IEEE P802.11
Wireless LANs

Terntative Agenda for last part of Interim May 1999 session of meeting:
Tele-conference on May 28, 1999

Date: May 19, 1999

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Objectives of this conference: To resolve any additional comments from balloters that have not submitted their votes and comment 67 of Tga (Chair’s note: plus the comments tabled by the editor)

1 Roll call
The following ports have been reserved, please mention the people present:
Al Petrick, Mat Shoemake, Dean Kawaguchi, Harry Worstell, John Kowalski, Hitoshi Takanashi, Bob O’Hara, David Bagby, Naftali Chayat, Tal Kaitz, Vic Hayes

2 Secretary, approval of agenda

3 TGb

3.1 Latest information from commenters (action: Vic)

3.2 Comments received after TGb adjournment: none

3.3 Motion to approve Recirculation Ballot
To to submit 802.11a/D5.3 for Sponsor recirculation ballot

3.4 Any Other Business

4 TGa

4.1 Latest information from commenters (action: Vic)

4.2 Comments received after TGa adjournment: yes

4.3 Comment resolution (see below)
63, 76, 75, 26, 24, 78, 79, 80, 67

4.4 Motion to approve Recirculation Ballot
To make the changes to 802.11a/D5.3 as agreed to in response to comments ………, and to submit 802.11a/D5.5 for Sponsor recirculation ballot
**Title is incorrect.**

Suggested Remedy:
- Match title to published 802.11-1997.
- You left out "LAN" after the word "Wireless" and also left out "Information technology."
- This is minor and can be corrected at time of publication by the IEEE editor.

Proposed Response:
- Tabled.
- Although the title needs to be changed as suggested to match to published 802.11-1997, the PAR says the title should be as shown in the draft D5.0. This issue needs to be treated by IEEE 802 editors.

**The PLCP frame changed dramatically between Draft 2.0 and Draft 3.1.**

Suggested Remedy:
- Persevering with the current system requires that the RATE information be moved to the start of the SIGNAL field. A lookup table based system could then be used to determine the modulation and coding rate without introducing significant latency into the receive chain.

Proposed Response:
- Tabled by Editor.
The PLCP frame changed dramatically between Draft 2.0 and Draft 3.1. Draft 2.0 defined the SIGNAL field as 2 short sequences each QPSK modulated by a pair of bits to convey the 4 bit RATE information. This system has the advantage that it is robust and the RATE information can be recovered from the receive PDU before demodulation and decoding of the PLCP header and MPDU has commenced.

In Draft 3.1 the SIGNAL field was re-defined as shown in Figure 107 of Draft 5.0. The rate information was moved into the PLCP header which is defined to be rate 1/2 BPSK coded OFDM. This scheme has a serious implementation problem. De-interleaving, demodulation, and decoding of the SERVICE field and PSDU (i.e. data portion of the packet) cannot commence until the RATE information has been extracted, as the information in this field (i.e. modulation type and FEC coding rate) affects the set-up of the de-interleaver, demodulator and Viterbi decoder. However the total latency through the de-interleaver, FFT, and Viterbi decoder will be of the order of 100 clock cycles, requiring buffering of the receive chain until the RATE information has successfully been extracted. A 100 deep I/Q FIFO is a significant overhead, and adds considerable complexity to the receive chain pipeline control. The previous system, where the RATE information was available immediately, was far superior from an implementation point of view.

**Suggested Remedy**

**Solution:**
Persevering with the current system requires that the RATE information be moved to the start of the SIGNAL field. A lookup table based system could then be used to determine the modulation and coding rate without introducing significant latency into the receive chain.

**Proposed Response**
Tabled by Editor.

This comment had not been submitted by the last interim meeting. This comment shall be discussed in TGa and WG.

**Comment:**
The phase relation between short preamble (t1-t10) and long preamble (T1,T2) of draft 5.0 may cause degradation in timing detection. This is because the matched filter output for detecting the short preamble pattern has large sidelobe in boundary region between t10 and T1 due to the phase relation in D5.0. This large sidelobe badly affects the timing decision when multipath delayed signals are superimposed.

**Recommmendation:**
Change Eq.(8) so as to rotate the all signal phase +(3/4)pi

\[
L = \{-1+j, -1+j, +1-j, +1-j, -1+j, -1+j, +1-j, -1+j, \ldots, -1+j, -1+j\}/\sqrt{2.0}
\]

**Suggested Remedy**
Temporary tabled.

Will be submitted to BRAN and be compared with their original proposal. The meeting will be held in two weeks.
Comment Type T
Equation 11 is not an integer.

Suggested Remedy
Use

Nsym = floor( (16 + 8*LENGTH + 6 + NDBPS - 1)/NDBPS )             (11)

Proposed Response Response Status W
Tabled by Editor.

Since this had not been submitted by the last interim meeting and technical comment, this comment is temporary tabled by Editor.

Comment Type T
The specification for interleaving changed dramatically between Draft 2.0 and Draft 3.1. Draft 2.0 specifies the mapping between the original location (k) of a bit in a block, and its final location (i) as:

k = 16i - (NCBPS - 1) floor(16i/NCBPS) i=0, 1, ..., NCBPS - 1

where NCBPS is the number of bits per OFDM symbol (formula 17, page 17 of Draft 2.0). Note that this method provides interleaving regardless of the modulation scheme.

The current interleaving scheme, introduced in Draft 3.1, results in bits being shuffled within groups of size s. This is an inferior scheme to that of Draft 2.0, especially for BPSK and QPSK modulation schemes where s = 1, resulting in an erroneous interleaving function of k = i. Also note that if 8PSK is to be supported at a later date, this would result in a fractional value of s = 1.5.

Suggested Remedy
Revert to the Draft 2.0 scheme.

Proposed Response Response Status W
Tabled by Editor.

Since this had not been submitted by the last interim meeting and technical comment, this comment is temporary tabled by Editor.

#The interleaver subclause has been updated.
### Comment Type: TR/technical required

#### Comment Status: D/dispatched

**Comment:** The specification for interleaving changed dramatically between Draft 2.0 and Draft 3.1. Draft 2.0 specifies the mapping between the original location \( k \) of a bit in a block, and its final location \( i \) as:

\[
k = 16i - (NCBPS - 1) \text{ floor}(16i/NCBPS) \quad i=0, 1, ..., NCBPS - 1
\]

where \( NCBPS \) is the number of bits per OFDM symbol (formula 17, page 17 of Draft 2.0). Note that this method provides interleaving regardless of the modulation scheme.

The current interleaving scheme, introduced in Draft 3.1, results in bits being shuffled within groups of size \( s \). This is an inferior scheme to that of Draft 2.0, especially for BPSK and QPSK modulation schemes where \( s = 1 \), resulting in an erroneous interleaving function of \( k = i \). Also note that if 8PSK is to be supported at a later date, this would result in a fractional value of \( s = 1.5 \).

**Suggested Remedy:**
Revert to the Draft 2.0 scheme.

**Proposed Response:**
Same as #75 except comment type. Tabled by Editor.
4.5 Any Other Business

5 Adjourn May 1999 interim session of meetings