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Re:	Comments on IEEE P802.16m/D2 for IEEE 802.16 Working Group Letter Ballot Recirc #30a
Abstract	The contribution proposes updates to the text related to persistent allocation in the 802.16m/D2
Purpose	To be discussed and adopted by the IEEE 802.16 Working Group.
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Proposed Changes to Persistent Scheduling in IEEE P802.16m /D2 (15.2.7)

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Introduction

In P802.16m/D2, Two Persistent Allocation (PA) mechanisms exist to support both Individual and Multiple connections for the same usage. Because the operation of PA for multiple connections is not clearly defined in P802.16m/D2, we recommend to delete PA mechanism for multiple connections.

Text proposal for inclusion in P802.16m/D2

[Change the text starting from line 57, page 142 as follows:]

-- Start Text Proposal ---

15.2.7 Persistent Scheduling in the Advanced Air Interface

Persistent allocation is a technique used to reduce assignment overhead for connections with periodic traffic pattern and with relatively fixed payload size. To allocate resources persistently to a single connection, the ABS shall transmit the DL ~~Individual~~ Persistent Allocation A-MAP IE for DL allocations and the UL ~~Individual~~ Persistent Allocation A-MAP IE for UL allocations. ~~To allocate resources persistently to multiple connections of multiple AMSs, the ABS may transmit the DL Composite Persistent Allocation A-MAP IE for DL allocations and the UL Composite Persistent Allocation A-MAP IE for UL allocations.~~ The persistently allocated resource size, position and the MCS shall be maintained by the ABS and AMS until the persistent assignment is de-allocated, changed, or an error event occurs. Persistent scheduling does not include special arrangements for HARQ retransmission of data initially transmitted using persistently allocated resources. Resources for retransmissions can be allocated one at a time as needed using a DL Basic Assignment A-MAP IE or a UL Basic Assignment A-MAP IE.

15.2.7.1 Allocation Mechanism

~~15.2.7.1.1 Allocation Mechanism for an Individual Connection~~

For ~~individual~~ persistent allocation in the DL/UL, the ABS shall transmit the DL/UL ~~Individual~~ Persistent Allocation A-MAP IE. Allocation of the persistently assigned resource begins in the DL/UL AAI subframe that is referenced by the DL/UL ~~Individual~~ Persistent Allocation A-MAP IE and repeats after an allocation period that is specified in the DL/UL ~~Individual~~ Persistent Allocation A-MAP IE. The attributes of the persistently allocated resource including size, location, MIMO encoder format and MCS are maintained as per the DL/UL ~~Individual~~ Persistent Allocation A-MAP IE. The values of ACID field and N_ACID field in the DL/UL ~~Individual~~ Persistent Allocation A-MAP IE are used together to specify an implicit cycling of HARQ channel identifiers. The allocation period and number of ACIDs required for persistent operation are configured in the DL/UL ~~Individual~~ Persistent Allocation A-MAP IE.

In order to facilitate link adaptation and avoid resource holes, the attributes of a persistently allocated resource can be changed. To change an ~~individual~~ persistent assignment, the ABS shall transmit the DL ~~Individual~~ Persistent Allocation A-MAP IE for DL reallocation and the UL ~~Individual~~ Persistent Allocation A-MAP IE for UL reallocation respectively. If an AMS has an existing ~~individual~~ persistent allocation in a particular AAI subframe and receives a new ~~individual~~ persistent allocation in the same AAI subframe, the new ~~individual~~ persistent allocation replaces the original allocation (i.e., the original persistent allocation is de-allocated).

When the BS sends a PA A-MAP IE to reallocate a persistently assigned resource, a different HARQ feedback channel must be assigned in the PA A-MAP IE used for reallocation. Reception of an ACK/NACK in the newly assigned HARQ feedback channel for the persistently assigned resource with the changed attributes will ensure that the reallocation A-MAP IE was received correctly.

