**IEEE P802.11  
Wireless LANs**

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| PASN Authenticated State 1a related text | | | | |
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**Abstract**

This submission contains proposed changes that augment the resolution from 11-19/0718r3 that was adopted in 802.11az to update the state machine Figure 11-16 in the base standard to support PASN (Pre-association Security Negotiation). It attempts to address a related comment that state machine descriptions in clauses 11.3.4 (Authentication) and 11.3.5 (Association) need an update for the new state in Figure 11-16.

Discussion of the comments, rationale and proposed changes are included. The changes are relative to *IEEE P802.11-REVmd™/D2.2 May 2019 [1] and IEEE P802.11-az/D1.0, February 2019 [2].*

# Document History

r0 – Initial Revision

# References

[1] Draft P802.11REVmd 2.2 - <http://www.ieee802.org/11/private/Draft_Standards/11md/Draft%20P802.11REVmd_D2.2.pdf>

[2] Draft P802.11az D1.0 - <http://www.ieee802.org/11/private/Draft_Standards/11az/Draft%20P802.11az_D1.0.pdf>

# Document Conventions

Suggested changes are specified as follows

* Red for editorial instructions
* Strikethrough for text to be deleted
* Underlined for any new proposed text
* Figures or changes to existing figures are described black and white or any other color.
* Black for existing text
* Prefix changes with

**<draft> Editor: [Add, Change, Delete, Replace] <description>(<CID>, <section>, p<page>, <line>)**

Where **<draft>** is **TGaz** for TGaz draft [2] changes or empty for base specification [1] changes

Existing clauses are identified by section, page and line numbers.

**Discussion**

PASN state 1a is added to the state machine in clause 11.3.2.

Related description in 11.3.4 and 11.3.5 needs an update to account for this state.

TBD in 11.3.3 Class 2 frame related. This was adopted from 11-19/0163 in TGaz, but does not seem to be incorporated into TGaz Draft 1.0. The SA query being classified as Class 2 with PASN is new in this proposal.

A few comments on rev. 00 of this document from Mike Montemurro

1. Need to add description for State 1a to the bulleted list in section 11.3.1 (4th para) √
2. For the change on 2208.60, I would modify the first sentence to make it apply to all Authentication protocols except PASN and add a separate sentence to indicate the requirement for PASN. It makes things much easier for the reader to parse. √
3. For 11.3.4.3 g), I think the last sentence needs work. Why would a device in stated 3 or 4 initiate PASN authentication? A device in state 2 makes things really more complicated. One easy way to address this would be to restrict PASN authentication to devices in state 1 only. √

In r01, PASN is restricted to State 1 only to keep it simple.

# Resolution Summary

| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
| 2222 | Michael Montemurro | 11 | 86.29 | PASN should be added to the state machine in clause 11.3.2 | 19/0718r3 added PASN information in 11.3.2 and update Fig 11-16 (state machine). This document updates the description of behavior for that state. | Revised. Make the changes as depicted by document 11-19/0970r4 as shown below. |

**Editor: Change 11.3.1 State Variables by adding another description to the bulleted list - p2204.10 as follows**

— State 1: Initial start state for non-DMG STAs and for DMG STAs that perform IEEE 802.11

authentication. Unauthenticated and unassociated.

— State 1a: Authenticated via PASN Authentication (12.13). Association is not possible from this state without non-PASN IEEE 802.11 Authentication.

— State 2: Initial start state…

**TGaz Editor: Change p78.4 as follows by removing TBD and restricting Class 2 classification to protected dual of public action frames.**

~~TBD (subset or all)~~ Unicast ~~Robust Management Frames~~ Protected Dual of Public Action frames (9.6.10) and SA Query (9.6.9) when PTKSA from PASN authentication exists

**Editor: Change 11.3.3 near p2207.47 as follows**

A STA shall not transmit Class 2 frames unless in State 1a or State 2 or State 3 or State 4.

