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Worldwide 5GHz Requirements

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STP for Worldwide 5.15GHz

Situation - The FCC allocated 300MHz of bandwidth in January of 1997 for unlicensed use called the "National Information Infrastructure." These frequencies became known as the NII frequencies, starting at 5.15GHz. The first 100MHz of frequency has also been allocated in Europe as the Hyperlan frequencies and the European Telecommunications Standards Institute (ETSI) has asked for an additional 150MHz to go with the original 100MHz. Japan has also set aside some of the 5.15GHz as an unlicensed band in Japan. These frequencies form the basis for the next worldwide unlicensed frequency allocation. The 2.4GHz ISM band in the US is actually a worldwide frequency which was allocated by the World Radio Conference (WRC) in 1990. The next WRC (2000) is the time for Boeing to recommend that 5.15GHz be the next worldwide frequency band.

Target - A recommendation from Boeing that 5.15GHz band be allocated in the WRC2000 as a worldwide frequency band.

Proposal - Boeing should submit an official recommendation to support and actually deploy the 5.15GHz band to the WRC as a worldwide unlicensed frequency.

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Facts

- Have a common PMD between 802.11 and BRAN

- Sets the stage for software radios at 5GHz

- The WRC meets in 2000, 5GHz unlicensed worldwide is not on agenda

- The US delegation for SG8 meets in November in preparation for the WRC

- Boeing is a corporate member of ITU-R

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Recommendations
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- 802.11 letter to SG8 or WRC supporting 5GHz unlicensed worldwide

- Submit 8802.11a and b to ISO and ITU

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Extract from Montreal
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Work in the 5 GHz band

Task Group a working on the high data-rate PHY in the 5 GHz band, project 802.11a, processed comments from it's Sponsor Ballot. The meeting actually started before the ballot closed, so comments continued to flow in as the work progressed. 86 people responded to the ballot, of which 5 submitted "no" votes. After processing the comments, only 2 "no" votes remained (97% support!), and we hope to resolve those at the teleconference scheduled to end of May. The editor already implemented the resolved comments into draft D5.3, after the teleconference D5.5 will be produced, and in the begining of June a Reconfirmation Sponsor Ballot will be issued. The comments from this ballot will be processed in the July plenary meeting in Montreal.

Representatives from BRAN and from MMAC contributed comments and participated in discussions. The structure of the packet preamble and its parameters were a hot discussion item. The changes to the 802.11a Draft were relatively minor. At the end of the meeting a liaison statement was issued to BRAN and MMAC-PC, acknowledging their contributions and updating them on the March and May changes in the draft standard.
The draft 802.11a standard is based on Orthogonal Frequency Division Multiplexing (OFDM) to modulate the data. The main benefit OFDM modulation is its robustness to multipath echoes, which are typical to the indoor and mobile environments. Each OFDM symbol is composed of 52 subcarriers, of which 48 carry data and 4 subcarriers serve as phase reference pilots. The specifications of the Physical Layer encompass data rates from 6 Mbit/s up to 54 Mbit/s, with 20 MHz spacing between adjacent channels. All implementations are required to support 6, 12 and 24 Mbit/s. Optional extensions are for 9, 18, 36, 48 and 54Mbit/s. The range of data rates is provided to match the wide range of radio channel characteristics in both indoor and outdoor environments. The multirate mechanism of the MAC protocol ensures that all devices communicate with each other at the best data rate in the present channel.

From the seminar:

Currently the 5 GHz band is open to unlicensed devides only in USA. Mr. Hashimoto (NTT) updated, among other issues, on the intent to open the 5 GHz band in Japan in the begining of 2000. Naftali Chayat, TGa chair, presented an overview of the 802.11a standard and the collaboration with MMAC-PC and with BRAN. In particular, MMAC-PC Wireless Ethernet working group intends to adopt the 802.11a standard, while the WATM groop of MMAC-PC and ETSI BRAN agreed with 802.11a on most modulation parameters. In Europe currently the only available band in 5 GHz is allocated to the HIPERLAN project. Based on the broad level of agreement and collaboration between 802.11a and BRAN, 802.11a issued a liaison statement to ETSI BRAN asking it to support the inclusion of 802.11 with 802.11a PHY in its HIPERLAN family of standards. If ETSI will support 802.11a in Europe, the 5 GHz high speed wireless LANs will enjoy same worldwide availability that 2.4 GHz devices enjoy today!

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