IEEE P802.11
Wireless LANs

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| **CIDs for: Section 9.3.1.23** **Random Access CIDs** |
| **Date:** 2016-11-04 |

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Abstract

This submission proposes resolutions for multiple comments related to TGax D0.5 with the following CIDs :

* 46, 50

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGax Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

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

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| 46 | Ahmadreza Hedayat | 25.5.2.6 | 60.01 | What is the bandwidth of the RU that is used for RA? Is it assumed that the smallest size RU is used for RA, or it is up to the AP to choose the right RA RU size that fits best to the BSS (given the number of associated STAs etc)? Clarify please. Also related to 9.3.1.23. | As in the comment. | Revised. Section 9.3.1.23 is revised to indicate the bandwidth of a set of RA RUs announced within a Trigger frame. TGax editor: Please apply the text changes in document 16/1516r0 noted under this CID. |
| 50 | Ahmadreza Hedayat | 25.5.2.6 | 60.01 | Are the RUs that are available for random access specified by RU index? E.g. in a 20MHz PPDU where all nine 26-tone RUs are available for random access, whould the AP indicate these RUs in the Trigger frame by repeating the Per-User Info or random access nine times? This is rather repetitive and inefficient signaling. Also related to 9.3.1.23. | Specify an efficient signaling for random access where if possible all the RUs available for random access are specified as a group. | Revised. Section 9.3.1.23 is revised so that a single User Info announces a set of random access RUs. TGax editor: Please apply the text changes in document 16/1516r0 noted under this CID. |

## Discussion:

There are many use cases where an AP wants to assign multiple RUs for RA, or even maybe a whole 20MHz sub-channel in an UL MU PPDU assigned for RA. If there are multiple RUs for RA, the content of User Info for each random access RU would almost be the same:

* Except for the RU indication, there is no practical reason for the AP to set e.g. MCS/NSS/RSSI/etc differently across RA User Info fields. Hence an AP would set e.g. MCS to the same value across all RA User Info fields. Similarly, RSSI, NSS, etc.
* Therefor practically multiple 5-byte User Info gets almost repeated.
* Given that practically Trigger frames with RA need to be sent with low MCS, this would result in an unnecessarily lengthy PPDU
* It’d be best if repetition of multiple User Info fields are avoided or reduced to minimum

The suggestion is to use an efficient way to indicate multiple or all the RA RUs with one User info. If a Trigger frame also indicates the RA RU size for the upcoming Trigger-based PPDU, it’d be possible to indicate RA RUs with a single User Info field. Therefore, regardless of how many RA RUs are announced, there is only one RA User Info. What is the gain? When an AP wants to assign “N” RUs for RA, the saving in the trigger frame size is up to 5x(N-1) bytes.

* + For example, if AP wants to assign two contiguous 26-tone RUs for RA, the AP announces the equivalent 52-tone RU for RA, and the STAs assume both 26-tone RUs are available for RA. This is a saving of 5 bytes in the size of the trigger frame.
	+ In another example, if AP wants to assign the secondary 20MHz sub-channel of a 40MHz PPDU for random access, i.e. nine contiguous 26-tone RUs for RA, the AP announces a single User Info for the equivalent 242-tone RU for random access and the STAs assume all nine 26-tone RUs are available for RA. This is a saving of 40 bytes in the size of the trigger frame.

This CR suggest a new Trigger variant, named Random Access, with no Trigger-dependent Common Info and no Trigger-dependent User Info. The “RU Allocation” subfield indicates the start of a contiguous set of RUs for random access. The “SS Allocation” subfield indicates the number of the contiguous RUs assigned for RA, each RU with the same bandwidth as the RU indicated in the “RU Allocation”.

## 9.3.1.23 Trigger frame format

***TGax Editor: Add a new row to Table 9-25a a new row with description “Random Access”. CIDs (46,50)***

***TGax Editor: Modify the clause 9.3.1.23 as follows. CIDs (46,50)***

**9.3.1.23 Trigger frame format**

**…**

Excluding the Random Access variant, the SS Allocation subfield of the User Info(#1520) field indicates the spatial streams of the HE triggerbased PPDU response of the STA identified by the AID12(#Ed) subfield(#1302). The format of the SS Allocation subfield is defined in Figure 9-52f (SS Allocation subfield format).(#663)

***TGax Editor: Add a new clause as follows. CIDs (46,50)***

**9.3.1.23.xy Random Access variant**

The RU Allocation subfield indicates the beginning of a contiguous set of RUs for random access.

The AID12 in the User Info field is set to zero to identify allocation for random access.

The number of spatial streams for the random access is one. The SS Allocation subfield of the User Info field instead indicates the number of contigious RUs used for random access starting from the RU indicated in the RU Allocation subfield, and each RU has the same size as the size of the RU indicated in RU Allocation.(#46, #50)

25.5.2.6

HE STAs access the random access RUs announced via Random Access variant follows the same rules as the Basic variant.