
IEEE 802.11
Wireless Access Method and Physical Layer Specifications

Title: **Proposed Updates to the D1 Draft, Section 1**

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Abstract: **This paper proposes changes to the D1 Draft to reflect the resolution of comments on Section 1 during the May 95 meeting.**

Action: **Adopt the changes in this paper to update the relevant portions of P802.11/D1**

Introduction:

The text of section 1 is modified by this document to reflect work done at the May 1995 meeting. The changes are described by the following categories

- Removal of references to 802.10
- Removal of "dead" editorial text
- Restructuring of the section to reflect its simpler content

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1. Purpose

The original Project Authorization Request (PAR) defines the scope of the IEEE 802.11 work as follows:

To develop a medium access control (MAC) and Physical Layer (PHY) specification for wireless connectivity for fixed, portable and moving stations within a local area.

The PAR further defines the purpose as follows:

To provide wireless connectivity to automatic machinery, equipment or, stations that require rapid deployment, which may be portable, or hand-held or which may be mounted on moving vehicles within a local area.

To offer a standard for use by regulatory bodies to standardize access to one or more frequency bands for the purpose of local area communication.

Specifically the 802.11 standard:

Describes the functions and services required by an 802.11 compliant device to operate within ad-hoc and infrastructure networks as well as the aspects of station mobility (transition) within those networks.

Describes the medium access control (MAC) procedures to support the asynchronous and time-bounded MAC service data unit (MSDU) delivery services.

Supports the operation of an 802.11 compliant device within a wireless LAN which may coexist with multiple overlapping wireless LANs.

Describes the requirements and services to provide ~~confidentiality, security, privacy~~ and authentication of 802.11 compliant devices.

1.1. Definitions

Access Point (AP). Any entity that has station functionality and provides access to the distribution services, via the WM for associated stations.

Ad-hoc network. An ad-hoc network is a network created for a specific purpose, typically in a spontaneous manner. The principal characteristic of an ad-hoc network is that the act of creating and dissolving the network is sufficiently straightforward and convenient so as to be achievable by non-technical users of the network facilities (i.e. no specialized 'technical skills' are required with little and/or no investment of time or additional resources required beyond the stations which are to participate in the (ad-hoc) network. The term "Ad-Hoc" is often used as slang to refer to an Independent BSS (IBSS).

Access control. The prevention of unauthorized usage of resources.

Association. The service used to establish AP/STA mapping and enable STA invocation of the Distribution System Services.

Authentication. The service used to positively establish the identity of one station to another station.

Basic Service Area (BSA). The conceptual area within which members of a Basic Service Set can communicate.

Basic Service Set (BSS). A set of stations controlled by a single Coordination Function. A BSS can have one PCF and one DCF.

Channel. An instance of medium use for the purpose of passing protocol data units that can be used simultaneously, in the same volume of space, with other instances of medium use on other channels by instances of the same PHY, with an acceptably low frame error rate due to mutual interference. Some PHYs only provide one channel, whereas others provide multiple channels.

single channel

1-narrowband channel
DSS with 1 code

n-channel

FDM channels
DSS with CDMA

Confidentiality. The property of information that is not made available or disclosed to unauthorized individuals, entities or processes.

Coordination Function (CF). That logical function which determines when a station operating within a Basic Service Set transmits and receives via the wireless medium.

Disassociation. The service which removes an existing Association.

Distributed Coordination Function (DCF). A class of possible coordination functions where the same coordination function logic is active in every station in the BSS at any any given time that the network is in operation.

Distribution: The service which (by using Association information) delivers MSDUs within the DS.

Distribution System (DS). A system used to interconnect a set of Basic Service Sets and integrated LANs to create an Extended Service Set.

Distribution System Medium (DSM). The medium used by a Distribution System (for Access Point interconnections).

Distribution System Services (DSS). The set of services provided by the distributions system which enable the MAC to transport MSDUs between stations that are not in direct communication with each other over a single instance of the WM. This includes transport of MSDUs between portals and BSSs within an ESS, and the transport of MSDUs between stations in the same BSS in cases where the station sending the MSDU chooses to involve DSS.

ESS_BASIC_RATE_SET: A set of rates that all the stations on the given ESS are required to be capable to receive. According to the PHYs definitions the default ESS BASIC RATE SETs for the different PHYs will be:

For 2,4 Ghz ISM DS PHY : {1Mbs,2MBs}

For 2,4 Ghz ISM FH PHY: {1Mbs}

For IR PHY: {1Mbs, 2Mbs} Note that this value is preset for all stations in the ESS.

EXTENDED_RATE_SET: The set of rates beyond the BASIC_RATE_SET that a station supports. This can be a speed that is defined in future PHY standards.

Extended Service Area (ESA). The conceptual area within which members of an Extended Service Set can communicate. An Extended Service Area is larger or equal to a Basic Service Area and may involve multiple, disjoint, BSAs

Extended Service Set (ESS). A set of one or more interconnected Basic Service Sets and integrated LANs which appear as a single Basic Service Set to the logical link control layer at any station associated with one of those BSSs.

Gaussian Frequency Shift Keying (GFSK). A modulation scheme where the data is first filtered by a Gaussian filter in the base band and then modulated with a simple frequency modulation.

Independent Basic Service Set (IBSS). A BSS which forms a self contained network independent of any other BSSs.

