

IEEE P802.11
Wireless Access Method and Physical Layer Specifications

Title: Definition of the Power Management bits in Section 4.

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Abstract:

This document proposes a change in Table 4-3 "Power Management values" in Section 4 of the draft standard to improve the options for direct station-to station capabilities.

Introduction:

Currently stations that are associated with an infrastructure, can send their traffic to other stations, by default best via the AP, also when the destination station is within range, and in the same BSS.

The primary reason for this is that when stations operate in Power Save Mode, then they can not maintain any knowledge of the Power Save state of other stations. Since the AP does maintain this knowledge, it is best to send everything through the AP, also because for a lot of network situations there is a high probability that the destination is not within the same BSS, but in another BSS or on a wired network segment.

Optimization possible:

However using direct Station-to-Station transmissions (To DS and From DS =00) where possible would reduce the bandwidth needed, and increase throughput and response times.

This is in particular interesting for stations that do not use Power Save modes, because they are powered continuously, perhaps because they are mobile.

In the past there was a CAM power management mode specified, which indicated that the station would never use Power Save Mode. Because this status information was encoded in every MAC Header, it would be possible for the MAC to determine whether direct Station-to-Station traffic with a given destination would be feasible.

The idea is that stations that themselves are using a Power Save mode, would have a means to detect that the destination station is never going into Power Save mode, so that it has the option to send its traffic to that destination directly instead of via the AP.

Proposed Solution:

Given that we currently have only one Power Save Mode (what was called Power Save Polling), we have an option to encode the CAM mode back into the Power Management bits.

Table 4-3 should be updated as follows to include this functionality for a station.

Value	Description
00	Continuous Active Mode
01	Power Save Mode
10	Active Mode, without More buffered frames
11	Active Mode, with More buffered frames

Table 4-3: Station Power Management Values

In traffic from an AP we only have to code the More indication, since an AP is assumed to be continuously active. Therefore a simpler table applies.

Value	Description
x0	No more buffered frames
x1	More buffered frames

Table 4-3: AP Power Management Values

An additional advantage would be that AP's can optimize its SID assignment algorithm such that stations that want to utilize a Power Save mode would be given low SID numbers, while CAM mode stations could be given high numbers, so that this may decrease the length of the TIM elements. This could however also explicitly be encoded in the capability field, as suggested in doc 95/145.