Issue Identification: 4.5 (Topic: Network Types).

Can a station be a member of an ad-hoc and non-ad-hoc network at the same time?

Alternatives:

1) - Yes
2) - No
3) - May be

References:

1) - P802.11-93/40 - The Wireless Hybrid Asynchronous Time-bounded MAC Protocol

2) - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol

Arguments:

General:

1.0) - To be true it must be a single channel.
2.0) - It could always be implemented using Sleep function.
3.0) - Wired networks do not allow this (but wireless networks could).

Pro:

1.1) - There is a need for the standard to support this alternative.

1.2) - Yes. Station A can be registered with a controller/AP, and associated with that AP - a member of an infrastructure network. Station B may be registered with that controller/AP, but not associated with the AP, it is registered only for the purpose of conversing with other wireless stations - it is not a member of the infrastructure network. These two stations can converse without station A having to disassociate from the AP, so it retains its membership in the infrastructure network while forming an ad-hoc network with station B.

1.3) - Members of the network would have 2 network IDs.

2.1) - Multiple association has security impacts.

2.2) - At any point in time a STA is a member of one, and only one, BSS. A STA may be within range of both types of networks, but will participate in one or the other.

3.1) - A strong market requirement as not been defined, and this requirement should not be a primary factor on the MAC protocol selection, neither should it delay the standardization process.

3.2) - Implementations will provide this anyway (e.g Sleep mode).

3.3) - The 802.11 standard should be mute on this issue. The standard should not required simultaneous association within an ad-hoc and & non-ad-hoc networks. The standard should not specify anything to enable or disable this function.

Con:

Related Issue Identification:

1) - 4.1 (Network Types)
2) - 4.3 (Network Types)

Issue Originator: Dave Bagby

Issue History:

January 1993: Date first opened.
March 1993: Alternatives #1 and 2 - Reference #1 - Argument_pro # 1.1, 2.1 and 2.2 - Attempt to close the Issue; failed in MAC group; result: yes-9, no-8, abstain-0.
May 1993: Reference #1 - Argument_pro #1.2
July 1993: Alternative #3, Argument-general #1.0 to #3.0 and Argument-pro #3.1
September 1993: Argument-pro #1.3, 3.2 and 3.3 - Closing of the Issue by adopting Alternative #3; - *Motion: The standard shall be mute on this issue; the standard should not require simultaneity; not doing anything to explicitly enable or disable function.* - Results: yes-28, no-1, abstain-1.

Issue Status: Closed September 1993

Issue Identification: 9.3 (Topic: Performance).

Is the same MAC must work in a minimum system and maximum system (network size independence)?

Alternatives:
1) - Yes

References:
1) - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol
2) - P802.11-93/115 - Protocol Layering Alternatives for Practical Implementation
3) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:
Pro:
1.1) - Not just to work in minimum and maximum system, but to work efficiently in both is the goal of the CODIAC protocol (Reference #1).

1.2) - The same MAC must support minimum and maximum system configurations.

Con:

Related Issue Identification:
1) - 5.5 (Topic: Distribution Systems)

Issue Originator:

Issue History:
May 1992: Date First opened
May 1993: Alternative #1 - Reference #1 - Argument_pro #1.1.
September 1993: Reference #2 & #3 and Argument_pro #1.2

Issue Status: Open

Issue Identification: 9.5 (Topic: Performance).

~~- Shall the 802.11 standard requires optional data compression at the MAC layer level?~~

- Shall the 802.11 standard provides the option for data compression at the MAC Layer level?

Alternatives:

1) - Yes
2) - No

References:

1) - P802/11-93/29 - Wireless LAN MAC Protocol: Data Compression as a MAC Option to Improve Effective Throughput

Arguments:

General:

1.0) - If the function is good enough to warrant an option, why not be provided all the time? - the effect of compression on compressed data can become data 'expansion' - this is not an option but a feature which can be 'turned on/off'.

2.0) - If performed 'before' MAC in data flow, why is it a MAC option? - compression must be symmetrical and because of different vendor options, the compression function need to be in the MAC.

3.0) - Compression performed above MAC works with a larger data stream and thus more efficient.

4.0) - Requirement for public compression as first choice.

5.0) - Miscellaneous questions:
- impact of compression on transfer delay.
- interaction of compression and privacy - compression first, then cypher.
- compression imply the requirement for fragmentation facilities - do not know how much the data will compress.

6.0) - Assessment of Compression function:

	Amount of Compression	Complexity	System Impact (memory)	Latency
Packet by Packet	Low (1.18-1.86)	Low	Low	Low
Multiple Compres. History	High (1.44-2.38)	High	High	Low
Block Buffering	High	Medium	Medium	High

Pro:

1.1) - A field for Compression and a unique algorithm. identification field should be provided in the MAC frames. - Example of procedure:

```
Obtain Association
If Association is not found then
    Notify local management
Else
    If Compression requirement = true then
        Invoke Compression function

    If Secure Data Exchange (SDE) is required then
        Append CRC & PAD
        Encipher function

Continue processing
```

Con:

Related Issue Identification:

1) - 9.1 (Performance)

Issue Originator:

Issue History:

March 1993: Date first opened - Alternative #1 - Reference #1 - Argument_general #1 to 5

September 1993: Alternative #2, Argument_general #6.0, Argument_pro #1.1 and closing of the Issue by endorsing Alternative #1 with the following motion: - *Motion: Compression will be supported by providing the necessary management hooks to invoke the mechanism of 802.10 and we will formally request that 802.10 to extend their work to include support of compression. If 802.10 declines, we will have to revisit this topic.* - Results: yes-25, no-5, abstain-1.

Issue Status: - Closed - September 1993.

Issue Identification: 9.5A (Topic: Performance).

- How should Compression be supported and specified?

Alternatives:

1) - yes
2) - no

References:

Arguments:

Pro:

1.1) - Field for compression and an unique algorithm identification be allocated in the MPDU.

Con:

Related Issue Identification:

Issue Originator: MAC Group

Issue History:

September 1993 - Date first opened - Alternative #1 and #2, Argument_pro #1.1

Issue Status: Open

Issue Identification: 9.5B (Topic: Performance).

Should the default Compression algorithm should be 'none'?

Alternatives:
1) - yes
2) - no

References:

Arguments:
General:
1.0) - Compression should not be an 802.11 issue but rather an 802,10 as for Security.

Pro:

Con:

Related Issue Identification:

Issue Originator: MAC Group

Issue History:
September 1993 - Alternative #1 and #2, Argument_general #1,0

Issue Status: Open

Issue Identification: 9.6 (Topic: Performance).

- How does 'interference' impact MAC throughput?

Alternatives:

References:

Arguments:
General:

Pro:

Con:

Related Issue Identification:

Issue Originator: MAC Group

Issue History:
March 1993: Date first opened

Issue Status: Open

Issue Identification: 10.1 (Topic: Coordination).

~~What is a Coordination Function (CF) ?~~
What Coordination Function (CF) will be specified in the standard?

Alternatives:

1) - A Distributed Coordination Function (DCF).
2) - Point Coordination Function (PCF)
3) - Both, DCF and PCF (same alternatives as specified in Issue 10.2B).

References:

1) - P802.11-93/40 - The Wireless Hybrid Asynchronous Time Bounded MAC Protocol.

2) - P802.11-93/70 - A Distributed Access Protocol Proposal Supporting Time Bounded Services.

3) - P802.11-93/10a1 - Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications (Draft)

4) - P802.11-93/3 - What are Adhoc Wireless LANs? - A Viewpoint.

5) - P802.11-93/70 - A distributed Access Protocol Proposal Supporting Time-bounded Services.

6) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol.

Arguments:

General:

1.0) - Selection is dependent on the selected MAC protocol or the protocol selection is dependent on the coordination alternative selected.

2.0) - Proposed to change the CF definition (see Reference #3). CF should include protocol flow control of all contention resolutions (Slotted aloha / CSMA) and also data packet delivery for local network management and interface to the access point.

3.0) - The current definition of CF should be retained (see Reference #3).

4.0) The issue of coordination appears to be at the heart of the difference between the 802.11 MAC proposals. From this point was derived the decision to select one MAC proposal for the foundation to the 802.11 MAC standard.

5.0) Attempt to distinguish between PCF and Point/Centralized-Control functions (e.g. Power Management, Store/forward functions, Distribution System access, channel option, network planning) - Counter argument: This has nothing to do with coordination function.

Pro:

1.1) - A DCF should be specified as the default mode of operation. A DCF is simple to implement, sufficient for asynchronous service, and well suited to ad-hoc networks. A PCF should be added as an optional extension when Time-bounded service is required. The WHAT protocol (Reference #1) is an example of this approach.

1.2) - A DCF should be specified as the primary mode of operation. A DCF based on CSMA/CA + Ack as proposed in this document (Reference #2) has good medium sharing characteristics

without added control overhead. The throughput efficiency is high and stable for high loads. It is well suited for Ad-Hoc operation, and allows overlap of infrastructure and Ad-Hoc, even on the same channel. It does fully support single channel PHY's.

1.3) - DCF facilitates ad-hoc networks better because it does not require a controller (From Alternative 2b of Issue 10.3 (Reference #2)).

1.4) - DCF is lower overhead and possibly lower access delay (in small population BSAs) (From Alternative 2e of Issue 10.3 (Reference #2)).

1.5) - Distributed Coordination function is better to deal with other transmitter in a Basic Service Area.