~~15.2.7.1.2 Allocation Mechanism for Multiple Connections~~

~~For multiple persistent allocations in the DL/UL, the ABS may transmit the DL/UL Composite Persistent A-MAP IE. Allocation of the persistently assigned resource for each connection begins in the DL/UL AAI subframe that is referenced by the DL/UL Composite Persistent A-MAP IE and repeats after an allocation periods that are specified in the DL/UL Composite Persistent A-MAP IE. The attributes of the persistently allocated resource for each connection including size, location, MIMO encoder format and MCS are maintained as per the DL/UL Composite Persistent A-MAP IE. The value of N_ACID is derived from PA_Max_ReTx Delay and the Allocation Period which is specified in the DL/UL Individual Persistent A-MAP IE. The value of the ACID field and N_ACID are used together to specify an implicit cycling of HARQ channel identifiers. The allocation period and number of ACIDs required for persistent operation are configured in the DL/UL Composite Persistent A-MAP IE.~~

~~In order to facilitate link adaptation and avoid resource holes, the attributes of a persistently allocated resource can be changed. To change persistent assignments for multiple connections, the ABS shall transmit a DL Composite Persistent A-MAP IE for DL reallocation and the UL Composite Persistent A-MAP IE for UL reallocation respectively. If an AMS has an existing persistent allocation in a particular AAI subframe and receives a new persistent allocation in the same AAI subframe, the new persistent allocation replaces the original allocation (i.e., the original persistent allocation is de-allocated).~~

~~When the BS sends a PA A-MAP IE to reallocate a persistently assigned resource, a different HARQ feedback channel must be assigned in the PA A-MAP IE used for reallocation. Reception of an ACK/NACK in the newly assigned HARQ feedback channel for the persistently assigned resource with the changed attributes will ensure that the reallocation A-MAP IE was received correctly.~~

15.2.7.2 Deallocation Mechanism

~~15.2.7.2.1 Deallocation Mechanism for an Individual Connection~~

For deallocation of ~~individual~~ persistent allocations in the DL/UL, the ABS shall transmit the DL/UL ~~Individual~~ Persistent Allocation A-MAP IE. When the Allocation Period is set to 0b00 in the DL/UL ~~Individual~~ Persistent Allocation A-MAP IE, the assigned persistent resource in DL/UL ~~Individual~~ Persistent Allocation A-MAP IE is deallocated in referenced DL/UL AAI subframe and the ABS and AMS terminate the persistent allocation.

When the BS sends a PA A-MAP IE to deallocate a persistently assigned resource, a different HARQ feedback channel must be assigned in the PA A-MAP IE used for deallocation. Reception of an ACK/NACK in the newly assigned HARQ feedback channel for deallocating a persistently assigned resource will ensure that the deallocation PA A-MAP IE was received correctly.

15.2.7.2.2 Deallocation Mechanism for Multiple Connections

For deallocation of multiple persistent allocations in the DL/UL, the ABS shall transmit the DL/UL Composite Persistent A-MAP IE. When the Allocation Period is set to 0b00 for each connection that is being deallocated in the DL/UL Composite Persistent A-MAP IE, the assigned persistent resource in DL/UL Composite Persistent A-MAP IE is deallocated in referenced DL/UL AAI subframe and the ABS and AMS terminate the persistent allocation.

When the BS sends a PA A-MAP IE to deallocate a persistently assigned resource, a different HARQ feedback channel must be assigned in the PA A-MAP IE used for deallocation. Reception of an ACK/NACK in the newly assigned HARQ feedback channel for deallocating a persistently assigned resource will ensure that the deallocation PA A-MAP IE was received correctly.

15.2.7.3 HARQ Retransmissions

Asynchronous HARQ retransmission is used for downlink individual and composite persistent allocations. The DL Basic Assignment A-MAP IE shall be transmitted to signal control information for HARQ retransmission. Synchronous HARQ retransmission is used for uplink individual and composite persistent allocations. The UL Basic Assignment A-MAP IE may be transmitted to signal control information for HARQ retransmission.

