IEEE P802.11
Wireless LANs

|  |
| --- |
| 11bi D1.0 Miscellaneous comments |
| Date: 2025-03-09 |
| Author(s): |
| Name | Affiliation | Address | Phone | Email |
| Po-Kai Huang | Intel |  |  | po-kai.huang@intel.com |

Abstract

This submission resolves the following CIDs:

 394, 399, 403, 405, 409, 410, 160, 267, 268, 457,

 459, 47, 164, 465, 407, 491, 495, 311, 496, 497,

 857, 742, 744, 261, 644, 393, 379, 979, 944, 927,

 962, 392

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Put similar CIDs together.

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGbi D1.0 Draft. This introduction is not part of the adopted material.

Editing instructions formatted like this are intended to be copied into the TGbi D1.0 Draft. (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents). TGbi Editor: Editing instructions preceded by “TGbi Editor” are instructions to the TGbi editor to modify existing material in the TGbi draft. As a result of adopting the changes, the TGbi editor will execute the instructions rather than copy them to the TGbi Draft.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 394 | 6.5.5 | 28.50 | "The set of elements and fields to be included in 802.1X Authenticationframes" -- surely in .ind (and .cfm) it's the set received | Change "to be included" to "received" at 28.50, 29.3, 29.50, 30.3 | Revised – Agree in principle with the commenter. Initiator has .request and gets .confirm. Responder gets .indication and prepares .response. Hence, .confirm and .indication is the reception results. TGbi editor to make the changes shown in the latest version of 11-25/0435 under all headings that include CID 394 |
| 399 | 9.3.3 | 0.00 | There are a bunch of "if the <something> frame is encrypted" but I think we normally use the more generic term "protected" | Change as suggested throughout 9.3.3 | Rejected – Note that protected may mean MIC only protection or encryption. Since the case is only true for encryption, we use encrypted to differentiate from being MIC protected.  |
| 403 | 9.3.3.11 | 37.55 | I have a nasty feeling it's not allowed to insert new elements in the middle | Add the new elements at the end, ah, but maybe it's OK because only used in a new auth frame type? | Rejected –The addition is a field not an element. |
| 405 | 9.3.3.11 | 37.55 | It would be cleaner just to define an element containing the EAPOL PDU, than to have a length field and an optional content field | Ah, but this is because the PDU can be >255 octets? OK, then just give a xref for row 9a to 9.4.1.81 Encapsulation Length field | Revised –We provide reference.TGbi editor to make the changes shown in the latest version of 11-25/0435 under all headings that include CID 405 |
| 409 | 9.3.3.11 | 38.48 | You cannot require existing FT implementations to include a new element | Change to "is optionally present" | Accepted - |
| 410 | 9.3.3.11 | 42.32 | The contents for ATSN 3 with success or not success are the same | Delete the rows for ATSN 3. At 42.44 change ">3" to ">= 3" where the >= should be the single glyph | Revised –We provide reference.TGbi editor to make the changes shown in the latest version of 11-25/0435 under all headings that include CID 410 |
| 160 | 9.3.3.5 | 35.47 | The text "...and the peer supports DS MAC Address;" doesn't make sense. It needs re-writing. | Change the cited text to "and the peer supports the use of a destination MAC address;". Make the same change at P35L42. | Revised –We refer to the indication in RSNXE.TGbi editor to make the changes shown in the latest version of 11-25/0435 under all headings that include CID 160 |
| 267 | 9.3.3.5 | 35.44 | non-AP MLDs should not have DS MAC address, because MLD address can do the same operations with reduced complexity. | Make DS MAC address present only for non-AP STAs. | Rejected –DS MAC address is never transmitted over the air. Non-AP MLD MAC address is still transmitted in authentication frame and as a result can not be used as DS MAC address. |
| 268 | 9.3.3.7 | 36.39 | non-AP MLDs should not have DS MAC address, because MLD address can do the same operations with reduced complexity. | Make DS MAC address present only for non-AP STAs. | Rejected –DS MAC address is never transmitted over the air. Non-AP MLD MAC address is still transmitted in authentication frame and as a result can not be used as DS MAC address. |
| 457 | 9.4.2.1 | 50.53 | Elements should be extensible unless there's a really good reason not to (2x) | As it says in the comment | Rejected – DS MAC address element is not extensible because the element is supposed to include only DS MAC address. OTA MAC Collision Warning element is not extensible because it has included all the required information for collision warning. |
| 459 | 9.4.2.23.3 | 51.35 | "0 (open) or 8 (IEEE 802.1X) " is confusing for a row that already says the auth type is "Authenticationnegotiated over IEEE Std 802.1X" | Add a xref to somewhere that explains why we have two options (now) | Rejected – We note that 0 (open) is used in baseline because EAPOL PDU is transferred using data frame which needs an open authentication to go into association. 8 is added so that EAPOL PDU can be exchanged using authentication frame. We also note that reference is generally not provided in the table.  |
