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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <**<http://ieee802.org/16>**>** |
| Title | **Clarification on Direct Communication Link Management in IEEE 802.16.1a** |
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| Re: | In response to Letter Ballot #38 Recirculation on P802.16.1a/D2 |
| Abstract | This contribution proposes text changes to clarify direct communication link management in IEEE 802.16.1a. |
| Purpose | To discuss and adopt the proposed texts in the IEEE 802.16.1a Draft Standard. |
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Clarification on Direct Communication Link Management in IEEE 802.16.1a

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# Introduction

The description on direct communication link management in IEEE 802.16.1a needs to be clarified including signaling mechanisms of the defined messages. Also, the description on releasing the TWDCs corresponding to the direct communication link being deleted is proposed to make their reassignment to other direct communication links valid. The details how the direct communication link is handled are suggested when its link reports are received as “no link found” in order to make the purpose of the link report clear.

# References

[1] IEEE P802.16.1aTM/D2, WirelessMAN-Advanced Air Interface for Broadband Access Systems - Draft Amendment: Higher Reliability Networks, Apr. 2012.

[2] IEEE P802.16.1TM/D6, IEEE Draft for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems, Apr. 2012.

# Proposed Texts on the IEEE 802.16.1a Amendment Draft Standard

The proposed texts are written in three different types of fonts according to each change purpose as follows.

The same texts in the current draft: black

The texts to be deleted by this contribution: ~~red strikeout~~

The texts to be added by this contribution: blue underline

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

*[Remedy #1: Modify the current sentences in Section 6.12.2.2.1.2.1.1 on Page 115 in the IEEE P802.16.1a/D2 Draft Standard as follows.]*

**6.12.2.2.1.2.1.1 Direct communication link creation**

~~When HR-BS creates direct communication link between two HR-MSs. It shall send link creation message to both source and destination HR-MSs. Direct communication link creation can only be initiated by the HR-BS. The HR-MSs shall send back a response once they receive the direct communication link creation request. Once the HR-BS receives responses from both HR-MSs, it can continue on other steps of direct communication setup.~~ When an HR-BS creates a direct communication link between two HR-MSs, the HR-BS shall request creation of the direct communication link to the HR-MSs by sending an AAI-DC-LC-REQ to the HR-MSs. If one of the HR-MSs is not associated with the HR-BS and the HR-MS has a control connection to the HR-BS which is forwarded by its peer HR-MS by the forwarding to network in 6.12.3.2, then its peer HR-MS should forward the received AAI-DC-LC-REQ to it. In response to the received AAI-DC-LC-REQ from the serving HR-BS or the peer HR-MS, the HR-MSs shall send an AAI-DC-LC-RSP to the HR-BS or the peer HR-MS. The AAI-DC-LC-RSP from the HR-MS not associated with the HR-BS should be forwarded to the HR-BS by the peer HR-MS. Once the HR-BS receives the responses including confirmation code set to 0 from both the HR-MSs, it can continue on next steps to establish a direct communication service flow. If at least one of the confirmation codes determined by the HR-MSs is set to 1, then the HR-BS stops creating the direct communication link at the moment and may attempt again to create the direct communication link by sending the AAI-DC-LC-REQ later.

*[Remedy #2: Modify the current sentences in Section 6.12.2.2.1.2.1.2 on Page 115 in the IEEE P802.16.1a/D2 Draft Standard as follows.]*

**6.12.2.2.1.2.1.2 Direct Communication Link Deletion**

~~When HR-BS wants to remove a direct communication link, it shall send deletion request to both HR-MS and wait for responses from the HR-MSs.~~

~~The HR-MS shall reply with reasons to HR-BS when it receives the link deletion request from HR-BS.~~

When an HR-BS wants to remove a direct communication link between two HR-MSs, the HR-BS shall request deletion of the direct communication link to the HR-MSs by sending an AAI-DC-LD-REQ to the HR-BSs. If one of the HR-MSs is not associated with the HR-BS and the HR-MS has a control connection to the HR-BS which is forwarded by its peer HR-MS by the forwarding to network in 6.12.3.2, then its peer HR-MS should forward the received AAI-DC-LD-REQ to it. In response to the received AAI-DC-LD-REQ from the serving HR-BS or the peer HR-MS, the HR-MSs shall send an AAI-DC-LD-RSP to the HR-BS or the peer HR-MS associated with the HR-BS. The AAI-DC-LD-RSP from the HR-MS not associated with the HR-BS should be forwarded to the HR-BS by the peer HR-MS. Once the HR-BS receives the responses from both the HR-MSs, it may release the TWDCs assigned to the HR-MSs, and then the TDWCs released can be re-assigned to a different direct communication link later.

*[Remedy #3: Modify the current sentences in Section 6.12.2.2.1.2.1.3 on Page 116 in the IEEE P802.16.1a/D2 Draft Standard as follows.]*

**6.12.2.2.1.2.1.3 Direct Communication Link Report**

~~HR-BS may require the HR-MS report the status of the direct communication link by sending a request to the relative HR-MS.~~

~~HR-MS shall send back report regarding the direct communication link when it receives a link report request from HR-BS.~~

An HR-BS may require an HR-MS involving a direct communication to report the status of its direct communication link by sending an AAI-DC-LR-REQ to the HR-MS in order to determine whether its activation is still valid or not. If one of the HR-MSs is not associated with the HR-BS and the HR-MS has a control connection to the HR-BS which is forwarded by its peer HR-MS by the forwarding to network in 6.12.3.2, then the peer HR-MS should forward the received AAI-DC-LR-REQ to it. In response to the received AAI-DC-LR-REQ from the serving HR-BS or the peer HR-MS, the HR-MS shall send an AAI-DC-LR-RSP including Link state to the HR-BS or the peer HR-MS. The AAI-DC-LR-RSP from the HR-MS not associated with the HR-BS should be forwarded to the HR-BS by the peer HR-MS associated with the HR-BS. If the HR-BS receives the response including Link state set to 0 from both the HR-MSs, the HR-BS maintains the direct communication link activated. Otherwise, the HR-BS may request the HR-MSs involving the direct communication to delete its link using the link deletion procedure in 6.12.2.2.1.2.1.2. Also, the HR-BS may deactivate the direct communication link rather than deletes it, and the HR-BS may request the HR-MS to report its link status again in order to check whether it becomes active or not later. If the link status of the direct communication link being considered as deactivated is reported as active, then the HR-BS can activate the direct communication link and establish service flow on it.

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