IEEE P802.11  
Wireless LANs

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| --- | --- | --- | --- | --- |
| Corrections to Device Location Format | | | | |
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|  |  |  |  |  |

Abstract

This submission proposes some correction to the device location information based on the recent RFC 6225, in place of the existing format based on RFC 3825.

This document is based on IEEE 802.11af-D1.04.

**Introduction**

## 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 TGaf Draft. This introduction is not part of the adopted material.

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

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

***Submission Note: Notes to the reader of this submission are not part of the motion to adopt. These notes are there to clarify or provide context.***

**Discussion:**

Refer to slides in doc: 11-11-1403r1.

## Editing instructions:

**8.2.6.1.4 Device Location Information**

***TGaf Editor: Change the Table 8-14g as shown:***

**Table 8-14g—Device Location Information definition**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Type** | **Length** | **Value** | **Scope** |
| Device location Information | <ANA> | ~~18~~ 16 | |  | | --- | | ~~When the Device Type subfield of the Table 8-14b (Device Class definition) is set to Fixed, the Device location Information contains the latitude, longitude and altitude information of the device with the for­mat using the first 128 bits of DSE Registered Loca­tion element in 8.4.2.54, in which the last 5 bits (B123 - B127) remains reserved.~~  ~~When the Device Type subfield of the Table 8 -14b (Device Class definition) is not set to Fixed TVBD, the device location information contains the device position information body fields specified in Table 8.4.2.166 (Device Position Information ele­ment).~~  The Device Location Information contains the latitude, longitude, and altitude information of the device in the format specified by the device location information body fields in Table 8.4.2.166 (Device Location Information element). When the Device Type subfield of the Table 8 -14b (Device Class definition) is not set to Fixed TVBD, the altitude information (Altitude Type, Altitude Uncertainty, Altitude Fraction and Altitude Integer subfields) of the Device Location Information remains unused. | | CAQ |

***TGaf Editor: Change the subclause 8.4.2.166 as follows:***

8.4.2.166 Device ~~Position~~ Location Information element

A Device Location Information element includes the location configuration information (LCI), which contains ~~geolocation position with~~ latitude, longitude, and ~~radius~~ altitude Information. The Device Location ~~Position~~ Information element format is shown in Figure 8-402bx (Device Location ~~Position~~ Information element format).

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  | ~~RLQP~~ Element ID | Length | Device Location ~~Position~~ Information body fields |
| Octets**:** | 1 | 1 | 16 |

Figure 8-402bx—Device ~~Position~~ Location Information element format

The Length field is set to 16.

The structure and information fields are little endian, per conventions defined in ~~7.1.1~~ 8.2.2 (Conventions), and are based on the LCI format described in IETF RFC 6225[[1]](#footnote-1) ~~3825~~.

The Device Location ~~Position~~ Information element body fields are shown in Figure 8-402by (Device Location ~~Position~~ Infor­mation element body fields format).

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0 B5 | B6 B30 | B31 B39 |
|  | Latitude ~~Resolution~~ Uncertainty | Lattitude Fraction | Latitude Integer |
| **Bits:** | 6 | 25 | 9 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | B40 B45 | B46 B70 | B71 B79 |
|  | Longitude ~~Resolution~~ Uncertainty | Longitude Fraction | Longitude Integer |
| **Bits:** | 6 | 25 | 9 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | B80 B83 | B84 B89 | B90 B97 | B98 B119 | B120 124 | B125 B127 |
|  | Altitude Type ~~Radius Fraction~~ | Altitude Uncertainty ~~Radius Integer~~ | Altitude Fraction ~~Radius Information Present~~ | Altitude Integer ~~Datum~~ | Reserved | Datum |
| **Bits:** | 4 | 6 | 8 | 22 | 5 | 3 |

**Figure 8-402by—Device ~~Position~~ Location Information element body fields format**

The definition of fields within the Device Location ~~Position~~ Information element body shall be as defined in Section 2.1 of IETF RFC 6225 ~~3825~~ except as defined in 8.4 (Management frame body components).