| 47 | 9.4.2.347 | 61.27 | "The DS MAC Address field indicates the DS MAC address." Needs "value" | At cited location make following edit :"The DS MAC Address field value indicates the DS MAC address." | Rejected – We note that in the baseline we have 672 instances of “field indicate” and only 11 instances of “field value indicate”. “field indicate” is sufficient based on the style of the baseline.  |
| 164 | 9.4.2.347 | 61.05 | With a new DS MAC address, a non-AP MLD will need to maintain 3 levels of MAC addresses, which is unnecessarily complicated.Instead of introducing a new DS MAC address, it would be better to reuse the MLD MAC address to achieve the same purpose of DS MAC address. | Remove the usage of DS MAC address for non-AP MLD | Rejected –DS MAC address is never transmitted over the air. Non-AP MLD MAC address is still transmitted in authentication frame and as a result can not be used as DS MAC address. |
| 465 | 9.4.2.188 | 59.09 | We're not allowed to rename fields | Reinstate "FILS" before "Nonce" throughout | Rejected –Have checked with Emily and Robert to understand reasons of no name change and with name change. Reason for no name change: - The name maybe connected to upper layer operation and name change will create confusion - The name maybe used by driver implementation and name change create confusion. Reason for name change: - Keeping the name creates confusion on protocol usage By considering above, the name change from “FILS Nonce” to “Nonce” has more benefits. There has been similar name change for another element from 11az, which changes “FILS wrapped data” to “Wrapped Data”. In that case, there is no confusion to upper layer and the name change does no create confusion to driver implementation. The name change does help protocol usage to clarify that Wrapped Data element can be used outside of FILS. The change from “FILS Nonce” to “Nonce” follows basically the same reasoning. |
| 407 |   | 0.00 | Err, I don't think we are allowed to rename elements (we certainly are not allowed to rename fields) | Reinstate "FILS" before "Nonce" throughout | Rejected –Have checked with Emily and Robert to understand reasons of no name change and with name change. Reason for no name change: - The name maybe connected to upper layer operation and name change will create confusion - The name maybe used by driver implementation and name change create confusion. Reason for name change: - Keeping the name creates confusion on protocol usage By considering above, the name change from “FILS Nonce” to “Nonce” has more benefits. There has been similar name change for another element from 11az, which changes “FILS wrapped data” to “Wrapped Data”. In that case, there is no confusion to upper layer and the name change does no create confusion to driver implementation. The name change does help protocol usage to clarify that Wrapped Data element can be used outside of FILS. The change from “FILS Nonce” to “Nonce” follows basically the same reasoning. |
| 491 | 9.6.38.1 | 65.46 | It's not clear why Protected EHT Compressed Beamforming/CQI frame is time-priority if Protected HE Compressed Beamforming/CQI is not. Ditto 67.62 | Change "Yes" to "No" | Revised –We note that HE Compressed Beamforming/CQI is time-priority per baseline. Hence, we add time-priority to protected HE Compressed Beamforming/CQI.TGbi editor to make the changes shown in the latest version of 11-25/0435 under all headings that include CID 491 |
| 495 | 9.6.42.2 | 69.35 | It would be better to just drop Table 9-658v and keep Table 9-658w with an indication that item 3 is only present for MLO, especially since the text in the para at line 29 does not actually say which format is used when | As it says in the comment | Rejected –The title specifies which is for MLO and which is for non-MLO.Table 9-658v—Capabilities And Operation Parameters Request frame Action field formatfor non-MLOTable 9-658w—Capabilities And Operation Parameters Request frame Action field formatfor MLO |
| 311 | 9.6.42.3 | 70.52 | Cyphering the beacon is a BPE behavior, which I assume is an MLD-only behavior. Therefore, does it make sense to have Capabilities and Operation Parameters Response frames for non-MLD? | Discuss | Rejected –The response frame is encrypted, which also provides the benefits of protection, which is not available under Probe response. As a result, it is still beneficial for non-MLO to have this feature in terms of both privacy and protection.  |
| 496 | 9.6.42.3 | 70.20 | This para does not actually say that Table 9-658x is used for non-MLO and Table 9-658y for MLO | Add words to that effect | Rejected –The title specifies which is for MLO and which is for non-MLO. It is in the second line.Table 9-658x—Capabilities And Operation Parameters Response frame Action field formatfor non-MLOTable 9-658y—Capabilities And Operation Parameters Response frame Action field formatfor MLO |
| 497 | 9.6.42.3 | 70.43 | It's not clear why MLO just gets a Basic Multi-Link element but non-MLO gets every single element from probe responses | Only pass for non-MLO what is actually needed | Rejected –For MLO, there are multiple links, and the elements for each link is in a per-STA profile of multi-link element. For non-MLO, there is only one link, so there is no need of ML element and just specific element.  |
