

Cl 00 SC P L # 3
COORDINATION, EDITORIAL

Comment Type ER Comment Status D

Good to go, Section 1 comments have been addressed.
-Mike Fisher, IEEE Staff Editor

SuggestedRemedy

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 00 SC P L # 59
PONNUSWAMY, SUBBURAJAN Individual

Comment Type G Comment Status D

more reason to keep it, as there may be

SuggestedRemedy

To

Proposed Response Response Status W

PROPOSED REJECT. Entry error on web form.

Cl 00 SC P L # 19
WORSTELL, HARRY R Individual

Comment Type TR Comment Status D

This ballot does not contain the 802.11e ammendment and should include it. I vote NO.

SuggestedRemedy

Include 802.11e in the rollout

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 00 SC P L # 20
COORDINATION, SCC14

Comment Type GR Comment Status D

In the early pages (!) of this document there is a large section devoted to definitions. However, it does not include definitions of "byte" and "octet". In some standards the two terms are synonymous, but in this standard the terms are used and are not synonyms. Please add the two definitions.

SuggestedRemedy

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE. All uses of "byte" the the text are synonymous with "octet". Replace all occurrences of "byte" with "octet", except in the C code in Annex H.

In H.5.1:

1. replace "preferable" with "preferably",
2. replace "lowest byte of time" with "least significant octet of the timestamp" in three locations,
3. replace "packet is seen" with "packet is received",
4. replace "concatenate the seen time" with "concatenate this octet",
5. replace "take the lowest byte of RSSI" with "take the least significant octet of RSSI",
6. replace "concatenate the sent time, received time, RSSI, and Snonce" with concatenate the sent time, received time, RSSI, and SNonce octets"

Cl 00 SC P L # 57
PONNUSWAMY, SUBBURAJAN Individual

Comment Type G Comment Status D

TGH, and should remain in the standard.

SuggestedRemedy

Proposed Response Response Status W

PROPOSED REJECT. Entry error on web form.

CI 00 SC P L # 56
 PONNUSWAMY, SUBBURAJAN Individual
 Comment Type **G** Comment Status **D**
 State 1. This capability was added by
 SuggestedRemedy
 vi) Action
 Proposed Response Response Status **W**
 PROPOSED REJECT. Entry error on web form.

CI 00 SC P L # 60
 PONNUSWAMY, SUBBURAJAN Individual
 Comment Type **G** Comment Status **D**
 applications which use this capability.
 SuggestedRemedy
 vi) Spectrum Management Action
 Proposed Response Response Status **W**
 PROPOSED REJECT. Entry error on web form.

CI 00 SC P L # 61
 PONNUSWAMY, SUBBURAJAN Individual
 Comment Type **G** Comment Status **D**
 Now, and prior to the introduction of TGW
 SuggestedRemedy
 Proposed Response Response Status **W**
 PROPOSED REJECT. Entry error on web form.

CI 00 SC P L # 62
 PONNUSWAMY, SUBBURAJAN Individual
 Comment Type **G** Comment Status **D**
 all Action frames, whether sent in State
 SuggestedRemedy
 Proposed Response Response Status **W**
 PROPOSED REJECT. Entry error on web form.

CI 00 SC P L # 83
 KLEINDL, GUNTER Individual
 Comment Type **TR** Comment Status **X**
 With this revision the definition of 11a, 11b and 11g get lost.
 SuggestedRemedy
 Indicate in the PICS (Annex A) which items are mandatory for 11a, 11b and 11g.
 Proposed Response Response Status **O**

CI 00 SC P L # 63
 PONNUSWAMY, SUBBURAJAN Individual
 Comment Type **G** Comment Status **D**
 1 or State 3 are unprotected
 SuggestedRemedy
 Proposed Response Response Status **W**
 PROPOSED REJECT. Entry error on web form.

CI 00 SC P L # 58
 PONNUSWAMY, SUBBURAJAN Individual
 Comment Type **G** Comment Status **D**
 Yes, this is a unique capability, all the
 SuggestedRemedy
 Within an IBSS, action frames are class 1.
 Proposed Response Response Status **W**
 PROPOSED REJECT. Entry error on web form.

CI 00 SC P L # 55
 PONNUSWAMY, SUBBURAJAN Individual
 Comment Type **G** Comment Status **D**
 802.11 to support Action frames in
 SuggestedRemedy
 Proposed Response Response Status **W**
 PROPOSED REJECT. Entry error on web form.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
 COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
 SORT ORDER: Clause, Subclause, page, line

CI 00
 SC

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CI 00 SC P 565 L # 80
 MORETON, MIKE Individual
 Comment Type TR Comment Status X
 It's no longer possible to identify which PICS items were introduced in which ammendment.
 As users of this standard tend to identify functionality by the name of the ammendment that introduced it, this is a bit of a problem.
 SuggestedRemedy
 Add definitions of "802.11a", "802.11b" etc.
 Proposed Response Response Status O

CI 00 SC Generally P L # 9
 STEPHENS, ADRIAN P Individual
 Comment Type E Comment Status D
 There are no line numbers
 SuggestedRemedy
 Add them
 Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 00 SC M P L # 71
 MYLES, ANDREW F Individual
 Comment Type TR Comment Status D
 This annex allegedly provides an AP functional description
 However, in reality it has very limited value given that it is mostly content free and almost totally disconnected from implementation reality. The use of a large number of new terms and the semi-formal specification language only increases its obscurity.
 SuggestedRemedy
 Remove entire annex
 Proposed Response Response Status W
 PROPOSED REJECT. The material in the annex does provide useful information to readers new to the standard, to understand the function and description of an AP, without providing normative requirements.

CI 00 SC N P L # 72
 MYLES, ANDREW F Individual
 Comment Type TR Comment Status D
 There is little obvious value in this annex
 SuggestedRemedy
 Remove entire annex
 Proposed Response Response Status W
 PROPOSED REJECT. The material in the annex does provide useful information to readers new to the standard, to understand the function and description of an AP, without providing normative requirements.