2.1) - A PCF can be built on top of the proposed CSMA/CA access method (Reference #2), allowing full coexistence and efficient sharing between Asynchronous and Time Bounded Services. Reserved but unused Isochronous bandwidth is fully available for the Asynchronous service, without any control overhead. The proposed Time Bounded Service (Reference #2) implementation using the CSMA/CA access method with priority does not burden the implementation of an Asynchronous Service only MAC.

2.2) - It is easy to manage the assignment of PCF in ad-hoc networks (see Reference #4).

2.3) - PCF lends itself to network planning topology.

2.4) - Having PCF access to the media can be tailored to the traffic nature of channel utilization optimization.

2.5) - PCF lends itself to power management.

2.6) - The quality of Time-bounded service is higher with PCF than the one provided by DCF.

2.7) - PCF is required for Time-bounded services (TBS) support (From Alternative 2a of Issue 10.3 (Reference #2)).

2.8) - PCF is better for high population networks, deterministic media access to avoid collisions (From Alternative 2d of Issue 10.3 (Reference #2)).

3.1) - By using DCF as the basic CF, with a PCF on top of it for Time Bounded service, there is no issue related to overlap of Ad-Hoc and infrastructure networks. For the same reason there is no issue for the MAC to operate on a single channel PHY, because of the medium sharing characteristics of the DCF (From Argument-pro 1.1 of Issue 10.3 (Reference #2)).

Con:

2.1) - There are difficulty to manage the assignment of PCF in ad-hoc network

2.2) - It is very difficult to manage assignment of PCF in a mobile station in a high mobility situation.

2.3) - Ad-hoc network require special function to become the PCF, opposed to the DCF which does not require any special function.

2.4) - PCF does not work without single channel PHY in overlapping BSAs

Related Issue Identification:

1) - 10.2B (Coordination)
2) - 10.3 (Coordination)

Issue Originator: Larry Van Der Jagt

Issue History:

May 1992: First opened
July 1992: Rephrase the Issue
March 1993: Alternative #1 - Reference #1 - Argument_pro # 1.1
May 1993: Alternative #2 - Reference #2 - Argument_pro #1.2 and #2.1
July 1993: Alternative #3, Argument-general #1.0 to #3.0, Argument-pro #2.2 to #2.8 and #3.1, Argument-con #2.1 to #2.3 and References #3 to #6.
September 1993 - Argument_General #4.0 & #5.0, Argument_pro #1.5 and Argument_con #2.4.

Issue Status: Open

Issue Identification: 10.2 (Topic: Coordination).

What are the event that causes switching between multiple Coordination Functions (CF) ?

Does multiple Coordination Functions (CF) need to be specify ?

Alternatives:

References:

Arguments:

General:

1.0) - Splitting of the Issue into 2 related issues:

10.2A - What are the event that causes switching between multiple Coordination Functions (CF) ?

10.2B - Does multiple Coordination Functions (CF) need to be specify ?

Pro:

Con:

Related Issue Identification:

1) - 10.1A - (Coordination)
2) - 10.1B - (Coordination)

Issue Originator: Larry Van Der Jagt

Issue History:

May 1992: First opened

Issue Status: Open

Issue Identification: 10.2A (Topic: Coordination).

What are the event that causes switching between multiple Coordination Functions (CF)?

Alternatives:

1) The following functions causes switching between multiple CFs:

- Hand-off: The process of passing control of the Mobile Station's activities from one Coordination Function to another, whether or not the Coordination Functions are members of the same Administrative Domain or not.

- Ranging: The act of a Mobile Station which is transiting from one Service Area to another while Signed-on and in session.

- Roaming: A form of Registration used for Mobile Stations which will use a network on a temporary basis.

2) - There are no multiple CF's needed as basic access method.

3) - Switching from Distributed Coordination Function (DCF) to Point Coordination Function (PCF).

References:

1) - P802.11-92/126 - The Use of Terms for Expressing the Concepts of "Roaming", "Hand-off", "Registration" and "Identification" in WLAN Systems.

2) - P802.11-93/70 - A Distributed Access Protocol Proposal Supporting Time Bounded Services.

3) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol

Arguments:

General:

1.0) - If the coordination function Alternative selected in Issues 10.1 and/or 10.2B (Related Issues #2 and #3) is 'both' PCF and DCF, than the text of this Issue should changed to 'What event causes a Basic Service Set (BSS) to switch between PCF and DCF?'

2.0) - A new Issue should be open (Related Issue #4) which states 'What are the events that causes a station to switch BSS within an ESS?'.

Pro:

2.1) - A Point Coordination Function (PCF) can be used as described for the Time Bounded Service (Reference #2), but it is built on top of the DCF. So the DCF is the basic CF. Therefore Switching is not applicable.

3.1) - Request for Time-bounded service from a station to a controller which supports Time-bounded services.

3.2) - Detection of high traffic causing high rate of collisions.

Con:

Related Issue Identification:

1) - 10.2B (Coordination)

2) - 10.1 (Coordination)

3) - 10.2B (Coordination)
4) - 10.5 (Coordination

Issue Originator:

Issue History:
May 1992: First opened
November 1992: Alternative #1 and Reference #1.
May 1993: Alternatives #2 and #3 - References # 2 and #3 - Argument_pro #2.1, #3.1 and #3.2.
July 1993: Argument-general #1.0 and #2.0 (decision to open a new Issue 10.5)

Issue Status: Open

Issue Identification: 10.2B (Topic: Coordination).

Do multiple Coordination Functions (CF) need to be specified?

Alternatives:

1) - Yes
2) - See Alternative #2 of Issue 10.2A
3) - Both Distributed Coordination Function DCF) and Point Coordination Function (PCF)

References:

1) - P802.11-92/126 - The Use of Terms for Expressing the Concepts of "Roaming", "Hand-off", "Registration" and "Identification" in WLAN Systems.

2) - P802.11-93/70 - A Distributed Access Protocol Proposal Supporting Time Bounded Services.

3) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol

Arguments:

General:

1.0) - It is proposed to close this Issue because the Issue is addressed as an Alternative of Issue 10.1 (Both PCF and DCF should be specified in the standard) (see Related Issue #2).

Pro:

2.1) - See Alternative_pro #2 of Issue 10.2A

3.1) - Both Distributed Coordination Function (DCF) and Point Coordination Function (PCF) are required to support efficient operation with network size independence for asynchronous service. PCF is required for TBS, but this should not be forced on small population and ad-hoc networks.

Con:

Related Issue Identification:

1) - 10.2A (Coordination)
2) - 10.1 (Coordination)

Issue Originator:

Issue History:

May 1992: First opened
November 1992: Alternative #1 and Reference #1
May 1993: Alternatives #2 and #3 - Reference #2 and #3 - Argument_pro #2.1 and #3.1
July 1993: Argument_general #1.0 proposing to close the Issue at the September 1993 meeting.

Issue Status: Open

Issue Identification: 10.3 (Topic: Coordination).

What are the issues surrounding the Point Coordination Function (PCF) and Distributed Coordination Function (DCF) arguments ?

Alternatives::

1) - No issue related to overlapped ad-hoc and infrastructure network.

2) - The following is a list of issue addressing the overlapped of ad-hoc and infrastructure network:
   a) - PCF is required for Time-bounded services (TBS) support.
   b) - DCF facilitates ad-hoc networks better because it does not require a controller.
   c) - PCF is better than DCF for minimizing power consumption of portable stations.
   d) - PCF is better for high population networks, deterministic media access to avoid collisions.
   e) - DCF is lower overhead and possibly lower access delay (in small population BSAs).

References:

1) - P802.11-93/70 - A Distributed Access Protocol Proposal Supporting Time Bounded Services.

2) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol

Arguments:

General:

1.0) - The alternatives and arguments of this are directly related to Issue 10.1. Therefore, the Alternatives and Arguments of this Issue are transferred to Issue 10.1 and closure of this Issue is recommended.

Pro:

1.1) - By using DCF as the basic CF, with a PCF on top of it for Time Bounded service, there is no issue related to overlap of Ad-Hoc and infrastructure networks. For the same reason there is no issue for the MAC to operate on a single channel PHY, because of the medium sharing characteristics of the DCF.

Con:

Related Issue Identification:

Issue Originator:

Issue History:

May 1992: Date first opened
May 1993: Alternative #1 and #2 - References #1 and #2 - Argument_pro #1.1.
July 1993: Argument_general #1.0 proposing to close this Issue at the September 1993 meeting.

Issue Status: Open

Issue Identification: 10.4 (Topic: Coordination).

- What are the requirements concerning service area ?

Alternatives:

Arguments:

General:

1.0) - As no special requirement for service area, which are not already specified for Basic Service Set (BSS), can be identified, closure of this Issue is recommended.

Pro:

Con:

Related Issue Identification:

1) - 10.2A (Coordination)

Issue Originator:

Issue History:

May 1992: Date first opened

July 1993: Argument_general #1.0 proposing to close the Issue at the September 1993 meeting.

Issue Status: Open

Issue Identification: 10.5 (Topic: Coordination).

- What are the events that causes a station to switch Basic Service Set (BSS) within an Extended Service Set (ESS)?

Alternatives:

1) - The following functions causes switching between multiple BSSs:
   a) - Change in quality of service (QOS):
      i) - Hand-off
      ii) - Ranging
      iii) Roaming
   b) Explicit station configuration changes:
      i) - User initiated request
      ii) BSS Management
   c) - Both, changes in QOS and station configuration changes

Arguments:

General:

Pro:

Con:

Related Issue Identification:

Issue Originator: Alex Belfer

Issue History:

July 1992: Date first opened and Alternative #1

Issue Status: Open

Issue Identification: 10.6 (Topic: Coordination).

