IEEE P802.11  
Wireless LANs

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| --- | --- | --- | --- | --- |
| [LCI comments resolution] | | | | |
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|  |  |  |  |  |

Abstract

This document provides resolutions for CIDs 2402, 2492, 2491, 2493 and 2403. Baseline is 11mc v2.2.

Changes indicated by a mixture of Word track-changes and instructions.

Text in black means existing text from TGmc draft.

Text in Blue is added text, while crossed out text means text deleted from the draft.

… indicates text not replicated fromTGmc draft, not intended to be modified.

***TGmc editor: Modify the text as indicated with Track Changes:***

**3. Definitions, acronyms, and abbreviations**

**3.1 Definitions**

…

**location configuration information (LCI):** As defined in IETF RFC 6225: includes latitude,

longitude, and altitude, with uncertainty indicators for each.

**4.3.9.8 Location**

The Location request/report pair returns a requested location in terms of latitude, longitude, and altitude. It includes types of altitude such as floors. The requested location may be the location of the requestor (e.g., “Where am I?”) or the location of the reporting STA (e.g., “Where are you?”)

**8.4.2.20.10 Location Configuration Request**

The Measurement Request field corresponding to an LCI request is shown in Figure 8-143 (Measurement

Request field format for LCI request).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Location Subject |  |  |  | Optional  Subelements |

Octets: 1 variable

**Figure 8-143—Measurement Request field format for LCI request**

The Location Subject field of an LCI request is a single octet. See Table 8-78 (Location subject definition).

…

The Optional Subelements field format contains zero or more subelements, each consisting of a 1-octet Subelement ID field, a 1-octet Length field, and a variable-length Data field, as shown in Figure 8-516 (Subelement format). Any optional subelements are ordered by nondecreasing subelement ID. The Subelement ID field values for the defined optional subelements are shown in Table 8-79 (Optional subelement IDs for LCI request (#1294)(#1429)). A Yes in the Extensible column of a subelement listed in Table 8-79 (Optional subelement IDs for LCI request (#1294)(#1429)) indicates that the (#1429)subelement might be extended in future revisions or amendments of this standard. When the Extensible column of an element is equal to Subelements, then the subelement might be extended in future revisions or amendments of this standard by defining additional subelements within the subelement. See 9.25.9 (Extensible subelement parsing).

**8.4.2.21.10 Location Configuration Information report**

|  |  |  |
| --- | --- | --- |
|  | LCI report subelement | Optional Subelements |
| Octets: | variable | variable |

**Figure 8-xxx—LCI Report field format**

**Table 8-yyy: Subelement IDs for LCI report**

|  |  |  |
| --- | --- | --- |
| **Subelement ID** | **Name** | **Extensible** |
| **0** | **Reserved** | **No** |
| **1** | **Unknown Location** | **No** |
| **2** | **LCI** | **No** |
| **3-220** | **Reserved** |  |
| **221** | **Vendor Specific** |  |
| **222-255** | **Reserved** |  |

The Unknown Location is an empty subelement.

The LCI subelementincludes the location information defined in coordinate-based geographic location format for the location subject provided in the Location Configuration Request.

The LCI subelement format is shown in Figure 8-187.

This structure and information fields are little-endian, per conventions defined in 8.2.2 (Conventions), and are based on the LCI format described in IETF RFC 6225(#1692).

The definition of elements within the LCI subelement are as defined in Section 2.2 of IETF RFC 6225(#1692) (July 2011) or as defined herein.

NOTE—Appendix C of RFC6225 provides examples of how to encode longitude, latitude, altitude and uncertaincies.

The RegLoc Agreement field is set to 1 to report that the STA is operating within a national policy area or an international agreement area near a national border (see 10.12.3 (Registered STA operation)); otherwise, it is 0.

***TGmc Editor: update figure 8-187:***

by deleting the Element ID and Length fields, renumber bits by substracting 16, rename fields as follows:

Latitude Resolution -🡪 Latitude Uncertainty

Latitude Fraction+Latitude Integer (bits 22 through 55) 🡪 Latitude

Longitude Resolution 🡪 Longitude Uncertainty

Longitude Fraction + Longitude Interger (bits 62 through 95) 🡪 Longitude

Altitude Resolution 🡪 Altitude Uncertainty

Altitude Fraction + Altitude Integer (bits 106 through 135) 🡪 Altitude

Change bits b142 and b143 from Reserved field to say "Version".

Remove Optional Subelements (bits 144 onwards).

