### IEEE P802.11Wireless LANs

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| Comment resolution for 9.3.1.22.7 and 9.3.1.22.8 and 9.3.1.22.9 |
| Date: 2025-04-08 |
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Abstract

This document contains comment resolutions for the following 16 CIDs related to subclause 9.3.1.22.7, 9.3.1.22.8 and 9.3.1.22.9.

* 22, 1038, 1421, 1564, 1730, 1954, 2092, 2510, 2578, 2666,
* 2667, 2932, 2933, 2934, 3755, 3840.

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Minor revisions.
* Rev 2: Added CID 22.
* Rev 3: Added a location indication for the I-FCS, as part of the resolution for CID 3755. Presented in the TGbn Joint call on 5/12/2025.
* Rev 4: Changes based on discussions, including modification in the Location Indication field format and changing I-FCS to IFCS. Presented in the TGbn Joint call on 5/15/2025.
* Rev 5: Changed “initial Control frame” to “ICF”. Changed “IFCS Present Flag subfield” to “IFCS Absent Flag subfield”. Presented in the TGbn Joint call on 5/29/2025.
* Rev 6: Changed “Location Indication field” to “IFCS Location Indication field”. Added discussion on the design of User Info field(s) to carry the IFCS. Presented in the TGbn MAC call on 7/23/2025.
* Rev 7: Made changes per discussion in the TGbn MAC call on 7/23/2025. Passed SP.

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 subsequent TGbn Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbn Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGbn Editor: Editing instructions preceded by “TGbn Editor” are instructions to the TGbn editor to modify existing material in the TGbn draft. As a result of adopting the changes, the TGbn editor will execute the instructions rather than copy them to the TGbn Draft.***