Should the standard specify means by which a Distributed Coordination Function (DCF) can cooperate with a Point Coordination Function (PCF) when a PCF is detected?

Alternatives:

Arguments:

General:

Pro:

Con:

Related Issue Identification:

1) - 10.1 (Coordination)
2) - 10.2 (Coordination)
3) - 10.2A (Coordination)
4) - 10.2B (coordination)
5) - 10.3 (Coordination)

Issue Originator: K. Lynn

Issue History:

September 1993: Date first opened.

Issue Status: Open

Issue Identification: 12.1 (Topic: Interfaces).

What is the MAC/PHY interface ?

Alternatives:

1) - A Parametric MAC-PHY Interface Model (Document P802.11-92/99). The paper defines a first cut of defining 'a universal MAC structure, or "load-able" state machine topology. The initial means to conceptualize this MAC structure is by defining a set of PHY independent primitives at the MAC-PHY interface'.

2) Document P802.11-92/100 - Proposed WLAN Architecture.
The paper addresses the following interfaces and Service Access Points (SAPs):
- MAC/PHY logical interface with a MAC-PHY / Medium Independent PHY Layer SAP boundary and a Local Management (PHY specific) / Medium Independent PHY Layer SAP boundary..
- DTE/DCE Interface optional exposed at the Medium Independent PHY Layer / PHY boundary

3) Document P802.11-92/125 - MAC/PHY Interface Specifics in Support of the Use of a Parameter Service Access Point Approach to PHY Independence.
This paper proposes "two Service Access Points between the MAC and PHY":
- The Data Service Access Point (DSAP). It "supports the transmission of normal data packets called MAC Protocol Data Units (MPDU)".
- The Parameter Service Access Point (PSAP). It "supports interactions between the MAC and PHY that can happen on a frame by frame basis in order to improve the ability of stations to access the medium.

4) - Separate data and Management paths support the Data Service Access Point (DSAP and the parameter Service Access Point (PSAP).

5) - MAC/PHY service primitives at the PHY Service Access Point (SAP) (Reference #5):
- PH-DATA-Request (Class, data)
- PH-DATA-indication (class, data)
- PH-DATA-confirm (Status)

6) - The MAC/PHY interface is generally a DTE/DCE interface of the type discussed previously (Reference #6) for the 'optionally exposed interface' between the 'convergence layer' and the 'medium independent layer' within PHY.

7) - The bulk of the paper (Reference #7) describes this MAC/PHY interface

References:

1) - P802.11-92/99 - A parametric MAC-PHY Interface Model
2) - P802.11-92/100 - Proposed WLAN Architecture
3) - P802.11-92/125 - MAC/PHY Interface Specifics in Support of the Use of a Parameter Service Access Point Approach to PHY Independence.
4) - P802.11-93/146 - The Need for MAC Data Delimiters in the PHY.
5) - P802.11-92/162 - MAC-PHY Service Primitives - Proposed Starting Point Text for Section 6 of Document P802.11/20 [Draft 802.11 Standard].
6) - P802.11-93/115 - Protocol Layering Alternatives for Practical Implementation.
7) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:

Pro:

1.1) - The solution proposed (P802.11-92/99) 'is put forward to overcome the dependency of MAC in PHY implementation techniques. In this way, the idea of a universal MAC can accomplished. The solution also frees the constraints placed on the system implementors to adopt a particular FY (?) structure so as to utilize the common MAC hardware. Thus, diverse PHY media such as IR, Sonics and Radio can benefit from the scale economy in the MAC hardware production.

2.1) - This paper (P802.11-92/100) captures the sense of the July [1992] discussion.

3.1) - The solution proposed (P802.11-92/125) that with 'this simple method a significant amount of flexibility is introduced into the MAC/PHY interface and into the MAC's ability to successfully achieve media access':

- Low cost in terms of MAC complexity
- Flexibility to take advantage of emerging technologies
- Critical to achieving the operation of multiple PHYs using a single MAC.

4.1) - It is agree with support of the parametric MAC-PHY interface model in concept if not in detail. A similar model of this type of interface is the PCMCIA Socket Services.

6.1) - The function at the MAC/PHY interface as described in Reference #6 are:

- Serial transmit and receive bit streams, using clocks provided by the PHY;
- Direct control and status signals fro transmitter and receiver enable clear-to-send, carrier-sense, and receive-data-enable;
- Serial command transfers from MAC to PHY for functions such as:
  - setting power levels;
  - setting transmit bit rate;
  - setting receive thresholds and acceptable quality levels;
  - defining Listen-Before-Talk (LBT) deferrals;
  - setting frequencies; and
  - requesting a status transfer; and
- Serial status transfers from PHY to MAC pursuant to request fro information such as receive signal quality, receive bit rate, and PHY specific parameter values.

Con:

Related Issue Identification:

Issue Originator:

Issue History:

May 1992: First opened
November 1992: Alternatives #1, 2 and 3, Argument-pro #1, 2 and 3 and References 1 to 3.
July 1993: Alternative #4 and Argument_pro #4.1.
September 1993: Reference #4, #5, #6 and #7. Alternative #5, #6 and #7, Argument_pro #6.1. The 802.11 committee agreed that the service primitives described in Alternative #5 and in Reference #5 shall be included in the 802.11 Draft Standard - *Motion: Move to adopt the service primitives as described in Document 93/162 (reference #5) as the service primitives for the PH SAP associated with data transfer between MAC and PHY. Those primitives have previously been described in P802.11-92/96, -92/119.* - Result (in joint MAC/PHY group): yes-42, no-0, abstention-0.

Issue Status: Open

Issue Identification: 12.1A (Topic: Interfaces).

What is the MAC Management/PHY interface?

Alternatives:

Arguments:
Pro:

Con:

Related Issue Identification:
1) - 12.1 (Interfaces)

Issue Originator: - F.Y. Simon

Issue History:
September 1993: Date first opened

Issue Status: Open

Issue Identification: 12.1B (Topic: Interfaces).

What is the Station Management/PHY interface?

Alternatives:

Arguments:
Pro:

Con:

Related Issue Identification:
1) - 12.1 (Interfaces)

Issue Originator: - F.Y. Simon

Issue History:
September 1993: Date first opened

Issue Status: Open

Issue Identification: 12.2 (Topic: Interfaces).

- What interfaces are exposed:
  - MAC/PHY ?
  - Distribution System Services (DSS) ?
  - Distribution System Media (DSM) ?

Editor's note: Ref: 29 (92/58R1)

Editor's note: 11/92 - Break-up of the issue in 3 parts: 12.2_A, 12.2_B, 12.2_C

12.2_A - MAC/PHY?

Alternatives:

1) Yes - but optional

Arguments:

Pro:

1) Standards defines interfaces, implementation can expose or not expose the interface based on implementation choices - vendors cannot be forced to expose an interface.
However, if the interface is exposed, it must conform to the standard specified interface to claim conformance to the standard.

Con:

Related Issue Identification:

Issue Originator:

Issue History:

May 1992: First opened

November 1992: Alternative #1, Argument-pro #1 and closure of the Issue by a motion to recommend that 'DTE/DCE interface be defined and exposable and that this interface be between the Medium Independent PHY layer and the PHY medium Dependent layer'. Result: yes-23, no-0, abstention-2

Issue Status: Close

12.2-B - ~~Distribution System Services?~~

- Are the infrastructure interfaces exposed? (see Argument-pro #1.2 below).

Alternatives:

1) - Yes - The interfaces to the Distribution System Services (DSS) need to be exposed.

References:

- P802.11-92/128 - IEEE 802.11 Distribution System Services Functionality

Arguments:

Pro:

1.1) - The closure of Issue 5.1 (Distribution Systems) mandates that the standard will specify the Distribution System (DS) interfaces. Therefore, for this specification to be useful, the interfaces must be exposed.

1.2) - To make this Issue (12.2-B) more accurate, the current Issue statement is to be replaced by: 'Are the infrastructure interfaces exposed?' where infrastructure is defined as follow:

The infrastructure includes Distribution System (DS), Access Points (APs) and Portals functions. An infrastructure contains one or more APs and zero or more Portals in addition to a DS. Within the infrastructure there are two exposed interfaces:

a) - between Stations (STAs) and APs; and

b) - between APs and DS.

Additionally, DS services are provided between pairs of 802.11 MACs.

Con:

Related Issue Identification:

1) - 5.4 (Distribution Systems)

2) - 5.1 (Distribution Systems)

Issue Originator:

Issue History:

May 1992: First opened

November 1992: Alternative #1, Reference and Related Issue.

January 1993: Change of the Issue statement - Arguments-pro #1 and 2 - Adoption of the Alternative (#1) and the definition of Infrastructure (see argument-pro #1.2).-Result: yes-13, no-0, abstain-2.

Issue Status: Close

12.2_C - Distribution System Media?

Alternatives:

1) No - It is not necessary for this to be exposed; the standard will not specified the 'internal' of the Distribution System (DS) (see Issue 5.1).

References:

- P802.11-92/128 - IEEE 802.11 Distribution System Services Functionality

Arguments:

Pro:

Con:

Related Issue Identification:

- 5.1 (Distribution Systems)

Issue Originator:

Issue History:

May 1992: First opened

November 1992: Alternative #1, Reference and Related Issue.

Issue Status: Open

Issue Identification: 12.3 (Topic: Interfaces).

