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Abstract	This contribution defines a flexible transmitting period mechanism which aims to decide the period of transmitting RS amble in next period base on channel quality and the move speed of RS
Purpose	For discussion and approval of inclusion of the proposed text into the P802.16j baseline document.
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A flexible transmitting mechanism of RS amble

1. Introduction

In IEEE 802.16e systems, the first symbol of the downlink transmission is the preamble, which can be used by a mobile station (MS) to obtain the time synchronization, carrier frequency estimation, channel response estimation, cell and sector identification, and so on. A similar amble can also be introduced into the relay zones for relay stations (RSs) to achieve the similar objectives as the preambles in relay link. RSs use the preamble in the access zone during initial entry procedure. After initial entry procedure, the RSs need relay zone's amble (RS amble) to obtain the time synchronization, carrier frequency estimation, channel response estimation, cell and sector identification, and so on.

The following choices are available for transmission the RS amble sequence.

- The first option of the transmission Mechanism is that upriver station (RS or BS) transmits RS amble every frame. However, this mechanism will cause problems in wasting bandwidth if the communications condition is so good that not need to obtain the time synchronization, carrier frequency estimation, channel response estimation every frame.

- The second option of the transmit Mechanism is that upriver station (RS or BS) transmits RS amble with a period,However, this mechanism will cause problems in unappeasable request if the communications condition is so bad that need to obtain the time synchronization, carrier frequency estimation, channel response estimation every frame.

2. Details

In this contribution, we define a flexible transmitting period of RS amble mechanism which aims to decide the period of transmitting RS amble base on channel quality and the move speed of RS, avoiding the drawbacks related to the other solutions outlined above, for example transmitting with every frame or with a fixed period .

The flexible transmitting mechanism should contain some process as follows:

The upriver station (BS or RS) obtains the change range of channel quality and the move speed of RS between period n and period $(n \quad 1)$ by inspecting some parameters which can denote channel quality and the move speed of RS. The parameter may be the mean, the minimal or the maximal of parameter during the period. The upriver station (BS or RS) can obtain the move speed of RS and channel quality by computing the change range of uplink's time offset and frequency offset between period n and period $(n \quad 1)$.The upriver station (BS or RS) compares change

range obtained in above with threshold limit value (TLV) and decides the period of transmitting RS amble in next period based on comparison result. The values of TLV are confirmed by both simulation in advance and the results of measure in fact.

A value of TLV correspond a RS amble transmitting period. For example, a transmitting period of p, n and 0 corresponds the value of TLV_p, TLV_n and TLV_0.If the change range exceeds the TLV_p, then the upriver station transmits RS amble in every frame; If the change range between the TLV_p and TLV_n,then the upriver station transmits RS amble in period n ; If the change range between the TLV_n and TLV_0,then the upriver station transmits RS amble in period p .(Where $0 \quad n \quad p \quad 4$ and $TLV_P \quad TLV_n \quad TLV_0$)

The RS amble symbol is holden by general data when current frame does not contained RS amble.

3. Specific text changes

Insert new subclause 8.4.6.1.1.3

8.4.6.1.1.3 Relay amble
The relay amble transmission mechanism should be a flexible period transmission mechanism structure. The period for transmitting the RS amble should be decided based on channel quality and the moving speed of RS.

The upriver station (BS or RS) obtains the changes of channel quality and the move speed of RS between period n and period $(n \quad 1)$ by inspecting some parameters which can denote channel quality and the move speed of RS. The value of parameter can be the mean, the minimal or the maximal values during the period.

The upriver station (BS or RS) compares changes obtained in above with threshold limit value (TLV) and decides the period for transmitting RS amble in next period based on comparison result. The values of TLV are determined by simulation in advance and the measurement. A TLV value corresponds to a RS amble transmission period.

The RS amble symbol is held by general data when current frame does not contain RS amble.

The period for transmitting the RS amble is denoted by a message added to the end of DL_MAP_IE. The coding of the message is illustrated in table xxx.

Table xxx – OFDMA DL_MAP_IE format

Syntax	Size	Notes
DL_MAP_IE(){		
RS amble period	2bit	00:the RS amble's transmit period is 0; 01:the RS amble's transmit period is 1; 10:the RS amble's transmit period is 2; 11:the RS amble's transmit period is 3.
}		

References

1. IEEE 802.16-2004 "IEEE Standard for Local and Metropolitan Area Networks – Part 16"

2. IEEE 802.16e-2005