IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 11bi D1.0 CRs for 10.71.2.5 | | | | |
| Date: 2025-03-05 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Jerome Henry | Cisco Systems |  |  | jerhenry@cisco.com |
| Domenico Ficara | Cisco Systems |  |  | dficara@cisco.com |
| Ugo Campiglio | Cisco Systems |  |  | ucampigl@cisco.com |
| Javier Contreras | Cisco Systems |  |  | jacontre@cisco.com |

Abstract

This submission proposes resolutions for the following CIDs:

91, 555, 121, 556, 92, 288, 1067, 214, 811, 93, 350, 349, 1068, 558, 94, 289, 559, 290, 812, 124, 560, 813, 351, 970.

Revisions:

* Rev 0: Initial version of the document.
* Rev 1 : added reference to 25/0452.
* Rev 2: corrected the OTA collision CRs
* Rev 3: integrate comments in Atlanta F2F and fixes to this clause in 11-25/693

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** | **Commenter** | **Clause** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 91 | Graham Smith | 10.71.2.5 | 81.01 | "OTA MACaddress collision avoidance". If I have this right, the idea is that the AP calculates that a collision will occur in the future. Presumealy therefore 2 STAs are involved. Does the AP only send to one, or both? If only one is a CPE then obviously sends to that, but what if both are CPEs ? Also there is a do nothing option, so what happens then? I think some more thought is required. | Addess conditions cited in comment. IF collision between CPE non-AP and a non-AP STA the the CPE non-AP must do something. Also if both CPE non-APs then does AP decide who to contact and again, how can CPE non-AP decide not to act? | REVISED  Add cases where the collision is with a CPE STA/-non-AP MLD, vs with a non-CPE STA. Also add text describing what happens if the CPE STA refuses the remediation, change with language as shown in 11-25/0451. |
| 555 | Mark RISON | 10.71.2.5 | 81.03 | "A CPE AP MLD and a CPE non-AP MLD anonymize selected OTA MAC header fields of individually addressed frames of the CPE affiliated STAs within EDP epochs. " -- STAs don't have frames | Change to "A CPE AP MLD and a CPE non-AP MLD anonymize selected OTA MAC header fields of individually addressed frames they transmit to each other." | ACCEPTED  change with language as shown in 11-25/0451. |
| 121 | Chaoming Luo | 10.71.2.5 | 81.03 | What is "CPE affiliated STAs"? Are there "non-CPE affiliated STAs" in a CPE AP MLD or a CPE non-AP MLD? | Change to "affiliated STAs" | REVISED  Accepted in principle. The term was removed as part of CID 555 resolution, change with language as shown in document 11-25/0451. |
| 556 | Mark RISON | 10.71.2.5 | 81.07 | "A CPE AP MLD may calculate that the OTA MAC address that a CPE non-AP MLD is anticipated to use in a subsequent epoch may cause a collision" makes it sound as if detecting collisions is optional | Change to "A CPE AP MLD shall determine whether the OTA MAC address that a CPE non-AP MLD will use in a subsequent epoch will cause a collision" | ACCEPTED  change with language as shown in 11-25/0451. |
| 92 | Graham Smith | 10.71.2.5 | 81.07 | "A CPE AP MLD may calculate that the OTA MAC address that a CPE non-AP MLD is anticipated to use in a subsequent epoch may cause a collision with the OTA MAC address of another CPE non-AP MLD(s) or another STA in the ESS." Is "may" OK in this scenario? Surely the CPE AP should or bette,r shall caclulate. | At cited location change "may" to "shall" | REVISED  Accepted in principle, the sentence was reworded while addressing CID 556, and the verb was changed from may to shall, as shown in document 11-25/0451. |
| 288 | Liwen Chu | 10.71.2.5 | 81.07 | the sentence is diffcult to understand and has some grammar error. | rewrite the sentence | REVISED  Accepted in principle, the sentence was reworded while addressing this CID and CID 556, as shown in document 11-25/0451. |
| 1067 | Philip Hawkes | 10.71.2.5 | 81.08 | A collision is only an issue when it occurs on the same link. Also it is a collision of a OTA MAC address of an affiliated STA, not | Clarify that a collision is only an issue when this occurs on the same link. Clarify that it is the OTA MAC address ifan afiliated STA. | REVISED  The collision is an issue when it occurs on a link. As discussed in March F2F, the collision may be this link or another link, as the frame indicates the link ID (thus “a” link instead of “the same link” was the group decision). The “OTA” and “ESS” terms are indeed misleading, and should be reworded, change as shown in document 11-25/0451. |
| 214 | Jarkko Kneckt | 10.71.2.5 | 82.30 | The address collision with a STA in ESS is not relevant, because STAs transmit frames to different APs and include AP address to every transmitted frame. | Please consider only collisions within the same BSS, or allow AP to signal whether the collision is with OBSS STA. | REVISED  The collision is an issue when it occurs on the same link, the “OTA” and “ESS” terms are indeed misleading, and should be reworded, change as shown in document 11-25/0451. Also see 11-25/0449. |
| 811 | John Wullert | 10.71.2.5 | 81.09 | The description of the behavior of the CPE AP MLD refers to "the CPE non-AP MLD" which suggests there is only one non-AP MLD. However, in order for there to be a OTA MAC address collision, there must be at least two non-AP MLDs and a collision could involve more than two. Also, language in long sentence is somewhat confusing. | Revise text to say "When such a potential collision is detected, the CPE AP MLD shall send an otaMAC Collision Warning frame to one or more of the colliding CPE non-AP MLDs before the epoch where the collision is anticipated to occur instructing the non-AP MLD(s) to apply the non-AP MLD specific epoch offset signaled in the otaMAC Collision Warning frame to avoid address collision. The CPE AP MLD indicates the epoch where the collision is anticipated to occur in the Colliding Epoch field in the otaMAC Collision Warning frame, | REVISED  Accepted in principle, the sentence was reworded along the same principles while aso addressing CID 91, change as shown in document 11-25/0451 |
| 93 | Graham Smith | 10.71.2.5 | 81.10 | "shall send to the CPE non-AP MLD an OTA MAC Collision Warning action frame before the epoch where the collision is anticipated" Which non-AP MLD, it takes two to collide? | Expand to cover which non-AP MLD and also cover case where other is a STA. | REVISED  Reworded as part of CID 91 resolution, and separated in two cases (collision against another CPE or a non CPE), as shown in 11-25/0451. |
| 350 | Carol Ansley | 10.71.2.5 | 81.10 | Reword for clarity "When such a collision is detected" | Change to "If such a collision is anticipated," | REVISED  Accepted in principle, the word risk was added as part of resolution of CID 556, as shown in 11-25/0451. |