CI 00 SC N & M P L # 7
 STEPHENS, ADRIAN P Individual
 Comment Type ER Comment Status X
 There is confusion between these two annexes as to exactly what an AP is. Annex N provides no means for an AP to discover about mapping changes from the DS. Annex M says that this is possible.
 SuggestedRemedy
 There probably needs to be a new DS-STA-NOTIFY.request (from DS to AP) to provide this communication. Alternatively the use of terms like AP needs to be clarified (i.e. in M it includes the DS, in N they are called out separately).
 Proposed Response Response Status W
 Darwin to provide draft response.

CI 02 SC 2 P 3 L # 37
 O'HARA, ROBERT Individual
 Comment Type T Comment Status D
 RFC 4086 obsoleted RFC 1750 (it still has the same title).
 SuggestedRemedy
 Change RFC 1750 to RFC 4086.
 Proposed Response Response Status W
 PROPOSED ACCEPT. Include correct date in citation.

Cl 02 *SC* 2 *P* 3 *L* # 36
 O'HARA, ROBERT Individual
Comment Type **G** *Comment Status* **D**
 Old citation for IEEE 802.1X dating from when it was a draft.
SuggestedRemedy
 IEEE P802.1X-2004 citation should remove the "P" and change the name to the official name (no draft!): "IEEE Standard for Local and Metropolitan Area Networks: Port-Based Network Access Control".
Proposed Response *Response Status* **W**
 PROPOSED ACCEPT.

Cl 02 *SC* 2 *P* 3 *L* # 39
 O'HARA, ROBERT Individual
Comment Type **E** *Comment Status* **D**
 IEEE Std 802-1990 should be -2001.
SuggestedRemedy
 Change to IEEE Std 802-2001.
Proposed Response *Response Status* **W**
 PROPOSED ACCEPT.

Cl 02 *SC* 2 *P* 3 *L* # 35
 O'HARA, ROBERT Individual
Comment Type **G** *Comment Status* **D**
 Many of the RFCs cited here are in fact not IETF standards (nor are they even standards-track documents), but are informational documents, yet they are cited here as "normative" references.
SuggestedRemedy
 Use the citation format from the RFC index, which has the standardization status as part of the citation.
Proposed Response *Response Status* **W**
 PROPOSED ACCEPT.

Cl 02 *SC* 2 *P* 3 *L* # 38
 O'HARA, ROBERT Individual
Comment Type **T** *Comment Status* **D**
 Citation for RFC 4017 has inaccurate title.
SuggestedRemedy
 Change title of RFC 4017 to "Extensible Authentication Protocol (EAP) Method Requirements for Wireless LANs".
Proposed Response *Response Status* **W**
 PROPOSED ACCEPT.

Cl 03 *SC* 3.10 *P* 5 *L* # 41
 O'HARA, ROBERT Individual
Comment Type **E** *Comment Status* **D**
 Incorrect citation of IEEE 802.1X.
SuggestedRemedy
 Replace with "IEEE 802.1X-2004."
Proposed Response *Response Status* **W**
 PROPOSED ACCEPT.

Cl 03 *SC* 3.106 *P* 11 *L* # 42
 O'HARA, ROBERT Individual
Comment Type **E** *Comment Status* **D**
 Incorrect citation of IEEE 802.1X.
SuggestedRemedy
 Replace with "See IEEE 802.1X-2004."
Proposed Response *Response Status* **W**
 PROPOSED ACCEPT.

CI 03 SC 3.107 P 11 L # 43
 O'HARA, ROBERT Individual
 Comment Type E Comment Status D
 Lack of parallel structure with 3.11.
 SuggestedRemedy
 Should have similar structure, such as: "The medium access control (MAC) address of the IEEE 802.1X Supplicant."
 Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 03 SC 3.11 P 5 L # 44
 O'HARA, ROBERT Individual
 Comment Type E Comment Status D
 Awkward sentence structure.
 SuggestedRemedy
 Would be clearer as: "The medium access control (MAC) address of the IEEE 802.1X Authenticator."
 Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 03 SC 3.116 P 12 L # 45
 O'HARA, ROBERT Individual
 Comment Type E Comment Status D
 Inconsistent definition. The synonym for "unicast frame" should be "directed frame" not "directed address".
 SuggestedRemedy
 Change "directed address" to "directed frame".
 Proposed Response Response Status W
 PROPOSED ACCEPT.
 Change 3.30 and 3.116 to "directed frame"
 In 9.8, change "either directed or group-addressed" to "either individual or group-addressed".

CI 03 SC 3.19 P 6 L # 46
 O'HARA, ROBERT Individual
 Comment Type E Comment Status D
 The name of the defined term is not in boldface.
 SuggestedRemedy
 Change formatting of "channel spacing" to boldface.
 Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 03 SC 3.24 P 6 L # 47
 O'HARA, ROBERT Individual
 Comment Type E Comment Status D
 Remove the second "with" from the name of the defined term.
 SuggestedRemedy
 Change all instances that spell out the definition of CCMP to remove the second "with".
 Proposed Response Response Status W
 PROPOSED ACCEPT. Make the deletion in the following clauses:
 3.24 in two places
 3.79
 3.95
 4
 5.2.3.2
 A.4.4.1 PC34.1.2.1

CI 03 SC 3.26 P 6 L # 40
 O'HARA, ROBERT Individual
 Comment Type E Comment Status D
 Missing punctuation.
 SuggestedRemedy
 Add a space after "disclosure" and add a period at end of sentence.
 Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 03 SC 3.69 P 9 L # 48
O'HARA, ROBERT Individual

Comment Type E Comment Status D
Too much detail.

SuggestedRemedy

No need to mention frame types when defining multicast. Remove all text after the first sentence of the definition.

Proposed Response Response Status W

PROPOSED ACCEPT.
replace:

3.69 multicast: A medium access control (MAC) address that has the group bit set. A multicast MAC service data unit (MSDU) is one with a multicast destination address. A multicast MAC protocol data unit (MPDU) or control frame is one with a multicast receiver address.

by:

3.69 multicast: When applied to a MAC service data unit (MSDU), it is an MSDU with a multicast address as the destination address (DA). When applied to a MAC protocol data unit (MPDU) or control frame it is an MPDU or control frame with a multicast address as the receiver address (RA).

