IEEE Std 802.16™-2004
(Revision of IEEE Std 802.16-2001)

IEEE Standards

802.16™

IEEE Standard for
Local and metropolitan area networks

Part 16: Air Interface for Fixed Broadband Wireless Access Systems

IEEE Computer Society
and the
IEEE Microwave Theory and Techniques Society

Sponsored by the
LAN/MAN Standards Committee

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Abstract: This standard specifies the air interface of fixed broadband wireless access (BWA) systems supporting multimedia services. The medium access control layer (MAC) supports a primarily point-to-multipoint architecture, with an optional mesh topology. The MAC is structured to support multiple physical layer (PHY) specifications, each suited to a particular operational environment. For operational frequencies from 10–66 GHz, the PHY is based on single-carrier modulation. For frequencies below 11 GHz, where propagation without a direct line of sight must be accommodated, three alternatives are provided, using OFDM, OFDMA, and single-carrier modulation. This standard revises and consolidates IEEE Std 802.16-2001, IEEE Std 802.16a™-2003, and IEEE Std 802.16c™-2002.

Keywords: fixed broadband wireless access network, metropolitan area network, microwave, millimeter wave, WirelessMAN® standards

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6.3.10 Ranging

Ranging is a collection of processes by which the SS and BS maintain the quality of the RF communication link between them. Distinct processes are used for managing uplink and downlink. Also some PHY modes support ranging mechanisms unique to their capabilities.

6.3.10.1 Downlink burst profile management

The downlink burst profile is determined by the BS according to the quality of the signal that is received by each SS. To reduce the volume of uplink traffic, the SS monitors the CINR and compares the average value against the allowed range of operation. This region is bounded by threshold levels. If the received CINR goes outside of the allowed operating region, the SS requests a change to a new burst profile using one of two methods. If the SS has been granted uplink bandwidth (a data grant allocation to the SS's Basic CID), the SS shall send a DBPC-REQ message in that allocation. The BS responds with a DBPC-RSP message. If a grant is not available and the SS requires a more robust burst profile on the downlink, the SS shall send a RNG-REQ message in an Initial Ranging interval. With either method, the message is sent using the Basic CID of the SS. The coordination of message transmit and receipt relative to actual change of modulation is different depending upon whether an SS is transitioning to a more or less robust burst profile. Figure 79 shows the case where an SS is transitioning to a more robust type. Figure 80 shows transition to a less robust burst profile.

The SS applies an algorithm to determine its optimal burst profile in accordance with the threshold parameters established in the DCD message in accordance with Figure 81.

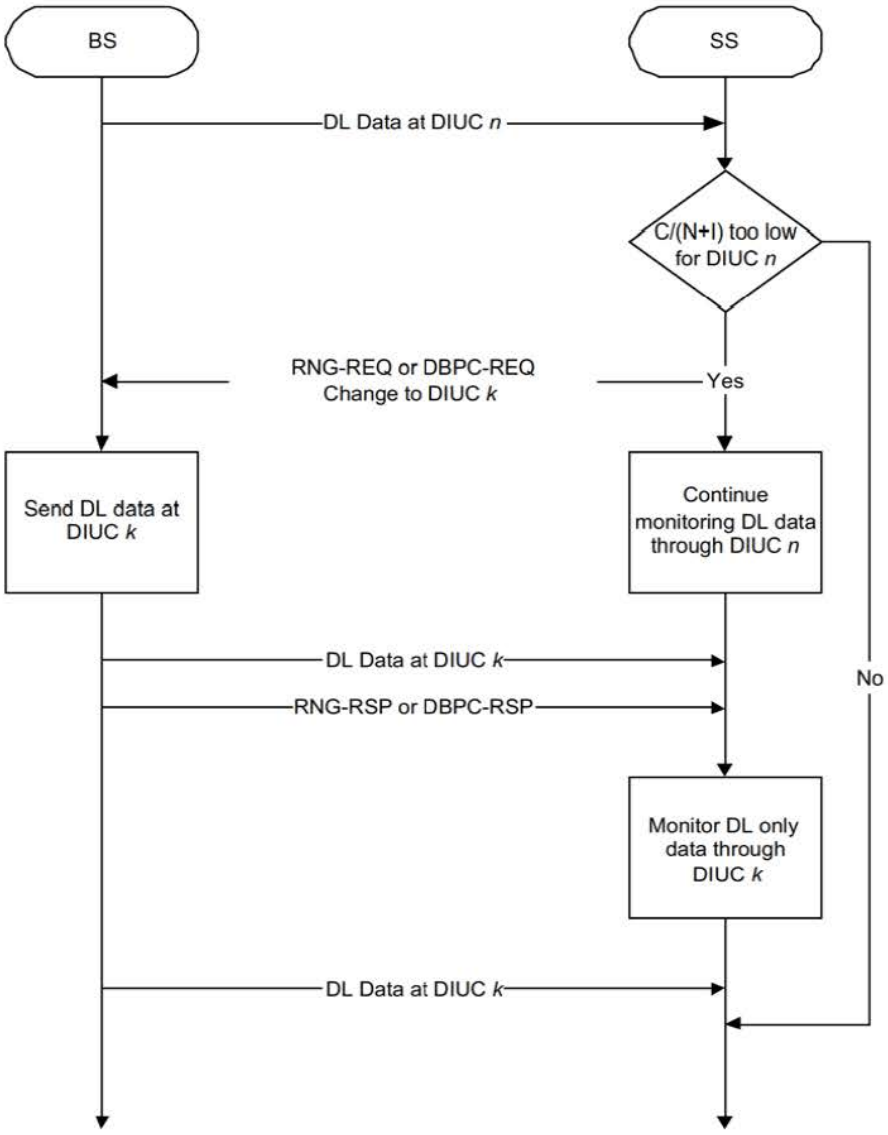

Figure 79—Transition to a more robust burst profile

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