| 857 | 9.6.42.3 | 71.13 | The Basic Multi-Link element should be a complete profile to be sure that all mandatory elements are included in the basic multi-link element. | Please modify such as "The Basic Multi-Link element is defined in 9.4.2.322 (Multi-Link element)(#1061) and is optionally present(see 12.16.4 (EDP capabilities and operation parameters request and response procedure))." | Rejected –In 12.16.4, it is specified that it is a complete profile. See cited texts below.*The EDP Capabilities And Operation**Parameters Response frame shall include a Basic Multi-Link element, and the Basic Multi-Link element**shall include a Per-STA Profile subelement with the Complete Profile subfield set to 1 for each AP affiliated with the AP MLD (see 9.4.2.321.2.4 (Link Info field of the Basic Multi-Link element)).* |
| 742 | C.3 | 141.30 | I don't understand why dot11EDPCapabilitiesAndOperationParametersRequestResponseActivated takes effect on start/join but dot11EDPRobustIndividuallyAddressedManagementFrameActivated "as soon as practical" | As it says in the comment | Revised –We revise to align the description.TGbi editor to make the changes shown in the latest version of 11-25/0435 under all headings that include CID 742 |
| 744 | C.3 | 142.43 | "to support DS MAC Address is enabled" -- not clear what this means and case wrong | Maybe "to support use of a DS MAC Address field" or "to support use of a DS MAC address"? | Revised –We revise to align the description.TGbi editor to make the changes shown in the latest version of 11-25/0435 under all headings that include CID 744 |
| 261 | 11.3.2 | 101.16 | Conditions to move from state 2 to state 4 look goofy. Especially word successful is used wildly. This makes the operations hard to understand. | Please modify the conditions to move from state 2 to state 4: - Start every condition with "Succesful..." | Rejected –Bullets without “successful” are the baseline texts. |
| 644 | 11.3.2 | 99.01 | It's not clear what's changed, but I don't see any reason 11bi should be messing with the auth/assoc state machine | Do not make any changes in this subclause | Rejected –11bi introduces encryption of (re)association request/response frame utilizing derived PTKSA, which does not need additional 4-way handshake. Hence, it is required to update the figure.  |
| 393 | 4.10.7 | 25.56 | "or first IEEE 802.1X Authentication frame" insertion seems to be changing required behaviour for existing devices | Delete the cited text | Rejected –The insertion does not change existing device behavior because there is a capability bit to use 802.1X Authentication frame. |
| 379 | 4.2.5 | 23.52 | I don't understand why .1X was added here, but not FT, which was missing compared to the para above too. Also, .1X is already covered by the next sentence | Change "IEEE 802.1X authentication" to "FT authentication" | Rejected –FT builds on other authentication like SAE and 802.1X. This reflects in the AKM definition where we have FT over XXX. |
| 979 | 4.2.5 | 23.18 | 802.1X-2020's clause 12 is about carrying EAPOL frames within "data" frames, and how they are controlled at the port for distribution to the PAE, versus to the MAC SAP. The addition of use (and mention of that use) of Management frames (i.e. Authentication frames) to carry EAPOL PDUs is not appropriate for reference to this clause of 802.1X. | Reword this sentence, or just add a new sentence instead of trying to merge, to keep the different uses clear. | Revised –We use different sentences.TGbi editor to make the changes shown in the latest version of 11-25/0435 under all headings that include CID 979 |
| 944 | 4.2.5 | 23.21 | The sentence added refers to "this process" but its unclear with "this" refers to | Revise the sentence to (presumably) refer to Authentication frames containing an IEEE 802.1X payload. | Revised –We use different sentences.TGbi editor to make the changes shown in the latest version of 11-25/0435 under all headings that include CID 979 |
| 927 | 4.5.4.2 | 23.56 | The sentence has been struck out. Is there a reason? It seems that the sentence is still valid | Provide an explanation or restore the sentence | Rejected –The struck out sentence has been moved to the paragraph above. |
| 962 | 4.5.4.2 | 23.22 | Introduction of the "EAPOL-Start Authentication frame" feels like unnecessary and undesired extra complexity. Furthermore, it is used incorrectly in 4.2.5 (it applies only to the last item in the list, not the first two: EAPOL-Key frames and EAPOL-Key request frames).The NOTE 1 using this term in 12.16.5 feels like something that should be normative language and not just an informative note since EAPOL-Start is not normally used to start EAP authentication in WLAN cases. The AP/Authenticator starts directly with EAP-Request/Identity on association. The Authentication frame case needs something special for the STA/Supplicant to use as a starting point. | At P21 L24-26, delete definition of EAPOL-Start Authentication frame.At P23 L22, delete "Authentication frames used for this purpose are generally referred to as EAPOL-Start Authentication frames."At P25 L44, replace "or EAPOL-Start Authentication frames" with "or in an Authentication frame".At P122 L46-47, delete NOTE 1. | Revised –Agree in principle with the commenter. TGbi editor to make the changes shown in the latest version of 11-25/0435 under all headings that include CID 962 |
| 392 |   | 0.00 | "EAPOL-Start frames or EAPOL-Start Authentication frames" -- have all instances of "EAPOL-Start" in the baseline been checked and "or EAPOL-Start Authentication" added where necessary? | As it says in the comment | Revised –We remove definition of EAPOL-Start. TGbi editor to make the changes shown in the latest version of 11-25/0435 under all headings that include CID 962 |