3.69a multicast address: A medium access control (MAC) address that has the group bit set.

3.69b multicast-group address: A medium access control (MAC) address associated by higher level convention with a group of logically related stations.

(the latter is consistent with an existing definition in the standard)

In reviewing the usage of "multicast address" I find it is used inaccurately in the following places so I suggest also:

In 9.7, replace all instances
Add "-group" after "multicast" to become:
4—"Data(bc/mc)" represents any frame of type Data with a broadcast or multicast-group address in the Address1 field.

In the description of MIB, "dot11GroupAddressesTable"
replace "multicast Address" by "multicast-group address"

In the description of MIB component, "dot11GroupAddressesEntry" -> "dot11Address"
replace "multicast Addresses" by "multicast-group addresses"

CI 03 SC 3.72 P 9 L # 49
O'HARA, ROBERT Individual

Comment Type E Comment Status D
Circular definition.

SuggestedRemedy

Don't use "pair" or "pairwise" when defining "pairwise". This definition avoids this issue: "Referring to, or an attribute of, two entities that are associated with each other, e.g., an access point (AP) and an associated station (STA), or two STAs in an independent basic service set (IBSS) network. This term is used to refer to a type of encryption key hierarchy pertaining to keys shared by only two entities."

Proposed Response Response Status W
PROPOSED ACCEPT.

CI 03 SC 3.8 P 5 L # 50
O'HARA, ROBERT Individual

Comment Type E Comment Status D
Circular definition.

SuggestedRemedy

Remove the word "suite" from the definition, or define it.

Proposed Response Response Status O
Mike Moreton to propose resolution.

CI 03 SC 3.9 P 5 L # 51
O'HARA, ROBERT Individual

Comment Type E Comment Status D
Incorrect citation of IEEE 802.1X.

SuggestedRemedy

Replace with "IEEE 802.1X-2004."

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 05 SC 5.6, a), 2), vi) P 36 L # 64
 PONNUSWAMY, SUBBURAJAN Individual

Comment Type TR Comment Status D

TGm has removed the capability of 802.11 to support Action frames in State 1. This capability was added by TGh, and should remain in the standard. Yes, this is a unique capability, all the more reason to keep it, as there may be applications which use this capability. Now, and prior to the introduction of TGw all Action frames, whether sent in State 1 or State 3 are unprotected.

SuggestedRemedy

Change from vi) Action within an IBSS, action frames are Class 1. To vi) Spectrum Management Action

Proposed Response Response Status W

PROPOSED REJECT. The reason for restricting the use of Action frames to class 3 in an infrastructure BSS is to limit the times when a STA must interpret and respond to an Action frame. When associated to an AP, a STA only needs to be responding to action frames from its AP. Requiring that Action frames be Class 1 in all cases leads to a new denial of service attack against a STA.

Cl 05 SC 5.6, a), 2), vi) P 36 L # 54
 PONNUSWAMY, SUBBURAJAN Individual

Comment Type TR Comment Status D

TGm has removed the capability of

SuggestedRemedy

Change from

Proposed Response Response Status W

PROPOSED REJECT. Entry error on web form.

Cl 05 SC 5.7 P 38 L # 53
 O'HARA, ROBERT Individual

Comment Type E Comment Status D

It seems that the section heading for "Reference Model" was deleted between D3.0 and D4.0 -- it used to be at 5.9, but now the text and diagram are concatenated with section 5.7 entitled "Differences between ESS and IBSS LANs". I think the section heading should be restored (now it would be 5.8).

SuggestedRemedy

Insert the correct heading and section number, renumber subsequent sections.

Proposed Response Response Status W

PROPOSED ACCEPT. In addition to the suggested remedy, ensure that any references to the new 5.8 are correctly linked and that current references to 5.8 are changed to 5.9.

Cl 06 SC 6.2.1.1.1 P 49 L 1 # 2
 JAMES, DAVID V Individual

Comment Type TR Comment Status D

(These apply throughout; the page, sub-clause, and line numbers were put in to bypass the format checker and are only relevant for a small portion of this comment)

This document does not conform to the IEEE Style Manual.

A couple of examples:

- 1) List of Figures ==> List of figures
- 2) Figure 118 in TOF breaks across line
- 3) Redundant/confusing names:
destination address, DA
- 4) Mbit/s ==> Mb/s
- 5) State machine on #811 not consistent with state machine notation in other 802 specifications

SuggestedRemedy

Conform to the IEEE Style Manual.

If necessary, please request assistance from the IEEE Editors.

Proposed Response Response Status W

PROPOSED ACCEPT. The Working Group editor is working with the IEEE-assigned project editor to ensure conformance with the IEEE Style Manual.

Change abbreviation for "megabits per second" to the correct spelling throughout (either Mbit/s or Mb/s).

There is no requirement for state machine format consistency between 802 documents.

Cl 07 SC 7.1.3.1.9 P L # 17
 STEPHENS, ADRIAN P Individual

Comment Type E Comment Status D

"Only WEP is allowed as the cryptographic encapsulation algorithm for management frames of subtype Authentication." This statement doesn't relate to the interpretation of the Protected Frame Field.

SuggestedRemedy

Move to an appropriate section under the format of the authentication frame.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Delete the last sentence of the clause. Change "When the Protected Frame field is set to 1 in a data frame" to "When the Protected Frame field is set to 1".

Cl 07 SC 7.3.2 P 80 L # 28
 O'HARA, ROBERT Individual

Comment Type T **Comment Status D**

As all bits in the Capability Information Field are now consumed, a new place to identify the use of new capabilities must be defined. An information element is the perfect place for this.

SuggestedRemedy

Add a new "Extended Capability Information Field" IE that is a bit field capable of extension to the full length of an IE.

Proposed Response **Response Status W**

PROPOSED ACCEPT. Incorporate text from 11/05-xxx from Kapil Sood. Change the format of the

Cl 08 SC 8.1.3 P 113 L 1 # 74
 DHARANIPRAGADA, KALYAN R Individual

Comment Type G **Comment Status D**

Usage of "a RSNA" and "an RSNA" is inconsistent

SuggestedRemedy

Use "a RSNA"

Proposed Response **Response Status W**

PROPOSED ACCEPT. The text is to made consistent.