| 349 | Carol Ansley | 10.71.2.5 | 81.11 | Change "where" to "when" | as comment directs | ACCEPTED  Implement as shown in 11-25/0451. |
| 1068 | Philip Hawkes | 10.71.2.5 | 81.11 | The non-AP MLD needs to use the entire FA parameter set, not just the CPE non-AP MLD OTA MAC address. Also in line 22 and 27 on this page | Replace "CPE non-AP MLD OTA MAC address" with "FA parameter set" | REVISED  The sentence describes a risk, the collision with another MAC address, and a remediation, applying an offset. The collision is with another MAC address, not with the FA parameter set. The remediation does not say that the STA needs to use a specific MAC address, the sentence states that the non-AP MLD should use the offset signaled in the OTA Collision warning frame. The offset applies to the parameters of the epoch, not to a specific MAC address. For clarity, added that the offset applies to the FA parameters, as shown in 11-25/0451 |
| 558 | Mark RISON | 10.71.2.5 | 81.13 | "the AP MLD OTA MAC Collision Warning action frame" -- no such frame | Refer to an actual frame | REVISED  Reference corrected to the OTA Collision Notification frame, as shown in 11-25/693 |
| 94 | Graham Smith | 10.71.2.5. | 81.17 | Para begining "Thus, if the Colliding".. The explaination but needs to be more readable. NOTE: What happens if the non-AP MLD rejects the proposed action is unspecified. The CPE AP MLD presumably will keep sending OTA Collision Warning elements, until it does accept? Or it goes after the other CPE non-AP MLD, or if the other STA is a non-CPE, then it can't be changed. In addition to the proposed resolution, these issues need to be addressed. | Replace cited paragraph with : In general, the operation is as follows. If the collision is calculated to occur m epochs after the current epoch then the CPE AP MLD sends an OTA Collision Warning element to the non-AP MLD with the Colliding Epoch filed value equal to m, the Collision Status field set to 0, indicating the collision risk, and the non-AP MLD Specific Epoch Number Offset set to n, where n is the epoch count that the non-AP MLD is requested to skip. The CPE AP MLD is therefore requesting that for the epoch occurring after m epochs, the CPE AP MLD uses the CPE non-AP MLD OTA MAC address that it had planned to use for the epoch occurring m+n epochs later. Then, in the subsequent epoch, the CPE non-AP MLD is expected to use the CPE non-AP MLD OTA MAC address that it had planned to use m+n+1 epochs later. The CPE non-AP MLD shall respond with an OTA MAC Collision Warning action frame with the Collision Status field set to either 1, indicating that the CPE non-AP will applying the epoch offset, or 2, indicating that the non-AP MLD will not take the proposed action. NOTE: What happens if the non-AP MLD rejects the proposed action is unspecified. The CPE AP MLD presumably will keep sending OTA Collision Warning elements, until it does accept? Or it goes after the other CPE non-AP MLD, or if the other STA is a non-CPE, then it can't be changed. | REVISED  The “comment on what happens if the STA rejects” was made by the same author also in CIDs 53 and 91, and addressed for this clause with CID 91 resolution. Splitting the sentences is added for this CID, as shown in 11-25/0451. |
| 289 | Liwen Chu | 10.71.2.5 | 81.17 | either change "Colliding Epoch value" to "Colliding Epoch Offset value" or change the sentence to"......occur at the epoch with epoch number m." | As in comment | REVISED  The sentence was also reworded as part of CID 94, among others, and split into several sentences. M is the target epoch for the collision, and n the offset, as shown in 11-25/0451. |
| 559 | Mark RISON | 10.71.2.5 | 81.17 | "the non-AP MLD Specific Epoch Number Offset is n" is missing "field" and should be "Non-AP" | As it says in the comment | ACCEPTED  change with language as shown in 11-25/0451. |
| 290 | Liwen Chu | 10.71.2.5 | 81.18 | shouldn't the sentence be "......Offset is n, then for the epoch occurring n......" | As in comment | REVISED  The sentence was confusing, n is the offset, m is the epoch when the offset should be applied. The sentence was split for clarity as shown in 11-25/0451. |
| 812 | John Wullert | 10.71.2.5 | 81.23 | Given that the CPE AP MLD might send otaMAC Collision Warning frames to mulitple CPE non-AP MLDs, need to reflect that in subsequent language. | Revise text to "A CPE non-AP MLD that receives an otaMAC Collision Warning frame shall respond with an otaMAC Collision Warning action frame acknowledging the CPE AP MLD warning..." | REVISED  Accepted in principle, the sentence was slightly reworded after other CIDs, but was also changed with this CID to state that a STA receiving the frame shall respond, as shown in 11-25/0451. |
| 124 | Chaoming Luo | 10.71.2.5 | 81.26 | It's not reasonable for non-AP to reject a proposed remediation of collision, since collison will not only affect this non-AP but also affect other non-APs. | Remove the option of rejecting. | REJECTED  This question was debated in the TG, and we concluded that the AP should not mandate a behavior that affects the STA privacy. However, the group concluded that the AP could block or disconnect the STA, and wording was added to the clause. |
| 560 | Mark RISON | 10.71.2.5 | 81.25 | It is not clear why the collision avoidance might ever be refused | At least add a NOTE to explain why a receiver might wish to ignore the warning | REVISED  Added a note as shown in 11-25/0451. |
| 813 | John Wullert | 10.71.2.5 | 81.26 | The text allows the CPE non-AP MLD to reject a CPE AP MLD's request to change its OTA MAC address. This sets the stage for a collision, which would be bad for any of the CPE non-AP MLDs involved in the potential collision. | Add a note indicating the potential implications of a rejection and suggesting potential AP behavior. (The note could suggest specific actions or indicate the AP's response in this case is left to implementation.) | REVISED  The paragraph was improved also while addressing CID 91, adding the consequences of the refusal as shown in 11-25/0451. |
| 351 | Carol Ansley | 10.71.2.5 | 81.27 | If a parameter collision is detected, the non-AP MLS should not be able to ignore the notification. | Add a requirement that the AP MLD disassociate the non-AP MLD before the collision occurs, if the non-AP MLD does not accept the required change. | REVISED  The paragraph was improved also while addressing CID 91, adding the consequences of the refusal as shown in 11-25/0451. |
| 970 | John Coffey | 10.71.2.5 | 81.27 | Varying style: "and thus" used where "thus" was used in an identical context earlier in the same sentence. | Change "and thus" to "thus". | ACCEPTED  change with language as shown in in 11-25/0451. |