***Proposal:***

**TGbi Editor: *Instruction: Modify 6.5.5 as follows***

* Authenticate
* MLME-AUTHENTICATE.confirm
* Semantics of the service primitive

***Modify MLME-AUTHENTICATE.confirm and the table as follows (not all lines shown):***

The primitive parameters are as follows:

MLME-AUTHENTICATE.confirm(

....

Content of 802.1X Authentication frame,

Content of EDPKE Authentication frame,

VendorSpecificInfo

)

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| ..... | ..... | ..... | ..... |
| AuthenticationType | Enumeration | OPEN\_SYSTEM,SHARED\_KEYFAST\_BSS\_TRANSITION, SAE, FILS\_SHARED KEY\_WITHOUT\_PFS, FILS\_SHARED\_KEY\_WITH\_PFS, FILS\_PUBLIC\_KEY, PASN, 802\_1X, EDPKE | Specifies the type of authentication algorithm that was used during the authentication process. This value matches the AuthenticationType parameter specified in the corresponding MLME-AUTHENTICATE.request primitive. |
| ..... | ..... | ..... | ..... |
| Content of 802.1X Authentication frame | Sequence of elements and fields | As defined in 12.16.5 (IEEE 802.1X authentication utilizing Authentication frames), 12.16.8.2 (IEEE 802.1X),9.4.1.81 (Encapsulation Length field), 9.4.1.82 (Encapsulation field), 9.4.2.295 (AKM Suite Selector element), 9.4.2.23 (RSNE), 9.4.2.240 (RSNXE), 9.4.2.188 (FILS Nonce element), 9.4.2.312 (Diffie-Hellman Parameter element). | The set of elements and fields received(#394) in 802.1X Authentication frames. Present if AuthenticationType indicates 802\_1X and dot11EDPIEEE8021XAuthenticationUtilizingAuthenticationFrameActivated is true, otherwise not present. |
| Content of EDKPE Authentication frame | Sequence of elements and fields | As defined in 12.16.9.3.2 (EDPKE Frame Construction and Processing), 9.4.2.23 (RSNE), 9.4.2.240 (RSNXE), 9.4.2.186 (Wrapped Data element), 9.4.2.305 (PASN Parameters element), 9.4.2.47 (Timeout Interval element) | The set of elements and fields received(#394) in EDPKE Authentication frames. Present if AuthenticationType indicates EDPKE and dot11EDPKEActivated is true, otherwise not present. |
| VendorSpecificInfo | A set of elements | As defined in 9.4.2.24 (Vendor Specific element) | Zero or more elements. |

* MLME-AUTHENTICATE.indication
* Semantics of the service primitive

***Modify MLME-AUTHENTICATE.indication and the table as follows (not all lines shown):***

The primitive parameters are as follows:

MLME-AUTHENTICATE.indication(

....

