IEEE P802.11
Wireless LANs

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| **Trigger Frame Format** |
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#### Trigger frame

The Trigger frame is used to allocate resource for UL MU transmission and to solicit an UL MU transmission at SIFS after the PPDU that carries the Trigger frame. The Trigger frame also carries other information required by the responding STA to send UL MU.

The frame format for the Trigger frame is as defined in Figure 9-51a (Trigger frame).

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Frame Control | Duration | RA | TA | Common Info | Per User Info | … | Per User Info | Padding | FCS |
| Octets: | 2 | 2 | 6 | 6 | TBD | TBD |  | TBD |  | 4 |

Figure 9‑51a - Trigger frame

The Duration/ID field is set as defined in 9.2.5 (Duration/ID field (QoS STA)).

The RA field of the Trigger frame is the address of the recipient STA.The TA field value is the address of the STA transmitting the Trigger frame.

The Common Info field is defined in Figure 9-51b.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Length | Cascade Indication | CS Required |  Spatial Reuse | BW | CP and LTF Type | MU MIMO LTF Mode  | # of LTFs |
| Bits: | 12 | 1 | 1 | >=2 | TBD | TBD | 1 | 3 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| STBC | LDPC Extra Symbol | AP TX Power | Packet Extension  | Trigger Type | Type-dependent Common Info |
| 1 | 1 | TBD | >=3 | 4 | variable |

Figure 9‑51b - Common Info field

Discussion:

The prposed modifications consider fields corresponding to functionalities that are already in the SFD and, tentatively, fields corresponding to additional functionalities being proposed at this meeting.

* We sugget to preserve the RA in the frame, for consistency with existing leacy frame formats.
* Trigger frame is supposed to include indications that responsder STAs shall inclide in SIG-A, except for the info already known by the STA.
* MU MIMO LTF mode field indicates the mode in which pilots are allocated
* # of LTFs includes the total number of LTFs the STA must include in the response TRIG PPDU.
* STBC indicates whether STBS is used (for all STAs)
* LDPC extra symbol indicates, to the STAs for which LDPC is requestd, whether the encoding should be done accounting for an extra uncoded symbol at the end of the PPDU.
* AP TX power is used in relation to the power control protocol
* Packet Extension indicates the presence and the parameters for the PE. It includes at least alpha-factor and disambiguation bit
* We suggest to use 4 bits for trigger type

The Length subfield of the Common Info field indicates the value of the L-SIG Length field of the HE trigger-based PPDU that is the response to the Trigger frame.

If the Cascade Indication subfield is 1, then a subsequent Trigger frame follows the current Trigger frame. Otherwise the Cascade Indication subfield is 0.

The CS Required subfield is set to 1 to indicate that the STAs identified in the Per User Info fields are required to use ED to sense the medium and to consider the medium state and the NAV in determining whether or not to repond. The CS Requred subfield is set to 0 to indicate that the STAs identified in the Per User Info fields are not required consider the medium state or the NAV in determining whether or not to respond.

The HE-SIG-A Info subfield of the Common Info field indicates the content of the HE-SIG-A field of the HE trigger-based PPDU response. The TBD bits in HE-SIG-A of the HE trigger-based PPDU that may be implicitly known by all responding STAs can be excluded.

The CP and LTF Type subfield of the Common Info field indicates the CP and HE-LTF type of the HE trigger-based PPDU response. The CP and LTF field encoding is defined in Table 9‑2.

Table 9‑2 - CP and LTF field encoding

|  |  |
| --- | --- |
| **CP and LTF field value** | **Description** |
| 0 | 2x LTF + 0.8 µs CP |
| 1 | 2x LTF + 1.6 µs CP |
| 2 | 4x LTF + 3.2 µs CP |
| 3-TBD | Reserved |

The Trigger Type subfield indicates the type of the Trigger frame. The Trigger frame can include an optional type-specific Common Info and optional type-specific Per User Info. Table 9‑3 defines the valid Trigger Type.

Table 9‑3 - Trigger Type field encoding

|  |  |
| --- | --- |
| **Trigger Type value** | **Trigger Type description** |
| 0 | Basic Trigger |
| 1 | Beamforming Report Poll Trigger |
| 2 | MU-BAR |
| 3 | MU-RTS |
| 4-15 | Reserved |

The Per User Info field is defined in Figure 9‑1.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | User Indentifier | RU Allocation | Coding Type | MCS | DCM | SS Allocation | Target RSSI | Type dependent Per User Info |
| Bits: | 12 | 8 | 1 | 4 | 1 | TBD | TBD | variable |

Figure 9‑1 - Per User Info field

Discussion

These are the proposed changes:

* Proposed RU allocation uses 8 bits
* Coding type only indicates BCC/LDPC, hence 1 bit is sufficient
* 4 bits MCS are sufficient
* Target RSSI is relted to the power control algorithm

The User Identifier subfield of the Per User Info field indicates the AID of the STA allocated the RU to transmit the MPDU(s) in the HE trigger-based PPDU.

The RU Allocation subfield of the Per User Info field indicates the RU used by the HE trigger-based PPDU of the STA identified by User Identifier subfield. The length and coding of RU Allocation subfield are TBD.

The Coding Type subfield of the Per User Info field indicates the code type of the HE trigger-based PPDU response of the STA identified by User Identifier subfield. Set to 0 for BCC and set to 1 for LDPC.

The MCS subfield of the Per User Info field indicates the MCS of the HE trigger-based PPDU response of the STA identified by User Identifier field. The encoding of the MCS field is as defined in Section XXX.

The DCM subfield of the Per User Info field indicates dual carrier modulation of the HE trigger-based PPDU response of the STA identified by User Identifier subfield. A value of 1 indicates that the HE trigger-based PPDU response shall use DCM as defined in section XXX. Set to 0 to indicate that DCM shall not be used.

The SS Allocation subfield of the Per User Info field indicates the spatial streams of the HE trigger-based PPDU response of the STA identified by User Identifier field.

The Padding field extends the frame length to give the recipient STAs more time to prepare a response. The length and the content of Padding field are TBD.

**Straw Poll**

**Do you agree to amend the Trigger Frame format in the SFD, as shown in this document?**