**Discussion**

**Starting state for the clause (after implementation of 11-25/0452 and 11-25/693).**

**10.71.2.5 OTA MAC address collision avoidance**

A CPE AP MLD and a CPE non-AP MLD anonymize selected OTA MAC header fields of individually addressed frames of the CPE affiliated STAs within EDP epochs.

A CPE AP MLD may calculate that the OTA MAC address that a CPE non-AP MLD is anticipated to use in a subsequent epoch may cause a collision with the OTA MAC address of another CPE non-AP MLD(s) or another STA in the ESS. When such a collision is detected, the CPE AP MLD shall send to the CPE non-AP MLD an OTA MAC Collision ~~Warning~~ Notification (11-25/693) action frame before the epoch where the collision is anticipated to risk occurring and indicated in the Colliding Epoch field, instructing the non-AP MLD to apply the non-AP MLD specific epoch offset signaled in the AP MLD OTA MAC Collision ~~Warning~~ Notification (11-25/693) action frame to avoid address collision.

Thus, if the Colliding Epoch value is m, indicating that the collision is expected to occur m epochs after the current epoch, and if the non-AP MLD Specific Epoch Number Offset is n, then for the epoch occurring m epochs later, the CPE AP MLD is requesting the CPE non-AP MLD to use the CPE non-AP MLD OTA MAC address that the CPE non-AP MLD had planned to use for the epoch occurring m+n epochs later. In the subsequent epoch, the CPE non-AP MLD is expected to use the CPE non-AP MLD OTA MAC address that the CPE non-AP MLD had planned to use m+n+1 epochs later, unless the CPE AP MLD also signals a collision ~~warning~~ notification (11-25/693) for that epoch. The sum m+n cannot be larger than the value of the Epochs Remaining field signaled during the epoch when the AP sent the OTA MAC Collision Notification frame (11-25/0452 & 693). The CPE non-AP MLD shall respond with an OTA MAC Collision ~~Warning~~ ~~action~~ Response (11-25/0693) frame acknowledging the CPE AP MLD warning, and either accepting the CPE AP MLD proposed remediation, thus applying the offset requested by the CPE AP MLD, or rejecting the CPE AP MLD proposed remediation, and thus using the CPE non-AP MLD OTA MAC address that the CPE non-AP MLD had planned to use for that epoch before receiving the CPE AP MLD OTA MAC Collision ~~Warning~~ Notification (11-25/693) action frame.

