IEEE P802.11

Wireless Access Method and Physical Layer Specification

Proposal to Allow a Delivery–Only PCF

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Abstract

This submission proposes that the draft standard explicitly permit operation of a PCF that uses the Contention Free Period solely for delivery of (From–DS) frames to stations, and does not poll stations for in–bound (To–DS) traffic. A PCF that operates in this manner is already permissible, but is not mentioned explicitly in the D1.2 text.

Summary of Proposed Change

This submission proposes that the draft standard explicitly permit operation of a (subset) PCF that uses the Contention Free Period solely for delivery of (From–DS) frames to stations, and does not poll stations for in–bound (To–DS) traffic. A PCF which operates in this manner is allowed by the PCF definition in D1.2 (as well as prior PCF definitions). However, if this PCF subset is explicitly permitted, the capability bits related to CF operation can indicate the presence of a point coordinator and the availability of contention free polling. This indication can be used by stations, during the association/reassociation process to select a PC that offers the desired set of services. This proposal adds **no** new functionality to the standard, instead this proposal adds some explanatory text and extends the definition of the CF–related capability bits already in D1.2

Benefits of Proposed Change

The principal operational advantage of using the PCF is efficiency of frame delivery. The usable portion of the raw data transfer rate available from the PHY is greater because deferrals, backoffs, and retries due to collisions are reduced, as well as because shorter gaps are used between frames. In cases where the bulk of the traffic in a BSS is between client stations and server resources attached to the distribution system, rather than intra–BSS traffic, the majority of these PCF advantages occur if the CFP is used solely to deliver From–DS frames to the stations. The result also may be more efficient to operate because the AP is not using processing resources to maintain a polling list.

By providing separate indication, using the capability bits, of the availability of CF frame delivery and CF polling, stations which desire in–bound (e.g. CF–poll) support are able to determine whether such support is available prior to associating with a given AP.

Modifications to D1.2 Text for Delivery–Only PCF

SECTION 6.3: add sentence at end of first paragraph

It is also permissible for a Point Coordinator to use Contention Free frame transfer solely for delivery of frames to stations, and never to poll those stations.

SECTION 6.3.5: remove the first sentence of the paragraph and insert the following text

If the PC supports use of the contention free period for in–bound frame transfer as well as for frame delivery, the PC shall maintain a "polling list" for use in selecting stations that are eligible to receive CF–Polls during contention free periods. The polling list functional characteristics are defined below. If the PC supports the use of the contention free period solely for frame delivery, the PC does not require a polling list, and never generates data frames with a sub–type that includes CF–Poll. The form of contention free support provided by the PC is identified in the Capability Information field of Beacon, Association Response, Reassociation Response, and Probe Response management frames (which are sent from APs, any such frames by stations, as in an Ad–Hoc network, always have these bits set to zero).

Bit 2 ("CF–Aware"):	=1 if a PC is operating at this station =0 if no PC is operating at this station
Bit 3 ("CF Polling Request")	=1 if the PC at this station maintains a polling list =0 if the PC at this station does not maintain a polling list and only supports CF frame delivery (never =1 unless bit 2 is also =1)

The meaning of these bits in the Capability Information field of Association Request, Reassociation Request, and Probe Request management frames are as follows:

Bit 2 ("CF–Aware"):	=1 if the sender can interpret CF sub–types =0 if the sender cannot interpret CF sub–types
Bit 3 ("CF Polling Request")	=1 if sender wants to be placed on the polling list =0 if the sender does not want to be on the polling list (bit 3 ignored when 2 is =0)