Cl 08 SC 8.1.3 P 113 L 6 # 75
 DHARANIPRAGADA, KALYAN R Individual

Comment Type G **Comment Status D**

words "to protect" are redundant

SuggestedRemedy

It programs the agreed-upon temporal keys and cipher suites into the MAC and invokes protection.

Proposed Response **Response Status W**

PROPOSED ACCEPT. Delete "to protect" from the first sentence of 8.1.3 a) 6).

Cl 08 SC 8.2.1.2 P L # 18
 STEPHENS, ADRIAN P Individual

Comment Type E **Comment Status D**

Footnote to Figure 86 seems out of place.

SuggestedRemedy

If it's necessary to say this, put it in a section on document conventions.

Proposed Response **Response Status W**

PROPOSED ACCEPT.

The footnote is not a necessary statement.

Delete the footnote.

Cl 08 SC 8.3.2.4 P 129 L 1 # 76
 DHARANIPRAGADA, KALYAN R Individual

Comment Type T **Comment Status D**

The standard requires the rate of MIC failures < 2 per 60 seconds! i.e. STA/Aps detecting 2 MIC failures in 60s must disable all receptions using TKIP for 60s. In addition the PTK and GTK should be changed (renegotiated) using a 4-way handshake. Can we have a MIB variable to configure the rate and set the default to 2/60

SuggestedRemedy

Introduce dot11RSNATKIPCounterMeasureRate = 2 (default) in dot11PrivacyTable

Proposed Response **Response Status W**

PROPOSED REJECT. The reason the rate of 2 per 60s is chosen is that to obtain the security objectives of the Michael MIC, i.e., to protect against frame forgeries, an attacker must require a certain, large amount of time to mount a successful attack against the MIC. In order to make the successful attack time large enough, the countermeasures must be carried out at a rate no less than that specified in the standard.

Cl 08 SC **8.3.2.4** P **129** L **1** # **77**
 DHARANIPRAGADA, KALYAN R Individual
 Comment Type **T** Comment Status **D**
 TKIP countermeasures optional/configurable?
 SuggestedRemedy
 Introduce dot11RSNATKIPCounterMeasures = TRUE (default) in dot11PrivacyTable
 Proposed Response Response Status **W**
 PROPOSED REJECT. The use of countermeasures in TKIP cannot be made configurable. To protect against frame forgeries, an attacker must require a certain, large amount of time to mount a successful attack against the MIC. In order to make the successful attack time large enough, the countermeasures must be carried out at a rate no less than that specified in the standard.

Cl 08 SC **8.3.3.3.3** P **140** L # **73**
 SHVODIAN, WILLIAM M Individual
 Comment Type **E** Comment Status **D**
 Some of the figures are very clear visually like Figures 100 and 101. Others are quite blocky and poor quality, like figure 89, 94, 95, 98, 99, 102, 103, and 104. This draft would be easier to read and look more professional if all of the figures had the same level of high quality.
 SuggestedRemedy
 Improve the visual quality of the figures.
 Proposed Response Response Status **W**
 PROPOSED ACCEPT. The editor is directed to determine a method to maintain a common, high quality for the figures.

Cl 08 SC **8.4.1.2.1** P **145** L # **30**
 O'HARA, ROBERT Individual
 Comment Type **E** Comment Status **D**
 The reference to section 5.5 is incorrect, after 5.5 was changed to 5.6.
 SuggestedRemedy
 change "5.5" to "5.6".
 Proposed Response Response Status **W**
 PROPOSED ACCEPT.

Cl 08 SC **8.5.1.1** P L # **84**
 MYLES, ANDREW F Individual
 Comment Type **TR** Comment Status **X**
 There is some concern that SHA-1 is not sufficiently strong as part of the PRF for the long term, although it is considered adequate in the short to medium term.
 SuggestedRemedy
 Make a modification in 7.3.2.25.2, 8.5.1.1 and possibly other clauses to allow the use of SHA-256 as part of the PRF instead of SHA-1 in a backward compatible way.
 In doing so other changes could also be made to the PRF to make precomputation attacks harder and prefix attacks impossible.
 Proposed Response Response Status **O**
 The commenter is asked to provide the details on how this can be accomplished "in a backward compatible way".

Cl 08 SC **8.5.1.2** P **156** L **2** # **29**
 O'HARA, ROBERT Individual
 Comment Type **T** Comment Status **D**
 the formula $PMK=L(PTK,0,256)$ is incorrect. The text is clearly stating that PMK is the first 256 bits of the AAA key.
 SuggestedRemedy
 Replace "PTK" with "AAA key".
 Proposed Response Response Status **W**
 PROPOSED ACCEPT.

Cl 08 SC **8.5.1.2** P **156** L **2** # **16**
 STEPHENS, ADRIAN P Individual
 Comment Type **TR** Comment Status **D**
 (Submitted on behalf of Jesse Walker, TGi editor)
 Line 2 says: "PMK <-- L(PTK, 0, 256)"
 This was an editorial error with normative consequences.
 SuggestedRemedy
 Replace the quoted text with:
 PMK <-- L(AAA Key, 0, 256)
 Proposed Response Response Status **W**
 PROPOSED ACCEPT.

Cl 08 SC **8.5.7.2** P **188** L **37** # **1**
 KARCZ, KEVIN J Individual
 Comment Type **E** Comment Status **D**
 EAPOL misspelled in definition of GTimeoutCtr as EAPIOL.
 SuggestedRemedy
 edit
 Proposed Response Response Status **W**
 PROPOSED ACCEPT.

Cl 09 SC **9.2.3.4** P **202** L # **81**
 MORETON, MIKE Individual
 Comment Type **TR** Comment Status **X**
 There are changes to EIFS behaviour, but these contradict changes made in the 802.11e amendment.
 SuggestedRemedy
 Incorporate the 802.11e amendment into this revision
 Proposed Response Response Status **O**
 double check this section after integration of 11e into the base revision draft.