What is the intelligence level at the MAC/PHY interface ?

Alternatives:

1) - Dumb interface
2) - Smart interface
3) - Half-dumb interface
4) - Simple
5) - Unintelligent

References:

1) - P802.11-93/40 - The Wireless Hybrid Asynchronous Time-bounded MAC Protocol
2) - P802.11-93/115 - Protocol layering
3) - P802.11-93/140 - MAC/PHY Functional Partitioning
4) - P802.11-93/146 - The need for MAC data Delimiters in the PHY Partitioning Alternatives for Practical Implementation

Arguments:

General:

1.0) - The function distribution between MAC and PHY should be such that :
- The PHY should generate the preamble upon a MAC command.
- The PHY should generate and detect the start and end delimiters, and should indicate this to the MAC.
- The PHY should be able to detect the proper bit rate of an incoming signal, when it is supporting multiple bit rates.
- A signalling field in the PHY preamble will allow future enhancements and proprietary functionality in the PHY.

2.0) The MAC/PHY interface should assume a "dumb" PHY. A single MAC can be designed to work effectively with different "dumb" PHY implementation.

Pro:

1.1) - Dumb is simple, easy to implement, assumed cheap.
1.2) - Dumb must, at least, detect Service Request type
1.3) - [Dumb] is desirable to have the PHY 'blind' to the type of data that passes thru it. - PHY must not be required to understand the meaning of bits that passe thru it.
1.4) - Minimum needs:
- Received signal quality
- Transmit level
- Handshake
- Desire to minimize DC power consumption

2.1) - Smart is flexible
2.2) - Smart may be required if the interface has options
2.3) - Smart may be required for one MAC for multiple PHY requirement
2.4) - Real time constraints motivate more smarts in the PHY
4.1) - A few generic primitives with parameters to control specific PHYs.
5.1) - The MAC-PHY interface is an 'unintelligent' interface, permitting a single, 'intelligent' MAC with a replaceable PHY adaptation function to directly attach, both logically and electrically, to a plurality of different PHY types.

Con:

3.1) 'Half-dumb' should not be considered - 'Dumb is Dumb'

Related Issue Identification:

Issue Originator:

Issue History:

May 1992: First opened
November 1992: Alternatives #1 to #3, Arguments #1.1 to #1.4 and #2.1 to #2.4 and Argument #3.1.
March 1993: Alternative #4 - Reference #1 - Argument_pro #4.1.
September 1993: Alternative #5, Reference #2 to #4, Argument_general #1.0 & #2.0 and Argument_pro #5.1.

Issue Status: Open

Issue Identification: 12.4 (Topic: Interfaces).

Is the layer that provides the PHY independence the same as the MAC/PHY interface ?

Alternatives:

1) - The Issue is also addressed in Issue 12.1; Alternatives #1, 2 and 3.
2) - No

References:

1) - P802.11-92/99 - A parametric MAC-PHY Interface Model
2) - P802.11-92/100 - Proposed WLAN Architecture
3) - P802.11-92/125 - MAC/PHY Interface Specifics in Support of the Use of a Parameter Service Access Point Approach to PHY Independence.
4) - P802.11-93/115 - Protocol Layering Alternatives for Practical Implementation.
5) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:

Pro:

2.1) - (Reference #4) - The independence is implemented in a subdivision of MAC dedicated to PHY adaptation. This permits processing of the relevant information from received frames, after MSDU acceptance and validation by the receiving MAC. This is done without an extra mechanism to return this data to PHY for processing.

2.2) - (Reference #5) - The PHY independence is achieve in a PHY dependent sub-layer within the MAC. This must be a sub-layer because it adds and removes fields in the MSDU header. This must be a MAC function because it involves transfer of the PHY specific information to a peer sublayer and the information is best sent in the protected portion of an MPDU. It also requires formatting and interpreting the MSDU header, which should only be done by the MAC.

Con:

Related Issue Identification:

1) - 12.8 (Topic: Interfaces)
2) - 12.1 (Topic: Interfaces)

Issue Originator: Dave Bagby

Issue History:

May 1992: First opened
November 1992: Alternative and Related Issue #2
September 1993: Alternative #2, References #4 & #5, and Argument_pro #2.1 & #2.2.

Issue Status: Open

Issue Identification: 12.5 (Topic: Interfaces).

- What entities (other than LLC) will the standard support as MAC layer user ?
Editor's note: Ref: 87 (92/58R1)

Alternatives:

Arguments:

Pro:

Con:

Related Issue Identification:

Issue Originator: John Corey

Issue History:
May 1992: First opened

Issue Status: Open

Issue Identification: 12.6 (Topic: Interfaces).

- What are the MAC services provided to the LLC ?
Editor's note: Ref: 38 (92/58R1)

Alternatives:

Arguments:

Pro:

Con:

Related Issue Identification:

Issue Originator:

Issue History:
May 1992: First opened

Issue Status: Open

Issue Identification: 12.7 (Topic: Interfaces).

- What is the definition of the MAC/LLC interface for Time-bounded services ?
Editor's note: Ref: 36 (92/58R1)

Alternatives:

Arguments:

Pro:

Con:

Related Issue Identification:
- 15.3 (Topic: Services)

Issue Originator:

Issue History:

May 1992: First opened

Issue Status: Open

Issue Identification: 12.8 (Topic: Interfaces).

Does a PHY independence layer need to be specify in the MAC ?

Alternatives:

1) - Yes
2) - No

References:

1) - P802.11-93/40 - The Wireless Hybrid Asynchronous Time-bounded MAC Protocol
2) - P802.11-93/115 - Protocol Layering Alternatives for Practical Implementation.
3) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:

Pro:

1.1) - See Reference #2
1.2) - See Reference #3

Con:

Related Issue Identification:

- Issue 12.1 (Interfaces)

Issue Originator:

Issue History:

May 1992: First opened
November 1992: Related Issue ID.
March 1993: Alternatives #1 and 2 - Reference #1.
September 1993: References #2 & #3 and Argument_pro #1.1 & #1.2.

Issue Status: Open

Issue Identification: 12.9 (Topic: Interfaces).

Should data and control information be passed simultaneously across the MAC / PHY logical interface ?

Alternatives:

1) - Yes
2) - No

References:

1) - P802.11-93/115 - Protocol Layering Alternatives for Practical Implementation.
2) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:

Pro:

1.1) - It was decided that there should be two separate, independent, bidirectional information paths between the MAC and PHY, one for data and one for management/control. This implies that data and control information can be passed simultaneously.

1.2) - See Reference #1

1.3) - See Reference #2

Con:

Related Issue Identification:

Issue Originator: Dave Bagby

Issue History:

May 1992: Date first opened
July 1993: Alternative #1 and #2 and Argument_pro #1.1.
September 1993: References #1 & #2 and Argument-pro #1.2 & #1.3.

Issue Status: Open

Issue Identification: 12.10 (Topic: Interfaces).

What specific parameters the MAC requires from the PHY?

Alternatives:

References:
1) - P802.11-93/147 - The Importance of Short Rx-Tx Turnaround time.

Arguments:
Pro:

Con:

Related Issue Identification:

Issue Originator: - W. Diepstraten

Issue History:
September 1993: Date first opened - Reference #1.

Issue Status: Open

Issue Identification: 13.6 (Topic: Management).

How will the MAC standard address Power Consumption ?

Alternatives:

1) - See Alternative #1 of Issue 13.3A

2) - The MAC protocol should allow stations to have their transceivers off most of the time when there is no traffic addressed to them. Also, the MAC protocol should provide a way for suspending an association (without de-associating), allowing for immediate reassociation when the station resumes operation.

References:

1) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol

2) - P802.11-93/136 - Opinions on Issues 13.6 and 17.3 and New Issues

Arguments:

Pro:

1.1) See Argument #1.1 of Issue 13.3A

2.1) See Reference #2

Con:

Related Issue Identification:

1) - 13.3 (Management)

2) - 13.3A (Management)

Issue Originator:

Issue History:

May 1992: Date first opened

May 1993: Alternative #1 - Reference #1 - Argument_pro #1.1

September 1993: Alternative #2, Reference #2 and Argument_pro #2.1.

Issue Status: Open

Issue Identification: 13.7 (Topic: Management).

Is MAC support required for Power Control ?

Alternatives:

1) - Yes - Assuming that Power Control means control of signal strength.

References:

1) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol

2) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:

Pro:

1.1) - See Argument_pro #1.1 of Issue 13.3B

1.2) - Determining signal strength requires the interpretation of the MSDU content exchanged with a given station. The PHY must not be required to do this. While the MAC may not be aware that communication 'improvement' is directly related to signal strength, it is, however, a MAC support.

1.3) - See Reference #2

Con:

Related Issue Identification:

1) - 13.3 (Management)

2) - 12.1 (Interfaces)

3) - 13.3B (Management)

Issue Originator:

Issue History:

May 1992: First opened

November 1992: Related Issue #2

May 1993: Alternative #1 - Reference #1 - Argument_pro #1.1 and #1.2

September 1993: Reference #2 and Argument-pro 1.3.

Issue Status: Open

Issue Identification: 13.8 (Topic: Management).

Is MAC support required for antenna diversity ?

Alternatives:

1) - Yes

References:

1) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol

2) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:

Pro:

1.1) - See Argument_pro #1.1 of Issue 13.7.