Content of 802.1X Authentication frame,

Content of EDPKE Authentication frame,

VendorSpecificInfo

)

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| ..... | ..... | ..... | ..... |
| AuthenticationType | Enumeration | OPEN\_SYSTEM,SHARED\_KEY,FAST\_BSS\_TRANSITION, SAE, FILS\_SHARED\_KEY\_WITHOUT\_PFS, FILS\_SHARED\_KEY\_WITH\_PFS, FILS\_PUBLIC\_KEY, PASN, 802\_1X, EDPKE | Specifies the type of authentication algorithm that was used during the authentication process. |
| ..... | ..... | ..... | ..... |
| Content of 802.1X Authentication frame | Sequence of elements and fields | As defined in 12.16.5 (IEEE 802.1X authentication utilizing Authentication frames), 12.16.8.2 (IEEE 802.1X),9.4.1.81 (Encapsulation Length field), 9.4.1.82 (Encapsulation field), 9.4.2.295 (AKM Suite Selector element), 9.4.2.23 (RSNE), 9.4.2.240 (RSNXE), 9.4.2.188 (FILS Nonce element), 9.4.2.312 (Diffie-Hellman Parameter element). | The set of elements and fields received(#394) in 802.1X Authentication frames. Present if AuthenticationType indicates 802\_1X and dot11EDPIEEE8021XAuthenticationUtilizingAuthenticationFrameActivated is true, otherwise not present. |
| Content of EDKPE Authentication frame | Sequence of elements and fields | As defined in 12.16.9.3.2 (EDPKE Frame Construction and Processing), 9.4.2.23 (RSNE), 9.4.2.240 (RSNXE), 9.4.2.186 (Wrapped Data element), 9.4.2.305 (PASN Parameters element), 9.4.2.47 (Timeout Interval element) | The set of elements and fields received(#394) in EDPKE Authentication frames. Present if AuthenticationType indicates EDPKE and dot11EDPKEActivated is true, otherwise not present. |
| VendorSpecificInfo | A set of elements | As defined in 9.4.2.24 (Vendor Specific element) | Zero or more elements. |
|  |  |  |  |

**TGbi Editor: *Instruction: Modify 9.3.3.11 as follows***

* Authentication frame format
* revme D7.0 up to order 27. 11be D7.0 up to order 28.

***Modify Table 9-70 as follows (not all lines shown):***

* Authentication frame body

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| … |  |  |
| 9 | Confirm | An unsigned integer encoded as described in 12.4.7.4 (Encoding and decoding of SAE Confirm messages). This is present only in certain Authentication frames as defined in Presence of fields and elements in Authentication frames. |
| 9a | Encapsulation Length | The Encapsulation Length field indicates the number of octets of the Encapsulation field as described in 9.4.1.81 (Encapsulation Length field)(#405). This is present only in certain Authentication frames as defined in Table 9-71 |
| 9b | Encapsulation | The field is used to carry an EAPOL PDU as described in 12.16.5 (IEEE 802.1X authentication utilizing Authentication frames). This is present only when the Encapsulation Length field is nonzero. |
| ... |  |  |
| 17 | ~~FILS~~ Nonce | The ~~FILS~~ Nonce element is present in ~~FILS~~ Authentication frames as defined in Table 9-71 (Presence of fields and elements in Authentication frames). |
| ... |  |  |
| 25 | PASN Parameters | A PASN Parameters element is present only in certain Authentication framesas defined in Table 9-71 (Presence of fields and elements in Authentication frames). |
| ... |  |  |
| 29 | Diffie-Hellman Parameter | A Diffie-Hellman Parameter element is present only in certain Authentication frames as defined in Table 9-71 (Presence of fields and elements in Authentication frames). |