15.2.7.4 Error Handling Procedure

15.2.7.4.1 Error Handling Procedure for an Individual Connection

For transmissions with HARQ enabled, an ACK is transmitted to acknowledge the successful decoding of a data burst, or a NACK is transmitted to notify failure in decoding a burst transmitted on the DL/UL. If an ACK or a NACK for the data burst identified by the DL Individual Persistent Allocation A-MAP IE is detected in the assigned HARQ Feedback channel, the ABS shall assume that the DL Individual Persistent Allocation A-MAP IE is correctly received by AMS. If the initial data burst identified by the UL Individual Persistent Allocation A-MAP IE is successfully decoded in HARQ period, the ABS shall assume that the UL Individual Persistent Allocation A-MAP IE is correctly received.

When NULL detection is used, in the absence of an ACK or a NACK in the HARQ feedback channel assigned in the DL Individual Persistent Allocation A-MAP IE for the data burst, the ABS shall assume that the AMS has not received the DL Individual Persistent Allocation A-MAP IE and the same DL Persistent Allocation A-MAP IE can be transmitted again.

In the case of deallocation of individual persistent allocations in the DL/UL, the ABS shall transmit a HARQ Feedback Allocation in the DL/UL Individual Persistent Allocation A-MAP IE. This allocation is used to identify the HARQ channel in which the ACK for the DL/UL Individual Persistent Allocation A-MAP IE signaling the deallocation is transmitted. In the absence (NULL detection) of an ACK, the ABS shall assume that the AMS has not received the DL/UL Individual Persistent Allocation A-MAP IE, and the same DL/UL Persistent Allocation A-MAP IE that signaled the deallocation can be transmitted again.

When NULL detection is used, in the absence (NULL detection) of the UL data busrt assigned in the UL Individual Persistent Allocation A-MAP IE, the ABS shall assume that the AMS has not received the UL Individual Persistent Allocation A-MAP IE and the ABS may transmit the same UL Persistent Allocation A-MAP IE again.

15.2.7.4.2 Error Handling Procedure for Multiple Connections

For transmissions with HARQ enabled, an ACK is transmitted to acknowledge the successful decoding of a data burst, or a NACK is transmitted to notify failure in decoding a burst transmitted on the DL/UL. If an ACK or a NACK for the data burst identified by the DL Composite Persistent A-MAP IE is detected in the assigned HARQ Feedback channel, the ABS shall assume that the DL Composite Persistent A-MAP IE is correctly

received by AMS. If one of the initial data burst identified by the UL Composite Persistent A-MAP IE is successfully decoded in HARQ period, the ABS shall assume that the UL Composite Persistent A-MAP IE is correctly received by that connections.

When NULL detection is used, in the absence of an ACK or a NACK in the HARQ feedback channel assigned to one or more connections in the DL Composite Persistent A-MAP IE for data burst, the ABS shall assume that the corresponding AMSs have not received the DL Composite Persistent A-MAP IE and the DL Composite A-MAP IE can be transmitted again for these connections. If the persistent allocation needs to be transmitted to only one connection the DL Individual A-MAP IE can be transmitted again for this connection.

When NULL detection is used, in the absence of the UL data burst assigned in the UL Composite Persistent A-MAP IE, the ABS shall assume that the AMS has not received the UL Composite Persistent A-MAP IE and the ABS may transmit the same UL Persistent A-MAP IE again.

In the case of deallocation of multiple persistent allocations in the DL/UL, the ABS shall transmit HARQ Feedback Allocations in the DL/UL Composite Persistent A-MAP IE. These allocations are used to identify the HARQ channels in which the ACK for the DL/UL Composite Persistent A-MAP IE signaling the deallocations are transmitted. In the absence (NULL detection) of an ACK from one or more connections, the ABS shall assume that the corresponding AMSs have not received the DL/UL Composite Persistent A-MAP IE, and the same DL/UL Composite A-MAP IE that signaled the deallocation may be transmitted again. If the deallocation needs to be transmitted to only one connection the DL/UL Individual A-MAP IE can be transmitted again for this connection.

-- End of Proposed Text --