1.2) - See Reference #2

Con:

Related Issue Identification:

1) - 12.1 (Interfaces)

2) - 13.7 (Management)

Issue Originator:

Issue History:

May 1992: Date first opened

November 1992: Related Issue

May 1993: Alternative #1 - Reference #1 - Argument_pro #1.1

September 1993: Reference #2 and Argument-pro #1.2.

Issue Status: Open

Issue Identification: 15.8 (Topic: Services).

Do all stations and all infrastructures support the Time-bounded service ?

Alternatives:

1) - Alternatives are dependent of the definition of 'support'
2) - Yes
3) - no

References:

1) - P802.11/92-107 - Alternatives to Issues Related to Time-bounded Services.

2) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol.

3) - P802.11-93/70 - A Distributed Access Protocol Proposal Supporting Time Bounded Services.

Arguments:

General:

1.0) All support (802.11 MAC proposals) Time-bonded (TB) services. - To simplify task, could the TB services be left for further study by the committee at this time? - (providing that hooks are provided in the MAC proposals on the table).

The group (Issue work group) agrees that hooks for time bounded services shall be included in the first release of the MAC and when fully specified, TB services are an option. These hooks are a mechanism whereby the MAC can cause the transfer of isochronous MSDUs in a manner which has an acceptable low probability of collision or deferral. This results in bounded absolute delay and delay variance. The "hook" also includes a MAC field that specifies TB or Asynchronous data type.

Pro:

1.1) - The issue is inter-related to how the Time-bounded interface is defined (see Issue 15.3 - What protocols above the MAC would drive the Time-bounded Services?).

1.2) - Possible related new issue: 'Do we define the MAC to service existing 'clients' of the MAC or do we define a MAC that is independent ?'.

1.3) - Sub-issue: 'Where is the Asynchronous / Time-bounded multiplexer resides (below or above the MAC)?' - See picture from Document P802.11-91/21.

1.4) -

a) - Stations:

The CODIAC protocol (Reference #2) requires that all non-controller stations be well behaved in both operating modes. This means a station must be:

i) - capable of communicating in both modes;

ii) - capable of communicating by the distributed mode rules only, but it must be quiet in the presence of a controller; or

iii) - capable of communicating by the centralized mode rules only, but it knows it must be quiet when it does not hear a controller.

This means that for non-controller stations "supporting" (where "supporting" means not precluding other stations from using TBS) TBS with the CODIAC protocol is a given, because TBS is provided by centralized mode operation .

For controller stations, whether they can operate in both modes should be an implementation decision. However if a station requests TBS, there should be a specific negative response to that request if the service cannot be provided (not yet defined).

b) Infrastructures:
Yes, where the definition of support is to handle in a well behaved manner - i.e. where a station requests TBS there should be a negative response to that request if the service is not provided.
If support = provide, then No.

Summary - in agreement with Pro arguments 3.1 and 3.5

2.1) - All stations support it - as all MACs are the same but the functions above the MAC are out of 802.11 scope.

2.2) - Responding 'no' to the question imply that the creation of an option is required (see Issue 1.4 - related to options).

3.1) - The lack of time-bounded service support should not preclude offering of time-bounded by other stations.

3.2) - The station implementation cost may be an issue.

3.3) - Constraints to fit, at the minimum, the existing 802.2 pieces. Additional capability may be provided as well.

3.4) - Distribution System implementation based on existing 802.x LANs (which do not have inherent support for Time-bounded services) must not be excluded.

3.5) - If a station ask for an optional service, it is preferable to receive an explicit response indicating that the service is not supported rather than ignore the request.

3.6) - Responding 'yes' to the question imply the use of infrastructure that does not exist today.

3.7 - Time Bounded Services are only supported in Infrastructure networks, and will need an AP. Not all stations within an ESA with infrastructure need to support Time Bounded Services. Its service is optional, and dependent on the PHY isolation.

When Time Bounded service is supported within an ESA, then all AP's covering the area of operation need to support Time Bounded Services to assure continuous operation, but there can be a mix of stations that do and do not support Time Bounded Services.

Con:

2.1) - See Arguments-pro #3.1
2.2) - See Arguments-pro #3.2
2.3) - See Arguments-pro #3.3
2.4) - See Arguments-pro #3.4
2.5) - See Arguments-pro #3.5
2.6) - See Arguments-pro #3.6
3.1) - See Arguments-pro #2.1
3.2) - See Arguments-pro #2.2

Related Issue Identification:

1) - 15.3 - Service
2) - 1.4 - 'Standard' Process

Issue Originator: Simon Black

Issue History:

May 1992: First opened
September 1992: Arguments 1 to 9
January 1993: - Alternatives #2 and 3 - Arguments-pro #2.2, 3.5 and 3.6 - Arguments-con #2.5, 2.6 and 3.2.
May 1993: References #2 and #3 - Argument_pro #1.4 and #3.7
September 1993: Argument_general #1.0.

Issue Status: Open

Issue Identification: 15.9 (Topic: Services).

How will the standard address the MAC ability to service various traffic:
- Data,
- Voice, and
- Video ?

Alternatives:
1) - See the CODIAC Protocol proposal - Reference #1
2) - Data service is always available

References:
1) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol.

2) - P802.11-93/70 - A Distributed Access Protocol Proposal Supporting Time Bounded Services.

Arguments:
Pro:
1.1) - The CODIAC protocol (Reference #1) supports asynchronous and time-bounded services. The centralized mode can be implemented to support the requirements of various TBS time constraints.

2.1) - The MAC can support different Time bounded service levels, depending on the PHY speed and characteristics. The MAC should support a range of PHY speeds. The Time Bounded Service levels can distinguish between Voice and Video, or any lower multiple of the primary Time Bounded Service (as a integer multiple of the IFP)

Con:

Related Issue Identification:

Issue Originator:

Issue History:
May 1992: First opened
May 1993: Alternatives #1 and #2 - References #1 and #2 - Argument_pro #1.1 and #2.1

Issue Status: Open

Issue Identification: 15.10 (Topic: Services).

- Between what service points is the Time-bounded service provided ?

Alternatives:

1) MAC/LLC boundary to MAC/LLC boundary (MAC_SAP to MAC_SAP).
2) MAC/PHY boundary to MAC/PHY boundary (PHY_SAP to PHY_SAP).

Arguments:

Pro:

1) The only one that make sense. It is the natural interface point. It is also the limits of the 802.11 scope.

2) Isolates performance implication from MAC layer.

Con:

1) Implies performance requirements on all 802.11 MAC and implementations (assuming Time-bounded service provided).

2) Not useful in providing Time-bounded service.

Related Issue Identification: Issue 15.1 - Topic: Services

Issue Originator: Simon Black

Issue History:

September 1992 - First opened - Alternative 1 & 2 - arguments and Straw-poll:
- For alternative #1 - 8
- For alternative #2 - 0
- Abstain - 1

To be forwarded to 802.11 Plenary with recommendation for alternative #1

November 1992: - Motion to close the issue by accepting Alternative #1. Result: yes-21, no-0, abstention-1. Issue closed

Issue Status: Close

Issue Identification: 15.11 (Topic: Services).

What are the classes of Time-bounded service will the 802.11 standard specifies in addition to the required Asynchronous service ?

Alternatives:

1) - Class 1: Best effort delivery, connectionless (i.e File transfer or Email) (the asynchronous service).

2) - Class 2: Time based reservation class (i.e. Video Conference).

3) - Class 3: Non-time-based reservation class, connection oriented (i.e Image browsing)

4) - Basic Voice Service class would be the default when supported

References:

1) - P802.11/92-109 - Communications Requirements of Multimedia Applications: A Preliminary Study.

2) - P802.11/92-110 - Wireless Networking Requirements of Multimedia Applications

3) - P802.11-93/70 - A Distributed Access Protocol Proposal Supporting Time Bounded Services.

Arguments:

Pro:

4.1) - Due to the variable frame size flexibility of the methodology described in this paper (Reference #3), this will automatically serve all lower ranges, although they can be specified as separate levels (using a longer IFP, being an integer multiple of the basic IFP).

A separate Video class may be needed.

Con:

Related Issue Identification: Issue 15.1 - Topic: Services

Issue Originator: Tim Kwok

Issue History:

September 1992: First opened - Alternatives #1 to #3
May 1993: Alternative #4 - Reference #3 - Argument_pro #4.1

Issue Status: Open

Issue Identification: 16.3 (Topic: Mobility).

Is anything required from IEEE 802.1 regarding roaming ?

Alternatives:

1) - Yes / no [?]
2) - AP to AP protocol

References:

1) - P802.11-92/126 - The Use of Terms for Expressing the Concepts of "Roaming", Hand-off", "Registration" and "Identification" in WLAN Systems.
2) - P802.11-93/136 - Opinions on Issues 13.6 and 17.3, and New Issues

Arguments:

Pro:

1.1) - This issue is addressed in document P802.11-92/126, in section 'Terms'. 'One of the important terms will be the one which describes the agent which will implement some of [the] mobility services. here (in 92/126) the term Administrator will be used to differentiate it from 802.1 network management functions, and Domain to indicate that there is a composite of network segments which may be administrated by an agent. Administration differs from 802.1 network management in two ways:

- It is mandatory
- It must operate over the Distribution System (DS) and directly manage the PHY in real-time (perhaps managing frequencies or code sequences, power levels, antenna switching or other PHY related service area functions)'.

2.1) - It is believed (see Reference #2) that such protocol must be defined, some of the functions of the protocol are:

- Exchange Association Information: If a station moves from one BSS to another, and reassociates with a new AP, the new AP will need to notify the previous AP (or all the APs) about the new association.
- Preauthentication: This function should be allowed.

