

Project	<b>IEEE 802.16 Broadband Wireless Access Working Group</b> < <a href="http://ieee802.org/16">http://ieee802.org/16</a> >	
Title	<b>AI on text changes of ACS</b>	
Date Submitted	<b>2007-07-09</b>	
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Re:	IEEE 802.16-07/013 : Task Group Review: Working Group Draft P802.16h/D2b (2007-06-19)	
Abstract	AI result according to the group resolution in meeting #49.	
Purpose	To consolidate the 16h draft.	
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## AI for interference threshold description

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### Overview

A comment was given by Kenneth Stanwood in meeting 48, see [1] comment 2142L, which call for clarification on the difference of ACS and DCS to prohibit overlapping mechanism dealing with same issue, and a AI was given in meeting 48 to Xuyong to provide text about the clarification within the ad hoc for channel selection chaired by Paul Piggin. On meeting 49, Contribution C80216h-07\_052 [6] was presented as output of the AI above. The principle of C80216h-07\_052 was accepted in the discussion, however there is no specific text changes in C80216h-052. So an AI was assigned after the discussion to provide text changes accordingly in 15.4.1 of D2b.

### Discussion

FROM IEEE C802.16h-07/052:

Logic	Incremental Condition	Operation	DCS	ACS	Exclusive Channel Occupation
<b>If</b>	<b>DCS feather not supported in this system</b>	<b>No</b>	—	—	—
<b>Else if</b>	<b>DCS find a vacant channel</b>	<b>Yes</b>	<b>Yes</b>	—	<b>Yes</b>
<b>Else if</b>	<b>ACS feature not supported in this system</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>No</b>
<b>Else if</b>	<b>Can not find candidate neighbor and channel</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>
<b>Else if</b>	<b>All the candidate neighbor do not support ACS</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>
<b>Else if</b>	<b>All the candidate neighbor failed during reallocation</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>
<b>Else</b>	<b>The new vacant channel was made using ACS</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>

### Reference:

- [1] IEEE 802.16-07/016r7: Letter Ballot Recirc #24a Comment Database (2007-06-12)
- [2] IEEE P802.16h/D2b: 802.16h draft for Task Group Review (2007-05-18)
- [3] IEEE 802.16-07/013 : Task Group Review: Working Group Draft P802.16h/D2b (2007-06-19)
- [4] IEEE 802.16-2004: IEEE Standard for Local and metropolitan area networks Part 16: Air Interface for Fixed Broadband Wireless Access Systems (2004-10-01)
- [5] IEEE 802.16e-2005: IEEE Standard for Local and metropolitan area networks Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems Amendment 2: Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Bands and Corrigendum 1 (2006-02-28)
- [6] C80216h-07\_052: Discussion on usage for DCS and ACS (Wu Xuyong; 2007-05-04)

**Proposed Changes accordingly:**

**(the following text is in current draft and under review according to the concept above, should be revised when necessary accordingly during the meeting. )**

**P104L34****15.4.1 Adaptive Channel Selection (ACS)**

This section describes the method of Adaptive Channel Selection (ACS) to prevent interference. The first step is to attempt to identify a vacant channel using the gathered information from the system and the neighbor systems (see 15.5.5). If a vacant channel is not found, the BS then tries to obtain an exclusive channel by optimization of channel distribution (see 15.4.1.1& 15.4.1.2).

Success of either step will enable the BS start working with an exclusive working channel. If no vacant channel can be found, then the BS will attempt the channel sharing coordination procedure.

**15.4.1.1 How to select a “free” channel (for ACS and DFS)**

After Scanning before interference identification, the IBS should try to figure out whether it interferes with other systems in each of these candidate channels. In the initialization phase of an IBS, its neighbors will send their current working channel ID, neighbor's working channel IDs, OCSI allocation and subframe allocation using CXP messages, as well as a flag having alternative channels. By the feedback messages received after the signaling broadcasting, the IBS will collect the information of its interference victims on each channel.

If there is neither interference detected nor interference victims found in some channel by the IBS, the channel is marked as a “free” channel of the IBS. When the IBS can find non-interfering channels at the initialization phase, it shall select its working channel as follows:

- If the IBS can find non-interfering channels that are also its 2-hop neighbors' working channels, it randomly selects one from those non-interfering channels as its working channel.
- Otherwise the IBS randomly selects one from all available non-interfering channels as its working channel.

When the IBS cannot find any non-interfering channel, the IBS should figure out whether a “free” channel can be vacated by optimized channel distribution, as described in 15.4.1.2.

The process of ACS is shown in *Figure h* . The ACS process concludes with either one of two possible results: a) a “free” channel is validated with or without channel distribution optimization, or b) no “free” channel.

If a “free” channel is validated, it means default interference-free master slot is to be used; otherwise, the IBS needs to share the channel with coexistence neighbors, as described in 15.4.2.1.