Cl 09 SC **9.2.5.4** P **206** L # **79**
 MORETON, MIKE Individual
 Comment Type **TR** Comment Status **D**
 A STA should update its NAV if it receives a broadcast frame with a non-zero duration - otherwise there would be no point in sending one. While it could be argued that this is already the requirement, there seems to be some confusion, so it's best clarified.
 SuggestedRemedy
 Rephrase the first sentence as: "STAs receiving a valid frame shall update their NAV with the information received in the Duration/ID field, but only when the new NAV value is greater than the current NAV value and only when the frame is not addressed to the unicast address of the receiving STA."
 Proposed Response Response Status **W**
 PROPOSED ACCEPT IN PRINCIPLE.

Replace the first sentence in 9.2.5.4 with the following:
 STAs receiving a valid frame shall update their NAV with the information received in the Duration/ID field for all frames where the new NAV value is greater than the current NAV value, except those where the RA is equal to the receiving STA's MAC address.

Cl 09 SC **9.6** P **222** L # **82**
 MORETON, MIKE Individual
 Comment Type **TR** Comment Status **D**
 As far as I can see, an Authentication response has to be sent at a basic rate, as the AP will not know the extended rate set of the STA (well unless it's saved a previous Probe request). An AP should be allowed to use the rate at which the STA sent the frame. This is probably more of an issue once 11k starts using class 1 action frames.
 SuggestedRemedy
 Give explicit rules for the rates at which a management frame can be sent if the supported rate set is not known. That is, either a basic rate, or the rate of the last management frame sent by the recipient. In fact, maybe this should be extended to class 1 data frames where the Extended Rate Set is not known?
 Proposed Response Response Status **W**
 PROPOSED ACCEPT.

In the case where the supported rate set of the receiving STA is not known, the transmitting STA shall transmit at a rate selected from the basic rate set or a rate at which the transmitting STA has received a frame from the receiving STA.

Cl 10 SC **10.3.20.1.3** P **289** L # **52**
 O'HARA, ROBERT Individual
 Comment Type **T** Comment Status **D**
 This section is about sending EAPOL frames, not Michael MIC failures. This comment was first entered in LB75, but I goofed in the section number (entered it as 10.3.20.1.1 instead of 10.3.20.1.3) but had the line number on the page correct. There were two places on the page that needed correction; only the first was done in D3.0. In LB76 I voted yes, but submitted this comment again with the corrected section number. I don't find it in the resolution spreadsheet, and believe it never was registered as a comment in LB76.
 SuggestedRemedy
 Change sentence to: This primitive is generated by the SME when the SME has an 802.1X EAPOL-Key frame to send
 Proposed Response Response Status **W**
 PROPOSED ACCEPT.

Cl 11 SC 11.1.3 P 308 L # 8
STEPHENS, ADRIAN P Individual

Comment Type TR Comment Status D

"A STA may start its own BSS without first scanning for a BSS to join".
One of the issues I have with the structure of the document is that it claims that the SME is outside the scope of the specification, and therefore doesn't have a section for the SME. However it also makes normative statements that only make sense as specification for an SME.
This statement is an example of that, hopefully I'll notice and report a few more. Because control of sequencing of scanning/joining/starting is under control of the SME, this statement should read: "The SME of a STA may start its own BSS..."

SuggestedRemedy

Add a section containing statements for the SME and move the amended statement there.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Delete the sentence.

Cl 11 SC 11.1.3.2.1 P L # 10
STEPHENS, ADRIAN P Individual

Comment Type TR Comment Status D

"In each BSS there shall be at least one STA&"
This is an example of another class of generic error that is, unfortunately, far too common in this document - wrong use of "shall".
"Shall" introduces a normative requirement on the implementer. In this example, shall cannot introduce a normative requirement on the implementer because the BSS consists of multiple STA from multiple implementers.
It should be possible to trace most "shall" statements to PICS entries.

SuggestedRemedy

I recommend that the document be scanned and each occurrence of "shall" (there are 2258 of them) be validated.

In this example, what it meant to say: "The procedures defined in this subclause ensure that in each BSS there is at least one STA&"

Proposed Response Response Status W

PROPOSED ACCEPT. The editor is to identify those uses of "shall" that are not normative and replace with descriptive language.

Cl 11 SC 11.1.3.2.1 P 308 L # 78
MORETON, MIKE Individual

Comment Type TR Comment Status D

It's implicit that the BSSID field is ignored in received Probe request frames, but it would make things clearer if this was explicitly stated.

SuggestedRemedy

Explicitly say that the BSSID field is ignored even when the Receiver Address is a broadcast address.

Proposed Response Response Status W

PROPOSED REJECT.

The requested change directly conflicts with 11.1.3.2.2 c). However, the text does need clarification.

Change the first sentence of 11.1.3.2.1:
STAs, subject to criteria below, receiving Probe Request frames shall respond with a probe response only if

- a) the SSID in the probe request is the wildcard SSID or matches the specific SSID of the STA, and
- b) the BSSID field of the probe request is the broadcast address or matches the BSSID of the STA, and
- c) the DA field is the broadcast address or matches the MAC address of the STA.

Cl 11 SC 11.2.1.1 P L # 11
STEPHENS, ADRIAN P Individual

Comment Type T Comment Status D

How big is "ProbeDelay"? Answer: it's not specified.
This creates a problem because later amendments (e.g. 802.11n) may result in long sequences of frames that are not PHY compatible. The legacy system waits for a "ProbeDelay" for a valid legacy header. A protection solution for the new system is to ensure the transmission of a valid legacy frame every ProbeDelay - but without knowing what this value is, there is no way this can be achieved.

SuggestedRemedy

Recommend that ProbeDelay is given a value in this document. Recommend suitable value is largest 802.11e TXOP duration.

Proposed Response Response Status W

PROPOSED REJECT.

ProbeDelay is a parameter passed to the MLME by the SME. The value for this parameter is outside the scope of the standard.

Cl 11 SC 11.2.1.4 P L # 13
STEPHENS, ADRIAN P Individual

Comment Type T Comment Status D

I wonder if it's worth adding a comment here on preserving ordering when moving frames resulting from an indication that a STA has changes power-saving state.

SuggestedRemedy

Add note something like: "An AP that moves frames to and from its buffer as learns that a STA has changed power-saving state should preserve the relative order of those frames."

