IEEE 802.11

PROPOSED WLAN ARCHITECTURE

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Foreword: Text below was placed on architecture Email reflector on August 25, 1992 (2nd try). One comment was received from Jim Schuessler. He agreed that this paper captured the sense of the July discussion. He also provided additional comments.
This document is submitted for approval as the starting point on a WLAN Architecture Model.

The central features of the Architecture, from top to bottom,(see figure on last page) are:

1. The MAC is a conventional 802 MAC which is primarily concerned with data transmission, reception and control of instantaneous access to the media.

2. The Local Manager deals primarily with the many vagaries of the radio media such as changing of DSS channel or chipping codes, selection of an alternation hopping pattern or selection of an alternate antenna.

3. ISO style management has access to the MAC and the PHY as well as an intimate connection to the local management.This allows management to deal effectively with the tight coupling (packet by packet) between signal quality detection and control of the radio media. It also provides the remote statistics and commands needed for ISO style management of stations and an entire network.

4. The PHY Media Independent Sublayer is the component which presents a uniform interface to MAC and Management from each of the quite different PHY layers.

5. Both the MAC and (local) Management have an independent MAC SAP to the Media-Independent PHY sublayer. The management SAP is shared ISO management due to their intimate relationship. It is the responsibility of media-independent PHY to coordinate management and MAC signaling to the PHY layer to maintain synchronism on a frame by frame or (perhaps less frequent) basis.

While the MAC-PHY interface carries data and timing as in a normal LAN interface, it can also carry bit-by-bit signal quality information from the PHY. This information may need to be used by the Local Management to build a map of transmission characteristics between each pair of WLAN nodes.

6. The optionally exposed DTE-DCE interface is the interface at which coordination between MAC & PHY is maintained. No implementation is required to expose this interface. However, if it is exposed, implementations must comply to the standard's definition. Thus a minimum of pins and signals is highly desirable to minimized implementation cost and power consumption (eg.in battery operated laptops/palmtops).

7. The several potential PHY layer Convergence Protocols map the unique requirement of each of the 3 or more PHY layers onto the generic definitions of the Media Independent interface. This is the point at which actual hopping sequences or antenna selection patterns will be carried out. This layer also performs media-dependent signal processing such as forward error correction codes and multi-bit-per-baud signaling.

8. The media element includes the actual RF transmission, reception mechanism, eg. the antenna system and the intervening "ether" (the atmosphere building walls, superstructure etc.)

OTHER AGREEMENTS

In no case will the PHY layer decode addresses or other information from the frame or calculate the FCS. Thus it is the total responsibility of the MAC and Local Management to deal with aberrations in the radio media (Ed note - beyond PHY phenomena such as signal strength ?).

The PHY will present a set of controls and transmission quality information to the MAC through the Media-Independent Interface. The MAC and/or local management will give commands to the PHY to select the best transmission path based on past history. This implies that local management will (Ed note - may on a per PHY basis) be keeping a pair-wise by node map of characteristics of transmission and best settings.