***Change Table 9-71 and insert new rows at the end of Table 9-71 as follows (not all lines shown):***

* Presence of fields and elements in Authentication frames

|  |  |  |  |
| --- | --- | --- | --- |
| Authentication algorithm | Authentication transaction sequence number | Status code | Presence of fields and elementsindicated as conditional in Table 9-70 (Authentication frame body) |
| FT | 1 | Reserved | The MDE is present. The FTE and RSNE(s) are present if dot11RSNAActivated is true.The RSNXE is present if any subfield of the Extended RSN Capabilities field in this element is nonzero, except the Field Length subfield.The Diffie-Hellman Parameter element is optionally(#409) present as defined in 12.16.8.1 (FT). |
| FT | 2 | Not REJECTED\_WITH\_SUGGESTED\_BSS\_TRANSITION | The MDE is present if the Status Code field is 0. The FTE and RSNE(s) are present if the Status Code field is 0 and dot11RSNAActivated is true.The Diffie-Hellman Parameter element is optionally(#409) present as defined in 12.16.8.1 (FT). |
| .... |  |  |  |
| FILS Shared Keyauthenticationwithout PFS | 1 | Reserved | The RSNE is present.The MDE is present if the FILS authentication is used for FT initial mobility domain association.The ~~FILS~~ Nonce element is present.The FILS Session element is present.The Wrapped Data element is present. |
| FILS Shared Keyauthenticationwithout PFS | 2 | Status | The RSNE is present.The MDE and the FTE are present if the Status Code field is 0 and FILS authentication is used for FT initial mobility domain association.The ~~FILS~~ Nonce element is present if the Status Code field is 0.The FILS Session element is present if the Status Code field is 0.The Wrapped Data element is present if the Status Code field is 0.The Association Delay Info element is present if the Status Code field is 0 and the AP expects that the (Re)Association Response frame will be transmitted more than 1 TU after the (Re)Association Requestframe. |
| FILS Shared Keyauthentication with PFS | 1 | Reserved | The Finite Cyclic Group field is present.The FFE field is present.The RSNE is present.The MDE is present if the FILS authentication is used for FT initial mobility domain association.The ~~FILS~~ Nonce element is present.The FILS Session element is present.The Wrapped Data element is present. |
| FILS Shared Keyauthentication withPFS | 2 | Status | The Finite Cyclic Group field is present if the Status Code field is 0.The FFE field is present if the Status Code field is 0.The RSNE is present.The MDE and the FTE are present if the Status Code field is 0 and FILS authentication is used for FT initial mobility domain association.The ~~FILS~~ Nonce element is present if the Status Code field is 0.The FILS Session element is present if the Status Code field is 0.The Wrapped Data element is present if the Status Code field is 0.The Association Delay Info element is present if the Status Code field is 0 and the AP expects that the (Re)Association Response frame will be transmitted more than 1 TU after the (Re)Association Request frame. |
| FILS Public Keyauthentication | 1 | Reserved  | The Finite Cyclic Group field is present.The FFE field is present.The RSNE is present.The MDE is present if the FILS authentication is used for FT initial mobility domain association.The ~~FILS~~ Nonce element is present.The FILS Session element is present. |
| FILS Public Keyauthentication | 2 | Status | The Finite Cyclic Group field is present if the Status Code field is 0.The FFE field is present if the Status Code field is 0.The RSNE is present.The MDE and the FTE are present if the Status Code field is 0 and FILS authentication is used for FT initial mobility domain association.The ~~FILS~~ Nonce element is present if the Status Code field is 0.The FILS Session element is present if the Status Code field is 0.The Association Delay Info element is present if the Status Code field is 0 and the AP expects that the (Re)Association Response frame will be transmitted more than 1 TU after the (Re)Association Request frame. |
| .... |  |  |  |
| IEEE 802.1X authentication | 1 | Reserved  | The Encapsulation Length field is present.The Encapsulation field is present only when the Encapsulation Length field is nonzero.The AKM Suite Selector element is optionally present as defined in 12.16.5 (IEEE 802.1X authentication utilizing Authentication frames).The RSNE is optionally present as defined in 12.16.8.2 (IEEE 802.1X).The RSNXE is optionally present as defined in 12.16.8.2 (IEEE 802.1X).The Nonce element is optionally present as defined in 12.16.8.2 (IEEE 802.1X).The Diffie-Hellman Parameter element is optionally present as defined in 12.16.8.2 (IEEE 802.1X). |
| IEEE 802.1X authentication | 2 | SUCCESS | The Encapsulation Length field is present.The Encapsulation field is present only when the Encapsulation Length field is nonzero.The AKM Suite Selector element is optionally present as defined in 12.16.5 (IEEE 802.1X authentication utilizing Authentication frames).The RSNE is optionally present as defined in 12.16.8.2 (IEEE 802.1X).The Nonce element is optionally present as defined in 12.16.8.2 (IEEE 802.1X).The Diffie-Hellman Parameter element is optionally present as defined in 12.16.8.2 (IEEE 802.1X). |
| IEEE 802.1X authentication | 2 | Not SUCCESS | The Encapsulation Length field is present.The Encapsulation field is present only when the Encapsulation Length field is nonzero. |
|  |  |  |  (#410) |
|  |  |  |  (#410) |
| IEEE 802.1X authentication | >= 3(#410) | Status | The Encapsulation Length field is present.The Encapsulation field is present only when the Encapsulation Length field is nonzero. |
| EDPKE authentication | 1 | Reserved | RSNE is present.RSNXE is present if any subfield of the Extended RSN Capabilities field in this element, except the Field Length subfield, is nonzero.PASN Parameters element is present.Timeout Interval element may be present.Wrapped Data element is present if the wrapped data format in PASN Parameters element is nonzero and not reserved. |
| EDPKE authentication | 2 | Status | RSNE is present and PASN Parameters element is present if Status Code field is 0.RSNXE is present if any subfield of the Extended RSN Capabilities field in this element, except the Field Length subfield, is nonzero.Timeout Interval element may be present.Wrapped data element is present if wrapped data format in PASN Parameters element is nonzero and not reserved and Status Code field is 0.MIC element is present. |
| EDPKE authentication | 3 | Status | PASN Parameters element is present if Status Code field is 0.Wrapped data element is present if wrapped data format in PASN Parameters element is nonzero and not reserved; and Status Code field is 0.MIC element is present. |