Proposed Response Response Status W

PROPOSED REJECT.

Commenter to bring this comment again, if incorporation of text from 802.11e does not address this topic.

Cl 11 SC 11.2.1.4 P L # 12
STEPHENS, ADRIAN P Individual

Comment Type TR Comment Status D

"An AP shall have an aging function to delete pending traffic when it is buffered for an excessive time period."

I'm not sure this normative requirement is necessary. It is certainly not testable without defining what "excessive" means.

SuggestedRemedy

Recommend turning this into an informative note.
Alternatively define the ageing algorithm so that compliance can be tested.

Proposed Response Response Status W

PROPOSED ACCEPT.

"An AP can delete buffered frames for implementation dependent reasons, including the use of an aging function and availability of buffers."

Cl 11 SC 11.2.1.9 P L # 14
STEPHENS, ADRIAN P Individual

Comment Type TR Comment Status D

"The AP shall have an aging function to delete buffered traffic when it has been buffered for an excessive period of time. That function shall be based on the ListenInterval parameter of the MLMEASSOCIATE request primitive of the STA for which the traffic is buffered."
"... shall have a function..." "... shall be based on ...".
Oh dear, oh dear, oh dear.

SuggestedRemedy

Either turn this into a recommendation, or provide enough specification that a compliant implementation can be constructed.

Proposed Response Response Status W

PROPOSED ACCEPT.

Delete the first two sentences of 11.2.1.9. Also, replace "The AP aging function" with "Any AP aging function" in the third sentence.

Cl 11 SC 11.3 P 319 L # 31
O'HARA, ROBERT Individual

Comment Type E Comment Status D

The reference to section 5.5 is incorrect, after 5.5 was changed to 5.6.

SuggestedRemedy

change "5.5" to "5.6".

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 11 SC 11.3 P 320 L # 25
 O'HARA, ROBERT Individual

Comment Type G Comment Status D

The current standard defines a number of values for result codes. Very few of these values have definitions for their use. Define how a STA is to respond upon receipt of particular values of the result code in a disassociation frame and when an AP is to use them.

Suggested Remedy

Append the following subclauses after 11.3.4:

11.3.5 STA disassociation procedure

Upon receipt of a Disassociation frame, a STA shall operate as follows:

- a) The MLME shall issue an MLME-DISASSOCIATE.indication with the ReasonCode parameter set to the value of the Reason Code received in the Disassociation frame.
- b) If the Reason Code indicates a configuration or parameter mismatch as the cause of the disassociation, the STA shall not attempt to associate or reassociate with the AP sending the Disassociation frame, until the configuration or parameter mismatch has been corrected.
- c) If the Reason Code indicates the STA was disassociated for a reason other than configuration or parameter mismatch, the STA shall not attempt to associate or reassociate with the AP sending the Disassociation frame until it has attempted to association or reassociate with at least one other AP or a period of 2 seconds has elapsed.

11.3.6 AP disassociation procedure

Upon receipt of an MLME-DISASSOCIATE.request, an AP shall use the following procedure when disassociating an STA:

- a) The AP shall send a Disassociation frame to STA being disassociated.
- b) The AP shall indicate a specific reason for the disassociation in the Reason Code field of the Disassociation frame. If any Reason Code value other than the unspecified reason Reason Code from Table 19 of clause 7.4.1.7 is appropriate for indicating the reason for the disassociation, the AP shall use that Reason Code value. The use of the unspecified reason value shall be used to indicate the STA was disassociated for a reason unrelated to all defined Reason Code values.

Proposed Response Response Status W

PROPOSED ACCEPT.

The commenter has identified the wrong clause. The correct clause is 11.4.

Append the following subclauses after 11.4.5:

11.4.6 Non-AP STA disassociation receipt procedure

Upon receipt of a Disassociation frame, a STA shall operate as follows:

- a)The MLME shall issue an MLME-DISASSOCIATE.indication with the ReasonCode parameter set to the value of the Reason Code received in the Disassociation frame.
- b)The state variable for the AP shall be set to State 2 if and only if it was not State 1.
- c)If the Reason Code indicates a configuration or parameter mismatch as the cause of the disassociation, the STA shall not attempt to associate or reassociate with the AP sending the Disassociation frame, until the configuration or parameter mismatch has been corrected.
- d)If the Reason Code indicates the STA was disassociated for a reason other than configuration or parameter mismatch, the STA shall not attempt to associate or reassociate with the AP sending the Disassociation frame until a period of 2 seconds has elapsed.

The STA's SME shall delete any PTKSA and temporal keys held for communication with the indicated STA by using the MLME-DELETEKEYS.request primitive (see 8.4.10) and by invoking MLME-SETPROTECTION.request(None) before invoking the MLME-DISASSOCIATE.request primitive.

11.4.7 AP disassociation initiation procedure

Upon receipt of an MLME-DISASSOCIATE.request, an AP shall use the following procedure when disassociating an STA:

- a)The AP shall send a Disassociation frame to STA being disassociated.
- b)The AP shall indicate a specific reason for the disassociation in the Reason Code field of the Disassociation frame. If any Reason Code value other than the unspecified reason Reason Code from Table 19 of clause 7.4.1.7 is appropriate for indicating the reason for the disassociation, the AP shall indicate that Reason Code value. The use of the unspecified reason value shall indicate the STA was disassociated for a reason unrelated to all defined Reason Code values.
- c)The state variable for the STA shall be set to State 2.
- d)The SME will update the DS.

The STA's SME shall delete any PTKSA and temporal keys held for communication with the indicated STA by using the MLME-DELETEKEYS.request primitive (see 8.4.10) and by invoking MLME-SETPROTECTION.request(None) upon receiving a MLME-DISASSOCIATE.indication primitive.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
 COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
 SORT ORDER: Clause, Subclause, page, line

Cl 11
 SC 11.3

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Cl 11 SC 11.3.1 P 319 L # 21
O'HARA, ROBERT Individual

Comment Type T Comment Status D

The current standard defines a number of values for status codes . Very few of these values have definitions for their use. Define how a STA is to respond upon receipt of particular values of status codes

SuggestedRemedy

Append the following text to clause 11.3.1 c):

The Status Code returned in the Association Response frame indicates the cause of the failed association attempt. Any misconfiguration or parameter mismatch, e.g., data rates required as Basic Rates that the STA does indicate as supported in the Supported Rates information element, shall be corrected before the STA attempts a subsequent association with the AP. If the Status Code indicates the association failed because of a reason that is not related to configuration, e.g., the AP is unable to support additional associations, the STA shall not attempt to associate with the same AP if other APs are available, until the STA has attempted to associate with at least one other AP or a period of 2 seconds has elapsed.