CID 91

Revised

The CID asks to articulate the cases (one CPE only, both CPEs). Also articulate what happens if the CPE STA refuses to skip.

A CPE AP MLD and a CPE non-AP MLD anonymize selected OTA MAC header fields of individually addressed frames of the CPE affiliated STAs within EDP epochs.

A CPE AP MLD may calculate that the OTA MAC address that a CPE non-AP MLD is anticipated to use in a subsequent epoch may cause a collision with the OTA MAC address of another ~~CPE~~ non-AP MLD(s) or another STA ~~in the ESS~~. When such a collision risk is detected with the OTA MAC of a non-CPE STA or non-AP MLD, the CPE AP MLD shall send to the CPE non-AP MLD an OTA MAC Collision ~~Warning~~ Notification (11-25/693) action frame before the epoch where the collision is anticipated to risk occurring and indicated in the Colliding Epoch field, instructing the non-AP MLD to apply the non-AP MLD specific epoch offset signaled in the AP MLD OTA MAC Collision ~~Warning~~ Notification (11-25/693) action frame to avoid address collision. When such a collision risk is detected with the MAC of a CPE STA or CPE non-AP MLD, the AP shall send the OTA MAC Collision Notification action frame to both CPE STAs or non-AP MLDs.

Thus, if the Colliding Epoch value is m, indicating that the collision is expected to occur m epochs after the current epoch, and if the non-AP MLD Specific Epoch Number Offset is n, then for the epoch occurring m epochs later, the CPE AP MLD is requesting the CPE non-AP MLD to use the CPE non-AP MLD OTA MAC address that the CPE non-AP MLD had planned to use for the epoch occurring m+n epochs later. In the subsequent epoch, the CPE non-AP MLD is expected to use the CPE non-AP MLD OTA MAC address that the CPE non-AP MLD had planned to use m+n+1 epochs later, unless the CPE AP MLD also signals a collision ~~warning~~ notification (11-25/693) for that epoch. The sum m+n cannot be larger than the value of the Epochs Remaining field signaled during the epoch when the AP sent the OTA MAC Collision Notification frame (11-25/0452 & 693). The CPE non-AP MLD shall respond with an OTA MAC Collision ~~Warning~~ ~~action~~ Response (11-25/0693) frame ~~acknowledging the CPE AP MLD warning~~, and either accepting the CPE AP MLD proposed remediation, thus applying the offset requested by the CPE AP MLD, or rejecting the CPE AP MLD proposed remediation, and thus using the CPE non-AP MLD OTA MAC address that the CPE non-AP MLD had planned to use for that epoch before receiving the CPE AP MLD OTA MAC Collision ~~Warning~~ Notification (11-25/693) action frame. The AP may refrain from accepting traffic from, or forwarding traffic to, a CPE STA or non-AP MLD that rejected the proposed remediation, during the epoch when the collision occurs. Alternatively, the AP may deassociate a CPE STA or non-AP MLD that rejected the proposed remediation.

CID 555, 121

Accepted

A CPE AP MLD and a CPE non-AP MLD anonymize selected OTA MAC header fields of individually addressed frames they transmit to each other ~~of the CPE affiliated STAs~~ within EDP epochs.

CID 556

Accepted

A CPE AP MLD shall determine whether the OTA MAC address that a CPE non-AP MLD will use in a subsequent epoch will cause a collision ~~may calculate that the OTA MAC address that a CPE non-AP MLD is anticipated to use in a subsequent epoch may cause a collision~~ with the OTA MAC address of another ~~CPE~~ non-AP MLD(s) or another STA ~~in the ESS~~. When such a collision risk is detected with the OTA MAC of a non-CPE STA or non-AP MLD, the CPE AP MLD shall send to the CPE non-AP MLD an OTA MAC Collision ~~Warning~~ Notification (11-25/693) action frame before the epoch where the collision is anticipated to risk occurring and indicated in the Colliding Epoch field, instructing the non-AP MLD to apply the non-AP MLD specific epoch offset signaled in the AP MLD OTA MAC Collision Notification (11-25/693) action frame to avoid address collision. When such a collision risk is detected with the MAC of a CPE STA or CPE non-AP MLD, the AP shall send the OTA MAC Collision Notification action frame to both CPE STAs or non-AP MLDs.

CID 92, 288

Revised

Sentence was reworded with CID 556 resolution.

