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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <**<http://ieee802.org/16>**>** |
| Title | Methods to Determine Paging Parameters in the Legacy Operation Mode of IEEE 802.16m (16.2.18) |
| Date Submitted | **2010-05-09** |
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| Re: |  |
| Abstract | This contribution proposes methods using which AMS in idle mode can determine paging parameters in the Legacy operation mode of IEEE 802.16m. |
| Purpose | To be discussed and adopted by TGm for 802.16m Letter Ballot 31a. |
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Methods to Determine Paging Parameters in the Legacy Operation Mode of IEEE 802.16m (16.2.18)

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1. Introduction

In the 16m legacy mode operation defined in IEEE 802.16m standard, a 16m base station is attached to a legacy 16e network. In this case, the legacy network considers all the terminals as legacy terminals and hence uses the legacy protocols for various operations such as idle mode, paging etc.

In legacy networks based on IEEE 802.16e standard, the paging cycles and paging offsets for idle mode MSs are represented in terms of number of frames. On the other hand, in IEEE 802.16m these parameters are represented in terms of number of super-frames. It may be noted that one super-frame consists of four frames. Duration of each frame in IEEE 802.16e and IEEE 802.16m is 5 ms. Thus, the duration of super-frame = 4 \* 5 = 20ms.

In legacy mode of operation the network entity responsible for idle mode operation of MSs , e.g., Paging Controller, assigns the paging cycle and paging offset that are represented in terms of frames. However, the MS is attached to a base station that uses IEEE 802.16m specifications. Thus, the MS is aware about paging cycle and paging offset to be defined in terms of number of super-frames. Therefore there is a need for mechanisms using which the MS can determine its paging operational parameters, i.e., its paging listening interval in IEEE 802.16m legacy mode operation using the IEEE 802.16e paging parameters that it receives from the BS.

1. Text proposal for inclusion in the P802.16m/D5

========================== *Start of Proposed Text* ==============================

*[Editor’s Note: Add the following text after line 45 in page 387 in “16.2.18.2.2 Operation during paging unavailable interval”]*

The AMS uses the following methods to determine its paging listening interval in legacy mode operation of IEEE 802.16m based networks.

1. If the paging cycle and paging offset that the AMS receives from the legacy network are both multiples of four, then the AMS uses the following equations to determine its paging cycle and paging offset for IEEE 802.16m

paging\_cycle\_m = paging\_cycle\_legacy/4

paging\_offset\_m = paging\_offset\_legacy/4

Where paging\_cycle\_legacy and paging\_offset\_legacy are the paging cycle and paging offset of the legacy network received by the AMS from the legacy network. paging\_cycle\_m and paging\_offset\_m are the paging cycle and paging offset of the IEEE 802.16m system that is derived from the paging\_cycle\_legacy and paging\_offset\_legacy parameters of the legacy network using the above equations.

After determining the paging cycle and paging offset, the AMS uses procedures defined in IEEE 802.16m to determine ( i.e. the procedures that are used during the advanced mode of operation in a IEEE 802.16m based network) to determine its paging listening interval (PLI) and the frame where its paging message is transmitted.

1. If the paging cycle is multiple of four however the paging offset is not multiple of four, then the AMS uses the following equation to determine its nth paging listening interval (PLI)

PLI (i) = (i-1) \* paging cycle\*frame\_duration + [floor (paging offset/4) ]\*frame\_duration

1. If the paging cycle is not multiple of four and paging offset is multiple of four, then the AMS uses the following equation to determine its nth paging listening interval

PLI (i) = (i-1) \* paging cycle\*frame\_duration + (paging offset/4) \*frame\_duration

1. If neither paging cycle and paging offset are multiple of four, then the AMS uses the following equation to determine its nth paging listening equation

PLI (i) = (i-1) \* paging cycle\*frame\_duration + [floor (paging offset/4) ]\*frame\_duration

Then the AMS determines the super-frame number where its PLI is located. This super-frame becomes the paging offset for that paging listening interval. Once the AMS determines the super-frame number as its paging offset, then it uses the procedures defined in IEEE 802.16m to determine the frame where its paging message is transmitted.

The ABS also uses the above procedures to determine the paging listening intervals of different idle mode AMSs so that it can transmit the paging listening interval at the AMS and ABS are synchronized.

========================== *End of Proposed Text* ==============================