**Figure 8-187— LCI Subelement format**

The RegLoc DSE field is set to 1 to report that the enabling STA is enabling the operation of STAs with DSE; otherwise, it is 0.(#1692)

The Dependent STA field is set to 1 to report that the STA is operating with the enablement of the enabling STA whose LCI is being reported; otherwise, it is 0.(#1692)

The Version field is a 2-bit field defined in IETF RFC 6225, and the use is described in IETF RFC 6225.

The Optional Subelements field format contains zero or more subelements, each consisting of a 1-octet Subelement ID field, a 1-octet Length field, and a variable-length Data field, as shown in Figure 8-516 (Subelement format). Any optional subelements are ordered by nondecreasing subelement ID.

…

**8.4.2.51 DSE Registered Location element**

***TGmc Editor: update figure 8-285:***

Rename fields as follows:

Latitude Resolution -🡪 Latitude Uncertainty

Latitude Fraction+Latitude Integer (bits 6 through 39) 🡪 Latitude

Longitude Resolution 🡪 Longitude Uncertainty

Longitude Fraction + Longitude Interger (bits 46 through 79) 🡪 Longitude

Altitude Resolution 🡪 Altitude Uncertainty

Altitude Fraction + Altitude Integer (bits 90 through 119) 🡪 Altitude

Change bits b126 and b127 from Reserved field to say "Version".

***TGmc Editor: After Dependent STA bit field description add new paragraph***

"The Version field is a 2-bit field defined in IETF RFC 6225, and the use is described in IETF RFC 6225.

**8.6.8.9 DSE Measurement Report frame format**

***TGmc Editor: update figure 8-574:***

Rename fields as follows:

Latitude Resolution -🡪 Latitude Uncertainty

Latitude Fraction+Latitude Integer (bits 54 through 87) 🡪 Latitude

Longitude Resolution 🡪 Longitude Uncertainty

Longitude Fraction + Longitude Interger (bits 94 through 127) 🡪 Longitude

Altitude Resolution 🡪 Altitude Uncertainty

Altitude Fraction + Altitude Integer (bits 138 through 167) 🡪 Altitude

Change bits b174 and b175 from Reserved field to say "Version".

***TGmc Editor: After Dependent STA bit field description add new paragraph***

The Version field is a 2-bit field defined in IETF RFC 6225, and the use is described in IETF RFC 6225.

**10.11.9.6 Location Configuration Information Report**

If dot11RMLCIMeasurementActivated is true, a STA shall reject any LCI (#1294)request for location information that is not available and shall respond with a Radio Measurement Report frame including a Radio Measurement Report element with the Refused bit set to 1. If dot11RMLCIMeasurementActivated is true and a STA accepts an LCI (#1294)request that does not include an Azimuth Request, it shall respond with a Radio Measurement Report frame including one LCI subelement (LCI (#1294)report). If both dot11RMLCIMeasurementActivated and dot11RMLCIAzimuthActivated are true, and the STA accepts an LCI request that includes an Azimuth Request, it shall respond with a Radio Measurement Report frame including one LCI subelement (LCI (#1294)report) and include the requested Azimuth Report as another subelement, if available. If dot11RMLCIAzimuthActivated is false, a STA shall reject any LCI (#1294)request that includes an Azimuth Request and shall respond with a Radio Measurement Report frame including an Radio Measurement Report element with the Incapable bit set to 1.

NOTE 1(#1101)— The physical location and azimuth MIB information of the STA might be set by administrative means.

The Datum value shall be 1 (World Geodetic System 1984), unless another datum is required for operation

in the regulatory domain.

If the Altitude Type is 2 (Floors of Altitude), the value reported shall be as required for operation in the

regulatory domain.

An LCI request shall indicate a location request for the requesting STA, the reporting STA, or a third STA

with the MAC address specified in the Target MAC Address subelement, by setting the LCI request

Location Subject field to indicate a Local, a Remote, or a third-party request, respectively. Local LCI

(#1294)request is used by the requesting STA to obtain its own location by asking “Where am I?” Remote

LCI (#1294)request is used by requesting STA to obtain location of reporting STA by asking “Where are

you?” Third-party Location request is used by requesting STA to obtain location of a STA with the MAC

address specified in the Target MAC Address subelement.

If the STA receiving an LCI request has no location information about the requested LCI Subject physical

location or requested Azimuth, it shallreturn an Unknown Location subelement ID.. The

method by which the physical location and azimuth information in the LCI (#1294)report is generated is

outside the scope of this standard.

NOTE 2(#1101)—. A STA that requested

an LCI including an Azimuth Request, and received an LCI (#1294)report in which the Incapable bit is 1 might

alternatively request the LCI with no Azimuth requested.