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| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 22 | Jialing Li (Alice Chen) | 9.3.1.22.6 | 54.15 | Add an instruction "Insert a new child subclause of 9.3.1.22 as follows:". In P54L17, add another instruction "Insert the following paragraphs:". | Refer to the comment. | Accepted |
| 1038 | Matthew Fischer | 9.3.1.22.7 | 54.21 | There are two TBDs here in place of text that should say where the IFCS appears in the frame and how it is formatted/encoded | Provide text to indicate how/where/encoding of the IFCS within the frame | Revised –Agree in principle with the comment. Proposed resolution defines the fields that carry the IFCS its encoding and location, namely the definition of two dedicated User Info fields that each carry portions of the IFCS.TGbn editor to make the changes shown in 11-25/0636r7 under all headings that include CID 1038. |
| 1421 | SunHee Baek | 9.3.1.22.7 | 54.25 | How to signal I-FCS should be defined. | I-FCS can be signaled by using one or two User info fields | Revised –Agree in principle with the comment. Proposed resolution defines the fields that carry the IFCS its encoding and location, namely the definition of two dedicated User Info fields that each carry portions of the IFCS.TGbn editor to make the changes shown in 11-25/0636r7 under all headings that include CID 1421. |
| 1564 | Michail Koundourakis | 9.3.1.22.7 | 54.28 | This text "The Intermediate FCS field is not present except in a Trigger frame that is used as an initial Control framesubject to the requirements defined in 37.14 (Padding for an Initial Control Frame)." is very restrictive and reserves future behaviour. There is no good reason to do so, in the future we may find that other frames can benefit from Intermediate FCS and we will then be stuck with breaking backwards compatibility. | Remove this sentence. | Rejected –The IFCS is added explicitly for the purpose of aiding recipient STAs of ICFs to transition from one state to another, upon verifying the validity of IFCS. The proposed text is inline with this and inline with approved motion 12: “Define a way in 11bn to include in an initial control frame an intermediate FCS for UHR STA(s) that precedes padding and the FCS field”. |
| 1730 | Gaius Wee | 9.3.1.22.7 | 54.28 | Inconsistent capitalization for "initial control frame/response". Occurs elsewhere also | Replace "initial Control" with "initial control" throughout | Accepted |
| 1954 | Insik Jung | 9.3.1.22.9 | 54.41 | We need to define UHR variant common info/user info/special user info field to convey some parameters for the shared AP to configure the common pre-UHR portion in the following CoBF PPDU. | As the comment |  |
| 2092 | Vishnu Ratnam | 9.3.1.22.7 | 54.28 | The text "The Intermediate FCS field is not present except in a Trigger frame that is used as an initial Control frame subject to the requirements defined in 37.14 (Padding for an Initial Control Frame)." is not required. There can be other benefits of including I-FCS, such as to allow early termination of frame reception, and so this should be left to implementation. | Change the sentence to: "The Intermediate FCS field shall be present in a Trigger frame that is used as an initial Control frame subject to the requirements defined in 37.14 (Padding for an Initial Control Frame)." | Rejected –The IFCS is added explicitly for the purpose of aiding recipient STAs of ICFs to transition from one state to another, upon verifying the validity of IFCS. The proposed text is inline with this and inline with approved motion 12: “Define a way in 11bn to include in an initial control frame an intermediate FCS for UHR STA(s) that precedes padding and the FCS field”. |
| 2510 | Laurent Cariou | 9.3.1.22.7 | 54.22 | Define how to carry iFCS in trigger frame. Propose to define a new iFCS User Info field with a special AID value and include the iFCS field in 2 consecutive iFCS User Info fields | as in comment | Revised –Agree in principle with the comment. Proposed resolution defines the fields that carry the IFCS its encoding and location, namely the definition of two dedicated User Info fields that each carry portions of the IFCS.TGbn editor to make the changes shown in 11-25/0636r7 under all headings that include CID 2510. |
| 2578 | Minyoung Park | 9.3.1.22.8 | 54.35 | As 802.11 is operating more on per TID based, it would be good to have a preferred TID in the Basic Trigger frame.Please include a preferred TID in the Basic Trigger frame. | As in the comment | Rejected –Currently the basic Trigger frame has a preferred AC, which guides the STA in selecting from which queue to send data in the TB PPDU that is sent in response to the Basic Trigger frame. It is unclear what the benefit would be of adding a preferred TID in addition to the preferred AC which is already available.  |
| 2666 | Xiaofei Wang | 9.3.1.22.7 | 54.28 | There is no need to have a double negative. Better to state the presence requirements directly. | change the sentence to "The Intermediate FCS field is only present in a Trigger frame...." | Revised –Agree in principle and incorporating the changes. Also renamed the cited subclause to “(Use and requirements for initial Control frames) so that we can list which Trigger frames can act as ICFs depending on the modes of operation.TGbn editor to make the changes shown in 11-25/0636r7 under all headings that include CID 2666. |
| 2667 | Xiaofei Wang | 9.3.1.22.7 | 54.18 | The three mentions of intermediate FCS uses three different formats in this subclause, "Intermediate FCS", "intermediate FCS" and "Intermediate FCS field". They need to be made consistent | as in comment | Revised –Agree in principle. Calling this as intermediate FCS (IFCS) and using this term throughout.TGbn editor to make the changes shown in 11-25/0636r7 under all headings that include CID 2667. |
| 2932 | Mark RISON | 9.3.1.22.7 | 54.15 | Assuming this is the field, then fields have one name, either "Intermediate FCS field" or "IFCS field" | Pick one and stick to it | Revised –Agree in principle. Calling this as intermediate FCS (IFCS) and using this term throughout.TGbn editor to make the changes shown in 11-25/0636r7 under all headings that include CID 2932. |
| 2933 | Mark RISON | 9.3.1.22.7 | 54.23 | "The intermediate FCS is 32 bits. The intermediate FCS is located before the padding and the FCS field of the Trigger frame, with specific location and format that is TBD." -- first sentence duplicates first sentence of previous para, and second sentence duplicates second sentence of previous para | Delete the cited text | Revised –Agree to delete. Added “32-bit” to the previous paragraph as well.TGbn editor to make the changes shown in 11-25/0636r7 under all headings that include CID 2933. |
| 2934 | Mark RISON | 9.3.1.22.7 | 54.27 | "The Intermediate FCS field is not present except in a Trigger frame that is used as an initial Control frame subject to the requirements defined in 37.14 (Padding for an Initial Control Frame)." doesn't clearly say when it's present | Change to "The xxx field is present in yyy, and not present otherwise." | Revised –Agree in principle. Accounted for the suggested changes.TGbn editor to make the changes shown in 11-25/0636r7 under all headings that include CID 2934. |
| 3755 | kaiying Lu | 9.3.1.22.7 | 54.21 | A User Info field with a special AID in a trigger frame can be used to carry the Intermediate FCS field. Clarify the format and how to indicate the location of I-FCS if a User Info field is used to carry the I-FCS. | As in comment. | Revised –Agree in principle with the comment. Proposed resolution defines the fields that carry the IFCS its encoding and location, namely the definition of two dedicated User Info fields that each carry portions of the IFCS. Added field that indicates the location of the IFCS.TGbn editor to make the changes shown in 11-25/0636r7 under all headings that include CID 3755. |
| 3840 | Abhishek Patil | 9.3.1.22.6 | 54.21 | Delete this sentence. The next sentence has a TBD for the same purpose. | As in comment | Revised –Agree in principle with the comment. Proposed resolution deletes the sentence and adds the details how the IFCS is carried in the Trigger frame.TGbn editor to make the changes shown in 11-25/0636r7 under all headings that include CID 3840. |