~~The Radius field value is defined to be in meters measured in horizontal plane from the point defined by the latitude and longitude coordinates and is formatted in twos-complement, fixed-point, 22-bit integer part with 8-bit fraction.~~

~~Radius Information present subfield indicates the presence of radius information when the number of device position information in Figure 8.4.5.3 (RLQP Channel Availability Query element) is one otherwise it is set to 0.~~

~~The Datum field format is as described in 8.4.2.54 (DSE Registered Location Element).~~

**Annex C**

**(normative)**

**ASN.1 encoding of the MAC and PHY MIB**

**C.3 MIB Detail**

***TGaf Editor: Change the text for dot11STALCITable element as shown:***

***Insert dot11STALCI table as follows***

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

-- \* dot11STALCI TABLE

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

dot11STALCITable OBJECT-TYPE

SYNTAX SEQUENCE OF Dot11STALCIEntry

MAX-ACCESS read-write

STATUS current

DESCRIPTION

“This table represents the geolocation of the STA as specified in clause specified in clause 10.38.6.1."

::= { dot11imt <ANA> }

dot11STALCIEntry OBJECT-TYPE

SYNTAX Dot11STALCIEntry

MAX-ACCESS read-write

STATUS current

DESCRIPTION

“STA’s location information in Geospatial coordinates”

INDEX {dot11STALCIDIndex }

::= { dot11STALCITable 1 }

Dot11STALCIEntry ::=

SEQUENCE {

dot11STALCIIndex Unsigned32, dot11STALCILatitudeUncertainty~~Resolution~~ Unsigned32,

dot11STALCILatitudeInteger Integer32, dot11STALCILatitudeFraction Integer32, dot11STALCILongitudeUncertainty~~Resolution~~ Unsigned32, dot11STALCILongitudeInteger Integer32,

dot11STALCILongitudeFraction Integer32, dot11STALCIAltitudeType INTEGER, dot11STALCIAltitudeUncertainty~~Resolution~~ Unsigned32, dot11STALCIAltitudeInteger Integer32, dot11STALCIAltitudeFraction Integer32,

dot11STALCIDatum INTEGER }

dot11STALCIIndex OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Index for STA LCI elements in dot11STALCITable, greater than 0."

::= { dot11STALCIEntry 1 }

dot11STALCILatitudeUncertainty~~Resolution~~ OBJECT-TYPE

SYNTAX Unsigned32 (0..63)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

“This is a control variable. It is written by an external management entity or the SME. Changes take effect as soon as practical in the implementation. Latitude uncertainty ~~resolution~~ is 6 bits indicating the amount of uncertainty in latitude value. A value of 0 is reserved to indicate that the uncertainty is unknown; values greater than 34 are reserved. ~~number of valid bits in the fixed-point value of Latitude.~~ This field is derived from IETF RFC 6225 ~~3825~~.”

::= { dot11STALCIEntry 2 }

dot11STALCILatitudeInteger OBJECT-TYPE

SYNTAX Integer32 (-359..359)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

“This is a control variable. It is written by an external management entity or the SME. Changes take effect as soon as practical in the implementation. Latitude is a twos-complement 34 bit fixed point value consisting of 9 bits of integer and 25 bits of fraction. This field contains the 9 bits of integer portion of Latitude. This field is derived from RFC-6225 ~~3825~~.”

::= { dot11STALCIEntry 3}

dot11STALCILatitudeFraction OBJECT-TYPE

SYNTAX Integer32 (-16777215..16777215)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

“This is a control variable. It is written by an external management entity or the SME. Changes take effect as soon as practical in the implementation. Latitude is a twos-complement 34 bit fixed point value consisting of 9 bits of integer and 25 bits of fraction. This field contains the 25 bits of fraction portion of Latitude. This field is derived from RFC-6225 ~~3825~~.”

::= { dot11STALCIEntry 4}

dot11STALCILongitude~~Resolution~~Uncertainty OBJECT-TYPE

SYNTAX Unsigned32 (0..63)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

“This is a control variable. It is written by an external management entity or the SME. Changes take effect as soon as practical in the implementation. Longitude ~~resolution~~ uncertainty is 6 bits indicating the amount of uncertainty in longitude value. A value of 0 is reserved to indicate that the uncertainty is unknown; values greater than 34 are reserved.~~number of valid bits in the fixed-point value of Longitude.~~ This field is derived from RFC-6225 ~~3825~~.”

