Internet Engineering Task Force
Internet Draft

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DHCP Option for Civil Location

STATUS OF THIS MEMO

Abstract

This document specifies a Dynamic Host Configuration Protocol option for the civil (country, street and community) location of the client.

1 Terminology

In this document, the key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in RFC 2119 [1] and indicate requirement levels for compliant implementations.

2 Introduction

Many end system services can benefit by knowing the approximate location of the end device. In particular, IP telephony devices need to know their location to contact the appropriate emergency response agency and to be found by emergency responders.

There are two common ways to identify the location of an object, either through geospatial coordinates or by so-called civil coordinates. Geospatial coordinates indicate longitude, latitude and altitude, while civil coordinates indicate a street address.

> This is commonly, but not necessearily, closely related to the postal address, used by the local postal service to deliver mail. However, not all postal addresses correspond to street addresses. For example, the author's address is a postal address that does not appear on any street or building sign. Naturally, post office boxes would be unsuitable for the purposes described here.

A related draft [7] describes a DHCP [2] option for conveying geospatial information to a device. This draft describes how DHCP can be used to convey the civil location to devices. Both can be used simultaneously, increasing the chance to deliver accurate and timely location information to emergency responders.

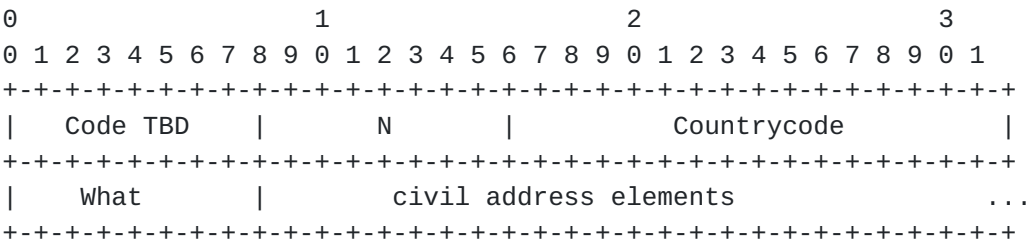
End systems that obtain location information via the mechanism described here then use other protocol mechanisms to communicate this information to the emergency call center.

Civil information is useful since it often provides additional, human-usable information particularly within buildings. Also, compared to geospatial information, it is readily obtained for most occupied structures and can often be interpreted even if incomplete.

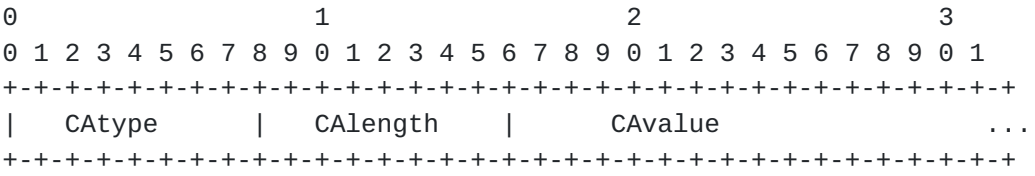
For example, for many large university or corporate campuses, geocoding information to building and room granularity may not be readily available.

Unlike geospatial information, the format for civil information differs from country to country. Thus, this draft establishes an IANA registry for civil location data fields. The initial set of data fields is derived from standards published by the United States National Emergency Numbering Association (NENA) [3]. It is anticipated that other countries can reuse many of the data elements.

3 Format of the DHCP Civil Location Option



Each civil address element has the following format:



Code TBD: The code for this DHCP option is TBD by IANA.

N: The length of this option is variable.

Countrycode: The two-letter ISO country code in capital ASCII letter, e.g., DE or US.

What: The 'what' element describes which location the DHCP refers to. Currently, three options are defined: the location of the DHCP server (0), the location of the network element believed to be closest to the client (1) or the location of the client (2). Option (2) SHOULD be used, but may not be known. Options (1) and (2) SHOULD NOT be

used unless it is known that the DHCP client is in close physical proximity to the server or network element.

In some cases, the local wiring plant makes it difficult to ascertain the device location with certainty. In that case, it is still preferable to indicate the DHCP server, Ethernet switch or router, but indicate the uncertainty. This avoids that the emergency responders try to break into the LAN closet.

CAtype: A one-octet descriptor of the data civil address value.

CAlength: The length, in octets, of the CAvalue, not including the CAlength field itself. Data SHOULD be encoded in uppercase.