**Discussion on the design of User Info field(s) to carry the IFCS:*[#1038, 1421, 2510, 3755, 3840]***

The 32-bit IFCS needs to be carried in at least one User Info field. If it is carried in a single User Info field, the AID12 subfield can not be set to a fixed value and at least 4 bits within the AID12 subfield would be used to carry the IFCS. In the passed motion #427 (refer to [11-25/634r3](https://mentor.ieee.org/802.11/dcn/25/11-25-0634-03-00bn-joint-pdt-cr-trigger-frame-format-part-3.docx)) and the latest 802.11bn spec D0.3, the AID12 subfield is set to a fixed value of 2011 for each User Info field that contains a portion of an IFCS. It is a neat design that the User Info field(s) that carry the IFCS could be self-identified. In this case, 2 User Info fields are the minimum to carry the IFCS. Therefore, in the proposed spec text change in this document, we use a 2-User Info field design. The design also splits the 32-bit IFCS into 2 User Info fields in the similar way as how the Trigger Control MIC field is split and carried into 8 User Info fields in [11-25/260r7](https://mentor.ieee.org/802.11/dcn/25/11-25-0260-07-000m-trigger-ba-bar-protection.docx).





**Spec Text Changes:**

***TGbn editor: Please change below as follows [#22]:***

***Insert a new child subclause of 9.3.1.22 as follows:[#22]***

* Intermediate FCS

***Insert the following paragraphs: [#22]***

***TGbn editor: Please change the paragraphs below as follows [#2933, 2667, 2932, 1038, 1421, 2510, 1730, 2666, 2934, 3755, 3840]:***

The intermediate FCS (IFCS) is a CRC*[#2933]* that is calculated following the rules in 9.2.4.9 (FCS field) except that the *calculation fields* are all of the fields of the MAC header and the Frame Body field up to and excluding the two User Info fields that contain the IFCS. After the two User Info fields that contain the IFCS, there may be other User Info fields for STAs that do not require an IFCS, before the Padding field and FCS field*[#2667, 2932]*. *[#**1038, 1421, 2993, 3840]*

.*[#2933]*

The IFCS is carried in two contiguous User Info fields, each with AID12 subfield equal to 2011, as shown in Figure 9-xxx (Formats of User Info fields with AID12 subfield equal to 2011).

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0   B11 | B12    B15 | B16 B39 |
| First User Info field | AID12 | Reserved | IFCS[0:23] |
| Bits: | 12 | 4 | 24 |
|  | B0   B11 | B12    B15 | B16 B23 | B24   B39 |
| Second User Info field | AID12 | Reserved | IFCS[24:31] | Reserved |
| Bits: | 12 | 4 | 8 | 16 |

Figure 9-xxx- Formats of User Info fields with AID12 subfield equal to 2011*[#1038, 1421, 2510, 3755, 3840]*

The two User Info fields that contain the IFCS *[#2667, 2932]* are present in a Trigger frame that is an ICF and that satisfies the requirements defined in 37.15 (Use and requirements of initial Control frames), and are not present otherwise.*[#1730, 2666, 2934]****TGbn editor: Please insert a new subclause as follows:***

9.3.1.22.7a IFCS Location Indication field*[#3755]*

The IFCS Location Indication field, if present, appears immediately after the Common Info field if the Special User Info field is not present and appears immediately after the Special User Info field otherwise.

The IFCS Location Indication field has the format shown in Figure 9-yyy (Formats of User Info fields with AID12 subfield equal to 2012) and the AID12 subfield is equal to 2012.

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0   B11 B12 B15 | B16     B23 | B24 B39 |
|  | AID12 | Reserved | IFCS Location | Reserved |
| Bits: | 12 4 | 8 | 16 |

Figure 9-yyy- Formats of User Info field with AID12 subfield equal to 2012

The IFCS Location field contains the number of User Info fields that appear immediately after the IFCS Location Indication field and up to and excluding the first User Info field with AID12 equal to 2011. The value 0 is reserved.

The IFCS Location field is present in a Trigger frame that is an ICF, and that satisfies the requirements defined in 37.15 (Use and requirements of initial Control frames), and is not present otherwise.*[#3755]*

***Change the subclause number of Basic Trigger frame format from 9.3.1.22.6 to 9.3.1.22.8 as follows:***

* Basic Trigger frame format

***Change the subclause number of BFRP Trigger frame format from 9.3.1.22.7 to 9.3.1.22.9 as follows:***

* BFRP Trigger frame format

***TGbn editor: Please change title below and insert new paragraphs as follows[#3755]:***

**37.15 Use and requirements of initial Control frames***[#3755]*

[TBD] If an intermediate FCS and padding are required, then a UHR STA affiliated with an MLD shall set the length of the Padding field of a Trigger frame, that is an initial Control frame (ICF), based on the rules defined in 35.5.2.2.3 (Padding for a Trigger frame), with the following superseding requirements:

— If a DPS STA is an intended receiver of the Trigger frame and the value in the DPS Padding Delay field received from the DPS STA is more than MinTrigProcTime, then the MinTrigProcTime is replaced by the value in the DPS Padding Delay field, and the last bit of the field that contains the intermediate FCS is at least LPAD, MAC, defined in Equation (35-1), where EMLSR\_PADDING\_DELAY is replaced by the value of the DPS Padding Delay field received from the DPS STA.

