### Project

### Title
Improve Sleep HO Context management

### Date Submitted
2008-07-17

### Source(s)
- **Lucy Pollak**  
  Altair Semiconductor  
  6 Haharash St. Hod Hasharon 45240, Israel  
  Voice: 972-9-7403045  
  E-mail: lucy.pollak@altair-semi.com
- **Navid Ehsan**  
  Nextwave  
  E-mail: nehsan@nextwave.com
- **Christopher Cushing**  
  Motorola  
  E-mail: Christopher.Cushing@motorola.com
- **Erik Colban**  
  Nextwave

### Abstract
The sleep context and sleep operations during HO are not clearly defined in the spec. The proposed clarification defines the sleep termination details for HO operations.

### Purpose
Discuss and adopt

### 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](http://standards.ieee.org/guides/bylaws/sect6-7.html#6) and  
Further information is located at [http://standards.ieee.org/board/pat/pat-material.html](http://standards.ieee.org/board/pat/pat-material.html) and  
Improve Sleep HO Context management

Lucy Pollak, Altair Semiconductor
Navid Ehsan, Nextwave
Christopher Cushing, Motorola
Erik Colban NextWave

Background

The sleep context and operation during HO are not clearly defined in the spec. It is not defined in the spec when the devices will terminate sleep mode during HO. In the case of MS-initiated HO it is reasonable to do this at the beginning of HO negotiation to speed up the HO negotiation and provide fast opportunity for BS to transmit MOB_BSHO-RSP. In the case of BS-initiated HO the BS will send MOB_BSHO-REQ at listening interval, and it is also reasonable that the sleep mode is terminated immediately to support fast HO negotiation and HO Action time proper scheduling of HO process.

The spec also explicitly requires MS and Serving BS to retain PSC context during HO in section 6.3.22.2.8.1.6.7. The spec is silent what to do with retained PSC data after HO cancellation. To prevent misinterpretation of the spec, which may cause automatic sleep mode activation expectation, the opportunity for the sleep mode activation after HO cancellation should be defined explicitly. This kind of MS and BS behavior clarification does not present in the spec.

The problems of PSC definition synchronization, which may occur as a result of packet loss during HO or as a result of non-coordinated HO may be resolved permitting the MS to send complete PSC definition after HO cancellation for the mentioned cases.

Proposed Changes

The proposed clarification defines the sleep termination details for HO operations.

Proposed Changes in 802.16Rev2/D5

[On page 429, Section “6.3.21.1 Introduction”, modify 17th paragraph:] The MS and the serving BS shall stop the sleep mode locally deactivate all PSCs when sending or receiving a MOB_HO-IND, MOB_MSHO-REQ or MOB_BSHO-REQ message and before handover to the target BS.

[On page 458, Section “6.3.22.2.8.1.6.7 Power Saving Class settings”, modify 4th paragraph:] The MS shall exit sleep mode, locally deactivate all active Power Saving Classes to perform HO. The MS and the serving BS shall not initiate new sleep transactions during HO negotiation. If there is some ongoing MS-initiated sleep transaction when HO negotiation starts and the MS receives the MOB_SLP-RSP message before transmitting the MOB_HO-IND message, the MS shall successfully complete this transaction accepting all PSC definitions from MOB_SLP-RSP message, but shall not activate any PSCs. If the MOB_SLP-RSP message is not received before handover to the target BS or before expiration of timer T43, the MS shall terminate the sleep transaction. If the serving BS receives MOB_SLP-REQ message after HO negotiation has started and before HO cancellation, the serving BS shall reject PSC definition(s) and shall not send MOB_SLP-RSP
MS may reenter sleep mode, upon HO completion, by transmitting a MOB_SLP-REQ message, which shall include all requested Power Saving Class configurations. If the MS cancels HO and returns to normal operation with its previous serving BS, it may re-enter sleep mode by activating retained PSC configurations. The MS should not include the definition of a retained Power Saving Class in a MOB_SLP-REQ message after HO cancellation unless some sleep transaction was terminated by the MS during HO.