Infrastructure. The infrastructure includes the logical Distribution System, Access Point and Portal functions. An infrastructure contains one or more Access Points and zero or more Portals in addition to the Distribution System.

DS services are provided between pairs of 802.11 MACs.

Integration. The service which enables delivery of MAC service data units between the Distribution System and an existing network (via a Portal).

MAC Protocol Data Unit (MPDU). The unit of data exchanged between two peer MAC entities using the services of the PHY.

MAC Service Data Unit (MSDU). The MAC service data unit is information that is delivered as a unit between MAC service access points.

Masquerade. The pretense by an entity to be a different entity.

Mobile Station: A mobile station uses network communications while in motion.

Net Allocation Vector (NAV): An indicator, maintained by each station, of time periods when transmission onto the WM may not be initiated by the station whether or not the Station's CCA function senses the WM as being busy.

Point Coordination Function (PCF). A class of possible coordination functions where the coordination function logic is active in only one station in a BSS at any given time that the network is in operation.

Portable Station: A portable station is one that may be moved from location to location, but only uses network communications while at a fixed location.

Portal: The logical point at which data from a non-802.11 LAN connects with an 802.11 LAN via the Distribution System.

Privacy. The functionality used to prevent the contents of messages from being read by other than the intended recipient.

Re-association. The service which enables an established association (between AP and station) to be transferred from one access point to another (or the same) access point.

Station (STA). Any device which contains an 802.11 conformant MAC and PHY interface to the wireless medium.

STATION_BASIC_RATE: A value belonging to the ESS BASIC RATE SET, that is used by the station for specific transmissions (it could change dynamically, for example the Station Basic Rate on the IR depends on the Power Consumption Mode of the Station).

Station Services (SS): The set of services which support transport of MSDUs between Stations within a BSS.

Unauthorized disclosure. The process of making information available to unauthorized individuals, entities or processes.

Unauthorized resource use. Use of resource not consistent with the defined security policy.

Wired Equivalent Privacy (WEP). The optional cryptographic ~~confidentiality~~privacy algorithm specified by 802.11 used to provide data confidentiality which is subjectively equivalent to the confidentiality of a wired LAN medium that does not employ cryptographic techniques to enhance privacy.

Wireless Medium (WM). The medium used to implement a wireless LAN.

1.2. Abbreviations

AP	=	Access Point
BSA	=	Basic Service Area
BSS	=	Basic Service Set
CF	=	Coordination Function
DA	=	Destination Address
DCE	=	Data Communication Equipment
DCF	=	Distributed Coordination Function
DIFS	=	Distributed Inter-Frame Space
DLL	=	Data Link Layer
DS	=	Distribution System
DSAP	=	Destination Access Point
DSM	=	Distribution System Medium
DSS	=	Distribution System Services
DSSS	=	Direct Sequence Spread Spectrum
DTBS	=	Distributed Time Bounded Service
DTE	=	Data Terminal Equipment
ESA	=	Extended Service Area
ESS	=	Extended Service Set
FCS	=	Frame Check Sequence
FHSS	=	Frequency Hopping Spread Spectrum
GFSK	=	Gaussian Frequency Shift Keying
ICV	=	Integrity Check Value
IDU	=	Interface Data Unit
IFF	=	IF And Only IF
LLC	=	Logical Link Control
MAC	=	Medium Access Control
MDF	=	Management-Defined Field
MIB	=	Management Information Base
MPDU	=	MAC Protocol Data Unit
MSDU	=	MAC Service Data Unit
NAV	=	Network Allocation Vector
PAR	=	Project Authorization Request
PCF	=	Point Coordination Function
PDU	=	Protocol Data Unit
PhL	=	Physical Layer
PhS	=	Physical Service
PHY	=	Physical
PIFS	=	Priority Inter-Frame Space
PSNP	=	Power Save Non-Polling (mode)
PSP	=	Power Save Polling (mode)
SA	=	Source Address
SAID	=	Security Association Identifier
SAP	=	Service Access Point
SDE	=	Secure Data Exchange
SDU	=	Service Data Unit
SID	=	Station Identifier
SIFS	=	Short Inter-Frame Space
SMIB	=	Security Management Information Base
SS	=	Station Services
SSAP	=	Source Service Access Point

STA = Station
WAN = Wide Area Network
WDS = Wireless Distribution System
WEP = Wired Equivalent Privacy.
WM = Wireless Medium

1.3. References

1. ISO 7498:1984, Information Processing Systems - Open Systems Interconnection - Basic Reference Model.
- ~~2. IEEE Std 802.10-1992, Interoperable LAN/MAN Security (SILS)~~
23. ISO-7498 or CCITT Recommendation X.200 series - OSI Model and Notation Service Definition
34. IEEE Std 802-1990, IEEE Standards for Local and Metropolitan Area Networks: Overview and Architecture (ANSI).
45. <editor please add a correct formal ref to ISO 10039 here>

1.4. Conformance Requirements

This section for further study.

1.5. Conventions

1. This standard represents information fields as octet strings of various lengths. The least significant bit (LSB) of each octet is defined as bit zero (0) for that octet. All octets are represented in figures with the LSB on the right.
2. This standard represents fields longer than a single octet as strings of octets and fractions thereof. A field longer than a single octet is represented in figures with the most significant bit (MSB) on the left. Each octet to the right of the MSB is of correspondingly lesser significance.