CID 1067, 214

Revised

A CPE AP MLD shall determine whether the OTA MAC address that a CPE non-AP MLD will use in a subsequent epoch will cause a collision with the OTA MAC address of another non-AP MLD(s) or another STA on a link ~~in the ESS~~. When such a collision risk is detected with the OTA MAC of a non-CPE STA or non-AP MLD, the CPE AP MLD shall send to the CPE non-AP MLD an OTA MAC Collision ~~Warning~~ Notification (11-25/693) action frame before the epoch where the collision is anticipated to risk occurring and indicated in the Colliding Epoch field, instructing the non-AP MLD to apply the non-AP MLD specific epoch offset signaled in the AP MLD OTA MAC Collision Notification (11-25/693) action frame to avoid address collision. When such a collision risk is detected with the MAC of a CPE STA or CPE non-AP MLD, the AP shall send the OTA MAC Collision Notification action frame to both CPE STAs or non-AP MLDs.

CIDs 811, 93

Revised

The sentences were reworded as part of CID 91 resolution.

CID 350

Revised

A CPE AP MLD shall determine whether the OTA MAC address that a CPE non-AP MLD will use in a subsequent epoch will cause a collision with the OTA MAC address of another non-AP MLD(s) or another STA on a link. When such a collision risk is anticipated ~~detected~~ with the OTA MAC of a non-CPE STA or non-AP MLD, the CPE AP MLD shall send to the CPE non-AP MLD an OTA MAC Collision ~~Warning~~ Notification (11-25/693) action frame before the epoch where the collision is anticipated to risk occurring and indicated in the Colliding Epoch field, instructing the non-AP MLD to apply the non-AP MLD specific epoch offset signaled in the AP MLD OTA MAC Collision Notification (11-25/693) action frame to avoid address collision. When such a collision risk is anticipated ~~detected~~ with the MAC of a CPE STA or CPE non-AP MLD, the AP shall send the OTA MAC Collision Notification action frame to both CPE STAs or non-AP MLDs.

CID 349

Accepted

A CPE AP MLD shall determine whether the OTA MAC address that a CPE non-AP MLD will use in a subsequent epoch will cause a collision with the OTA MAC address of another non-AP MLD(s) or another STA on a link. When such a collision risk is anticipated with the OTA MAC of a non-CPE STA or non-AP MLD, the CPE AP MLD shall send to the CPE non-AP MLD an OTA MAC Collision ~~Warning~~ Notification (11-25/693) action frame before the epoch when ~~where~~ the collision is anticipated to risk occurring and indicated in the Colliding Epoch field, instructing the non-AP MLD to apply the non-AP MLD specific epoch offset signaled in the AP MLD OTA MAC Collision Notification (11-25/693) action frame to avoid address collision. When such a collision risk is anticipated with the MAC of a CPE STA or CPE non-AP MLD, the AP shall send the OTA MAC Collision Notification action frame to both CPE STAs or non-AP MLDs.

CID 1068

Revised

A CPE AP MLD shall determine whether the OTA MAC address that a CPE non-AP MLD will use in a subsequent epoch will cause a collision with the OTA MAC address of another non-AP MLD(s) or another STA on a link. When such a collision risk is anticipated with the OTA MAC of a non-CPE STA or non-AP MLD, the CPE AP MLD shall send to the CPE non-AP MLD an OTA MAC Collision Notification (11-25/693) action frame before the epoch when the collision is anticipated to risk occurring and indicated in the Colliding Epoch field, instructing the non-AP MLD to apply the non-AP MLD specific FA parameters epoch offset signaled in the AP MLD OTA MAC Collision Notification (11-25/693) action frame to avoid address collision. When such a collision risk is anticipated with the MAC of a CPE STA or CPE non-AP MLD, the AP shall send the OTA MAC Collision Notification action frame to both CPE STAs or non-AP MLDs.

Thus, if the Colliding Epoch value is m, indicating that the collision is expected to occur m epochs after the current epoch, and if the non-AP MLD Specific Epoch Number Offset is n, then for the epoch occurring m epochs later, the CPE AP MLD is requesting the CPE non-AP MLD to use the CPE non-AP MLD FA parameters ~~OTA MAC address~~ that the CPE non-AP MLD had planned to use for the epoch occurring m+n epochs later. In the subsequent epoch, the CPE non-AP MLD is expected to use the CPE non-AP MLD FA parameters ~~OTA MAC address~~ that the CPE non-AP MLD had planned to use m+n+1 epochs later, unless the CPE AP MLD also signals a collision ~~warning~~ notification (11-25/693) for that epoch. The sum m+n cannot be larger than the value of the Epochs Remaining field signaled during the epoch when the AP sent the OTA MAC Collision Notification frame (11-25/0452 & 693). The CPE non-AP MLD shall respond with an OTA MAC Collision Response (11-25/0693) frame, and either accepting the CPE AP MLD proposed remediation, thus applying the offset requested by the CPE AP MLD, or rejecting the CPE AP MLD proposed remediation, and thus using the CPE non-AP MLD FA parameters ~~OTA MAC address~~ that the CPE non-AP MLD had planned to use for that epoch before receiving the CPE AP MLD OTA MAC Collision Notification (11-25/693) action frame. The AP may refrain from accepting traffic from, or forwarding traffic to, a CPE STA or non-AP MLD that rejected the proposed remediation, during the epoch when the collision occurs. Alternatively, the AP may deassociate a CPE STA or non-AP MLD that rejected the proposed remediation.