**Editor: Change 11.3.4 Authentication and deauthentication near p2208.10 as follows**

Successful authentication other than PASN authentication sets the STA’s state to State 2, if it was in State 1 or State 1a. Successful PASN authentication sets the STA’s state to State 1a, if it was in State 1. PASN authentication is disallowed in states other than State 1. Unsuccessful authentication leaves the STA’s state unchanged.

…

If STA A in an infrastructure BSS receives a Class 2 or Class 3 frame from STA B when in State 1 that is not authenticated

with STA A ~~(i.e., the state for STA B is State 1)~~, STA A shall discard the frame. If the frame has an

individual address in the Address 1 field, the MLME of STA A shall send a Deauthentication frame to

STA B.

If STA A in an infrastructure BSS receives any frame other than Class 1 or protected Class 2 frames (11.3.3 Frame filtering based on STA state) from STA B when in PASN Authenticated State 1a, STA A shall discard the frame.

**Editor: Change 11.3.4.2 Authentication—originating STA as follows p2208.60**

**…**

c) For any authentication protocol that is not PASN, If the authentication was successful within the AuthenticateFailureTimeout, the state for the indicated STA shall be set to State 2 if it was in State 1 or State 1a; the state shall remain unchanged if it was other

than State 1 or State 1a.

d) For PASN authentication, if the authentication was successful within the AuthenticateFailureTimeout, the state for the

indicated STA shall be set to State 1a if it was State 1; PASN authentication is disallowed in states other than State 1.

e~~d~~) The MLME shall issue an MLME-AUTHENTICATE.confirm primitive to inform the SME of the

result of the authentication.

**Editor: Change 11.3.4.3 Authentication—destination STA as follows p2209.31**

**…**

f) Upon receipt of an MLME-AUTHENTICATE.response primitive, if the ResultCode is not

SUCCESS, the MLME shall transmit an Authentication frame with the corresponding status code,

as defined in 9.4.1.9 (Status Code field), and the state for the originating STA shall be left

unchanged. The Authentication frame is constructed using the appropriate procedure in 12.3.3.2

(Open System authentication), 12.3.3.3 (Shared Key authentication), 13.5 (FT protocol), ~~or~~ 13.6 (FT

resource request protocol) or 12.13 (Pre-association Security Negotiation).

g) Upon receipt of an MLME-AUTHENTICATE.response primitive, if the ResultCode is SUCCESS,

the MLME shall transmit an Authentication frame that is constructed using the appropriate

procedure in 12.3.3.2 (Open System authentication), 12.3.3.3 (Shared Key authentication), 13.5 (FT

protocol), ~~or~~ 13.6 (FT resource request protocol), or 12.13 (Pre-association Security Negotiation)

with a status code of SUCCESS.~~, and~~ ~~the~~ The state for the originating STA shall be set to State 2 if it was in State 1(#1403)

or State 1a when PASN authentication procedure was not used. The state for the originating STA shall be set to State 1a if it was in State 1 and PASN authentication procedure was used; PASN authentication is disallowed in states other than State 1.

**Editor: Change 11.3.4.4 Deuthentication—originating STA as follows p2210.1**

b) On receipt of the MLME-DEAUTHENTICATE.request primitive, if the state for the indicated STA

is State 1a, State 2, State 3, or State 4, the MLME shall generate a Deauthentication frame to be transmitted to

the indicated STA.

**Editor: Change 11.3.4.5 Deuthentication—destination STA as follows p2210.37**

…

Otherwise, upon receipt of a Deauthentication frame from a STA for which the state is State 1a, State 2, State 3, or

State 4, the destination STA shall deauthenticate with the originating STA using the following procedure:

**Editor: Change 11.3.5 Association, reassociation, and disassociation as follows p2211.4**

Association and reassociation are allowed only in State 2. In order to associate or reassociate, a STA in State 1a must perform a IEEE Standard 802.11 non-PASN authentication or FILS authentication and transition to State 2.

