| Project | **IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>** |
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| Title | **MSS's buffer capability negotiation for DL IR H-ARQ operation** |
| Date Submitted | **2005-01-17** |
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| Re: | This contribution is for call for contribution about IEEE P802.16e/D5a |
| Abstract | This contribution proposes the MSS buffer capability information for H-ARQ. |
| Purpose | To be discussed and adopted in TGe. |
| Notice | |
| Release | |
| Patent Policy and Procedures | |

# MSS's buffer capability negotiation for DL IR H-ARQ operation

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## 1.  Problem statements

H-ARQ scheme is optional and can be enabled on per-terminal basis. This scheme may be supported only for the OFDMA PHY. The signaling of the per-terminal H-ARQ and associated parameters shall be done during initialization procedure. The associated parameters mentioned above are *MSS Capability encodings*, *bandwidth allocation support*, *capabilities for construction and transmission of MAC PDUs* and *physical parameters supported* and many others.
For the IR H-ARQ scheme, the MSS shall be able to store the different versions of subpackets to successfully decode the corresponding H-ARQ encoded packet. The MSS shall be capable of supporting the reordering to deliver the received MAC PDUs to the upper layer in order.

If the BS knows the MSS memory ability, the BS may allocate the reasonable amount of downlink H-ARQ resource to the MSS through compact DL-MAP IE. If the BS allocates the downlink H-ARQ bandwidth to the MSS without the MSS buffer ability, the MSS may fail to decode the downlink H-ARQ encoded packet because of lack of memory.  The more H-ARQ channels, the more storages the MSS needs.

Without signaling of MSS buffer capability, even though the channel condition is being improved, the possibility of retransmission and the traffic latency may be increased because of MSS buffer overflow. Therefore, it needs MSS buffer capability signaling during initialization procedure.

## 2.  Proposed remedy

Add the parameter 'MSS buffer capability' into MSS Capability encodings which may be included in SBC-REQ/SBC-RSP messages. The H-ARQ enabled MSS informs the BS of its buffer capability during initialization procedure.

## 3.  Proposed text change

*[Insert the following after lines 18 of page 119 in P802.16e/D5a, before section 6.3.17.1 as indicated]*

The MSS which supports H-ARQ scheme shall be equipped with enough buffer capability to perform the combining of several versions of H-ARQ encoded subpackets and reordering of the successfully decoded H-ARQ packets. Therefore, MSS buffer capability associated with H-ARQ shall be specified and negotiated during initialization procedure using SBC-REQ/RSP.

*[Add the following text to section 11.7.8 before section 11.7.9]*

### 11.7.8.12  IR HARQ buffer capability

This parameter defines the MSS's ability to process the received H-ARQ packets. For IR, the MSS shall have enough memory to store H-ARQ subpackets and support reordering of the received H-ARQ packets. During the initialization procedure, the MSS needs to inform the BS of its ability for DL-HARQ. After establishment of H-ARQ service connection, the BS shall allocate the downlink resource for the established H-ARQ service based on the signaled MSS buffer ability.

| Type | Length | Value | Scope |
|------|--------|-------|-------|
| XX | 1 | Index that defines the MSS buffer capability for DL IR HARQ connections.<br>Bits #7-#4: $N_{EP}$ (See Table 330)<br>Bits #3-#0: Max number of HARQ channels | SBC-REQ<br>SBC-RSP |

The BS shall not allocate more bits than the (default $N_{EP}$ size that corresponds to the signaled index) * (Index%16) as the downlink HARQ burst per frame for the MSS.