IEEE P802.11
Wireless Access Method and Physical Layer Specifications

Title: MAC State Machine Changes

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Abstract:

This submission presents a minor change to the MAC State Machine currently proposed to the standard. The change allows for more flexible implementations without changing the State Machine Behavior.
The submission belongs to the "we could do better" category.

Introduction

This submission presents a conceptual change to the MAC State Machines as presented by Bob O'Hara, in document IEEE P802.11-94/01. The change allows for more flexible and tolerant implementations while giving the same external behavior.
The reader of this submission is assumed to be familiar with the above mentioned document.

Change Description

The Control State Machine described in the document is almost memory-less, where each of the actions is taken according to external events.

There are two main exceptions to this case, and they appear in transitions C27 and C47, where the transition is triggered by Timeouts (after RTS, and after Data Transmission). During this timeouts the Receiver State Machine Flags are not checked, since the State Machine assumes very tight and short timeouts.

The proposed change is to prolong these timeouts, allowing "slow" implementations, or more "asynchronous" implementations to still be operational, and to add a Receiver State Machine Flag condition (Reception Flag) to trigger these transitions too. This will give the same behavior as the original state machine when there is pending traffic (because any received frame triggers the "timeout"), and gives a more tolerant (asynchronous) State Machine when there is no traffic on the network.

Detailed Changes Description

Add new Flag Rx_flag

Receive State Machine:

- Any transition from R1 sets the Rx_Flag.

Control State Machine:

- Transition C12 clears Rx_Flag, and Frame Type Flags
- Transition C34 clears Rx_Flag, and Frame Type Flags
- Add Transition C27a when RxFlag is set
- Add Transition C47a when RxFlag is set
- Enlarge CTS_timeout and ACK_Timeout.
- C70 does not Reset frame type flags