**TGbi Editor: *Instruction: Modify 9.3.3.5 as follows***

* Association Request frame format

***Insert new rows to Table 9-64 in numeric order (not all lines shown):.***

* Association Request frame body

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| … |  |  |
| <Last assigned+1> | DS MAC Address | The DS MAC Address element is present if the Association Request frame is encrypted, dot11DSMACAddressActivated is true, and the peer indicates support for DS MAC Address in the RSNXE(#160); otherwise, it is not present. |
| <Last assigned+2> | EDP | The EDP element is present if the Association Request frame is encrypted and dot11EDPGroupEpochActivated is true; otherwise, it is not present. This element carries the desired parameters of the Epoch to be joined by the sending STA. |

**TGbi Editor: *Instruction: Modify 9.3.3.7 as follows***

* Reassociation Request frame format

***Insert new rows to Table 9-66 in numeric order (not all lines shown):.***

* Reassociation Request frame body

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| … |  |  |
| <Last assigned+1> | DS MAC Address | The DS MAC Address element is present if the Reassociation Request frame is encrypted, dot11DSMACAddressActivated is true, and the peer indicates support for DS MAC Address in the RSNXE(#160); otherwise, it is not present. |
| <Last assigned+2> | EDP | The EDP element is present if the Reassociation Request frame is encrypted and dot11EDPGroupEpochActivated is true; otherwise, it is not present. This element carries the desired parameters of the Epoch to be joined by the sending STA. |

**TGbi Editor: *Instruction: Modify 9.6.32.1 as follows***

* Protected HE Action field

***Insert the following new rows to Table 9-647 while maintaining the numerical order and updating the reserved range (not all lines shown):***

* Protected HE Action field values

|  |  |  |
| --- | --- | --- |
| Value | Meaning | Time priority(#491) |
| 0 | HE BSS Color Change Announcement | No |
| 1 | MU EDCA Reset | No |
| 2 | Protected HE Compressed Beamforming/CQI  | Yes |
| 3 | Protected Quiet Time Period | No |
| ~~2~~4-255 | Reserved |  |