Related Issue Identification:

1) - 16.9 (Mobility)

Issue Originator:

Issue History:

May 1992: First opened
November 1992: Alternative #1, Argument #1 and Reference
September 1993: Alternative #2, Reference #2 and Argument_pro #2.1.

Issue Status: Open

Issue Identification: 17.2 (Topic: Addressing).

What level of reliability for Broadcast (Multicast) Addressing is required ?

Alternatives:

1) - These are not inherently reliable delivery mechanisms.
2) - Multichannel system negative acknowledgement could use a spare channel for error correction.

References:

1) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol.

Arguments:

Pro:

1.1) - Multicast and broadcast reliability is directly tied to the MSDU error rate, as they cannot be acknowledged. This is the case for all LANs, wired and wireless.

1.2) - Higher level protocol above MAC or application should handle missing packets and errors in transmission.

Con:

Related Issue Identification:

Issue Originator:

Issue History:

May 1992: First opened
May 1993: Alternative #1 - Reference #1 - Argument_pro #1.1
September 1993: Alternative #2 and Argument_pro #1.2.

Issue Status: Open

Issue Identification: 17.3 (Topic: Addressing).

What is the extent of Multicast ? ~~(Basic Service Set (BSS), Extended Service Set (ESS)).~~

Alternatives:

1) - Basic Service Set (BSS)
2) - Extended Service Set (ESS)
3) - Both BSS and ESS

References:

1) - P802.11-93/40 - The Wireless Hybrid Asynchronous Time-bounded MAC Protocol
2) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol.
3) - P802.11-93/136 - Opinions on Issues 13.6 and 17.3, and New Issues.

Arguments:

Pro:

3.1) - A Station should be explicitly control the scope of multicasts. The WHAT protocol (Reference #1) provides this capability with the 'hierarchical' bit.

3.2) - Both ESS and BSS multicast should be supported, a station should be able to explicitly control the scope of multicast (this supports the position of document 93/40 on the WHAT protocol-Reference #2). The hierarchical bit provides this capability.

3.3) - Data PDUs and MAC PDUs should be differentiated. Data PDUs are regular data, so their extent is independent of the actual location (current BSS0, hence Multicast Messages should be forwarded to the whole ESS (unless an implementation dependent filtering function is used in the Access Point.

MAC Control PDUs may (and probably should, depending on the PDU's content) be limited to the BSS.

Con:

Related Issue Identification:

Issue Originator:

Issue History:

May 1992: First opened
March 1993: Alternative #2 - Reference #1 - Argument_pro #3.1.
May 1993: Reference #2 - Argument_pro #3.2
September 1993: Reference #3, and Argument_pro #3.3.

Issue Status: Open

Issue Identification: 17.5 (Topic: Addressing).

What is meant by addressing?

Alternatives:

1) - Size
2) - IEEE 802
3) - Media Link Framing (MLF) address (Reference #4)

References:

1) - P802.11-93/40 - The Wireless Hybrid Asynchronous Time-bounded MAC Protocol

2) - P802.11-93/22 - Further Exploration of Transactions and Name Spaces

3) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol.

4) - P802.11-93/61 - Wireless LAN MAC Protocol: MAC-to-MAC Interface.

Arguments:

Pro:

2.1) - Wireless Stations should be identified by 48 bit unique IDs that are compatible with other IEEE 802 standards. All asynchronous service MPDUs carry the full 48 bit address in the WHAT protocol (see Reference #1). Time-bounded MPDUs use a short local identifier. However, the Call Setup message for Time-bounded connections contains the full 48 bit addresses of the source and destination.

2.2) - IEEE 802 addressing is required (supports the position of document 93/40 on the WHAT protocol - Reference #1). Wireless stations should be identified by 48 bit unique IDs that are compatible with other IEEE 802 standards. The 48 bit addresses of source and destination stations are contained in the four step transaction of the CODIAC protocol (Reference #3).

3.1) - With a one byte coding, there exist 255 different MLF addresses. This set is divided into several subsets according to table 2 of paper P802.11-93/61 (see Reference #4). The justification of defining some addresses ranges for Access Point(AP), for mobile stations and ad-hoc network are:

a) - it speeds up the connection establishment time: indeed a Mobile Station willing to 'get in touch' with an AP can take into account only the MPDU packets originating from an AP.

b) - In the same time, if an ad-hoc network is co-located with other wireless networks, it helps to discriminate between both; a mobile station pertaining to an ad-hoc network can easily discard any information that does not originate from a station of the same ad-hoc network.

Con:

Related Issue Identification:

Issue Originator:

Issue History:

May 1992: First opened
March 1993: Reference #1 and 2 - Argument_pro #2.1
May 1993: Reference #3 - Argument_pro #2.2
July 1993: Alternative #3, Reference #4 and Argument_pro #3.1
September 1993: Recommend Alternative #2 (IEEE 802 - 48 bit address).

Issue Status: Open

Issue Identification: 17.6 (Topic: Addressing).

How does Global Addressing and Directory services affect the MAC ?

Alternatives:

Arguments:

General:

1.0) - This is not a Layer 2 issue.

2.0) - The MAC entity should have a 48 bit address to be identifiable in global networks.

3.0) - The intent of addressing Global addressing in this Issue, is not understood by the committee.

Pro:

Con:

Related Issue Identification:

Issue Originator:

Issue History:

May 1992: First opened

September 1993: - Argument_general #1.0, #2.0 and #3.0 - Close the Issue by concluding that this Issue is not a Layer 2 issue and it does not affect the MAC. - Result yes-31, no-0, abstain-0.

Issue Status: Close (September 1993)

Issue Identification: 17.7 (Topic: Addressing).

Does the MAC supply a packet number to the PHY ?

Alternatives:
1) - No

Arguments:
Pro:
1.1) - The MAC entity does not provide a packet number recognizable by the PHY layer - the PHY entity cannot interpret packet numbers.

Con:

Related Issue Identification:
- 12.1 (Topic: Interfaces)

Issue Originator:

Issue History:
May 1992: First opened
September 1993: - Alternative #1, Argument_pro #1.1 - Closing of the Issue by adopting Alternative #1. Results: yes-33, no-0, abstain-0.

Issue Status: Closed (September 1993)

Issue Identification: 18.2 (Topic: Data Rates).

Will the standard support one MAC driving multiple PHYs of different rates ?

Alternatives:

1) - Yes
2) - No

References:

1) - P802.11-93/115 - Protocol Layering Alternatives for Practical Implementation.
2) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:

Pro:

1.1) - If one accepts the PAR demand for one MAC and one accepts that the different MAC's may decide on different data rates then the answer is yes. Since we know that the range of data rates is small this should not present implementation problems.

1.2) - The use of a PHY adaptation layer at the bottom of the MAC (see Reference #1) allows such multiple-PHY support, provided that the necessary parameters regarding the PHY capabilities can be requested by this PHY adaptation layer via the MAC/PHY interface.

1.3) - A single MAC should support multiple PHYs with different rates. Preamble length and other parameters reported by the PHY.

Con:

Related Issue Identification:

1) - 18.1 (Data Rates)

Issue Originator:

Issue History:

May 1992: Date first opened
July 1993: Alternatives #1 and #2, Argument_pro #1.1 and proposal to close the Issue at the September meeting by endorsing Alternative #1.
September 1993: - Reference #1 & #2 and Argument_pro #1.2 & #1.3.

Issue Status: Open

Issue Identification: 18.3 (Topic: Data Rates).

Will the standard support PHY with variable rates ?

Alternatives:

1) - Yes
2) - No

References:

1) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol.
2) - - P802.11-93/140 - MAC/PHY Functional Partitioning
3) - P802.11-93/146 - The Need for MAC Data Delimiters in the PHY.

Arguments:

Pro:

1.1) (See Reference #1) - RSYNC frames could be issued at different rates within a superframe, or different superframes could be issued. PSYNC could be issued at one rate while communication was going on at another.
Little consideration has been given to this issue at this time. However, this is a very important issue. First generation wireless LANs will be released at lower speeds than forthcoming generations, but they must coexist - it is not desirable tell customers they must upgrade their equipment because the company across the hall installed a newer, higher speed LAN.

1.2) - This group (July 93 'Data Rate' work group) can see no reason why the MAC should not support a PHY that is capable of operation at more than one rate. As we see the 802.3 parameter being changed to be specified in bits so that it is data rate independent so 802.11 should prepare for multiple data rates by scalable specifications.

1.3) - (Reference #3) - It is important that the MAC can support this (PHY with variable rates) in view of the migration requirements toward future higher speed PHY's, within the same band. This should allow for mixed operation where higher speed products can be build that are backward compatible with a currently developed standard. This functionality would further be applicable in environments that can take advantage of dynamic speed switching.

1.4) See Reference #2

Con:

Related Issue Identification:

1) - 18.2 (Topic: Data Rates)

Issue Originator:

Issue History:

May 1992: Date first opened
May 1993: Alternative #1 - Argument_pro #1.1
July 1993: Alternative #2, Argument_pro #1.2 and proposal to close the Issue at the September 1993 meeting by endorsing Alternative #1.
September 1993: Reference #2 & #3 and Argument_pro #1.3 & #1.4.

Issue Status: Open

Issue Identification: 18.4 (Topic: Data Rates).

Will the standard allow PHY data rate to vary as function of signal quality ?

Alternatives:

1) - Yes
2) - No

References:

1) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:

General:

1.0) - If the standard allows PHY data rate to vary, the criteria for changing should be up to the implementer.