CID 558

Revised

A CPE AP MLD shall determine whether the OTA MAC address that a CPE non-AP MLD will use in a subsequent epoch will cause a collision with the OTA MAC address of another non-AP MLD(s) or another STA on a link. When such a collision risk is anticipated with the OTA MAC of a non-CPE STA or non-AP MLD, the CPE AP MLD shall send to the CPE non-AP MLD an OTA MAC Collision Notification (11-25/693) ~~action~~ frame before the epoch when the collision is anticipated to risk occurring and indicated in the Colliding Epoch field, instructing the non-AP MLD to apply the non-AP MLD specific FA parameters epoch offset signaled in the AP MLD OTA MAC Collision Notification (11-25/693) ~~action~~ frame to avoid address collision. When such a collision risk is anticipated with the MAC of a CPE STA or CPE non-AP MLD, the AP shall send the OTA MAC Collision Notification ~~action~~ frame to both CPE STAs or non-AP MLDs.

Thus, if the Colliding Epoch value is m, indicating that the collision is expected to occur m epochs after the current epoch, and if the non-AP MLD Specific Epoch Number Offset is n, then for the epoch occurring m epochs later, the CPE AP MLD is requesting the CPE non-AP MLD to use the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for the epoch occurring m+n epochs later. In the subsequent epoch, the CPE non-AP MLD is expected to use the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use m+n+1 epochs later, unless the CPE AP MLD also signals a collision notification (11-25/693) for that epoch. The sum m+n cannot be larger than the value of the Epochs Remaining field signaled during the epoch when the AP sent the OTA MAC Collision Notification frame (11-25/0452 & 693). The CPE non-AP MLD shall respond with an OTA MAC Collision Response (11-25/0693) frame, and either accepting the CPE AP MLD proposed remediation, thus applying the offset requested by the CPE AP MLD, or rejecting the CPE AP MLD proposed remediation, and thus using the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for that epoch before receiving the CPE AP MLD OTA MAC Collision Notification (11-25/693) ~~action~~ frame. The AP may refrain from accepting traffic from, or forwarding traffic to, a CPE STA or non-AP MLD that rejected the proposed remediation, during the epoch when the collision occurs. Alternatively, the AP may deassociate a CPE STA or non-AP MLD that rejected the proposed remediation.

CID 94

Revised

In general, the operation is as follows. ~~Thus, if the Colliding Epoch value is m, indicating~~ ~~that~~ If the collision is expected to occur m epochs after the current epoch, then the CPE AP MLD sends an OTA Collision Notification frame to the CPE non-AP MLD with the value of the Colliding Epoch field in the Collision Warning element equal to m, the Collision Status field set to 0, indicating the collision risk, and the non-AP MLD Specific Epoch Number Offset set to n, where n is the epoch count that the non-AP MLD is requested to skip. The CPE AP MLD is therefore requesting that for the epoch occurring after m epochs, the CPE AP MLD uses ~~and if the non-AP MLD Specific Epoch Number Offset is n, then for the epoch occurring m epochs later, the CPE AP MLD is requesting the CPE non-AP MLD to use~~ the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for the epoch occurring m+n epochs later. Then, i~~I~~n the subsequent epoch, the CPE non-AP MLD is expected to use the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use m+n+1 epochs later, unless the CPE AP MLD also signals a collision notification (11-25/693) for that epoch. The sum m+n cannot be larger than the value of the Epochs Remaining field signaled during the epoch when the AP sent the OTA MAC Collision Notification frame (11-25/0452 & 693). The CPE non-AP MLD shall respond with an OTA MAC Collision Response (11-25/0693) frame with the Collision Status field set to either 1, ~~and either~~ accepting the CPE AP MLD proposed remediation, thus applying the offset requested by the CPE AP MLD, or 2, rejecting the CPE AP MLD proposed remediation, and thus using the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for that epoch before receiving the CPE AP MLD OTA MAC Collision Notification (11-25/693) frame. The AP may refrain from accepting traffic from, or forwarding traffic to, a CPE STA or non-AP MLD that rejected the proposed remediation, during the epoch when the collision occurs. Alternatively, the AP may deassociate a CPE STA or non-AP MLD that rejected the proposed remediation.

CID 289

Revised

Clarification made while splitting the sentences for CID 94.