::= { dot11STALCIEntry 5}

dot11STALCILongitudeInteger OBJECT-TYPE

SYNTAX Integer32 (-359..359)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

“This is a control variable. It is written by an external management entity or the SME. Changes take effect as soon as practical in the implementation. Longitude is a twos-complement 34 bit fixed point value consisting of 9 bits of integer and 25 bits of fraction. This field contains the 9 bits of integer portion of Longitude. This field is derived from RFC-6225 ~~3825~~.”

::= { dot11STALCIEntry 6}

dot11STALCILongitudeFraction OBJECT-TYPE

SYNTAX Integer32 (-16777215..16777215)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

“This is a control variable. It is written by an external management entity or the SME. Changes take effect as soon as practical in the implementation. Longitude is a 2’s complement 34 bit fixed point value consisting of 9 bits of integer and 25 bits of fraction. This field contains the 25 bits of fraction portion of Longitude. This field is derived from IETF RFC 6225 ~~3825~~.”

::= { dot11STALCIEntry 7}

dot11STALCIAltitudeType 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 an external management entity or the SME. Changes take effect as soon as practical in the implementation. Altitude Type is four bits encoding the type of altitude. Codes defined are: meters in 2s-complement fixed-point 22-bit integer part with 8-bit fraction floors: in 2s-complement fixed-point 22-bit integer part with 8-bit fraction hagm: Height Above Ground in meters, in 2s-complement fixed-point 22-bit integer part with 8-bit fraction. This field is derived from IETF RFC 6225 ~~3825~~.”

::= { dot11STALCIEntry 8}

dot11STALCIAltitude~~Resolution~~Uncertainty OBJECT-TYPE

SYNTAX Unsigned32 (0..63)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

“This is a control variable. It is written by an external management entity or the SME. Changes take effect as soon as practical in the implementation. Altitude uncertainty ~~resolution~~ is 6 bits indicating the the amount of uncertainty in the altitude value. A value of 0 for is reserved to indicate that altitude uncertainty is not known; values above 30 are also reserved. Altitude uncertainty only applies to Altitude Type 1. ~~number of valid bits in the altitude.~~ This field is derived from IETF RFC 6225 ~~3825~~.”

::= { dot11STALCIEntry 9}

dot11STALCIAltitudeInteger OBJECT-TYPE

SYNTAX Integer32 (-2097151..2097151)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

“This is a control variable. It is written by an external management entity or the SME. Changes take effect as soon as practical in the implementation. Altitude is a 30 bit value defined by the Altitude type field. The field is encoded as a 2s-complement fixed-point 22-bit integer Part with 8-bit fraction. This field contains the fixed-point Part of Altitude. This field is derived from IETF RFC 6225 ~~3825~~.”

::= { dot11STALCIEntry 10}

dot11STALCIAltitudeFraction OBJECT-TYPE

SYNTAX Integer32 (-127..127)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

“This is a control variable. It is written by an external management entity or the SME. Changes take effect as soon as practical in the implementation. Altitude is a 30 bit value defined by the Altitude type field. The field is encoded as a 2s-complement fixed-point 22-bit integer Part with 8-bit fraction. This field is derived from IETF RFC 6225 ~~3825~~.”

::= { dot11STALCIEntry 11 }

dot11STALCIDatum OBJECT-TYPE

SYNTAX INTEGER (0..7)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

“This is a control variable. It is written by an external management entity or the SME. Changes take effect as soon as practical in the implementation. Datum is an 8-bit value encoding the horizontal and vertical references used for the coordinates given in this LCI. IETF RFC 6225 ~~3825~~ defines the values of Datum. Type 1 is WGS-84, the coordinate system used by GPS. Type 2 is NAD83 with NAVD88 vertical reference. Type 3 is NAD83 with Mean Lower Low Water vertical datum. All other types are reserved. This field is derived from IETF RFC 6225 ~~3825~~.”

::= { dot11STALCIEntry 12 }

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

-- \* End of dot11STALCI TABLE

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

1. IETF RFC 6225, Dynamic Host Configuration Protocol Options for Coordinate-Based Location Configuration Information [↑](#footnote-ref-1)