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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <**<http://ieee802.org/16>**>** | |
| Title | ***Clarifying allocation of dedicated ranging channel for a large number of devices , Revision 1*** | |
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| Re: | Call for contributions for 802.16 WG Letter Ballot (#36)(IEEE 802.16.1b) | |
| Abstract | This contribution proposes to clarifying allocation of dedicated ranging channel for a large number of devices. | |
| Purpose | To be discussed and adopted for 802.16.1b amendment working document. | |
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***Clarifying allocation of dedicated ranging channel for a large number of devices, Revision 1***

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1. **Introduction**

Current dedicated ranging channel for M2M will be assigned in two messages (AAI-SCD& AAI-PAG-ADV message).Actually ranging channel related information belongs to system configuration and current information of dedicated ranging channel will conflict with ranging channel allocation of legacy 16m system. One issue is that in fact ranging channel is PHY system configuration information. If we need change this information, BS should notify all of M2M stations. So If we use PAG-ADV to allocate dedicated ranging channel for M2M; Actually other MSs can't know the start point of this channel and end point of this channel. So AAI-SCD message is good carrier body for assigning ranging channel for M2M. The other issue is that current spec address 4 cases for allocating ranging channel including:

0b000: transmission in every frame

0b001: transmission in the first frame in every superframe

0b010: transmission in the first frame in every even numbered superframe, i.e., mod(superframe number, 2) = 0

0b011: transmission in the first frame in every 4th superframe, i.e., mod(superframe number, 4) = 0

For case 1, it can't be used because normal ranging channel will be configured for every frame. one subframe can't carry two initial ranging channel because overhead is heavy.

For case2,3,4 alll of them are similar with NS-ranging channel configuration of 16m,actually we need indicate different subframe  with normal ranging channel for this dedicated ranging channel. But actually it doesn't make sense because first frame overhead is heavy. So I proposed use third& fourth frame to carry dedicated ranging channel and separate UL overhead. This contribution proposes to use unique message to carry information of dedicated ranging channel and modify configuration of dedicated ranging channel and avoid conflicting with ranging channel allocation of legacy 16m system.

1. **The Proposed Text in AWD**

------------------------------- Text Proposal Start ---------------------------------------------------

------------------------------- Text Proposal 1 Start ---------------------------------------------------

**[*Remedy1: Add proposed text from line# 5 Page 28 in IEEE P802.16.1b/D1 with the followings:*]**

Table 57—AAI-SCD message field description

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Size (bits)** | **Value/Description** | **Condition** |
| … | … | … | … |
| If ((M2M ranging indicator == 0b01) { |  |  |  |
| ~~M2M ranging opportunity subframe index~~ | ~~3~~ | ~~Indicates the subframe index of the allocated ranging opportunity dedicated for M2M devices.~~ | ~~Present if an ABS assigns ranging resources dedicated for M2M devices~~ |
| ~~Periodicity of the M2M ranging~~ | ~~3~~ | ~~Indicates the periodicity of the ranging dedicated for M2M devices.~~  ~~0b000: transmission in every frame~~  ~~0b001: transmission in the first frame in every super­frame~~  ~~0b010: transmission in the first frame in every even numbered superframe, i.e., mod(superframe number, 2) = 0~~  ~~0b011: transmission in the first frame in every 4th superframe, i.e., mod(super­frame number, 4) = 0~~  ~~[0b100~0b111: Reserved]~~ | ~~Present if an ABS assigns ranging resources dedicated for M2M devices~~ |
| Configuration of M2M ranging for NS-RCH | 2 | 0b00: (OSF+2)th UL AAI subframe in every frame  0b01: (OSF+1)th UL AAI subframes in the third frame in every superframe  0b10: (OSF+1)th UL AAI subframes in the third frame in in every even numbered superframe, i.e., mod(superframe number, 2) = 0  0b11: (OSF+1)th UL AAI subframes in the third frame in every 4th superframe, i.e., mod(superframe number, 4) = 0 | Present if an ABS assigns ranging resources dedicated for M2M devices |
| Configuration of M2M ranging for S-RCH | 2 | 0b00: (OSF+3)th UL AAI subframe in every frame  0b01: (OSF+1)th UL AAI subframes in the fourth frame in every superframe  0b10: (OSF+1)th UL AAI subframes in the fourth frame in in every 4th numbered superframe, i.e., mod(superframe number, 4) = 0  0b11: (OSF+1)th UL AAI subframes in the fourth frame in in every 8th superframe, i.e., mod(superframe number, 8) = 0 | Present if an ABS assigns ranging resources dedicated for M2M devices |
| } |  |  |  |

------------------------------- Text Proposal 1 End ---------------------------------------------------

------------------------------- Text Proposal 2 Start ---------------------------------------------------

**[*Remedy2: Add proposed text from line# 39 Page 22 in IEEE P802.16.1b/D1with the followings:*]**

**Table 706—AAI-PAG-ADV message field description**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Size (bits)** | **Value/Description** | **Condition** |
| … | … | … | … |
| ~~If (M2M network access type == 0b01 | 0b10) {~~ |  |  |  |
| ~~M2M ranging opportunity subframe index~~ | ~~3~~ | ~~Indicates the subframe index of the allocated ranging opportunity dedicated for M2M devices.~~ |  |
| ~~Periodicity of the M2M ranging~~ | ~~3~~ | ~~Indicates the periodicity of the ranging dedicated for M2M devices.~~  ~~0b000: transmission in every frame~~  ~~0b001: transmission in the first frame in every super­frame~~  ~~0b010: transmission in the first frame in every even numbered superframe, i.e., mod(superframe number, 2) = 0~~  ~~0b011: transmission in the first frame in every 4th superframe, i.e., mod(super­frame number, 4) = 0~~  ~~[0b100~0b111: Reserved]~~ |  |
| ~~}~~ |  |  |  |
| … | … | … | … |
| M2M network access type |  | Indicate the network re-entry type for M2M device;  0b00: Resource allocation (i.e., Assignment A-MAP offset) for AAI-RNG-REQ  ~~0b01: dedicated ranging channel allocation in AAI-PAG-ADV~~  0b~~10~~01: dedicated ranging channel allocation in broad-cast assignment A-MAP IE  0b~~11~~10: No dedicated ranging channel  0b11:Reserved |  |
|  |  |  |  |
| ~~M2M ranging opportunity subframe index~~ | ~~3~~ | ~~Indicates the subframe index of the allocated ranging opportunity dedicated for M2M devices.~~ |  |
| ~~Periodicity of the M2M ranging~~ | ~~3~~ | ~~Indicates the periodicity of the ranging dedicated for M2M devices.~~  ~~0b000: transmission in every frame~~  ~~0b001: transmission in the first frame in every super­frame~~  ~~0b010: transmission in the first frame in every even numbered superframe, i.e., mod(superframe number, 2) = 0~~  ~~0b011: transmission in the first frame in every 4th superframe, i.e., mod(super­frame number, 4) = 0~~  ~~[0b100~0b111: Reserved]~~ |  |

------------------------------- Text Proposal 2 End ---------------------------------------------------

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