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Title	**Quasi-Random Ranging Code and Ranging Sub-channel Selection in OFDMA System.**
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Re:	IEEE C802.16a-02/33
Abstract	This document contains the concept of Quasi-Random Selection of Ranging Code and Ranging Sub-channel for the 802.16a system
Purpose	This proposal should be used for the Ranging design.
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Quasi-Random Ranging Code and Ranging Sub-channel Selection in OFDMA System

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Introduction

On CDMA based ranging procedure, each terminal selects ranging code and sub-channel randomly. We propose the Quasi-random ranging code and sub-channel selection procedure for the avoidance of the collision of the ranging signals. This new procedure may reduce the collision probability of the ranging process.

This document proposes extended concept, following our recent contribution, IEEEPC80216aP-02_19r1[1].

Quasi-Random Selection of Ranging Code and Ranging Sub-channel

The AP does not have any a priori information of SSs in the initial ranging process. But, after the Initial Ranging procedure each SSs may register successfully. And in the bandwidth request ranging process the AP will issue the Connection ID (CID) to registered SSs. The AP will issue the Connection ID uniquely. Using this uniquely issued CID the SS can choose the Ranging Code and Ranging Sub-channel as following

Ranging Code Index = Connection ID **mod** The number of allocated Ranging Codes.

Ranging Sub-channel Index = Connection ID **mod** The number of available Ranging Sub-channels.

As we known, the Connection ID is assigned uniquely per each connection to each SS within one cell. In another point of view, the AP may manage the index of Ranging code and sub-channel depends on the number of users on Bandwidth Request Ranging status. According to this conjecture, the collision probability of proposed procedure may be decreased compare to the current procedure in the Bandwidth Request Ranging Region in D2 document.

Changes in Subsections

Replace text of line 27 sub-clause 8.3.5.6.5.1 with the following

To effect a ranging transmission, in case of initial ranging, each user randomly chooses one ranging code from a bank of specified binary codes. Other cases, each user quasi-randomly chooses one ranging code and sub-channel as following rules:

Ranging Code Index = Connection ID **mod** The number of allocated Ranging Codes

Ranging Sub-channel Index = Connection ID **mod** The number of available Ranging Sub-channels

Replace the figure 141 of subsection 6.2.6.5 with the following

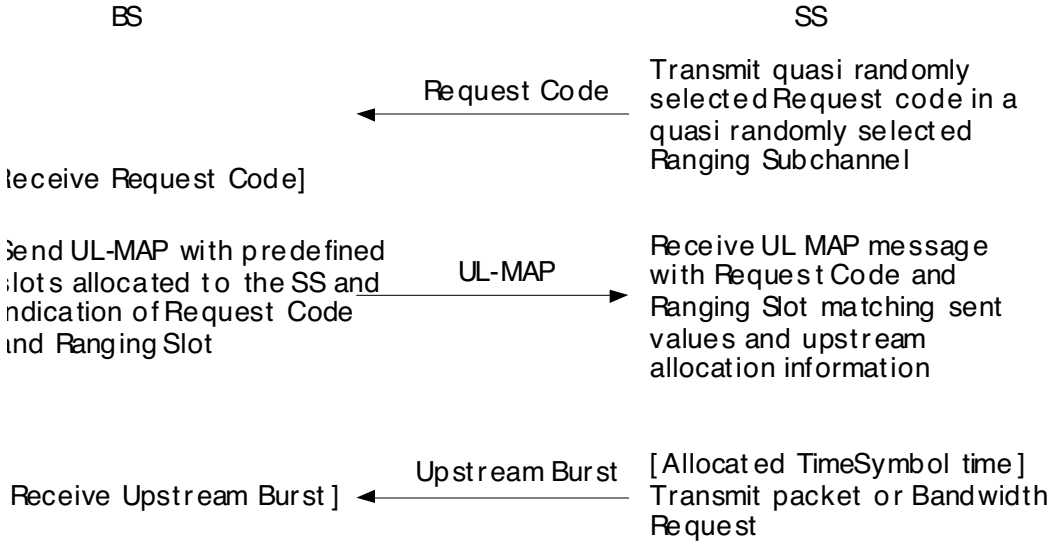

Figure 141 - Bandwidth Request in OFDMA

Conclusion

The proposed procedure of the Quasi-random selection of ranging signal may avoid the collision due to the random selection of the ranging signal. This scheme may not change any message field. But the performance of the bandwidth request ranging procedure shall be enhanced.

References

[1] C802.16aP-02/19r1, Concept of Ranging Code Set in BWA, KiHo Chung, JungMin Ro, DaeEop Kang.