# The Proximate Location Claim

## Abstract

The Entity Attestation Token (EAT) is an extensible attestation
version of a CBOR Web Token (CWT). EAT defines a location claim, but
does not define a proximate location claim. This document proposes a
claim in which an attester can relay detected relative location of a
target.

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provisions of BCP 78 and BCP 79.

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## 1.  Introduction

The Entity Attestation Token i.e. EAT [EAT.Draft] provides a method
for sending attesation-related data in the form of a CBOR Web Token
(CWT) [RFC8392]. Attested location is claim provided in the EAT
specification wherein an attester can provide location data in the
form of a standard geodetic coding system (WGS 84).

Secure ranging involves the process of determining the relative
location of a device (entity) with respect to a receiver. In this
case, the receiver may actually attest to the location of the device
in a similar manner to how the Entity Attestation Token conveys
location data. However, there are majore differences between the EAT
convveyance of location and a secure ranging receiver: (1) the EAT
location is that of the entity to which the attester created the
token, while the secure ranging receiver is conveying the detected
location of the entity, and (2) the receiver is providing the
relative location of the entity.

In this document, a new claim - the proximate location claim - is
specified that will distinguish location determined via secure
ranging from location conveyed by as part of a entity's attestation
evidence. Although this claim could appear in a CWT for non-
attestation scenarios, it can be conveyed as part of a delegated
attestation (i.e. the secure ranging receiver attests to the
location on behalf of the target entity). A sample architecture is
provided in Figure 1. The secure ranging receiver in this case makes
an angle-of-arrival (AoA) and distance determination based upon a
transmitted signal from a target device. The receiver (assuming it
can determine its own location) can project these measurements to a
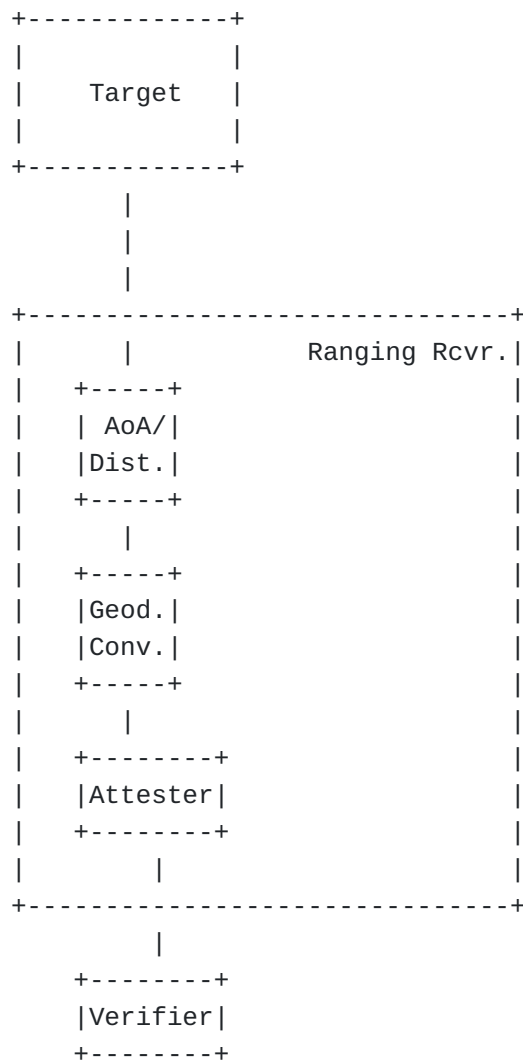geodetic coordinate system and attest to it.

```
                    +-------------+
                    |             |
                    |    Target   |
                    |             |
                    +-------------+
                          |
                          |
                          |
             +-------------------------------+
             |      |            Ranging Rcvr.|
             |   +-----+                      |
             |   | AoA/|                      |
             |   |Dist.|                      |
             |   +-----+                      |
             |      |                         |
             |   +-----+                      |
             |   |Geod.|                      |
             |   |Conv.|                      |
             |   +-----+                      |
             |      |                         |
             |   +--------+                   |
             |   |Attester|                   |
             |   +--------+                   |
             |        |                       |
             +-------------------------------+
                      |
                  +--------+
                  |Verifier|
                  +--------+
```

               Figure 1: Secure Ranging and Attestation

**2.  The Proximate Location Claim (proxloc)**

   The proximate location claim provides the location of a target
   entity based on what a secure ranging receiver derives. If the
   secure ranging receiver is capable of determining its own location,
   then it can project the entity's location to an appropriate geodetic
   coordinate system based on the relative location of the entity. It
   is partially derived derived from the EAT location claim
   [EAT.Draft], but includes the ueid claim to uniquely identify the
   entity.

   If the location cannot be derived as per the EAT specification, then
   the relative angle-of-arrival, angle-of-elevation, and ranging
   distance may be sent (the angular measurements in radians and the
   distance in meters).

```
proxloc-label => proxloc-type

proxloc-type = {
    target-ueid => ueid, ; derived from EAT claim ueid
    ? target-location => location ; derived from EAT claim location if W
    ? aoa => float ; angle-of-arrival optionally sent
    ? distance => float ; ranging distance optionally sent
    ? aoe =? float ; angle-of-elevation optionally sent
}
```

Note that this claim may be extended in the future for other coordinate systems.

## 3. IANA Considerations

This document requests registration of the following claim in the "CBOR Web Token (CWT) Claims Registry" (http://www.iana.org/assignments/cwt).

  *Claim Name: proxloc

  *Claim Description: The Proximate Location Claim

  *JWT Claim Name: "proxloc"

  *CWT Claim Key: TBD

  *Claim Value Type(s): map

  *Change Controller: IESG

  *Specification Document(s): **this document**

## 4. Normative References

**[EAT.Draft]** Lundblade, L., Mandyam, G., O'Donoghue, J., and C. Wallace, "The Entity Attestation Token (EAT)", Work in Progress, Internet-Draft, draft-ietf-rats-eat-19, 19 December 2022, <https://datatracker.ietf.org/doc/html/draft-ietf-rats-eat-19>.

**[RFC8392]** Jones, M., Wahlstroem, E., Erdtman, S., and H. Tschofenig, "CBOR Web Token (CWT)", RFC 8392, DOI 10.17487/RFC8392, May 2018, <https://www.rfc-editor.org/rfc/rfc8392>.

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