination of system parameters is important to the STA at that moment in time. |
| 4272 | Alfred Asterjadhi | 10.23.2.2 | 180.06 | Backwards compatibility issue. Did not go over the details but changing the item from e) to i) has the potentiality to make legacy deviced incompliant. Please undo the change and submit to REVme if a change is needed. | As in comment. | Reject – there is no backwards compatibility problem created by the change. The change is simply a renumbering due to the insertion of an item. Compare the TGme baseline to the current TGbe draft to see that the renumbering is indeed, correctly done. |
| 4351 | Arik Klein | 10.3.2.9 | 166.44 | Use unified terminology of STA affiliated with MLD rather than STA of MLD, as in the sentence: "a STA \*of the\* MLD is a TXOP holder or TXOP responder on one of the other links ..... " | The revised sentence shall be:"a STA affiliated with the MLD is a TXOP holder or TXOP responder on one of the other links ..... " | Reject – many sentences in the draft would be increased in size and rendered less readable, were the proposed change adopted, while the existing, shorter phrasing is unambiguous. |
| 4751 | Chunyu Hu | 35.3.14.1 | 275.09 | "may elect to not transmit" ==> "may elect not to transmit" | As commented | Reject – there’s no rule in the English language against splitting an infinitive. See <https://en.wikipedia.org/wiki/Split_infinitive>. If one were arguing from the angles of precedence and consistency, it is true that a search of the baseline reveals fewer than 10 instances of “to not verb” vs about 20 instances of “not to verb”. Unless the WG or 802 editing staff makes a definitive declaration on the point, there seems to be no favored syntax, in which case, let the sleeping dog lie. |
| 5232 | Ilya Levitsky | 10.3.2.9 | 166.26 | From the text it is not clear how to consider the NSTR limits determining whether to respond with CTS. There should be a a text with the proceduce of considering NSTR limits is explained, or a reference to such text. | Add a text that explains the proceduce of considering NSTR limits, or add a reference to such text, or remove "and NSTR limits". | Revise – TGbe editor shall makes the changes shown in 11-21-1358r1 under CID 5232 which generally agree with the commenter’s suggestions and make a few other changes that are in agreement with a few other complaints indicated by other members and which generally make the text more readable and the technical interpretation more readily and consistently understood. |
| 5290 | Jarkko Kneckt | 10.22.2.2 | 179.54 | The term "NSTR Deferral" is used only two times in the 802.11be D1.0 spec. The term is not defined and it is not clear what does this term mean. | Please clarify, or delete the NSTR deferral term. Is this term the same as PPDU start time synchronization? | Revise – within 35.3.15.3 of D1.1 at P313 L23, TGbe editor to change “perform an NSTR deferral for the EDCAF associated with that AC by invoking backoff per item h) of 10.23.2.2 (EDCA backoff procedure)” to “invoke a backoff for the EDCAF associated with that AC as allowed per item h) of 10.23.2.2 (EDCA backoff procedure)” and within 10.23.2.2 at P201 L54 of D1.1, change “An NSTR deferral is performed as described in 35.3.14.3” to “If explicitly indicated as in 35.3.15.3” |
| 4220 | Alfred Asterjadhi | 35.3.14.3 | 275.15 | What is an NSTR deferral? I don't think such a term exists anywhere elese in the spec (there is one mention of it in item h) but that points back to here so... | Define what NSTR deferral is. | Revise – within 35.3.15.3 of D1.1 at P313 L23, TGbe editor to change “perform an NSTR deferral for the EDCAF associated with that AC by invoking backoff per item h) of 10.23.2.2 (EDCA backoff procedure)” to “invoke a backoff for the EDCAF associated with that AC as allowed per item h) of 10.23.2.2 (EDCA backoff procedure)” and within 10.23.2.2 at P201 L54 of D1.1, change “An NSTR deferral is performed as described in 35.3.14.3” to “If explicitly indicated as in 35.3.15.3” |
| 5641 | Joseph Levy | 3.1 | 37.18 | The nonsimultaneous transmit and receive link pair definition is a definition specific to 802.11, so it should be in clause 3.2. Note this same comment was made on draft 0.3 | Move the NSTR definition to clause 3.2 | Reject – really, this is an accept in principle because the requested change was already made during the creation of D1.1 from D1.0. Note that the definition is moved to 3.2 and the definition is rewritten to include a more formal definition of NSTR which includes a reference to the subclause containing receiver minimum performance. |
| 5656 | Joseph Levy | 3.4 | 43.65 | U-SIG is the name of a field, field names should not be listed as abbreviations or acronyms in clause 3.4. | Delete the abbreviation: "U-SIG Universal SIGNAL field" | Accept |
| 5896 | Liangxiao Xin | 10.23.2.2 | 179.64 | change "MPDUS" to "MPDUs" | same as in the comment | Reject – the cited text is part of the baseline that is unaltered by the TGbe draft, thereby rendering the comment out of scope. Please submit the comment to TGme. |
| 6104 | Mark Hamilton | 3.1 | 37.18 | Definitions are lower case | Lower-case the "N" in "Nonsimultaneous" | Accept |
