RADEXT Working Group
Internet-Draft
Intended status: Standards Track
Expires: 20 April 2026

M. Grayson
S. Gundavelli
Cisco Systems

17 October 2025

Carrying location objects with uncertainty in RADIUS
draft-grayson-5580uncertainty-00

Abstract

This document describes a new location profile for use with the RADIUS Location-Data Attribute. The new profile is used to carry a geospatial location profile that includes location uncertainty.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at https://datatracker.ietf.org/drafts/current/.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on 20 April 2026.

Table of Contents

1. Introduction

The Location-Data Attribute specified in [RFC5580] defines the ability to encode a geospatial location format where the geospatial location information is encoded as an opaque object, with the format being based on the Location Configuration Information (LCI) format defined in Section 2 of [RFC3825].

[RFC3825] has been obsoleted by [RFC6225], where the encoding of the geospatial location format has been enhanced to enable signalling of uncertainty parameters for latitude, longitude and altitude.

This specification defines the ability to transport the GeoLocation (GeoLoc) profile defined in [RFC6225] in the Location-Data Attribute specified in [RFC5580], enabling location uncertainty values to be signaled.

Individual use-cases operating using this location profile may require the location uncertainty is below some threshold value. Details of such use-cases and how a RADIUS Server responds when receiving a Location-Data Attribute with uncertainty that exceeds any defined threshold are out of scope of this document.

1.1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

1.2. Terminology

Uncertainty:

The uncertainty of a location estimate is the distance from the actual location the estimate is likely to fall within. The lower the value the more accurate the estimate.

Confidence:

An estimated upper bound on the probability that a "true" value is found within the extents defined by the uncertainty.

2. Geospatial Location With Uncertainty Profile

This section defines the geospatial location-information profile corresponding to the value (TBC) indicated in the Code field of the Location-Information Attribute, as specified in [RFC5580].

Geospatial location information with uncertainty is encoded as an opaque object. The format is based on the DHCPv4 GeoLoc Option 144, as specified in Section 2.2.2 of [RFC6225], but starts with the third octet (i.e., the code for the DHCP option and the length field is not included).

Whereas [RFC6225] defines a means for representing uncertainty, it does not specify a corresponding value for the confidence. Following Section 3.4 of [RFC7459], a default value of 95% confidence SHOULD be assumed for the combination of the uncertainty on each axis.

3. Security Considerations

Providing uncertainty information can reveal information about the process by which location information is generated.

4. IANA Considerations

4.1. Updated Location Profiles Registry

IANA is requested to allocate the value TBC to signal the encoding of this type in the Code field of the Location-Information Attribute, as specified in [RFC5580], and to update the Location Profiles Registry with the new value:

* Value (TBC): Geospatial location profile with uncertainty, as described in Section 2.

4.2. Updated Location-Capable Attribute Registry

IANA is requested to allocate the value TBC to add a new entry in the Location-Capable Attribute as specified in [RFC5580]:

* Value (TBC): Capability Token corresponds to GEO_UNCERTAINTY_LOCATION

4.3. Updated Requested-Location-Info Attribute Registry

IANA is requested to allocate the value TBC to add a new entry in the Requested-Location-Info Attribute as specified in [RFC5580]:

* Value (TBC): Capability Token corresponds to GEO_UNCERTAINTY_LOCATION

5. References

5.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <https://www.rfc-editor.org/rfc/rfc2119>.

[RFC5580] Tschofenig, H., Ed., Adrangi, F., Jones, M., Lior, A., and B. Aboba, "Carrying Location Objects in RADIUS and Diameter", RFC 5580, DOI 10.17487/RFC5580, August 2009, <https://www.rfc-editor.org/rfc/rfc5580>.

[RFC6225] Polk, J., Linsner, M., Thomson, M., and B. Aboba, Ed., "Dynamic Host Configuration Protocol Options for Coordinate-Based Location Configuration Information", RFC 6225, DOI 10.17487/RFC6225, July 2011, <https://www.rfc-editor.org/rfc/rfc6225>.

[RFC7459] Thomson, M. and J. Winterbottom, "Representation of Uncertainty and Confidence in the Presence Information Data Format Location Object (PIDF-LO)", RFC 7459, DOI 10.17487/RFC7459, February 2015, <https://www.rfc-editor.org/rfc/rfc7459>.

[RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <https://www.rfc-editor.org/rfc/rfc8174>.

5.2. Informative References

[RFC3825] Polk, J., Schnizlein, J., and M. Linsner, "Dynamic Host Configuration Protocol Option for Coordinate-based Location Configuration Information", RFC 3825, DOI 10.17487/RFC3825, July 2004, <https://www.rfc-editor.org/rfc/rfc3825>.

Authors' Addresses

Mark Grayson
Cisco Systems
10 New Square Park
Feltham
TW14 8HA
United Kingdom
Email: mgrayson@cisco.com

Sri Gundavelli
Cisco Systems
170 West Tasman Drive
San Jose, 95134
United States of America
Email: sgundave@cisco.com