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| Title | Automatic PSC Reactivation Procedure | |
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| Source(s) | Floyd Simpson, Stephen Wang, Mark Cudak<br><br>Motorola, Inc.<br>8000 W. Sunrise Blvd<br>Plantation, FL 33322, USA | Voice: +1-954-723-5269<br>Fax : +1-954-723-3391<br>mailto: floyd.simpson@motorola.com |
| Re: | IEEE Maintenace Project | |
| Abstract | This contribution solves a problem created, but not adequately addressed, by the IEEE 802.16e specification. According to the current spec, a PSC may be automatically deactivated by MPDU or TRF-IND if so configured with the Traffic-Triggered-Wakening-Flag. This method provides an effective way for BS and MS to exchange non-real-time traffic (e.g. FTP, HTTP, e-mail, etc.) that is bursty in nature. However under the current spec, MS and BS must reactivate PSC via a series of message exchanges, which takes at least 8 frames to complete under the best case scenario. Such lengthy reactivation is costly to a MS as far as duty cycle is concerned. | |
| Purpose | Adopt proposed changes | |
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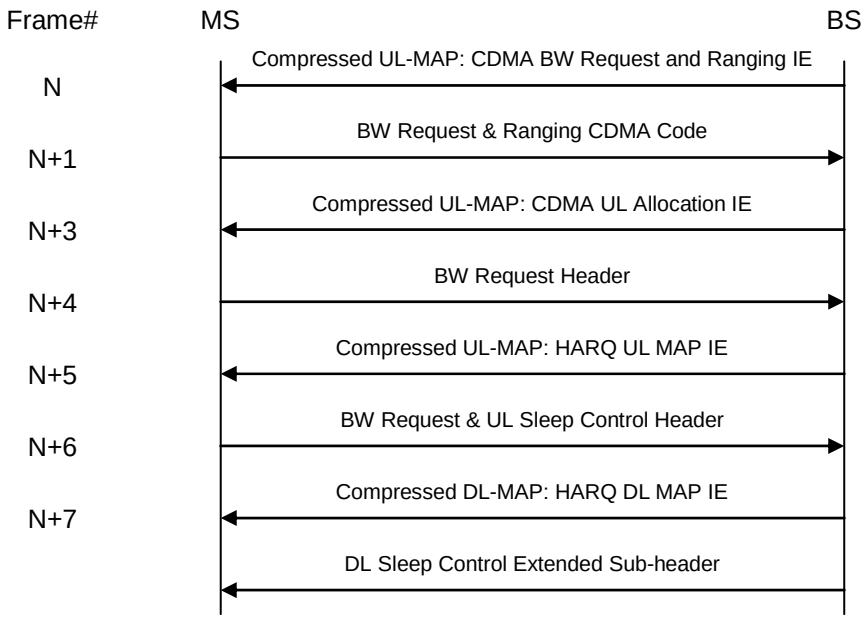
# Automatic PSC Reactivation Procedure

*Floyd Simpson, Stephen Wang*
*Motorola*

## Motivation

This contribution solves a problem inherent to, but not adequately addressed by the IEEE 802.16e specification. The spec defines Power Saving Class of Type I for connections of BE and NRT-VR type. When the Traffic Triggered Wakening flag is set, power saving classes of type I may be automatically deactivated by reception of MPDU or TRF-IND or transmission of BW Request. This mechanism is well suited for the exchange of non-real-time traffic (e.g. HTTP, FTP, e-mail, etc.) that is bursty in nature.

However, under the current spec, BS and MS must complete a series of signaling exchanges to reactivate a power saving class. Taking power saving class activation using Bandwidth Request with UL Sleep Control Header/DL Sleep Control Extended Subheader as example, MS and BS must complete the following signaling exchange:




Under the best case scenario (e.g. no retransmission), it would take at least 8 frames to reactivate a power saving class. After taking into consideration of HARQ retries, the time required for PSC reactivation could be stretched to 100+ ms.

The lengthy procedure must be repeated each time a bursty traffic exchange is completed. It adds a significant overhead to both BS and MS and results in higher power consumption on the MS. More importantly, it prevents MS from using sleep intervals that is short than the time needed to a complete PSC reactivation.

Therefore, there is a need to reduce power saving class reactivation overhead through simplified signaling.

### Suggested Remedy:

For a PSC that is deactivated by traffic triggered wakening flag, BS automatically includes DL Sleep Control Extended Subheader whenever it intends to end a bursty (BE or NRT-VR) traffic exchange with the MS. It encompasses following steps:

1. Each time when the Power Saving Class is deactivated by MPDU or TRF-IND or UL BW Request, the BS will automatically insert a DL Sleep Control Extended Subheader into a DL MPDU whenever it wants to end traffic exchange for connection of the PSC.
2. The Power Saving Class is reactivated from the next frame immediately after the frame in which DL Sleep Control Extended Subheader was transmitted.

## Formal Change Request

In page 41, change as follows:

#### 6.3.2.2.7.2 DL Sleep control extended subheader

The DL Sleep control extended subheader is sent by the BS to activate/deactivate certain Power Saving Class. The requested operation is effective from the next frame after the one where the message was transmitted.

The format of DL Sleep control extended subheader is as described in Table 13e.BS may transmit this message to reactivate the Power Saving Class after the BS determines the end of data transmission.

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