If dot11RM3rdPartyMeasurementActivated is false, a STA shall reject any LCI (#1294)request that includes

an(#1294) LCI (#1294)request with the Location Subject field equal to 2 and shall respond with a Radio

Measurement Report frame including an Radio Measurement Report element with the incapable bit set to 1.

It is optional for a STA to support an LCI (#1294)request and an LCI (#1294)report with the Location

Subject field equal to 2. If dot11RM3rdPartyMeasurementActivated is true and a STA supports LCI

(#1294)request and LCI (#1294)report, the following procedure shall be followed:

— When a non-AP STA requests the geospatial location of a STA with the MAC address specified in

the Target MAC address field, it shall also include its own MAC address in the Originator

Requesting STA MAC address field. When an AP receives an LCI (#1294)request with the Location

Subject field value equal to 2, the AP shall generate an LCI (#1294)request to the STA with the

MAC address specified in the Target MAC address field. If the AP does not have an association with

the STA with the MAC address specified in the Target MAC address field, the AP shall reject the

received LCI (#1294)request and shall respond with an(#1294) LCI (#1294)report where the

Incapable bit is set in the MeasurementReport Mode field. The AP shall copy the Originator

Requesting STA MAC address and Target MAC address fields into the request from the received

LCI request.

— When a STA receives an LCI (#1294)request with the Location Subject field value equal to 2, the

STA shall only generate an LCI (#1294)report if the MAC address in the Target MAC address field

is its own MAC address. When an LCI (#1294)report is generated, the reporting STA shall include

its MAC address into the Target MAC address field and the MAC address present in the Originator

Requesting STA MAC address field of the corresponding LCI (#1294)request into the Originator

Requesting STA MAC address field. When an AP receives an LCI (#1294)report with an Originator

Requesting STA MAC address field present, the AP shall generate an LCI (#1294)report to the

associated STA with the MAC address specified in the Originator Requesting MAC address field.

The AP shall copy the Originator Requesting STA MAC address and Target MAC address fields

into the LCI report being transmitted to the originating requesting STA.

If dot11RMLCIMeasurementActivated is false, a station shall reject the received LCI (#1294)request and

shall respond with an(#1294) LCI (#1294)report with the Incapable bit in the Measurement Report Mode

field set to 1.

If dot11RMLCIMeasurementActivated is true and a STA has its own location configured in LCI format, it

shall set the Geospatial Location field to 1 in the Extended Capabilities element (see 8.4.2.26 (Extended

Capabilities element)).

NOTE 3(#1101)—It is recommended that User Applications not send location information to other stations without the

express permission of the user. User agents acquire permission through a user interface, unless they have prearranged

trust relationships with users. Those permissions that are acquired through the user interface and that are preserved

beyond the current browsing session (i.e., beyond the time when the BSS connection is terminated) are revocable and

receiving stations should respect revoked permissions. Some user applications might have prearranged trust

relationships that do not require such user interfaces. For example, while a social networking application might present a

user interface when a friend performs a location request, a VOIP telephone might not present any user interface when

using location information to perform an E911 function.

**10.12.3 Registered STA operation**

A registered STA(#1289) shall have dot11DSERequired set to false. They shall transmit the DSE Registered

Location element in every Beacon frame and shall set the Dependent STA bit in the DSE Registered

Location element to 0. If the registered STA is located within a national policy area, such as a Fixed Satellite

Service exclusion zone, or within an international agreement area near a national border, the RegLoc

Agreement bit in the DSE Registered Location element shall be set to 1, signifying to other STAs that

additional restrictions on STAs with directional antennas may apply; otherwise, it shall be set to 0.

The

Altitude Type field value shall be 3 (i.e., height above ground is in meters or, in other words, the altitude is

in meters above adjacent terrain), unless another altitude type is required for operation in the regulatory

domain. The Datum field value shall be 1 (World Geodetic System 1984), unless another datum is required

for operation in the regulatory domain.

An enabling STA is a registered STA that broadcasts its registered location, and regulatory authorities

permit it to enable operation of unregistered STAs (see 10.12.4 (Enabling STA operation with DSE)). A

dependent STA is an unregistered STA that operates under the control of an enabling STA (see 10.12.5

(Dependent STA operation with DSE)).

