Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**TLV Definitions for Management Signaling Messages**
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Re:	
Abstract	This contribution proposes TLV definitions for Management Signalling Messages.
Purpose	Adoption
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1. Introduction

This contribution proposes TLV definitions for Management Signalling Messages.

2. Proposed Text

2. References

[Add the following reference:]

IETF RFC3825 "Dynamic Host Configuration Protocol Option for Coordinate-based Location Configuration Information", July 2004

6.3.2.3.64.1 Query IE Request message (QRY_IE-REQ)

[Add the following subclausess:]

The QRY_IE-REQ may include the following TLVs.

MS Geo location (see 11. 23.1)

MS geo location in Latitude, Longitude, and altitude to be provided from GPS or other location measurement method.

MS inventory data: Vendor ID is reported by REG-REQ.

- Software ID (11.2.2.3) – Software version
- Hardware ID (see 11.2.2.2) – Hardware version

6.3.2.3.64.2 Query IE Response message (QRY_IE-RSP)

[Add the following subclausess:]

The QRY_IE-RSP may include the following TLVs.

MS Geo location (see 11.23.1)

It contains MS geo location in Latitude, Longitude, and altitude. If MS can't report geo location, it shall return "MS geo location not supported" code.

MS inventory data

- Software ID (see 11.2.2.3) – Software version
- Hardware ID (see 11.2.2.2) – Hardware version

11.23 Management Signaling TLVs

11.23.1 MS / BS Geo Location

The fields indicate the MS / BS location in latitude, longitude, and altitude that are based on the LCI (Location Configuration Information) format as defined in RFC3825. Latitude and longitude are represented in 34 bits fixed-point 2s-complement number, consisting of 9 bits of integer and 25 bits of fraction. Altitude is represented in 30 bits fixed-point 2s-complement number with 22 bits of integer and 8 bits of fraction. Latitude and longitude shold be normalized to within +/- 90 degrees and +/- 180 degrees, respectively. Each field also includes resolution bits that define the number of valid bits in the fixed-point value. Here are the definition of 2s-complement number.

- Positive numbers
  - Latitide – North
  - Longitude – East
  - Altitude – above ground
- Negtive numbers
  - Latitide – South
  - Longitude – West
  - Altitude – below ground

The structure of these fields shall be little-endian.

Name	Type	Length	Value	Scope
Longitude	1	5	Bits # 0-5: longitude resolution 1-34 – number of valid bits in fixed-point value of longitude value 35 – MS geo location not supported Others – reserved Bits # 6-14: longitude integer Bits # 15-39: longitude fraction	QRY_IE-REQ QRY_IE-RSP MOB_NBR-ADV
Latitude	2	5	Bits # 0-5: latiitude resolution 1-34 – number of valid bits in fixed-point value of latitude value 35– MS geo location not supported Others – reserved Bits # 6-14: latitude integer Bits # 15-39: latitude fraction	QRY_IE-REQ QRY_IE-RSP MOB_NBR-ADV
Altitude	3	5	Bits # 0-3: altitude type 1 – meters 2 – floors Others – reserved Bits # 4-9: altitude resolution 1-30 – number of valid bits in fixed-point value of altitude value 31 – MS geo location not supported Others – reserved Bits # 10-31: altitude integer Bits # 32-39: altitude fraction	QRY_IE-REQ QRY_IE-RSP MOB_NBR-ADV

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