CAvalue: The civil address value, encoded as UTF-8, and written in uppercase letters where applicable.

4 Civil Address Components

Since each country has different administrative hierarchies, with often the same (English) names, this specification adopts a simple hierarchical notation that is then instantiated for each country. We assume that five levels are sufficient for sub-national divisions above the street level.

All elements are OPTIONAL and can appear in any order. Abbreviations do not need a trailing period.

CAtype	label	description
1	A1	national subdivisions (state, region, province, prefecture)
2	A2	county, parish, gun (JP), district (IN)
3	A3	city, township, shi (JP)
4	A4	city division, borough, city district, ward, chou (JP)
5	A5	neighborhood, block
6	A6	street

For specific countries, the administrative sub-divisions are described below.

US: The mapping to NENA designations is shown in parentheses. A1=state (STA), using the the two-letter state and possession abbreviations recommended by the United States Postal Service Publication 28 [4], Appendix B; A2=county

(CNA); A3=civil community name (city or town) (MCN); A6=street (STN). A4 and A5 are not used. The civil community name (MCN) reflects the political boundaries. These may differ from postal delivery assignments for historical or practical reasons.

CA: The mapping to NENA designations is shown in parentheses. A1=province (STA), A2=county (CNA), A3=city or town (MCN).

JP: A1=metropolis (To, Fu) or prefecture (Ken, Do); A2=city (Shi) or rural area (Gun); A3=ward (Ku) or village (Mura); A4=town (Chou or Machi); A5=city district (Choume); A6=block (Banchi or Ban).

DE: A1=state (Bundesstaat); A2=county (Kreis); A3=city (Stadt, Gemeinde); A6=street (Strasse).

Additional CA types appear in many countries and are simply omitted where they are not used:

CAtype	NENA	description	examples
16	PRD	leading street direction	N
17	POD	trailing street suffix	SW
18	STS	street suffix	AVE, PLATZ
19	HNO	house number	123
20	HNS	house number suffix	A, 1/2
21	LMK	landmark or vanity address	SHADELAND CRESCENT APTS
22	LOC	additional location information	APT 17
23	NAM	name (residence and office occupant)	JOE'S BARBERSHOP
24	ZIP	postal/zip code	10027-1234

These CA types correspond to items from the NENA "Recommended Formats & Protocols For ALI Data Exchange, ALI Response & GIS Mapping" [3], but are applicable to most countries. The "NENA" column refers to the data dictionary name in Exhibit 18 of [3].

The NAM object is used to aid user location ("Joe Miller" "Alice's Dry Cleaning"). It does not identify the person using a communications device, but rather the person or organization associated with the address.

For POD and PRD, in English-speaking countries, the abbreviations N, E, S, W, and NE, NW, SE, SW should be used.

STS designates a street suffix. In the United States (US), the abbreviations recommended by the United States Postal Service

Publication 28 [4], Appendix C, SHOULD be used.

The DHCP long-options mechanism described in RFC 3396 [5] MUST be used if the civil address option exceeds the maximum DHCP option size of 255 octets.

5 Security Considerations

The information in this option may be used for a variety of tasks. In some cases, integrity of the information may be of great importance. In such cases, DHCP authentication in [6] SHOULD be used to protect the integrity of the DHCP options.

6 Acknowledgments

Rohan Mahy provided helpful comments.

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8 Normative References

[1] S. Bradner, "Key words for use in RFCs to indicate requirement levels," RFC 2119, Internet Engineering Task Force, Mar. 1997.

[2] R. Droms, "Dynamic host configuration protocol," RFC 2131, Internet Engineering Task Force, Mar. 1997.

[3] National Emergency Number Association, "Nena recommended formats & protocols for ali data exchange, ali response & gis mapping," Standard NENA-02-010, NENA, Washington, DC, 2002 Jan.

[4] United States Postal Service, "Postal addressing standards," Publication 28, USPS, Washington, DC, Nov. 2000.

[5] T. Lemon and S. Cheshire, "Encoding long options in the dynamic host configuration protocol (DHCPv4)," RFC 3396, Internet Engineering Task Force, Nov. 2002.

[6] R. Droms and W. Arbaugh, eds., "Authentication for DHCP messages," RFC 3118, Internet Engineering Task Force, June 2001.

9 Informative References

[7] J. Polk et al., "DHCP option for geographic location," Internet Draft, Internet Engineering Task Force, Oct. 2002. Work in progress.

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