| 6157 | Michael Montemurro | 3.1 | 37.18 | It's hard to determine what the context is here for link. What is the link between. | Change "A pair of links for which a STA of an MLD has" to "A pair of links between STAs affiliated with associated MLDs that have" | Reject – really, an accept in principle, sort of, because the language here has already been changed during the creation of D1.1 from D1.0. Note that the suggested modification is incorrect. Note that the definition is moved to 3.2 and the definition is rewritten to include a more formal definition of NSTR which includes a reference to the subclause containing receiver minimum performance and the offending language has been modified. |
| 6405 | Muhammad Kumail Haider | ﻿35.3.14.6 | 279.13 | "a non-STR" should be replaced with "an NSTR" in this subclause for consistency. | as in comment | Reject – really an accept in principle, because the suggested change has already been made during the creation of D1.1 from D1.0 |
| 6650 | Qi Wang | 10.3.2.9 | 166.44 | "A STA of the MLD is a TXOP holder or TXOP responder on one of the other links that is a member of at least one of the NSTR link pairs of which the link on which the RTS was received is a member. " this sentence is difficult to parse and confusing. Please rewrite to make its meaning clear. | As in comment. | Reject – while admittedly complex, the meaning is discernible. Without a suggested modification, there appears to be no alternative. |
| 6935 | Saju Palayur | 10.3.2.9 | 166.26 | The term "NSTR Limits" should be defined by the standard in more precise manner. | Add definition | Revise – TGbe editor shall makes the changes shown in 11-21-1358r1 under CID 5232 which generally agree with the commenter’s suggestions and make a few other changes that are in agreement with a few other complaints indicated by other members and which generally make the text more readable and the technical interpretation more readily and consistently understood. |
| 6971 | Sanghyun Kim | 9.4.1.6 | 110.13 | The NSTR soft AP MLD does not transmit beacon frames on the nonprimary link. So, a non-AP MLD shall indicate the Listen interval in units of beacon interval of primary link when the non-AP MLD transmits (Re)Association Request frame to the NSTR soft AP MLD. | Clarify it. | Reject – since the NSTR soft AP MLD only transmits beacons on the primary, there is no ambiguity as to which link will wake for which beacons at which times. |
| 7382 | Stephen McCann | 10.3.2.9 | 166.56 | The cited bulleted paragraph can be re-arranged to remove the new exception bullet. | Change the paragraph to "If the NAV indicates idle and CCA has been idle for all secondary channels (secondary 20 MHz channel, secondary 40 MHz channel, and secondary 80 MHz channel) in the channel width indicated by the RTS frame's RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT for a PIFS prior to the start of the RTS frame, then the STA may respond with a CTS frame carried in a non-HT or non-HT duplicate PPDU after a SIFS. If the STA is additionally not NSTR limited then the STA shall respond with a CTS frame. The CTS frame's TXVECTOR parameters CH\_BANDWIDTH and CH\_BANDWIDTH\_IN\_NON\_HT shall be set to the same value as the RTS frame's RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT." | Reject – there is ambiguity in the proposed language regarding the full set of conditions that is expressed in the first sentence of the proposed new text. The proposed text does not seem to add any clarity and introduces new ambiguity. |
| 7383 | Stephen McCann | 10.3.2.9 | 167.10 | The first sentence of the cited bulleted paragraph can be re-arranged to remove the new exception bullet. | Change "If the NAV indicates idle, and the STA is not NSTR limited, then the STA shall respond with a CTS frame in a non-HT or non-HT duplicate PPDU after a SIFS" to "If the NAV indicates idle the STA may respond with a CTS frame in a non-HT or non-HT duplicate PPDU after a SIFS. If the STA is additionally not NSTR limited then the STA shall respond with a CTS frame." | Reject – there is ambiguity in the proposed language regarding the full set of conditions that is expressed in the first sentence of the proposed new text. The proposed text does not seem to add any clarity and introduces new ambiguity. |
| 7384 | Stephen McCann | 10.3.2.9 | 167.30 | The cited bulleted paragraph can be re-arranged to remove the new exception bullet. | Change the paragraph to "If the NAV indicates idle the STA may respond with a CTS frame after a SIFS. If the STA is additionally not NSTR limited then the STA shall respond with a CTS frame." | Reject – there is ambiguity in the proposed language regarding the full set of conditions that is expressed in the first sentence of the proposed new text. The proposed text does not seem to add any clarity and introduces new ambiguity. |
| 7484 | Tomoko Adachi | 3.1 | 37.19 | "... an nonsimultaneous transmit and receive relationship as defined in 35.3.14.3 (Nonsimultaneous transmit and receive (NSTR) operation)." 35.3.14.3 does not define an NSTR relationship. 35.3.14.3 talks about the behavior when there is NSTR based interference but it still does not explain what the NSTR based interference is. | Explain here saying such as "... has indicated that a transmitted or received signal at one link may interfere the operation at another link. Each pair ... ." Or, say here such as "... has indicated that NSTR based interference is expected as explained in 35.3.14.3 (Nonsimultaneous transmit and receive (NSTR) operation). Each pair ... ." and explain in 35.3.14.3 what the NSTR based interference is. | Reject – the commenter’s request for clarification/explanation has been addressed by changes made to produce the D1.1 draft from the D1.0 draft. |