CID 559

Accepted

In general, the operation is as follows. If the collision is expected to occur m epochs after the current epoch, then the CPE AP MLD sends an OTA Collision Notification frame to the CPE non-AP MLD with the value of the Colliding Epoch field in the Collision Warning element equal to m, the Collision Status field set to 0, indicating the collision risk, and the non-AP MLD Specific Epoch Number Offset field set to n, where n is the epoch count that the non-AP MLD is requested to skip. The CPE AP MLD is therefore requesting that for the epoch occurring after m epochs, the CPE AP MLD uses the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for the epoch occurring m+n epochs later. Then, i~~I~~n the subsequent epoch, the CPE non-AP MLD is expected to use the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use m+n+1 epochs later, unless the CPE AP MLD also signals a collision notification (11-25/693) for that epoch. The sum m+n cannot be larger than the value of the Epochs Remaining field signaled during the epoch when the AP sent the OTA MAC Collision Notification frame (11-25/0452 & 693). The CPE non-AP MLD shall respond with an OTA MAC Collision Response (11-25/0693) frame with the Collision Status field set to either 1, accepting the CPE AP MLD proposed remediation, thus applying the offset requested by the CPE AP MLD, or 2, rejecting the CPE AP MLD proposed remediation, and thus using the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for that epoch before receiving the CPE AP MLD OTA MAC Collision Notification (11-25/693) frame. The AP may refrain from accepting traffic from, or forwarding traffic to, a CPE STA or non-AP MLD that rejected the proposed remediation, during the epoch when the collision occurs. Alternatively, the AP may deassociate a CPE STA or non-AP MLD that rejected the proposed remediation.

CID290

Revised

Sentence split for clarity with CID 94.

CID812

Revised

In general, the operation is as follows. If the collision is expected to occur m epochs after the current epoch, then the CPE AP MLD sends an OTA Collision Notification frame to the CPE non-AP MLD with the value of the Colliding Epoch field in the Collision Warning element equal to m, the Collision Status field set to 0, indicating the collision risk, and the non-AP MLD Specific Epoch Number Offset field set to n, where n is the epoch count that the non-AP MLD is requested to skip. The CPE AP MLD is therefore requesting that for the epoch occurring after m epochs, the CPE AP MLD uses the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for the epoch occurring m+n epochs later. Then, i~~I~~n the subsequent epoch, the CPE non-AP MLD is expected to use the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use m+n+1 epochs later, unless the CPE AP MLD also signals a collision notification (11-25/693) for that epoch. The sum m+n cannot be larger than the value of the Epochs Remaining field signaled during the epoch when the AP sent the OTA MAC Collision Notification frame (11-25/0452 & 693). A STA or non-AP MLD that received an OTA MAC Collision Notification frame ~~The CPE non-AP MLD~~ shall respond with an OTA MAC Collision Response (11-25/0693) frame with the Collision Status field set to either 1, accepting the CPE AP MLD proposed remediation, thus applying the offset requested by the CPE AP MLD, or 2, rejecting the CPE AP MLD proposed remediation, and thus using the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for that epoch before receiving the CPE AP MLD OTA MAC Collision Notification (11-25/693) frame. The AP may refrain from accepting traffic from, or forwarding traffic to, a CPE STA or non-AP MLD that rejected the proposed remediation, during the epoch when the collision occurs. Alternatively, the AP may deassociate a CPE STA or non-AP MLD that rejected the proposed remediation.

CID 124

Rejected

This question was debated in the TG, and we concluded that the AP should not mandate a behavior that affects the STA privacy.

CID560

Revised

In general, the operation is as follows. If the collision is expected to occur m epochs after the current epoch, then the CPE AP MLD sends an OTA Collision Notification frame to the CPE non-AP MLD with the value of the Colliding Epoch field in the Collision Warning element equal to m, the Collision Status field set to 0, indicating the collision risk, and the non-AP MLD Specific Epoch Number Offset field set to n, where n is the epoch count that the non-AP MLD is requested to skip. The CPE AP MLD is therefore requesting that for the epoch occurring after m epochs, the CPE AP MLD uses the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for the epoch occurring m+n epochs later. Then, i~~I~~n the subsequent epoch, the CPE non-AP MLD is expected to use the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use m+n+1 epochs later, unless the CPE AP MLD also signals a collision notification (11-25/693) for that epoch. The sum m+n cannot be larger than the value of the Epochs Remaining field signaled during the epoch when the AP sent the OTA MAC Collision Notification frame (11-25/0452 & 693). A STA or non-AP MLD that received an OTA MAC Collision Notification frame shall respond with an OTA MAC Collision Response (11-25/0693) frame with the Collision Status field set to either 1, accepting the CPE AP MLD proposed remediation, thus applying the offset requested by the CPE AP MLD, or 2, rejecting the CPE AP MLD proposed remediation, and thus using the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for that epoch before receiving the CPE AP MLD OTA MAC Collision Notification (11-25/693) frame. The AP may refrain from accepting traffic from, or forwarding traffic to, a CPE STA or non-AP MLD that rejected the proposed remediation, during the epoch when the collision occurs. Alternatively, the AP may deassociate a CPE STA or non-AP MLD that rejected the proposed remediation.

