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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <**<http://ieee802.org/16>**>** | |
| Title | **Trigger Condition for a Specific Cell Type** | |
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| Re: | Call for Contributions: Multi-tier Networks (16-13-0152-01-000q) | |
| Abstract | This contribution proposes an additional parameter to define trigger conditions for a specific cell type. | |
| Purpose | To discuss and adopt the proposed texts in IEEE P802.16q AWD | |
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# Trigger Condition for a Specific Cell Type

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# Introduction

Trigger TLV defined in the base standard is used to control MS’s scanning and HO decision. The optimal trigger value may differ depending on the overlap area between the base stations or mobility environment. IEEE Std 802.16-2012 supports Neighbor BS trigger TLV to allow for a network operator to specify an optimal trigger value for a specific neighbor base station. But, this TLV can be included in MOB\_NBR-ADV message only when system information of the corresponding neighbor BS is included in the MOB\_NBR-ADV message. In other words, this TLV can’t be used for small BSs if system information of the small BSs is not included in the MOB\_NBR-ADV message. Please, note that system information of neighbor small BSs is not always included in the MOB\_NBR-ADV message. In this contribution, we propose to define a new trigger TLV to prevent aforementioned problem. The proposed TLV (Complementary trigger TLV) may be included in DCD message regardless of inclusion of system information of neighbor BSs and can be used to define optimal trigger value for a specific group of neighbor BSs.

In addition, we also have to think about optimal trigger value based on MS’s moving speed. For example, an MS with high moving speed has to start scanning or HO preparation earlier than an MS with low moving speed to avoid unexpected HO drop. Therefore, we also propose to add MS moving speed in the definition of the new trigger TLV.

# Proposed Texts

----------------- Start of the text proposal --------------------------------------------------------------------------------------

[*Remedy 1: Insert the following rows at the end of Table 11-19 as follows:*]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Type  (1 byte) | Length | Value (variable length) | PHY  scope |
| CT\_Add Threshold | 230 | 1 | Threshold used by the MS to add a neighbor BS to the Multi-BS CT candidate set. When the CINR of a neighbor BS is higher than CT\_Add, the MS should send IM\_CT-REQ to request adding this neighbor BS to the Multi-BS CT candidate set. This threshold is used for Multi-BS CT operation. It is in the unit of decibels. If the BS does not support Multi-BS CT, this value is not set. | OFDMA |
| CT\_Delete Threshold | 231 | 1 | Threshold used by the MS to drop a BS from the Multi-BS CT candidate set. When the CINR of a BS is lower than CT\_Delete, the MS should send IM\_CT-REQ to request dropping this BS from the Multi-BS CT candidate set. This threshold is used for Multi- BS CT operation. It is in the unit of decibels. If the BS does not support Multi-BS CT, this value is not set. | OFDMA |
| Complementary trigger | 232 | variable | The Complementary trigger is a compound TLV value that indicates trigger metrics. The trigger in this encoding is defined for serving BS or commonly applied to a set of neighbor BSs. | OFDMA |

[*Remedy 2: Insert the following texts at the end of subclause 11.4.1 as follows:*]

***Insert the following texts at the end of subclause 11.4.1 as indicated:***

The Complementary trigger TLV (type 234) in Table 11-19 is encoded using the description in Table 11-22a.

Table 11-22a – Complementary trigger TLV description

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Length  (1 byte) | Value |
| Cell type | 234.1 | 1 | See Table 11-19 for description |
| MS moving speed | 234.2 | 1 | MS moving speed  0x00: low (0 ~ 10 km/h)  0x01: medium (10-120 km/h)  0x02: high (above 120 km/h)  0x03~0xFF: *Reserved* |
| Type/Function/Action | 234.3 | 1 | See Table 11-21 for description |
| Trigger value | 234.4 | 1 | Trigger value is the Value used in comparing measured metric for determining a trigger condition |
| Trigger averaging duration | 234.5 | 1 | Trigger averaging duration in the time measured in number of frames over which the metric measurements are averaged |

The Type/function/action byte field of the Complementary trigger TLV description in Table 11-22a is described in Table 11-21. If the Complementary trigger TLVs are included in the DCD message, the MS may ignore Trigger TLVs having a metric that the MS and BS have not agreed to support during SBC-REQ/RSP message exchange.

[*Remedy 3: Change texts on page 64 as follows:*]

**~~17.2.1.2 Trigger condition definitions~~**

**17.2.1.3 HO decision**

An MS may access unsubscribed CSG-Open small BS if no candidate BSs are available at the MS after scanning macro BS and accessible small BSs. After a decision of HO, a serving BS recommends target BS list by including one or more possible target BSs in MOB\_BSHO-REQ or MOB\_BSHO-RSP messages. In case of macro BS only networks, serving BS criteria for recommendation of target BS may include factors such as expected MS performance at potential target BS, BS and network loading conditions, and MS QoS requirements. In case of multi-tier networks, serving BS criteria for recommendation of target BS may also include MS BS type preference, CSG membership, and MS moving speed in addition to the criteria above.

**17.2.1.4 HO process~~from Macro BS to small BS~~**

When an MS performs HO ~~from a macro BS to a small BS~~, the MS shall follow the procedure in 6.3.20 with the exceptions as defined in 17.2.

**~~17.2.1.5 HO from small BS to Macro BS~~**

~~When an MS performs HO from a macro BS to a small BS, the MS shall follow the procedure in 6.3.20.~~

**~~17.2.1.6 HO between small BSs~~**

~~When an MS performs HO from a macro BS to a small BS, the MS shall follow the procedure in 6.3.20 with the exceptions as defined in 17.2.~~

----------------- Start of the text proposal --------------------------------------------------------------------------------------