Location Object Semantics

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draft-polk-geopriv-loc-object-semantics-00
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Purpose of ID

Give semantic intent of the Location Object
described in:

draft-polk-dhcp-geo-loc-option-00.txt

Immediate Practical Use

- Emergency Response for wired-ethernet (IP-phone) infrastructures

- Host needs to know where it is in order to send its location to emergency responder

- Simple method using host configuration protocol
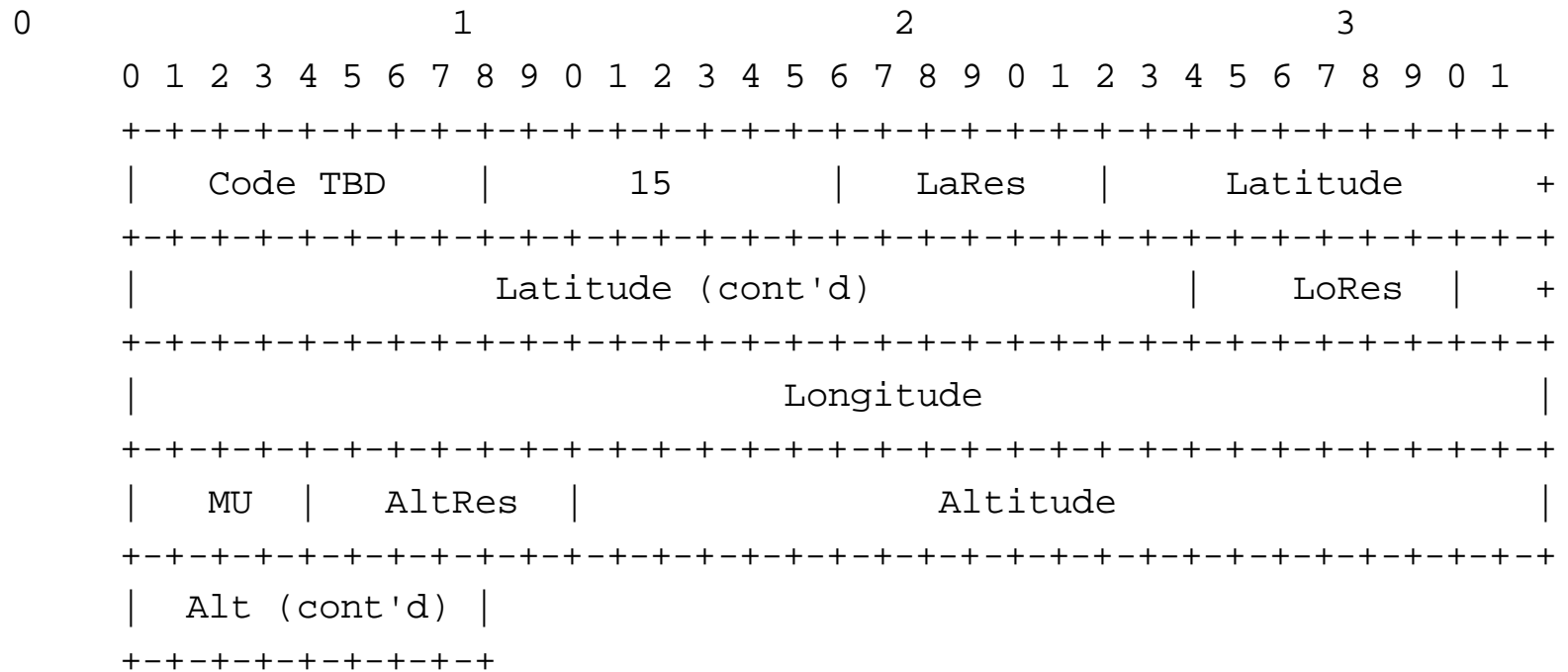
Issues for discussion

This preso will cover at least these 3 points:

- Use of "Resolution" instead of "Accuracy"
- Host control (modification) of Resolution
- Domain control of (maximum) Resolution

Idea of Resolution vs. Accuracy

- Accuracy generally describes:
  - I'm within X number of meters from "this" point
- Resolution generally describes:
  - I'm (somewhere) within a (square, rectangle, trapezoid) of these dimensions

LO Format

```
0                   1                   2                   3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|    Code TBD     |      15       |    LaRes    |    Latitude      +
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                 Latitude (cont'd)             |    LoRes    |   +
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                          Longitude                            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|   MU   |   AltRes   |                 Altitude                 |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Alt (cont'd) |
+-+-+-+-+-+-+-+-+-+
```

LO Specifics

- Latitude and Longitude are 34 bits each
  - In a Degree.fraction format (2s-complement)
- Altitude is 30 bits (2s-complement)
- Resolution length field for each above
- Altitude requires a Measurement Unit
  - Meters and Floors chosen

Resolution control by Endpoint

LaRes, LoRes and AltRes are length fields for their corresponding coordinate field

To reduce precision of location provided, reduce the value in the xRes field(s)

White House example

```
Postal Address:            Standing on the sidewalk,    Latitude 38.89868 degrees North
  White House              north side of White House,   Longitude 77.03723 degrees West
  1600 Pennsylvania Ave. NW   between driveways         Altitude 15
  Washington, DC 20006
```

xRes value	Latitude area	Longitude Area	Total Area described
2	Equator to North Pole	-1°(W) to -128°(W)	20 million sq n-miles
3	Equator to 63°N	-65° to -128°	10 million sq n-miles
5	32°(N) to 48°(N)	-64° to -80°	700,000 square n-miles
9	38° to 39°	-77° to -78°	9600 sq km (111.3km x 86.5km)
18	38.8984375° x 38.9003906°	-77.0390625° x -77.0371094°	36,600 sq m (169m x 217m)
34	38.8986800° x 38.8986802°	-77.0372300° x -77.0372296°	7.5 sq mm (3.11mm x 2.62mm)

```
An example of e911's 7000 sq ft requirement:
  21/20        38.8984375°              -77.0371094°         89ft x 75 ft
               to 38.8988616°           to -77.0375977°       or 6669 sq ft
```

Resolution control by Domain

Accomplished by DHC Reply containing
xRes values which the endpoint could
interpret as the maximum resolution
allowed for any Location Reply

- Perhaps except in Emergency situations where
xRes fields are set to maximum values

Open Issues

- Who owns this effort?