NOTE – A STA or non-AP MLD may decline to apply the requested offset for procedural reasons, e.g., the inability to skip epoch FA parameter sequences, or internal privacy configuration or policy reasons.

CID 813, 351

Revised

The sentence was improved as part of CID 91, describing the AP action in case of refusal.

CID 970

Accepted

In general, the operation is as follows. If the collision is expected to occur m epochs after the current epoch, then the CPE AP MLD sends an OTA Collision Notification frame to the CPE non-AP MLD with the value of the Colliding Epoch field in the Collision Warning element equal to m, the Collision Status field set to 0, indicating the collision risk, and the non-AP MLD Specific Epoch Number Offset field set to n, where n is the epoch count that the non-AP MLD is requested to skip. The CPE AP MLD is therefore requesting that for the epoch occurring after m epochs, the CPE AP MLD uses the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for the epoch occurring m+n epochs later. Then, i~~I~~n the subsequent epoch, the CPE non-AP MLD is expected to use the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use m+n+1 epochs later, unless the CPE AP MLD also signals a collision notification (11-25/693) for that epoch. The sum m+n cannot be larger than the value of the Epochs Remaining field signaled during the epoch when the AP sent the OTA MAC Collision Notification frame (11-25/0452 & 693). A STA or non-AP MLD that received an OTA MAC Collision Notification frame shall respond with an OTA MAC Collision Response (11-25/0693) frame with the Collision Status field set to either 1, accepting the CPE AP MLD proposed remediation, thus applying the offset requested by the CPE AP MLD, or 2, rejecting the CPE AP MLD proposed remediation, ~~and~~ thus using the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for that epoch before receiving the CPE AP MLD OTA MAC Collision Notification (11-25/693) frame. The AP may refrain from accepting traffic from, or forwarding traffic to, a CPE STA or non-AP MLD that rejected the proposed remediation, during the epoch when the collision occurs. Alternatively, the AP may deassociate a CPE STA or non-AP MLD that rejected the proposed remediation.

NOTE – A STA or non-AP MLD may decline to apply the requested offset for procedural reasons, e.g., the inability to skip epoch FA parameter sequences, or internal privacy configuration or policy reasons.

*TGbi editor: Modify clause 10.71.2.5 as follows (track change on):*

**10.71.2.5 OTA MAC address collision avoidance**

A CPE AP MLD and a CPE non-AP MLD anonymize selected OTA MAC header fields of individually addressed frames they transmit to each other.

A CPE AP MLD shall determine whether the OTA MAC address that a CPE non-AP MLD will use in a subsequent epoch will cause a collision with the OTA MAC address of another non-AP MLD(s) or another STA on a link. When such a collision risk is anticipated with the OTA MAC of a non-CPE STA or non-AP MLD, the CPE AP MLD shall send to the CPE non-AP MLD an OTA MAC Collision Notification frame before the epoch when the collision is anticipated to risk occurring and indicated in the Colliding Epoch field, instructing the non-AP MLD to apply the non-AP MLD specific FA parameters epoch offset signaled in the AP MLD OTA MAC Collision Notification frame to avoid address collision. When such a collision risk is anticipated with the MAC of a CPE STA or CPE non-AP MLD, the AP shall send the OTA MAC Collision Notification frame to both CPE STAs or non-AP MLDs.

In general, the operation is as follows. If the collision is expected to occur m epochs after the current epoch, then the CPE AP MLD sends an OTA Collision Warning element to the CPE non-AP MLD with the value of the Colliding Epoch field in the Collision Warning element equal to m, the Collision Status field set to 0, indicating the collision risk, and the non-AP MLD Specific Epoch Number Offset field set to n, where n is the epoch count that the non-AP MLD is requested to skip. The CPE AP MLD is therefore requesting that for the epoch occurring after m epochs, the CPE AP MLD uses the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for the epoch occurring m+n epochs later. Then, in the subsequent epoch, the CPE non-AP MLD is expected to use the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use m+n+1 epochs later, unless the CPE AP MLD also signals a collision notification for that epoch. The sum m+n cannot be larger than the value of the Epochs Remaining field signaled during the epoch when the AP sent the OTA MAC Collision Notification frame. A STA or non-AP MLD that received an OTA MAC Collision Notification frame shall respond with an OTA MAC Collision Response frame with the Collision Status field set to either 1, accepting the CPE AP MLD proposed remediation, thus applying the offset requested by the CPE AP MLD, or 2, rejecting the CPE AP MLD proposed remediation, thus using the CPE non-AP MLD FA parameters that the CPE non-AP MLD had planned to use for that epoch before receiving the CPE AP MLD OTA MAC Collision Notification frame. . The AP may refrain from accepting traffic from, or forwarding traffic to, a CPE STA or non-AP MLD that rejected the proposed remediation, during the epoch when the collision occurs. Alternatively, the AP may deassociate a CPE STA or non-AP MLD that rejected the proposed remediation.

NOTE – A STA or non-AP MLD may decline to apply the requested offset for procedural reasons, e.g., the inability to skip epoch FA parameter sequences, or internal privacy configuration or policy reasons.