Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**	
Title	**Ranging scenarios for co-existence zone**	
Date Submitted	**2006-11-11**	
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Re:	Call for Comments and Contribution, "IEEE 802.16's License-Exempt (LE) Task Group Action item (AI-1113) was decided in July, 2006 conference (Conf number #44)	
Abstract	This document proposes some enhancement/modifications during the ranging process in the co-existence zone	
Purpose	To provide some contextual ideas for further exploration and understanding	
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Proposed enhancement in the ranging procedure

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Introduction

In the July meeting one action item was decided to review the ranging process for co-existence.

This contribution aims basically at addressing some of the case studies in the initial ranging procedure, and proposing addition of extra felids in RNG-REQ, RNG-RSP.

Insert following new paragraphs in 6.3.9.5 with the existing one

A BS station with same or different phy profile when wants to co-exist with other BS stations in a WirelessMAN-CX system, one negotiates as master and other one as a slave base station. It is assumed that they have become as cx-cc member by using CMI or CSI method.

A new SS when attempts to join the co-existence network of the multiple BSs (as described above) detects long preamble after detecting the correct CP (Cyclic prefix) and synchronizes with the master/slave BS's downlink in a master/slave sub-frame and learns the uplink channel characteristics through the UCD MAC management message.

For the co-existence zone BSs need to send UCD message having co-existence zone profile for a specific UIUC (extended UL-MAP_IE given in the new table –refer table below 302W) or a predefined profile can be used. SS shall scan the UL-MAP message to find an Initial Ranging Interval, CXZ type (given in the new table –refer table below 302W). (CXZ type needs to be defined in the CXZ profile definition of UCD message also).

SS sends RNG-REQ with initial ranging CID during that interval. Apart from the parameters/fields present in the RNG-REQ SS can send its willingness that it wants to establish uplink with multiple BS or only with that particular BS.

SS may introduce a new 'CXZ specific field' (8 bit character parameter) in RNG-REQ for providing BS with this fact (as described in the above paragraph).

This (CXZ specific field in RNG-REQ) is required to perform the power calculation (as this CXZ specific field defines the SS's willingness to co-exist or perform ranging with the multiple BSs) while sending back the anomalies in the RNG-RSP to SS by the associated BS (to which ranging is currently being done).

Once the BS has successfully received the RNG-REQ message, it shall return RNG-RSP message using the initial ranging CID.

Within the RNG-RSP message along with the Basic and Primary Management CIDs BS may also send a new co-existence zone field/TLV which may consist of its BS-ID (Base station id), CXZ approval field for approving SS's willingness for co-existence, CXZ type (master/slave frame on which this RNG-RSP exists, etc.) to the SS as co-existence zone parameters.

SS may get same basic-cids from the master as well as slave BS's RNG-RSP in the co-existence network. So SS must manage/identify its unicast opportunities for invited ranging (for completion of ranging procedure it is needed) as well as other uplink transmission by associating them (basic-cid) with respective master or slave frame.

Following cases may occur in the uplink-path establishment of coexistence zone.

Case –1:
Uplink sub-frame of master BS and downlink sub frame of slave BS overlaps.

In this context SS may decide it will not perform ranging with the slave BS, and will continue uplink transmission only with the uplink grant provided by the master BS in uplink subframe of master.

SS may perform initial ranging after synchronizing with the slave BS, having the initial ranging opportunities given in the uplink subframe of slave.

Hence SS may perform synchronization with master as well as slave BS and perform ranging with both the BSs.

Case-2:
Uplink sub-frame of master BS and downlink/uplink sub frame of slave BS never overlaps:
SS may perform synchronization with master as well as slave BS and perform ranging with both the BSs.

Case-3:
Uplink sub-frame of master BS and uplink sub frame of slave BS overlaps:
This is a critical case for SS to manage in this case it may not perform any initial ranging with slave BS if initial ranging opportunity of slave BS overlaps with the unicast opportunity given by the master BS.