IEEE 802.11
Wireless Access Method and Physical Layer Specifications

Title: **FH RSSI Requirements**

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Abstract: This submission proposes text changes to specify received signal strength indication (RSSI) and facilities in the FH PHY and MIB. This submission was prepared per the FH PHY sub-group's request.

Introduction:

This paper focuses on the measurement and inter-layer exchange of RSSI information between the FH Physical LME and MAC, and its specification within the MIB. RSSI may be used for other purposes within a particular implementation of a FH PHY, for example, within CCA or antenna diversity algorithms. However, internal use of signal strength information within the FH PHY is outside the scope of this submission.

RSSI currently is not used within the MAC. Ultimately it may be of use in implementing roaming or rate switching algorithms. RSSI information, made available to a network management entity, has considerable value in fault isolation. A significant motivation for this paper is to allow RSSI measurements to be accessed through the MIB.

Lastly, some conformant FH PHY's may not support RSSI measurement capabilities. Providing that the MAC does not ultimately require RSSI, the standard should accommodate these PHY's as well as those that do support RSSI.

Summary of Proposed Changes:

1. Addition of two primitives, RSSI_Max, and RSSI_Current.

2. RSSI_Current and RSSI_Max are integer values between 0 and 255 (8 bits). RSSI_Max = 0 indicates that the PMD has no RSSI measurement capability.

3. RSSI is measured between the beginning of the start frame delimiter and the end of the PLCP header, and is passed to the MAC with the RXVECTOR. The RXVECTOR is modified to provide 8 bits for RSSI, rather than the 4 bits now specified in the draft. Except for the RSSI_Max parameter, RSSI is passed to the MAC in the same manner as in the DS PHY. DS may also wish to include the RSSI_Max parameter.

Signal Quality Indication:

The DS PHY also passes a Signal Quality Indication (SQI) parameter in the RXVECTOR. This possibility of doing the same for FH was discussed in the March meeting. While inclusion of SQI is not proposed here, further input on the need for or value of SQI is requested.

Section 10.9.3

Managed Object	Default Value	Operational Semantics	Operational Behavior
aRSSI_Max	none	Static	Implementation Dep.
aRSSI_Current	none	Dynamic	Implementation Dep.

<div align="center">**Table 10-17: FHSS PHY Managed Objects**</div>

10.9.3.4.1. FH PHY Managed Objects Definitions

10.9.3.4.1.XX aRSSI_Max

This is the maximum RSSI value that may be indicated in the RXVECTOR. RSSI_MAX may take an integer value from 0 to 255. A zero value indicates that the PMD does not have an RSSI measurement capability.

10.9.3.4.1.XX aRSSI_Current

This is the RSSI value measured during the last valid PLCP header. It may take any integer value from 0 to RSSI_RSSI_Max. If RSSI_Max = 0, RSSI_Current is ignored.

References

1. P802.11/D1 Draft Standard IEEE 802.11. Sections 10 and 11.

10.5.5.8 PMD_RSSI.indicate

Function. This primitive transfers a receive signal strength indication of the physical medium from the PMD sublayer to the PLCP sublayer. This value will be used by the PLCP to performing any diversity or clear channel assessment functions required by the PLCP or other sublayers.

Semantics of the Service Primitive. The primitive shall provide the following parameters:

PMD_RSSI.indicate (STRENGTH)

The STRENGTH parameter can be a value from 0-~~15~~ RSSI_Max.

Section 10.9.2.

10.9.2.2. FHSS PHY Object Class

add:

aRSSI_Max	GET
aRSSI_Current	GET

Notes:
1. These primitives must be added to section 9 of the draft as well.

10.9.2.4.XX aRSSI_Max

RSSI Max   ATTRIBUTE
WITH APPROPRIATE SYNTAX
      Integer;
BEHAVIOR DEFINED AS
      "This is the maximum RSSI level indication allowed in the RXVECTOR ".
REGISTERED AS : TBD

10.9.2.4.XX aRSSI_Current

RSSI Max   ATTRIBUTE
WITH APPROPRIATE SYNTAX
      Integer;
BEHAVIOR DEFINED AS
      "This is the RSSI level indication in the RXVECTOR for the most recently received PLCP header ".
REGISTERED AS: TBD

Notes:

1. Registration Required for these primitives.

Section 10.9.3

Managed Object	Default Value	Operational Semantics	Operational Behavior
aRSSI_Max	none	Static	Implementation Dep.
aRSSI_Current	none	Dynamic	Implementation Dep.

Table 10-17: FHSS PHY Managed Objects

10.9.3.4.1. FH PHY Managed Objects Definitions

10.9.3.4.1.XX aRSSI_Max

This is the maximum RSSI value that may be indicated in the RXVECTOR. RSSI_MAX may take an integer value from 0 to 255. A zero value indicates that the PMD does not have an RSSI measurement capability.

10.9.3.4.1.XX aRSSI_Current

This is the RSSI value measured during the last valid PLCP header. It may take any integer value from 0 to RSSI_RSSI_Max. If RSSI_Max = 0, RSSI_Current is ignored.

References

1. P802.11/D1 Draft Standard IEEE 802.11. Sections 10 and 11.