2.0) - The PHY data rate may be varied if the PHY is capable of multiple rates (see Issue 18.3). However, if the issue means 'can the PHY make its own decision to adjust data rate based on signal quality' then the answer is NO. The MAC may decide to tell the PHY to change data rate based on signal quality indication.

Pro:

1.1) - (Reference #1) - The MAC must tell the PHY to change the data rate based on information presented to the MAC by the PHY. The PHY must not make this decision independently. The MAC needs to understand the timing of MPDU transmissions and not in position to know if the PHY is independently making these decisions.

Con:

Related Issue Identification:

1) - 18.3 (Data Rates)
2) - 18.5 (Data Rates)

Issue Originator:

Issue History:

May 1992: First opened
May 1993: Argument_general #1.0
July 1993: Alternative #1 and #2 and Argument_general #2.0.
September 1993: Reference #1 and Argument_pro #1.1.

Issue Status: Open

Issue Identification: 18.5 (Topic: Data Rates).

Is data rate 'agility' only a PHY matter ?

Alternatives:

1) - No
2) - Yes

References:

1) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:

General:

1.0) A new issue should be open: Shall 802.11 MAC support multiple, simultaneous data rates phys? (see Issue 18.7)

Pro:

1.1) - If stations are functioning at various speeds the MAC must maintain (somehow) the mapping of stations to speeds because the PHY cannot interpret address fields on MSDUs.

1.2) - The standards for different PHY's may specify multiple data rates or a fixed data rate. However the decision to operate at or change data rates (for multiple rate PHY's) is made by the MAC.

1.3) - (Reference #1) - The MAC must decide when to switch data rates (Pro #1.2). However, the data rate indication must occur in the PHY preamble to allow proper clocking, bit alignment, and other PHY functions.

Con:

Related Issue Identification:

1) - 18.4 (Data Rates)
2) - 18.7 (data Rates)

Issue Originator:

Issue History:

May 1992: First opened
May 1993: Alternative #1 - Argument_pro #1.1.
July 1993: Alternative #2 and Argument_pro #1.2.
September 1993: - Argument_general #2.0, Argument_pro #1.3, Agree to close the Issue by adopting Alternative #1 - Result yes-33, no-0, abstain-0.

Issue Status: Close (September 1993)

Issue Identification: 18.7 (Topic: Data Rates).

Shall 802.11 standard supports multiple, simultaneous data rate PHYs?

(editor's note: It seems that this Issue is equivalent to 18.2)

Alternatives:

1) - Yes

Arguments:

General:

1.0) - (Taken from Meeting discussion) - The increase rate is only relative to old generation equipment (migration)

- Fall-back rate is a separate issue.
- Conformance questions: Are all rates required? some optional?
- Cost: The increase of rate is presumed to add cost; one must get 'something for his/her money'.
- Throughputs: Is units of throughput are different or the same than performance?

2.0) - explore each MAC proposal in the ability to handle multiple, simultaneous PHY data rates.

- WHY?
  1.) Increase rate in next generation
  2.) Lower speed to increase reliability

Classifications:

- Class 1.) - BSS (other rates in other BSS within ESS) (only works in multi-channel environ.)
- Class 2a.) - per station (stations are fixed at different rates.)
- Class 2b.) - per station (stations are capable of lowest common rate.)
- Class 3.) - within a frame (Wim contends this the level 2.)

Class 3:

- Common data rate at beginning of frame (NCR PHY specific fields) - not differing in frame, just preamble.
- "preamble" includes start delimiter and PHY specific information.
- Function could include speed determination. (i.e. 1 or 2 Mb/s). MAC of Transmitter needs to know data rate to use (tells the PHY).
- Multi-cast packets within BSS are retransmitted by AP at Lowest common denominator of STA associated with AP.

Class 1:

- Class 1 is simply a PHY type. MAC knows based on ID of PHY.
- What about PHY capable of multiple rates?
  - multi-rates is desirable. sooner or later we will have higher data rates -- a fact. However, APs assume all station can hear it. If multi-rates at same time this is a problem. Think of N data rates.
  - IBM protocol will not take advantage of higher rates due to fixed slot times.
  - Same holds true for Gaps. Need to be smaller for higher data rates. Technically dependent.

Class 2:

- Contends that Class 2 is not viable.
- Can we put hooks in now to accommodate future rates?
- Not necessary; dual mode devices can be made in channelized systems without any.

- What are our options to address this?
- Channelize (easiest coexistence means)
- core rate negotiation (works in single channel PHY)

Issues/Problems:

Multicast/Broadcast: All stations must be able to receive Multicast without having to send "n" copies where "n" is number of rates. Definition is interoperability (same as Ad-Hoc).

Coexistence: Definition. All station must support the same medium access rules. i.e. energy detection may solve problem, but length fields break it (everyone must read length). If in the same band and code space "We are all on the same wire"

Ad-Hoc networks: Same as Multicast/Broadcast (Bootstrap may be harder -- initialization)

Time-Bounded services (interaction with reservation system) Definition: The one doing the reservation must know the data rate of each station associated with it. The coordination of any speed change and the coordination of TB reservation need to be one and the same. Only applies AFTER reservation for a connection has been set.

Power Management (receive time stamps) Definition: Same as Multicast/Broadcast - must be sure all can hear time reference. There are some synchronization implications. Negotiated rondivous [??] are similar to TB situation.

Worry of inefficiency of backward compatibility method. (The cost of NOT providing the hooks) Complexity of feature in MAC. (all of the above) Definition: Identify the hook and the cost.

Worry about minimal amount of information that needs to be at common speed. Every frame / "n" frames.

Roaming: reaquisition of channel -- reassociation.

Assumptions:
MAC tells PHY which data rate to transmit MSDU
PHY will tell MAC what speeds it capable of
PHY will tell MAC what speed latest frame was received.

Matrix of orthogonal axis:
Channelized and Non-channelized PHY: DSSS, FHSS and IR PHY - All 11 MAC proposals.

Message to MAC Authors: MAC Authors should address above issues. Assess throughput gain to 2x PHY rate difference.

Group (Issue study group) agrees that some mechanism for accommodating increased speed migration must be provided in the MAC (PHY also!). Consequences of failing to do it are undesirable ad-hoc solutions.

Pro:

1.1) - For the purpose of increasing rates and only for significant throughput gains.

Con:

1.1) - The MAC will work in other frequency band (i.e 1.9 GHZ) which provides a better throughput.

Related Issue Identification:

1) - 18.2 (Data Rates)
2) - 18.5 (Data Rates)

Issue Originator: Dave Bagby
- History: September 1993: Date first opened - Alternative #1, Argument-general #1.0 & 2.0, Argument-pro #1.1 and Argument-con #1.1.

Issue History:

September 1993: Date first opened - Alternative #1, Argument_general #1.0 & 2.0, Argument_pro #1.1 and Argument_con #1.1.

Issue Status: Open

Issue Identification: 20.2 (Topic: Data Unit Structure).

Can the MAC handle different preamble lengths from different PHYs ?

Alternatives:

1) - No
2) - Yes

References:

1) - P802.11-93/54 - The CODIAC Protocol - Centralized or Distributed Integrated Access Control (CODIAC), A Wireless MAC Protocol.
2) - P802.11-93/146 - The Need for MAC Data Delimiters in the PHY.

Arguments:

Pro:

1.1) - If different PHYs must generate different preamble lengths then preamble should be handled by the Medium Independent Layer, which is on the PHY side of the MAC/PHY interface. The preamble would be stripped off by the time the frame is seen by the MAC.
To facilitate MAC independence from preamble length, perhaps the preamble should not be considered part of the MAC frame.

2.1) - (Reference #2) - The PHY should be responsible for generating the preamble, upon a MAC command. The PHY should indicate the end of the preamble to the MAC, so that the MAC can start generating the MSDU data.

Con:

Related Issue Identification:

Issue Originator:

Issue History:

May 1992: Date first opened
May 1993: Alternative #1 - Reference #1 - Argument_pro #1.1.
September 1993: Alternative #2, Reference #2 and Argument_pro #2.1

Issue Status: Open

Issue Identification: 20.5 (Topic: Data Unit Structure).

Should the 802.11 MAC or PHY be responsible for MAC data delimiter generation and detection?

Alternatives:

1) - MAC=No, PHY=Yes

References:

1) - P802.11-93/146 - The Need for MAC Data Delimiters in the PHY

Arguments:

Pro:

1.1) - (Reference #1) - Only the PHY can implement proper means for end delimiter detection. It can start delimiter detection in various ways, including bit-stream detection.

- Start delimiter detection on the PHY allows for the implementation of a PHY-to-PHY signalling field. This is desirable for migration flexibility to future standards. It is further needed to allow mixed bit rate implementations where the PHY is to adapt automatically to the proper speed.

Con:

1.1) - The MAC can only do bit-stream delimiting detection. This is acceptable for a start delimiter, but not for an end delimiter, because it violates the hamming distance requirements of 802.

Related Issue Identification:

1) - 12.1 (Interfaces)

Issue Originator: W. Diepstraten

Issue History:

September 1993: Date first opened - Alternative #1, Reference #1, Argument_pro #1.1 and Argument_con #1.1.

Issue Status: Open

Issue Identification: 24.3 (Topic: PHY Types).

How multiple PHY support for the MAC be specified ?

