Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Ranging Considerations for WirelessMAN-CX**
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Re:	802.16 LE action item from Session #47 regarding comment 1132
Abstract	Additional issues that need to be addressed for ranging in WirelessMAN-CX systems.
Purpose	Resolution to comment 1132.
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Ranging Considerations for WirelessMAN-CX

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Background

Comment 1132 of [2] recommended acceptance of [3] to resolve certain ranging issues that could arise for WirelessMAN-CX systems. It was the determination of the task group that there were issues that need to be addressed, but that [3] proposed a solution that was too complex and did not appropriately address the issues. An action item was created to find a more appropriate solution. This contribution is the output of that action item.

The basic problem to be solved can be stated: With either aEQP or the Common/Master/Slave frame concepts some frames are controlled by one BS and some by another. The SS needs to be able to figure out which ranging opportunities to use, and a system must enact ranging without causing additional interference to its coexistence neighbors:

1) A BS should only schedule ranging opportunities in frames or subframes it "owns", I.E., it is the master. We already have the rule of no non-unicast UL allocations in slave frames, but it's good to reinforce it.
2) The SS should pick a BS as its serving BS, identified by BSID, and stick with it, ignoring frames transmitted by BSs with different BSIDs. The SS can even use the operator ID embedded in the BSID as part of its criteria for choosing a BS, but that is irrelevant to the issue addressed by this contribution.
3) The SS only ranges in ranging opportunities (regardless of PHY) scheduled in UL subframes by its serving BS or by a neighbor BS in a handover scenario.
4) It's up to the BS to ensure sufficient ranging opportunities.
5) In bands where LBT is required, the SS should perform LBT before using the ranging opportunity.

Items 2, 3, 4, and 5 are how the system is already specified to work and add no new requirements.

Specific editorial changes

This section provides a list of changes to IEEE P802.16.D2 document [1].

Blue underlined text represents specific editorial additions.

~~Red strikethrough~~ text is to be deleted.

Black text is text already in the draft.

Bold italic text is editorial instructions to the editor.

Add a new section 6.4.1.3 (or wherever this section ends up):

6.4.1.3 Additional ranging requirements for WirelessMAN-CX systems

A WirelessMAN-CX BS shall only schedule ranging opportunities in UL subframes for which it is the master or can otherwise guarantee interference-free operation relative to other WirelessMAN-CX systems. It is the BS's responsibility to guarantee sufficient ranging opportunities for its operational environment.

WirelessMAN-CX SSs shall identify their serving BS via the BS ID in the DL-MAP message and the 4 lsbs of the BSID in the DLFP. They shall only respond to ranging opportunities from their serving BS or, in a handover scenario, from an appropriate neighbor BS.

References

[1] IEEE P802.16h/D2: *Air Interface for Fixed Broadband Wireless Access Systems Improved Coexistence Mechanisms for License-Exempt Operation*, Draft Standard.

[2] IEEE 80216h-06_068r5: *Letter Ballot #24 Commentary file with resolutions from Session #47.*

[3] IEEE C80216h-06_120: *Ranging scenarios for co-existence zones, Soma Bandyopadhyay, 3 Nov 2006.*