**TGbi Editor: *Instruction: Modify C.3 as follows***

* MIB detail

Dot11EDPStationConfigEntry ::= SEQUENCE

 {

 dot11EPDPKEActivated TruthValue,

 dot11EDPGroupEpochActivated TruthValue,

 dot11EDPEpochStartTimeMargin Unsigned32,

 dot11EDPEpochTransitionTime Unsigned32,

 dot11EDPGroupEpochCurrentGroup Unsigned32,

 dot11EDPRobustIndividuallyAddressedManagementFrameActivated

 TruthValue,

 dot11EDPCapabilitiesAndOperationParametersRequestResponseActivated

 TruthValue,

 dot11EDPReAssociationFrameEncryptionSupportActivated TruthValue,

 dot11EDPIEEE8021XAuthenticationUtilizingAuthenticationFrameActivated

 TruthValue,

 dot11EDPPMKSACachingPrivacySupportActivated TruthValue

 dot11DSMACAddressActivated TruthValue,

 dot11PrivacyBeaconResponseTime Unsigned32

 }

(…existing texts…)

dot11EDPRobustIndividuallyAddressedManagementFrameActivated OBJECT-TYPE

 SYNTAX TruthValue

 MAX-ACCESS read-write

 STATUS current

 DESCRIPTION

 "This is a control variable. It is written by an external management entity or the SME. Changes take effect for the next MLME-START.request primitive or MLME-JOIN.request primitive.(#742) This attribute, when true, indicates the capability to support EDP robust individually addressed Management frame is enabled. The capability is disabled otherwise."

 DEFVAL { false }

 ::= { dot11EDPStationConfigEntry 6 }

dot11EDPCapabilitiesAndOperationParametersRequestResponseActivated OBJECT-TYPE

 SYNTAX TruthValue

 MAX-ACCESS read-write

 STATUS current

 DESCRIPTION

 "This is a control variable. It is written by an external management entity or the SME. Changes take effect for the next MLME-START.request primitive or MLME-JOIN.request primitive. This attribute, when true, indicates the capability to support capabilities and operation parameters request and response is enabled. The capability is disabled otherwise."

 DEFVAL { false }

 ::= { dot11EDPStationConfigEntry 7 }

(…existing texts…)

dot11DSMACAddressActivated OBJECT-TYPE

 SYNTAX TruthValue

 MAX-ACCESS read-write

 STATUS current

 DESCRIPTION

 "This is a control variable. It is written by an external management entity or the SME. Changes take effect for the next MLME-START.request primitive or MLME-JOIN.request primitive. This attribute, when true, indicates the capability to support use of a(#744) DS MAC Address is enabled. The capability is disabled otherwise."

 DEFVAL { false }

 ::= { dot11EDPStationConfigEntry 11}

(…existing texts…)

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \* End of dot11EDPStationConfig TABLE

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**TGbi Editor: *Instruction: Modify 4.2.5 as follows***

* Interaction with other IEEE 802® layers

***Change the second paragraph as follows:***

In a robust security network association (RSNA), IEEE Std 802.11 provides functions to protect Data frames, IEEE Std 802.1X-2020 provides authentication and a Controlled Port, and IEEE Std 802.11 and IEEE Std 802.1X-2020 collaborate to provide key management. All STAs in an RSNA have a corresponding IEEE 802.1X entity that handles these services. This standard defines how an RSNA utilizes IEEE Std 802.1X-2020 to access these services. Within IEEE Std 802.11, EAPOL PDUs are carried as MSDUs within one or more Data frames , as described in Clause 12 of IEEE Std 802.1X-2020. Within this standard, Data frames used for this purpose are generally referred to as *EAPOL-Key frames, EAPOL-Key request frames, and EAPOL-Start frames*.

Within IEEE Std 802.11, EAPOL PDUs can also be carried within Authentication frames (see 12.16.5 (IEEE 802.1X authentication utilizing Authentication frames)). (#979) (#962)

**TGbi Editor: *Instruction: Modify 3.2 as follows***

* Definitions specific to IEEE 802.11

***Insert the following definitions (maintaining alphabetical order):***

(#962)

**TGbi Editor: *Instruction: Modify 4.10.3.2 as follows***

* AKM operations with AS

***Change item b) of the first paragraph as follows (not all lines are shown):***

The following AKM operations are carried out when an IEEE 802.1X AS is used:

* A STA discovers the AP’s security policy through passively monitoring Beacon frames or through active probing. If IEEE 802.1X authentication is used, the EAP authentication process starts when the Authenticator sends the EAP-Request or the Supplicant sends the EAPOL-Start PDU (in one or more EAPOL-Start frames or in an(#962) Authentication frame). EAP messages pass between the Supplicant and AS via the Authenticator and Supplicant’s Uncontrolled Ports as described in 12.7 (Keys and key distribution).

**TGbi Editor: *Instruction: Modify 12.16.5 as follows***

**12.16.5 IEEE 802.1X authentication utilizing Authentication frames**

(#962)