…

Successful association enables a STA to exchange Class 3 frames. (#2223)Successful association sets the

state for a (11ai)non-FILS STA to State 3 or State 4. Successful association sets the state for FILS STAs to

State 4(11ai).

Successful reassociation enables a STA to exchange Class 3 frames. Unsuccessful reassociation ~~when not in~~

~~State 1~~ leaves the STA’s state unchanged (with respect to the AP or PCP that was sent the Reassociation

Request (which may be the current STA)). Successful reassociation sets the non-FILS(11ai) STA’s state to

State 3 or State 4 (with respect to the AP or PCP that was sent the Reassociation Request frame(11ai)).

Successful reassociation ~~when not in State 1~~ sets the STA’s state to State 2 (with respect to the current AP or

PCP, if this is not the AP or PCP that was sent the Reassociation Request frame(11ai)). Successful

reassociation sets a FILS STA’s state to State 4 (with respect to the AP or PCP that was sent the

Reassociation Request frame) and enables it to exchange Class 3 frames(11ai). Reassociation shall be

performed only if the originating STA is already associated in the same ESS.

Disassociation is not allowed in State 1 or State 1a.

Disassociation notification ~~when not in State 1~~ sets a non-FILS(11ai) STA’s state to State 2. Disassociation

notification ~~when not in State 1~~ sets a FILS STA’s state to State 1(11ai).

**Editor: Change 11.3.5.2 Non-AP and non-PCP STA association initiation procedures as follows p2212.13**

Upon receipt of an MLME-ASSOCIATE.request primitive, a non-AP and non-PCP STA shall associate

with an AP or PCP using the following procedure:

a) If the state for the AP is State 1 or State 1a, the MLME shall inform the SME of the failure of the association by

issuing an MLME-ASSOCIATE.confirm primitive, and this procedure ends.

**Editor: Change 11.3.5.3 AP or PCP association receipt procedures as follows p2213.40**

**..**

b) If the state for the STA is State 1 or State 1a and the STA is a non-DMG STA, the SME shall refuse the association

request by issuing an MLME-ASSOCIATE.response primitive with ResultCode

NOT\_AUTHENTICATED.

**Editor: Change 11.3.5.4 Non-AP and non-PCP STA reassociation initiation procedures as follows p2215.62**

**…**

Upon receipt of an MLME-REASSOCIATE.request primitive, a non-AP and non-PCP STA shall

reassociate with an AP or PCP using the following procedure:

a) If the STA is not associated in the same ESS or the state for the new AP is State 1 or State 1a, the MLME shall

inform the SME of the failure of the reassociation by issuing an MLME-REASSOCIATE.confirm

primitive, and this procedure ends.

**Editor: Change 11.3.5.5 AP or PCP reassociation receipt procedures as follows p2218.15**

b) If the state for the STA is State 1 or State 1a and the STA is a non-DMG STA, the SME shall refuse the reassociation

request by issuing an MLME REASSOCIATE.response primitive with ResultCode

NOT\_AUTHENTICATED.

**Editor: Change 11.3.5.6 Non-AP and non-PCP STA disassociation initiation procedures p2220.30 as follows**

b) The state for the AP or PCP shall be set to State 2 if it was not State 1 or State 1a. In the case of an MM-SME

coordinated STA, the MLME shall perform this for each STA whose address was included in the

MMS parameter of the MLME-ASSOCIATE.request or MLME-REASSOCIATE.request primitive

that established the association.

**Editor: Change 11.3.5.8 AP or PCP disassociation initiation procedure p2221.29 as follows**

b) The state for the STA shall be set to State 2, if it was not State 1 or State 1a. The MM-SME shall perform this

process for each STA whose address was included in the MMS parameter of the MLMEASSOCIATE.

request or MLME-REASSOCIATE.request primitive that established the association.