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Re:	IEEE 802.16j-07/007r2:“Call for Technical comments and contributions regarding IEEE Project P802.16j”
Abstract	This document presents sleep mode operations for IEEE 802.16j. The existing IEEE 802.16e messages are reused and new parameters are introduced in order to facilitate the sleep mode management in IEEE 802.16j.
Purpose	Propose an efficient signaling acknowledgment operations for IEEE 802.16j
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Signaling Acknowledgment Mechanism in MR Network

Introduction

In MR network defined by IEEE802.16j, many signaling messages are shared between MR-BS and RS although network procedures are performed by MR-BS and MS. In distributed scheduling mode, the amount of signaling required between MR-BS and RS is greatly increased since the MR-BS needs to inform RSs of important MS information to aid RSs in resource scheduling. In order to ensure delivery of these messages in a reliable and on-time manner, an acknowledgment mechanism is needed for IEEE802.16j.

In this contribution, we propose to add a generic acknowledgment MAC header which RS can use to transmit acknowledgment of received MAC management messages if necessary. An generic ACK MAC header provides the following advantages:

1. Use minimum bandwidth to provide acknowledgment with all necessary information
2. No need to define a new ACK message for each messages needs acknowledgment
3. Allows flexibility in implementation. One ACK header is implemented to acknowledge all messages.

The generic ACK header format is based on accepted contribution C80216j-07_028r3[2], in which an extended MAC signaling header type II is added.

The use of generic ACK header is optional and the capability of supporting ACK header is negotiated during network entry of a RS using REG-REQ/RSP message.

The proposed text change also included modification of several messages flows using ACK header as an option based on IEEE802.16j-06/026r3.

Specific Text change

[Insert the following subclause at the end of 6.3.2.1.2.2:]

6.3.2.1.2.2.2 Extended MAC Signaling Header Type II

Table X-1—Extended Type field encodings for Extended MAC signaling header type II

Extended Type field	MAC header Type	Reference figure	Reference table
2	Acknowledgment Header used by the RS to acknowledge the reception of a MAC management message from the MR-BS or		

	superordinate RS		
3-72 3	*Reserved*		

[Insert the following subclause at the end of 6.3.2.1.2.2.3:]

6.3.2.1.2.2.3 Acknowledgment Header (ACK Header)

An Acknowledgment Header is sent by an RS as a response to a MAC management messages received from the MR-BS or its superordinate RS that requires acknowledgment. The RS sends this header to the MR-BS or its superordinate RS as an indication of the message reception. The Acknowledgment Header shall be sent on RS's basic CID. The Acknowledgment Header is illustrated in Figure 20l. The support of Acknowledgement header is optional for both MR-BS and RS and shall be negotiated during network entry of a RS using REG-REQ and REG-RSP message.

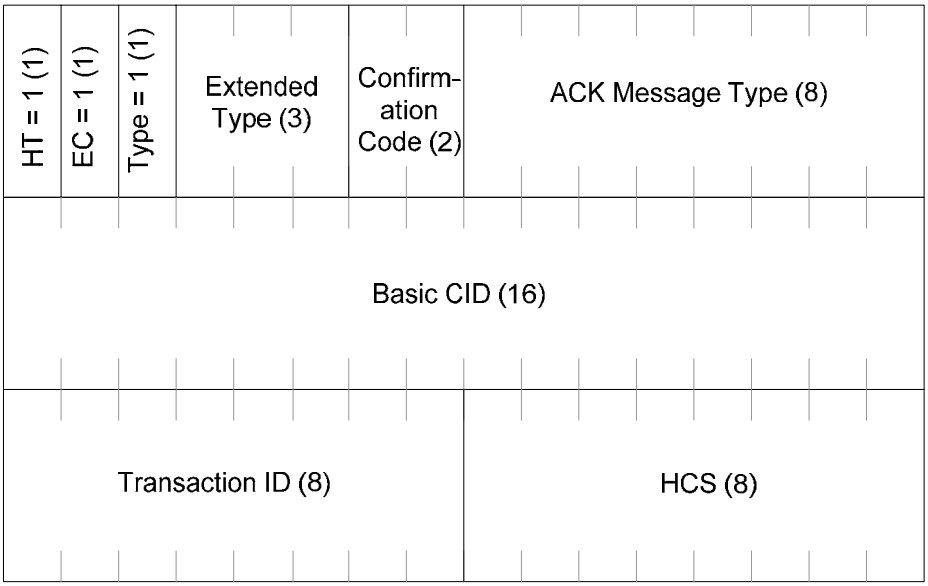

Figure 20l – Acknowledgement Header

The Acknowledgment header shall have the following properties:

a. This is a MAC signaling header type II. The length of the header shall always be 6 bypes.
b. The Type field of this header shall be set to 1.
c. The Extended Type field of this header shall be set to 0b010
d. The content of the header is listed in table 7k.

The content of Acknowledgment header is defined in Table 7k.

Table 7k - Acknowledgement header fields

Name	Size	Description
Confirmation Code	2 bits	An indication that MAC message received by RS 0b00: Received successfully 0b01 – 0b11: Reserved
ACK Message Type	8 bits	The MAC message type of the message received by the RS from the MR-BS or its superordinate RS
Basic CID	16 bits	The basic CID of the RS
Transaction ID	8 bits	Transaction ID included in the MAC management message received from the BS. If Transaction ID is not included, set this field to zero.
HCS	8 bits	Header Check Sequence (same usage as HCS entry in Table 5).

[Modify section 6.3.22.1.2 Page 80, line 42 as following:]

6.3.22.1.2 MS scanning of neighbor BSs

…….

In the case of distributed scheduling, the MR-BS sends MS_SCN-INF message to inform the access RS of MS scanning related information after the MR-BS determines the scanning intervals of MS. The access RS shall transmits MS_SCN-ACK message or ACK header (as defined in 6.3.2.1.2.2.3) as an acknowledgement of MS_SCN-INF. Based on MS_SCN-INF message, the access RS schedules MS data transmission.

[Modify section 6.3.22.1.2 Page 86, line 42 as following:]

6.3.22.5.1 MS Movement among access stations with different preamble/FCH/MAP

…….

If a serving MR-BS recognizes that MS attaches to a new access station or Resource retain timer expires, and the MS's old access station is an RS which is controlled by the MR-BS, the MR-BS may send the MS_INFO-DEL message to make the RS discard MS context information. Upon receiving the MS_INFODEL message, the RS shall transmit MS_DEL-ACK or ACK header (as defined in 6.3.2.1.2.2.3) as a reply and remove the MS context information

[Insert section 11.7.25 after 11.7.8.14, Pg115, line 41]

11.7.25 MAC header and extended header support

Type	Length	Value	Scope
43	3	…. Bit #18 PDU SN(long) extended subheader Bit#19: ACK header Bit #~~19~~20–23: Reserved	REG-REQ REG-RSP

References

[1] IEEE802.16j-06/026r3 Baseline Document for Draft Standard for 16j
[2] IEEE C802.16j_07/028r3 Message definition to support MS network entry in centralized allocation model