| 7500 | Tomoko Adachi | 3.4 | 0.00 | "NSTR" and "STR" These terminologies are not intuitive. "ISTR Independent Transmission and Reception" and "DSTR Dependent Transmission and Reception" sounds better to me. Revisit these terminologies. | As in comment. | Reject – the meaning of “dependent” is that one thing “cannot be achieved without another”, but the mechanism in question is one in which the sense is instead one thing “cannot be achieved with another”, and therefore, the use of the word “dependent” is the inverse of what is required for an accurate description of the relationship between the links. |
| 7555 | Tomoko Adachi |  | 0.00 | Mixture of "an NSTR" and "a NSTR". | Search for "a NSTR" and replace them with "an NSTR" throughout the draft. | Accept |
| 7711 | Xiaofei Wang | 10.3.2.9 | 166.38 | are the criteria for NSTR limited only for valid in this subclause? | if it is not the case, remove "in this subclause" | Accept |
| 7777 | Yanchao Xu | 10.3.2.9 | 166.28 | For the current descripion "A STA that receives an RTS frame addressed to it considers the NAV and NSTR limits in determining whether to respond with CTS, unless the NAV was set by a frame originating from the STA sending the RTS frame (see 10.24.2.2 (EDCA backoff procedure))." , it means if the STA's NAV is reserved by AP on link1, the STA will still response a CTS even if the STA is NSTR limits. But the NSTR limits shall be considered by STA even if the NAV is set by the AP that transmits the RTS, which means the NSTR limit is a condition independent to the original NAV rule. | Change to "A STA that receives an RTS frame addressed to it considers the followings in determining whether to respond with CTS, a.)the NAV, if the NAV was not set by a frame originating from the STA sending the RTS frame (see 10.24.2.2 (EDCA backoff procedure)). and, b.)the NSTR limits. | Revise – TGbe editor shall makes the changes shown in 11-21-1358r1 under CID 5232 which generally agree with the commenter’s suggestions and make a few other changes that are in agreement with a few other complaints indicated by other members and which generally make the text more readable and the technical interpretation more readily and consistently understood. |
| 7778 | Yanchao Xu | 10.3.2.9 | 166.28 | Current NSTR limited condition is only considered for CTS/BA response. For the CTS response to MU-RTS, the rule in 11ax is almost the same to CTS response to RTS. So the NSTR limited shall also be considered in the MU-RTS/CTS exchange. | The recommanded change, is to at least add a note that is "The STA shall also consider the NSTR limited for CTS response to MU-RTS in the same way as the CTS response to RTS" | Revise – agree in principle – Tgbe editor shall execute the changes to D1.1 as found in 11-21-1258r1 under the heading CID 7778. |
| 7874 | Yongho Kim | 3.1 | 37.18 | NSTR link pair should be defined given that the definition of MLD is provided. Therefore, it is defined specfic to IEEE 802.11 | Move the definition of 'NSTR link pair' to clause 3.2 (Definitions specific to IEEE 802.11) | Accept |
| 7887 | Yongho Seok | 10.23.2.8 | 180.16 | PIFS recovery procedure of the non-STR MLD should be modififed to avoid the IDC interference. | As in the comment. | Reject – there is no need for any modification to the baseline, as the existing text already indicates that PIFS recovery is an optional operation. The existence of NSTR limitations simply provides a new rationale for making the decision to NOT invoke a PIFS recovery. Note that the baseline does NOT currently indicate any reasons why a STA might decide to either invoke or NOT to invoke a PIFS recovery, so there is no precedent for including any such reason including the new one that arises with the existence of NSTR limitation. |
| 8301 | Zhiqiang Han | 10.3.2.9 | 166.26 | There is no definition of NSTR limits. Please clarify it. | as in comment. | Revise – TGbe editor shall makes the changes shown in 11-21-1358r1 under CID 5232 which generally agree with the commenter’s suggestions and make a few other changes that are in agreement with a few other complaints indicated by other members and which generally make the text more readable and the technical interpretation more readily and consistently understood. |
| 8302 | Zhiqiang Han | 10.3.2.11 | 167.47 | A STA that is NSTR limited may transmits an acknowledge, but here "may" doesn't have any guidance for the transmission. Please clarify when a STA that is NSTR shall transmit ack and when a STA that is NSTR shall not transmit ack. | as in comment. | Reject – the determination of when to respond and when not to respond is an individual choice determined by each implementation, obeying any limitations that might be present in the standard. There are hundreds of instances of the use of “may” in the standard which provide for optional choices of behavior on the part of a STA and there is no requirement that all of the possible reasons to take one choice versus another are to be provided whenever “may” is used in the standard. |

