

MAC Protocol Version Control: A proposal for our future.

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Submission Category:
New Functionality Required.

Abstract:

All 802 standards have undergone revisions during their lifetime. There is no reason to expect that the 802.11 standard will be different in this respect. Practical considerations require that multiple revision levels of 802.11 compliant devices be able to coexistence in the field. The current draft standard does not address this need. A small enhancement of the draft stanard to provide protocol version control is proposed.

Version control requirement:

All 802 standards have undergone revisions during their lifetime. There is no reason to expect that the 802.11 standard will be different in this respect. Practical considerations require that multiple revision levels of 802.11 compliant devices be able to coexistence in the field. The current draft standard (all comments in this paper are relative to draft revision 93/20b0) does not address this need. A small addition now to the draft standard will avoid major logistical problems later. It would be very wise for 802.11 to include version numbers in the standard.

The Proposal:

The traditional way to provide version control is via version number bits in the header.

The current draft contains a *Fixed Header* component. The draft assumes that the fields in the fixed header never change in either size or meaning. The assumption about constant meaning is required because the draft has no version provisions.

When version indication ability is provided, only the version indicating field must remain fixed across revisions. All other fields are fixed only with reference to a particular protocol (standard) version.

802.11 needs to provide for multiple protocol version handling, starting with the first approved draft of the standard. This is best accomplished by the traditional approach of incorporating a version number field in the MAC header information.

Forward / backward version compatibility and parsing requirements dictate that version information be the first MAC information field in the frame format.

How many bits are needed for version indication? The size of the field is determined by the anticipated number of revision levels.

Some people prefer fields that are octet multiples, others are very concerned about overhead and begrudge every bit used. The absolute minimum field size is one bit. A single bit allows for only one revision. This minimalist approach is seldom used. An octet allows 255 revisions before requiring further expansion of header information. The author believes that this is more than we are likely to need.

A 4 bit field is proposed as a good compromise between number of bits and number of revisions possible before header expansion is required. The author proposes starting the protocol version numbers with 1 and reserving the value 0 for future expansion.

(If anyone really hates the 1/2 octet length, the author suggests that the sub fields of the Type field in the Fixed Header field may be a bit small. Further examination of the fields may suggest that this a place to use another 4 bits; bringing the header total back to an octet multiple. This additional modification is not proposed as part of this paper.)

Motion to add revision handling capabilities to the 802.11 standard:

Moved: That 802.11 add the ability to handle protocol revisions by incorporating the following changes to draft standard 93/20/b0:

- 1) On page 4-1 add the line:
 2. A fixed-length Protocol Version field which is invariant across all versions of the standard.
- 2) Renumber the previous line items 2-4 to 3-5.
- 3) On page 4-2 add the Protocol Version field to the header diagram. The field is to be added before (to the left of) the current Fixed Header field and after the P-adaptation field.
- 4) Add the following definition of the Protocol Version field to the text on page 4-2:

Protocol Version

This 4 bit field is invariant in size and placement across all revisions of the 802.11 standard. The values of the field are defined as follows:

1-15 Revision level of the 802.11 MAC protocol. The values are assigned sequentially starting with the value 1. The currently assigned values are:

0 Reserved value for future expansion.

This value will be assigned only after all other available protocol revision values have been used. When the 0 value is assigned, the standard shall also specify an extension of the header to include an additional Protocol version field.

1 MAC protocol as defined by the 802.11 standard version x.xx dated xx-xx-xx. <editors to replace the x's with the appropriate information to indicate the first approved standard version.>
- 5) Any other editorial changes necessitated by the adoption of this motion (as determined by the 802.11 editors).