Proposed Response Response Status W

PROPOSED ACCEPT.

The commenter has identified the incorrect clause. The correct clause is 11.4.1.

Append the following text to clause 11.4.1 c):

The Status Code returned in the Association Response frame indicates the cause of the failed association attempt. Any misconfiguration or parameter mismatch, e.g., data rates required as Basic Rates that the STA did not indicate as supported in the STA's Supported Rates information element, shall be corrected before the SME issues an MLME-ASSOCIATE.request for the same AP. If the Status Code indicates the association failed because of a reason that is not related to configuration, e.g., the AP is unable to support additional associations, the SME shall not issue an MLME-ASSOCIATE.request for the same AP, until a period of at least 2 seconds has elapsed.

Cl 11 SC 11.3.2 P L # 15
STEPHENS, ADRIAN P Individual

Comment Type TR Comment Status X

"The STA's SME shall delete any PTKSA&"

See also my earlier comment. We need to put this in a section containing normative requirements on the SME.

SuggestedRemedy

Add a section containing statements for the SME and move the statement there. Recommend scanning for SME and doing likewith with any other similar statements.

Proposed Response Response Status O

Need to discuss with Jesse Walker.

Cl 11 SC 11.3.2 P 319 L # 22
O'HARA, ROBERT Individual

Comment Type T Comment Status D

The current standard defines a number of values for status codes . Very few of these values have definitions for their use. Define how a STA is to respond upon receipt of particular values of status codes.

SuggestedRemedy

Append the following text after 11.3.2 c):

d) When the status value of the association is not successful, the AP shall indicate a specific reason for the failure to associate in the Status Code of the Association Response frame. If any Status Code value from Table 20 in clause 7.3.1.9 is an appropriate reason for the failure to associate, the AP shall use that Status Code value. The use of the unspecified reason value of the Status Code shall be used to indicate the association failed for a reason that is unrelated to every other defined Status Code value.

Proposed Response Response Status W

PROPOSED ACCEPT.

The commenter has not identified the correct clause. The correct clause is 11.4.2.

Append the following text after 11.4.2 c):

d) When the status value of the association is not successful, the AP shall indicate a specific reason for the failure to associate in the Status Code of the Association Response frame. If any Status Code value from Table 20 in clause 7.3.1.9 is an appropriate reason for the failure to associate, the AP shall indicate that Status Code value. The use of the unspecified reason value of the Status Code shall indicate the association failed for a reason that is unrelated to every other defined Status Code value.

ReNUMBER subsequent items in the list in 11.4.2.

Cl 11 SC 11.3.3 P 320 L # 23
O'HARA, ROBERT Individual

Comment Type T Comment Status D

The current standard defines a number of values for status codes. Very few of these values have definitions for their use. Define how a STA is to respond upon receipt of particular values of the status code.

SuggestedRemedy

Append the following text to 11.3.3 c):

The Status Code returned in the Reassociation Response frame indicates the cause of the failed reassociation attempt. Any misconfiguration or parameter mismatch, e.g., data rates required as Basic Rates that the STA does indicate as supported in the Supported Rates information element, shall be corrected before the STA attempts a subsequent reassociation with the AP. If the Status Code indicates the reassociation failed because of a reason that is not related to configuration, e.g., the AP is unable to support additional associations, the STA shall not attempt to reassociate with the same AP if other APs are available, until the STA has attempted to reassociate with at least one other AP or a period of 2 seconds has elapsed.

Proposed Response Response Status W

PROPOSED ACCEPT.

The commenter has identified the incorrect clause. The correct clause is 11.4.3.

Append the following text to clause 11.4.3 d):

The Status Code returned in the Reassociation Response frame indicates the cause of the failed reassociation attempt. Any misconfiguration or parameter mismatch, e.g., data rates required as Basic Rates that the STA did not indicate as supported in the STA's Supported Rates information element, shall be corrected before the SME issues an MLME-REASSOCIATE.request for the same AP. If the Status Code indicates the reassociation failed because of a reason that is not related to configuration, e.g., the AP is unable to support additional associations, the SME shall not issue an MLME-REASSOCIATE.request for the same AP, until a period of at least 2 seconds has elapsed.

Cl 11 SC 11.3.4 P 320 L # 24
O'HARA, ROBERT Individual

Comment Type T Comment Status D

The current standard defines a number of values for status codes. Very few of these values have definitions for their use. Define how a STA is to respond upon receipt of particular values of the status code.

SuggestedRemedy

Append the following text after 11.3.4 c):

d) When the status value of the reassociation is not successful, the AP shall indicate a specific reason for the failure to reassociate in the Status Code of the Reassociation Response frame. If any Status Code value other than the unspecified reason Status Code value from Table 20 in clause 7.3.1.9 is an appropriate reason for the failure to associate, the AP shall use that Status Code value. The use of the unspecified reason value of the Status Code shall be used to indicate the reassociation failed for a reason that is unrelated to every other defined Status Code value.

Proposed Response Response Status W

PROPOSED ACCEPT.

The commenter has not identified the correct clause. The correct clause is 11.4.4.

Append the following text after 11.4.4 d):

e) When the status value of the reassociation is not successful, the AP shall indicate a specific reason for the failure to reassociate in the Status Code of the Reassociation Response frame. If any Status Code value from Table 20 in clause 7.3.1.9 is an appropriate reason for the failure to reassociate, the AP shall indicate that Status Code value. The use of the unspecified reason value of the Status Code shall indicate the reassociation failed for a reason that is unrelated to every other defined Status Code value.

Renumber subsequent items in the list in 11.4.4.