**Discussion**

XXXX

**Proposed changes**

**CID 5232**

***TGbe editor: Within TGbe Draft D1.1, change 10.3.2.9 as shown:***

**10.3.2.9 CTS and DMG CTS procedure**

Insert the following two paragraphs as the first and second paragraphs of the subclause:

In this subclause, a STA is NSTR limited if all of the following conditions are true:

—the STA is affiliated with an MLD that has at least one NSTR link pair

—the STA has received the RTS on a link that is a member of one or more of the MLD’s NSTR link pairs

—a STA of the MLD is a TXOP holder or TXOP responder on one of the other links that is a member of at least one of the NSTR link pairs of which the link on which the RTS was received is a member

If at least one of the above conditions is not true, then the STA is not NSTR limited.

Change the first paragraph as follows:

A STA that receives an RTS frame addressed to it considers whether the STA is NSTR limited and considers the NAV in determining whether to respond with CTS, unless the NAV was set by a frame originating from the STA sending the RTS frame (see 10.24.2.2 (EDCA backoff procedure)). In this subclause for a non-S1G STA, “NAV indicates idle” means that the NAV count is 0 or that the NAV count is nonzero but the nonbandwidth signaling TA obtained from the TA field of the RTS frame matches the saved TXOP holder address. In an S1G STA, “NAV indicates idle” means that both NAV and RID counters are 0 or that either NAV or RID counter is nonzero but the TA field of the RTS frame matches the saved TXOP holder address.

**CID 7778**

***TGbe editor: Within TGbe Draft D1.1, insert a new subclause and editing instructions as shown:***

**26.2.6.3 CTS frame response to an MU-RTS Trigger frame**

***Change the first two paragraphs as shown:***

If a non-AP STA receives an MU-RTS Trigger frame, the non-AP STA shall commence the transmission of a CTS frame response at the SIFS time boundary after the end of a received PPDU ~~when~~if the non-AP STA is not NSTR limited and all the following conditions are met:

— The MU-RTS Trigger frame has one of the User Info fields addressed to the non-AP STA. The User Info field is addressed to a non-AP STA if the AID12 subfield is equal to the 12 LSBs of the AID of the STA and the MU-RTS Trigger frame is sent by the AP with which the non-AP STA is associated or by the AP corresponding to the transmitted BSSID if the non-AP STA is associated with an AP corresponding to a nontransmitted BSSID and has indicated support for receiving Control frames with TA field set to the transmitted BSSID by setting the Rx Control Frame To MultiBSS subfield to 1 in the HE Capabilities element that the non-AP STA transmits.

— The UL MU CS condition indicates that the medium is idle (see 26.5.2.5 (UL MU CS mechanism)).

If the non-AP STA is NSTR limited and the conditions above are met, then the non-AP STA may commence transmission of a CTS frame response at the SIFS time boundary after the end of the received PPDU.

If the conditions above are not met, then~~Otherwise,~~ the non-AP STA shall not send a CTS frame response. **(#7778)**