Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Proposed Change on Direct Communication over IEEE 802.16.1a**
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Re:	"IEEE 802.16n-11/0020," in response to Call for Comments on GRIDMAN AWD
Abstract	General description clarification of direct communication on IEEE 802.16 GRIDMAN Amendment Draft Standard
Purpose	To discuss and adopt the proposed text in the draft amendment document on GRIDMAN
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Proposed Change on Direct Communication over IEEE 802.16.1a

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1. Introduction

IEEE 802.16.1a AWD[3] (i.e., over WirelessMAN-AAI[5]) describes multimode operation and direct communication.

Table 1 describes the comparison between base station function for HR-BS and coordinator based DC. As shown Table 1, any HR-MS may be initiated as an HR-BS or coordinator to provide connectivity for HR-MSs in the case of unavailability of BS. In the reactive operation on multimode operation, an HR-MS is selected among a group of HR-MSs as an HR-BS. In addition, in the coordinator based DC, an HR-MS is also selected among a group of HR-MSs as a coordinator. To be an HR-BS or coordinator, HR-MS has to contend against other HR-MSs with collision avoidance procedure.

Thus, two operations (i.e., HR-MS acting as BS and coordinator based DC) can be merged into one single operation.

Table 1—Comparison between HR-MS acting as BS and Coordinator based DC

	HR-MS acting as BS	Coordinator based DC
why	- to provide connectivity for itself and other HR-MSs	- to support out of coverage of any HR-infrastructure stations
when (triggered)	- when HR-BS is unavailable	- when HR-infrastructure station does not exist
who (in charge of communication)	- selected HR-MS among HR-MSs	- selected HR-MS among HR-MSs
what (functional operation)	- standalone network (not supporting HO)	- simplified HR-BS (i.e., not supporting HO)
how (to select)	- contention based with collision avoidance procedure	- contention based with collision avoidance procedure
how (to communicate between HR-MSs)	- via HR-MS acting as HR-BS	- via HR-MS acting as coordinator

Table 1—Comparison between HR-MS acting as BS and Coordinator based DC

what else	- role-over procedure - no description of discovery yet	- PA-preamble and SA-preamble are reused to discover - additional discovery message after preamble

2. References

[1] IEEE 802.16n-10/0048r2, 802.16n System Requirement Document including SARM annex, July 2011.
[2] IEEE 802.16n-11/0024, P802.16n Draft AWD, October 2011.
[3] IEEE 802.16n-11/0025, P802.16.1a Draft AWD, October 2011.
[4] IEEE P802.16Rev3/D2, IEEE Draft Standard for Local and metropolitan area networks; Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems," October 2011.
[5] IEEE P802.16.1^{TM}/D2, [Draft] WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems, October 2011.

3. Proposed Text on the IEEE 802.16.1a Amendment Draft Standard

Note:

The text in **BLACK** color: the existing text in the IEEE 802.16 GRIDMAN AWD

The text in **RED** color: the removal of existing IEEE 802.16 GRIDMAN AWD

The text in **BLUE** color: the new text added to the IEEE 802.16 GRIDMAN AWD

[-----------------------------------Start of Text Proposal---]

[*Remedy1: Change the text line 10-42, page 97 in the 802.16.1a AWD as follows:*]

In HR-MS direct communication, data packets are exchanged between two HR-MSs directly or by passing through another HR-MS. The two communicating HR-MSs are the source and the sink of data. The data packets are passed from upper layers to MAC at the source HR-MS and back to upper layers at the sink HR-MS.

HR-MS direct communication is applicable when 1) the two HR-MSs are in coverage of and are directly associated to an HR infrastructure station; 2) one HR-MS is in coverage of and directly associated to an HR infrastructure station, while the other HR-MS is out of coverage of any HR infrastructure stations; 3) the two HR-MSs are out of coverage of any HR infrastructure stations.

HR-MS direct communication using centralized resource allocation allocated by HR-BS, that is called BS-controlled direct communication, is described in 6.12.2.2.

Resource for HR-MS direct communication can be allocated by the HR infrastructure station for cases (1) and (2).

For case-3, either base station function for HR-MS or talk-around direct communications between HR-MSs may be performed as described in 6.12.1.3.2 and 6.12.2.3, respectively. ~~shall satisfy:~~

- ~~When HR-MSs are out of coverage of any HR infrastructure stations, the operation of HR-MSs shall not interfere with any existing infrastructure stations. When HR-MS cannot receive any BS preamble from any infrastructure station and HR-MS direct communication without infrastructure is permitted by device configuration, HR-MSs are allowed to communicate with each other in the same band without getting permission from infrastructure stations.~~

- ~~A Coordinator is selected for the coordination of transmission among HR-MSs. Until a coordinator is selected, an HR-MS is only allowed to transmit signals necessary to enable coordinator selection. To avoid collisions among HR-MSs in coordinator selection, the HR-MS follow a collision avoidance procedure. The procedure is defined in 6.12.2.4.~~

- ~~A coordinator shall function as a simplified HR-BS except it may not support handover.~~

- ~~The coordinator and any HR-MS that are communicating through the coordinator shall continue cell search operation and shall cease DC operation as soon as the criteria for DC and prevention of interference above are not met.~~

Resource for HR-MS direct communication may be allocated in a distributed manner among nearby HR-MSs independent of infrastructure node deployment for cases (1), (2), and (3).

HR-MS direct communication using distributed resource allocation among nearby HR-MSs, that is called talk-around direct communication, is described in 6.12.2.3.

[Remedy2: Delete the whole text in 6.12.2.4 from line 16, page 132 to line 10, page 136in the 802.16.1a AWD]

[-----------------------------------End of Text Proposal--]