***TGmc Editor: Remove lines RM9.1.2, RM9.1.3, RM9.1.4 from the Table in B.4.15 Radio Management extensions***

***TGmc Editor: Modify the MIB variables in Annex C.3 as follows:***

Dot11LCIDSEEntry ::=

SEQUENCE {

dot11LCIDSEIndex Unsigned32,

dot11LCIDSEIfIndex InterfaceIndex,

dot11LCIDSECurrentOperatingClass Unsigned32,

dot11LCIDSELatitudeUncertainty Unsigned32,

dot11LCIDSELatitude Integer32,

dot11LCIDSELongitudeUncertainty Unsigned32,

dot11LCIDSELongitude Integer32,

dot11LCIDSEAltitudeType INTEGER,

dot11LCIDSEAltitudeUncertainty Unsigned32,

dot11LCIDSEAltitude Integer32,

dot11LCIDSEDatum Unsigned32,

dot11RegLocAgreement TruthValue,

dot11RegLocDSE TruthValue,

dot11DependentSTA TruthValue,

dot11DependentEnablementIdentifier Unsigned32,

dot11DSEEnablementTimeLimit Unsigned32,

dot11DSEEnablementFailHoldTime Unsigned32,

dot11DSERenewalTime Unsigned32,

dot11DSETransmitDivisor Unsigned32 }

dot11LCIDSELatitudeUncertainty OBJECT-TYPE

SYNTAX Unsigned32 (0..63)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a control variable.

It is written by the SME when the device is initialized.

Latitude uncertainty is 6 bits as defined in RFC6225"

::= { dot11LCIDSEEntry 4 }

dot11LCIDSELatitude OBJECT-TYPE

SYNTAX Integer32 (-359..359)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a control variable.

It is written by the SME when the device is initialized.

The field is defined in RFC6225"

::= { dot11LCIDSEEntry 5 }

dot11LCIDSELongitudeUncertainty OBJECT-TYPE

SYNTAX Unsigned32 (0..63)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a control variable.

It is written by the SME when the device is initialized.

Longitude uncertainty is defined in RFC6225"

::= { dot11LCIDSEEntry 7 }

dot11LCIDSELongitude OBJECT-TYPE

SYNTAX Integer32 (-359..359)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a control variable.

It is written by the SME when the device is initialized.

This field is defined in RFC6225."

::= { dot11LCIDSEEntry 8 }

dot11LCIDSEAltitudeType OBJECT-TYPE

SYNTAX INTEGER { meters(1), floors(2), hagm(3) }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a control variable.

It is written by the SME when the device is initialized.

Altitude Type is 4 bits encoding the type of altitude.

Codes defined are:

meters : in (#273)2s complement(#273) fixed-point 22-bit integer part with

8-bit fraction

floors : in (#273)2s complement(#273) fixed-point 22-bit integer part with

8-bit fraction

hagm : Height Above Ground in meters, in (#273)2s complement(#273) fixedpoint

22-bit integer part with 8-bit fraction. "

DEFVAL { 3 }

::= { dot11LCIDSEEntry 10 }

dot11LCIDSEAltitudeUncertainty OBJECT-TYPE

SYNTAX Unsigned32 (0..63)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a control variable.

It is written by the SME when the device is initialized.

Altitude uncertainty is defined in RFC6225(#1692)"

::= { dot11LCIDSEEntry 11 }

dot11LCIDSEAltitude OBJECT-TYPE

SYNTAX Integer32 (-2097151..2097151)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a control variable.

It is written by the SME when the device is initialized.

This field is defined in RFC6225."

::= { dot11LCIDSEEntry 12 }

***TGmc Editor: Rename:***

dot11RMRqstLCILatitudeResolution to dot11RMRqstLCILatitudeUncertainty

dot11RMRqstLCILongitudeResolution to dot11RMRqstLCILongitudeUncertainty

dot11RMRqstLCIAltitudeResolution to dot11RMRqstLCIAltitudeUncertainty

Dot11LCIReportEntry ::=

SEQUENCE {

dot11LCIReportIndex Unsigned32,

dot11LCIReportToken OCTET STRING,

dot11LCIIfIndex InterfaceIndex,

dot11LCISTAAddress MacAddress,

dot11LCILatitudeUncertaintyn Unsigned32,

dot11LCILatitude Integer32,

dot11LCILongitudeUncertainty Unsigned32,

dot11LCILongitude Integer32,

dot11LCIAltitudeType INTEGER,

dot11LCIAltitudeUncertainty Unsigned32,

dot11LCIAltitude Integer32,

dot11LCIDatum Unsigned32,

dot11LCIAzimuthType INTEGER,

dot11LCIAzimuthResolution Unsigned32,

dot11LCIAzimuth Integer32,

dot11LCIVendorSpecific OCTET STRING,

dot11LCIRprtMeasurementMode INTEGER}

**References:**