A UHR STA shall set the IFCS Location Support field to 1 in UHR Capabilities elements it transmits if dot11IFCSLocationIndicationImplemented is true and shall set it to 0 otherwise.

A UHR STA that transmits a Trigger frame as an ICF shall include an IFCS Location Indication field in the Trigger frame if both of the following conditions are satisfied:

* The IFCS Absent Flag subfield of the Common Info field of the Trigger frame is equal to 0
* The STA has set the IFCS Location Support field to 1 in the UHR Capabilities element it transmits*[#3755]*

**C.3 MIB Detail**

***TGbn editor: Insert the following in the dot11StationConfigEntry:***

Dot11StationConfigEntry ::= SEQUENCE

{

dot11StationIDMacAddress,

…

dot11IFCSLocationIndicationImplemented TruthValue*[#3755]*

}

***TGbn editor: Insert the following in the dot11StationConfig TABLE:***

dot11IFCSLocationIndicationImplemented OBJECT-TYPE*[#3755]*

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

*"This is a capability variable.*

*Its value is determined by device capabilities.*

*This attribute, when true, indicates the ability of the STA to include the IFCS Location Indication field in Trigger frames that are sent as ICFs. If the attribute is false, the STA does not support including the IFCS Location Indication field."*

::= { dot11StationConfigEntry <ANA> }*[#3755]*

* UHR Capabilities element
* General

A STA declares that it is a UHR STA by transmitting the UHR Capabilities element.

The UHR Capabilities element contains a number of fields that are used to advertise the UHR capabilities of a UHR STA. The UHR Capabilities element is defined in Figure9-aa4 (UHR Capabilities element format).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Element ID | Length | Element ID Extension | UHR MAC Capabilities Information | UHR PHY Capabilities Information |
| Octets: | 1 | 1 | 1 | TBD | TBD |
| * UHR Capabilities element format
 |

The Element ID, Length, and Element ID Extension fields are defined in 9.4.2.1 (General).

The UHR MAC Capabilities Information, UHR PHY Capabilities Information are defined in the subclauses below.

* UHR MAC Capabilities Information field

The format of the UHR MAC Capabilities Information field is defined in Figure9-aa5 (UHR MAC Capabilities Information field format). [TBD]

***TGbn editor: Please change the figure below as follows:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B4 | B5 |  B6  | B7 Bx |
|  | DPS Support | DPS Assisting Support | Multi-Link Power Management | NPCA Supported | BSR Enhancement Support | IFCS Location Support*[#3755]* | Reserved |
| Bits: | 1 | 1 | 1 | 1 | 1 | 1 | x-(7+1) |
| * UHR MAC Capabilities Information field format
 |

The subfields of the EHT MAC Capabilities Information field are defined in Table9-130a (Subfields of the UHR MAC Capabilities Information field).

***TGbn editor: Please insert a new row as follows:***

|  |
| --- |
| * Subfields of the UHR MAC Capabilities Information field (continued)
 |
| Subfield | Definition | Encoding |
| DPS Support | Indicates whether or not DPS is supported | Set to 1 if dot11DynamicPowerSaveSupport is true (see 37.9.1 (Dynamic power save (DPS) operation)).Set to 0 otherwise. |
| DPS Assisting Support | Indicates whether or not the transmission of an ICF for DPS is supported | Set to 1 if dot11DynamicPowerSaveAssistingSupport is true (see 37.9.1 (Dynamic power save (DPS) operation)).Set to 0 otherwise. |
| Multi-Link Power Management Support | Indicates whether or not the multi-link power management is supported | For an AP MLD Set to 1 if the AP MLD supports the reception of frames with the multi-link power management signal. Set to 0 otherwise.For a non-AP MLD Set to 1 if the non-AP MLD supports the transmission of frame with multi-link power management signal. Set to 0 otherwise. |
| NPCA Supported | Indicates whether NPCA operation is supported | Set to 1 to indicate that NPCA operation is supported.Set to 0 to indicate that NPCA operation is not supported. |
| BSR Enhancement Support | For an AP, indicates support for receiving a frame with a BSR Enhancement field. For a non-AP STA, indicates support for transmitting a frame with a BSR Enhancement field. | Set to 1 if supported.Set to 0 otherwise. |
| IFCS Location Support | Indicates whether transmission of the IFCS Location field is supported. | Set to 1 to indicate that transmission of the IFCS Location field in Trigger frames that are sent as ICFs is supported.Set to 0 to otherwise.*[#3755]* |