Project	**IEEE 802.16 Broadband Wireless Access Working Group <**http://ieee802.org/16**>**
Title	**CDD Parameters in DCD to Improve MIMO Channel Estimation**
Date Submitted	**2007-11-04**
Source(s)	Frank Zhou, Djordje Tujkovic, Harold Artes, Arogyaswami Paulraj, Sriram Mudulodu, Louay Jalloul Beceem Communications	fzhou@beceem.com
Re:	802.16 Working Group Letter Ballot #26
Abstract	We propose a solution for Asymmetric HFDD
Purpose	Review and approve for 802.16 Revision 2
Notice	*This document does not represent the agreed views of the IEEE 802.16 Working Group or any of its subgroups.* It represents only the views of the participants listed in the "Source(s)" field above. It is offered as a basis for discussion. It is not binding on the contributor(s), who reserve(s) the right to add, amend or withdraw material contained herein.
Release	The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE's name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE's sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.16.
Patent Policy	The contributor is familiar with the IEEE-SA Patent Policy and Procedures: <http://standards.ieee.org/guides/bylaws/sect6-7.html#6> and <http://standards.ieee.org/guides/opman/sect6.html#6.3>. Further information is located at <http://standards.ieee.org/board/pat/pat-material.html> and <http://standards.ieee.org/board/pat>.

Asymmetric HFDD

Frank Zhou, Djordje Tujkovic, Harold Artes, Arogyaswami Paulraj, Sriram Mudulodu, Louay Jalloul
Beceem Communications

1.   Introduction

The proposal caters to system wise asymmetric DL-UL traffic which is solved in TDD but not FDD part of 16e standard. The proposal also minimizes HW and SW changes at MS and BS, including the extra burden HFDD put on BS scheduler comparing with FFDD only system, and avoid per-MS HFDD constrain which further complicates the scheduler.
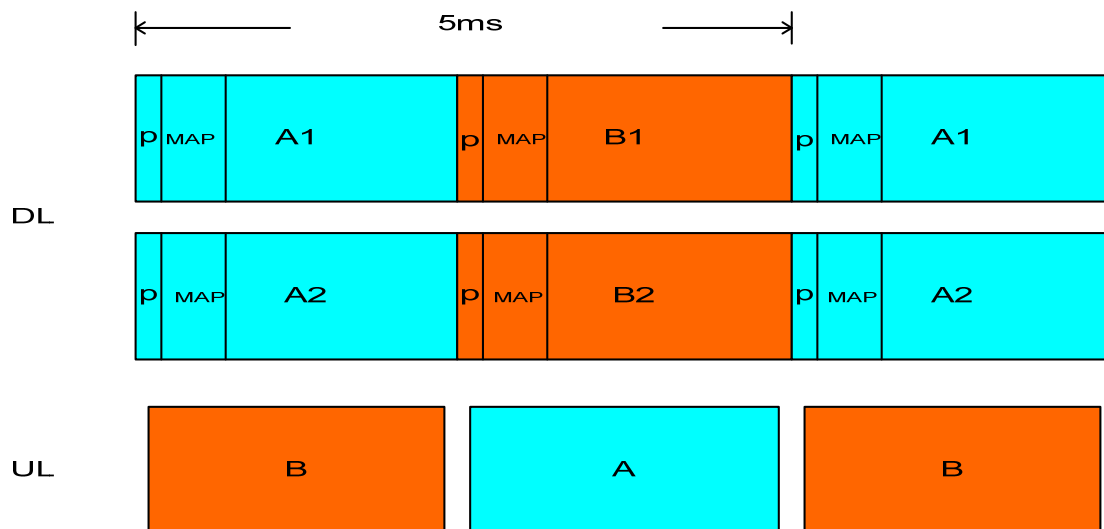
2.   The Proposal

Figure 1 Asymmetric HFDD Frame Structure

Figure 1 shows the frame structure of the proposal Asymmetric HFDD solution. Here 2 DL carriers pair with 1 UL carrier. Each DL frame size is 2.5 ms to support both HFDD and FFDD. UL frame size is a little less than 2.5 ms due to SSTTG and SSRTG. Each MS is served on one of the two DL carriers throughout the call with the exception of call setup for some MSs. This is to minimize HW changes: no BB HW changes required. Each MS belongs to one of the four groups, A1, A2, B1, B2, and stays on throughout the call. No per-MS HFDD constrain which complicates the scheduling algorithm. Here the BS need to coordinate two UL-MAPs to avoid collision on the UL.

BS performs load balancing when assigning MSs to the two DL carriers during call setup. Call setup is done on DL carrier 1 (Anchor Carrier), i.e., a MS always starts a call on DL carrier 1. If the call stays on carrier 1, it continues similar to TDD case. If the MS is load balanced to carrier 2, the switch of DL from carrier 1 to carrier 2 is similar to InterFA HO. This process should be easier than InterFA HO in general due to same BS serving both FA. Optionally for stationary users, the MS can recommend which DL carrier to continue the call by measuring the two DL preamble CINR.

For reuse 3 deployment, HO is based on the anchor carrier, e.g., MS sniffs the preamble of the anchor carrier of the target BS. For reuse 1 deployment, MS sniffs the same carrier of the target BS as the current carrier of the serving BS

3.   Conclusion

- This proposal requires no baseband HW changes. RF HW changes only required for FDD in general
- No complicated per-MS HFDD scheduling requirement