Alternatives:

1) - In the MAC Layer
2) - In the PHY adaptation layer at the bottom of MAC (see Reference #2).
3) - In a PHY dependent MAC sublayer (see Reference #3)

References:

1) - P802.11-93/40 - The Wireless Hybrid Asynchronous Time-bounded MAC Protocol.
2) P802.11-93/115 - Protocol Layering Alternatives for Practical Implementation.
3) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:

Pro:

1.1) - The intelligence should be in the MAC layer. There should be a PHY specific sub-layer in the MAC to accommodate different wireless PHYs. One way to provide parameters to the interface is to provide a field in the MAC header that is used to pass PHY specific information across the MAC/PHY interface, and from MAC to MAC. The WHAT protocol (see Reference #1) follows this approach.

2.1 - (Reference #2) - This adaptation layer processes PHY specific information, inserts and extracts such information to/from MAC headers being exchanged over the wireless media.

3.1) - (Reference #3) - A PHY dependent MAC sublayer will be defined that generates and processes PHY specific information in the MPDU header. There will also be a MAC management entity that implements certain PHY specific functions. The PHY layer will also include PHY specific and PHY independent sublayers.

Con:

Related Issue Identification:

1) - 12.1 (Topic: Interfaces)

Issue Originator:

Issue History:

May 1992: First opened
March 1993: Alternative #1 - Reference #1 - Argument_pro #1.1.
September 1993: Alternative # & #3, References #2 & #3 and Argument_pro #2.1 & #3.1.

Issue Status: Open

Issue Identification: 24.6 (Topic: PHY Types).

Does the PHY layer provide the PHY type to the MAC layer ?

Alternatives:
1) - Yes

References:
1) - P802.11-93/115 - Protocol Layering Alternatives for Practical Implementation.
2) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:
Pro:
1.1) - The MAC must be able to identify the type of PHY being used.

Con:

Related Issue Identification:
- 12.1 (Topic: Interfaces)

Issue Originator:

Issue History:
May 1992: First opened
September 1993: - Alternative #1, Reference #1 & #2 and Argument-pro #2.1.

Issue Status: Open

Issue Identification: 24.7 (Topic: PHY Types).

Will the MAC standard specify the support of multiple PHYs transparently ?

Alternatives:

1) - Yes
2) - No

References:

1) - P802.11-93/30 - Wireless LAN MAC Protocol: PHY Layer Transparency.
2) - P802.11-93/115 - Protocol Layering Alternatives for Practical Implementation.
3) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:

Pro:

1.1) - P802.11-93/30 describes how the MAC Protocol (described in P802.11-92/39) can be adapted in a straight forward manner to address several PHY layer types:

- Infra-red
- Spread Spectrum Direct Sequence
- Spread Spectrum Frequency Hopping
- Multi-channel Spectrum

1.2) - See Reference #2

1.3) - See Reference #3

Con:

Related Issue Identification:

1) - 24.3 (Topic PHY Types)

Issue Originator:

Issue History:

May 1992: First opened
March 1993: Alternatives #1 and 2 - Reference #1 - Argument_pro #1.1.
September 1993: Reference #2 & #3 and Argument_pro #1.2 & #1.3.

Issue Status: Open

Issue Identification: 24.8 (Topic: PHY Types).

What functions are required in the Medium Independent PHY layer?

Alternatives:

1) - None
2) - The interface to the MAC that implements the core functions (Reference #2 - Section 4

References:

1) - P802.11-93/115 - Protocol Layering Alternatives for Practical Implementation.
2) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:

Pro:

1.1) - (Reference #1) - This layer is unnecessary. All medium-independent functions are able to be performed in MAC. The "adaptation" or "convergence" function is needed at the bottom of MAC - not at the top of PHY. The appropriate MAC/PHY interface is to the "medium dependent" portion of PHY.

Con:

Related Issue Identification:

Issue Originator: Jim Schuessler

Issue History:

November 1992: First opened
September 1993: Alternatives #1 & #2, References #1 & #2 and Argument_pro #1.1.

Issue Status: Open

Issue Identification: 24.9 (Topic: PHY Types).

Given a Frequency Hopping (FH) PHY, which protocol entity is responsible for the real time aspect of the PHY layer?

Alternatives:

1) - PHY adaptation layer within the MAC (see Reference #1)
2) - MAC

References:

1) - P802.11-93/115 - Protocol Layering Alternatives for Practical Implementation.
2) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:

General:

1.0) - The wording of the Issue is ambiguous.

Pro:

1.1) - (Reference #1) - This adaptation layer controls the timing of the hopping and the channel sequence. The PHY (medium dependent portion) controls the tuning changes necessary to execute the hops commanded from the PHY adaptation layer.

2.1) - (Reference #2) - The MAC must tell the PHY when to tune to a new frequency and therefore controls the timing of the frequency hopping. The PHY controls all other realtime aspects.

Con:

Related Issue Identification:

Issue Originator: Phil Langer

Issue History:

January 1993: Date first opened
September 1993: Alternatives #1 & #2, References #1 & #2, Argument_general #1.0 and Argument_pro #2.1.

Issue Status: Open

Issue Identification: 24.11 (Topic: PHY Types).

~~1) How will Hopping synchronization, acquisition and tracking be accomplished in the Frequency Hopping (FH) and their terms defined?~~

2) - How will:
a) - synchronization, acquisition and tracking be accomplished when using Frequency Hopping (FH) PHY?; and
b) - their terms defined as they relate to FH?

Alternatives:
1) - The MAC makes decision related to PHY control when the appropriate information is only known by the MAC.
2) - See Reference #1

References:
1) - P802.11-93/148 - Preamble and MAC Header to Support Hop Acquisition for a Frequency Hopped PHY.

Arguments:

General:
1.0) - (Reference #1 - Abstract) - The requirements for the MAC header to support hop acquisition and timing are investigated. A preamble suitable for a frequency hopped radio is also presented. The preamble should support carrier detection/antenna diversity selection, baseband DC offset adjustment, and symbol timing recovery and unique word detection.

Pro:
1.1) - The MAC must make decisions regarding PHY control where information is used that only the MAC has.
The PHY will not interpret received information with the exception of any that is in the PHY header or any non-data symbols. All information received by the PHY will be passed to the MAC other than the PHY header and any non-data symbols.

The following synchronization and acquisition functions must be commanded by the MAC:
- some sort of timing reference,
- what pattern sequence is to be used,
- what state the PHY should be in (e.g. sync hunt, receiver on/off).

Con:
1.1) - The MAC should not directly control very time critical operations of the PHY or the MAC; implementation will be difficult.
Trying to control from the MAC all the FH parameters that some suggest, will make the MAC too complex and delay the standard too much. If the MAC must control these parameters, incorporate what is now the top PHY sub-layer into the MAC and don't worry that breaks with tradition.

Related Issue Identification:

Issue Originator: 802.11 PHY Group

Issue History:
May 1993: Date first opened
July 1993: New Issue text (#2), Alternative #1, Argument-pro #1.1 and Argument_con #1.1.
September 1993: Alternative #2, Reference #1 and Argument_general #1.0.

Issue Status: Open

Issue Identification: 24.12 (Topic: PHY Types).

What are the values in the Template defined in the current version of P802.11-93/83 (reference #1) related to Direct Sequence Spread Spectrum (DSSS) PHY?

Alternatives:

References:

1) - P802.11-93/83 - Draft Proposal for a Frequency Hopping and Direct Sequence Spread Spectrum PHY Standard.

Arguments:

Pro:

Con:

Related Issue Identification:

Issue Originator: 802.11 PHY Group

Issue History:

July 1993: Date first opened

Issue Status: Open

Issue Identification: 24.13 (Topic: PHY Types).

What are the values in the Template defined in the current version of P802.11-93/83 (reference #1) related to Frequency Hopping Spread Spectrum (FHSS) PHY?

Alternatives:

References:

1) - P802.11-93/83 - Draft Proposal for a Frequency Hopping and Direct Sequence Spread Spectrum PHY Standard.

Arguments:

Pro:

Con:

Related Issue Identification:

Issue Originator: 802.11 PHY Group

Issue History:

July 1993: Date first opened

Issue Status: Open

Issue Identification: 24.14 (Topic: PHY Types).

What are the values in the Template defined in the current version of P802.11-93/83 (reference #1) related to Infra Red (IR) PHY?

Alternatives:

References:
1) - P802.11-93/83 - Draft Proposal for a Frequency Hopping and Direct Sequence Spread Spectrum PHY Standard.

Arguments:
Pro:

Con:

Related Issue Identification:

Issue Originator: 802.11 PHY Group

Issue History:
September 1993: Date first opened - Reference #1.

Issue Status: Open

Issue Identification: 25.2A (Topic: Channel).

Must the MAC work on a single channel PHY ?

Alternatives:
1) - Yes

References:
1) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:
General:

Pro:
1.1) - See Reference #1

Con:

Related Issue Identification:
1) - 25.2 - Channel

Issue Originator: C. Heide

Issue History:
May 1993: Date first opened - Alternative #1
September 1993: Reference #1 and Argument_pro #1.1.

Issue Status: Open

Issue Identification: 25.2B (Topic: Channel).

Will the standard support multiple channel PHYs ?

Alternatives:
1) - Yes

References:
1) - P802.11-93/140 - MAC/PHY Functional Partitioning

Arguments:
General:

Pro:
1.1) - See reference #1.

Con:

Related Issue Identification:
1) - 25.2 - Channel

Issue Originator: C. Heide

Issue History:
May 1993: Date first opened - Alternative #1
September 1993: Reference #1 and Argument_pro #1.1.

Issue Status: Open