Cl 11 SC 11.4 P 320 L # 32
O'HARA, ROBERT Individual

Comment Type E Comment Status D

The reference to section 5.5 is incorrect, after 5.5 was changed to 5.6.

SuggestedRemedy

change "5.5" to "5.6".

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 11 SC 11.5.1 P L # 67
MYLES, ANDREW F Individual

Comment Type TR Comment Status D

The text defines association based on transmit power capability
However, no use has ever been demonstrated for this feature and few if any implementations provide it for any useful purpose

SuggestedRemedy

Delete all text related to association based on transmit power capability

Proposed Response Response Status W

PROPOSED REJECT. The commenter does not provide a compelling reason for deprecating this function. It is not proven that no use has ever been demonstrated for this feature. It is to soon to determine that no use will be found for this feature.

Cl 11 SC 11.5.3 P L # 68
MYLES, ANDREW F Individual

Comment Type TR Comment Status D

The text defines adaption of transmit power
However, no use has ever been demonstrated for this feature in relation to DFS and few, if any, implementations provide it for any useful purpose

SuggestedRemedy

Delete all text related to adaption of transmit power, and allow 11k and 11v to define new more appropriate features

Proposed Response Response Status W

PROPOSED REJECT. The commenter does not provide a compelling reason for deprecating this function. It is not proven that no use has ever been demonstrated for this feature. It is to soon to determine that no use will be found for this feature.

The commenter is urged to work with 802.11 task groups k and v to define new, more appropriate features and to delete this feature at that time.

Cl 11 SC 11.6.1 P L # 69
MYLES, ANDREW F Individual

Comment Type TR Comment Status D

The text defines association based on supported channels
However, no use has ever been demonstrated for this feature in relation to DFS and few if any implementations provide it for any useful purpose

SuggestedRemedy

Delete all test related to association based on supported channels

Proposed Response Response Status W

PROPOSED REJECT. The commenter does not provide a compelling reason for deprecating this function. It is not proven that no use has ever been demonstrated for this feature. It is to soon to determine that no use will be found for this feature.

Cl 11 SC 11.6.3 P L # 66
MYLES, ANDREW F Individual

Comment Type TR Comment Status D

The text references ETSI EN 301 893.
This reference is European focused and incorrect

SuggestedRemedy

Remove all references to ETSI EN 301 893

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE. Remove ETSI EN 301 893 from the normative references (clause 2) and move to the bibliography.

Cl 11 SC 11.6.6 P L # 70
MYLES, ANDREW F Individual

Comment Type TR Comment Status D

The text defines a complex measurement request and response mechanism.
The mechanism is not required for DFS or TPC purposes. It is clearly not sufficient for the measurement purposes given that 11k is currently redefining it

SuggestedRemedy

Delete all text related to measurement request and response, and allow 11k to define more appropriate features

Proposed Response Response Status W

PROPOSED REJECT. The commenter is urged to work with 802.11 task group k to make this change in that amendment.

Cl 11 SC 11.6.7.2 P L # 65
MYLES, ANDREW F Individual

Comment Type TR Comment Status X

The DFS channel changing facilities for IBSS represent a very complex set protocols that have little value in the vast majority of cases and will not work in many circumstances.
There is no know implementation of this feature.

SuggestedRemedy

Delete all text related to selecting a new channel in an IBSS

Proposed Response Response Status O

Andrew Myles, the former editor of 802.11h, will determine the exact scope of this change to the document.

Cl 17 SC 17.1.2 P 437 L 1 # 4
LANDT, JEREMY A Individual

Comment Type G Comment Status D

There is no section 5.9 as referenced.

There are two page 437s.

SuggestedRemedy

Replace '5.9' with '5.7' or remove the reference, correct page numbering

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE. The new correct reference is 5.8. The editor is to correct the page numbering.

Cl A SC A.4.4.1 P 569 L # 33
O'HARA, ROBERT Individual

Comment Type E Comment Status D

In item PC1.1 The reference to section 5.5 is incorrect, after 5.5 was changed to 5.6.

SuggestedRemedy

change "5.5" to "5.6".

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl A **SC A.4.4.1** **P 571** *L* # 34

O'HARA, ROBERT Individual

Comment Type G **Comment Status D**

In item PC14.1, The reference to section 5.5 is incorrect, after 5.5 was changed to 5.6.

SuggestedRemedy
change "5.5" to "5.6".

Proposed Response **Response Status W**

PROPOSED ACCEPT.

Cl H **SC H.6.3** **P 950** *L* # 27

O'HARA, ROBERT Individual

Comment Type T **Comment Status D**

Table H.7 lists some vectors for testing TKIP encryption. It would be nice to also list the source and destination MAC addresses, so that an implementor could walk through the derivation of the the Phase 1 and Phase 2 outputs.

The MAC addresses are recoverable from the plaintext message, if we want to add them to the table.

SuggestedRemedy
Add the MAC addresses to the table.

Proposed Response **Response Status W**

PROPOSED ACCEPT.

Cl H **SC H.7.1.1** **P 954** *L* # 26

O'HARA, ROBERT Individual

Comment Type E **Comment Status D**

The caption for Table H.14 is incorrect.

SuggestedRemedy
change the caption to "Sample derived CCMP temporal key (TK)"

Proposed Response **Response Status W**

PROPOSED ACCEPT.

Cl N **SC N.1** *P* *L* # 5

STEPHENS, ADRIAN P Individual

Comment Type E **Comment Status X**

The architecture picture is confusing because it has the same SAP at multiple layers. Also the multiplicities of the entities are not clear.

SuggestedRemedy
Recommend drawing with a wide portal layer at the top below which are multiple portals and multiple AP stacks. This emphasises the role of the DS in distribution and positions the DS-SAPs at the same level.

Proposed Response **Response Status O**

Darwin to prepare a response

Cl N **SC N.1** *P* *L* # 6

STEPHENS, ADRIAN P Individual

Comment Type E **Comment Status X**

The DS-STA-NOTIFY primitive is probably best viewed as travelling "up the stack" from the AP to the DS.

SuggestedRemedy
Change it from a "request" to an "indication"

Proposed Response **Response Status O**

Darwin to prepare a response