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DHCP Option for Mobile IP Mobility Agents  
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Abstract

This document defines a new Dynamic Host Configuration Protocol (DHCP) option with suboptions. One suboption is passed from the DHCP Server to the DHCP Client to announce the presence of one or more Mobile IP Mobility Agents. For each announced Mobility Agent, information is provided which is the same as that of the Mobile IP Agent Advertisement extension to ICMP Router Advertisements. There is also one suboption which may be used by a DHCP client to provide identity information to the DHCP server.

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## 1. Introduction

There already exists a DHCP option to announce Mobile IP Home Agent addresses, described in [RFC 2132](#) [2]. There is, however, no option available to announce Mobile IP Foreign Agents.

Announcement of available Mobile IP Mobility Agents by means of DHCP provides possibilities for selective and individual assignment of Mobility Agents to Mobile Nodes. This in turn makes load-sharing and selective service offerings easier. This draft describes a DHCP option for announcing Mobility Agents to DHCP Clients.

## 2. Requirements terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [8].

The Mobile IP related terminology used in this document is described in [RFC 3220](#) [5].

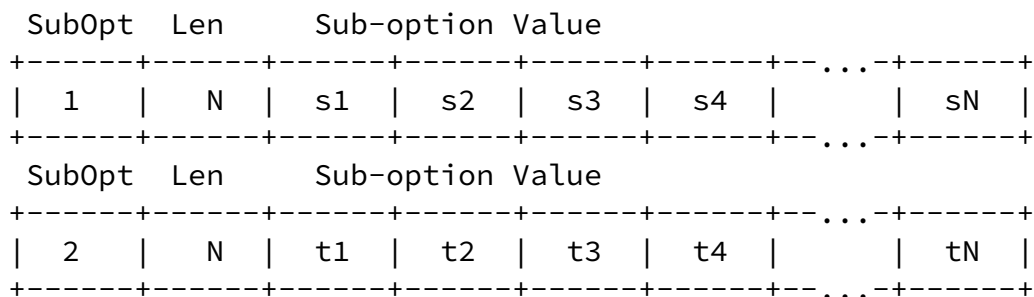
## 3. Mobility Agent Information Option

### 3.1 Mobility Agent Information Option Definition

This document defines a new DHCP Option called the Mobility Agent Option. It is a "container" option for specific agent-supplied sub-options. The format of the Mobility Agent option is:

Code	Len	Mobility Agent Information Field					
TBD	N	a1	a2	a3	a4	...	aN

The length N gives the total number of octets in the Mobility Agent Field. The Mobility Agent Information field consists of a sequence of SubOpt/Length/Value tuples for each sub-option, encoded in the following manner:



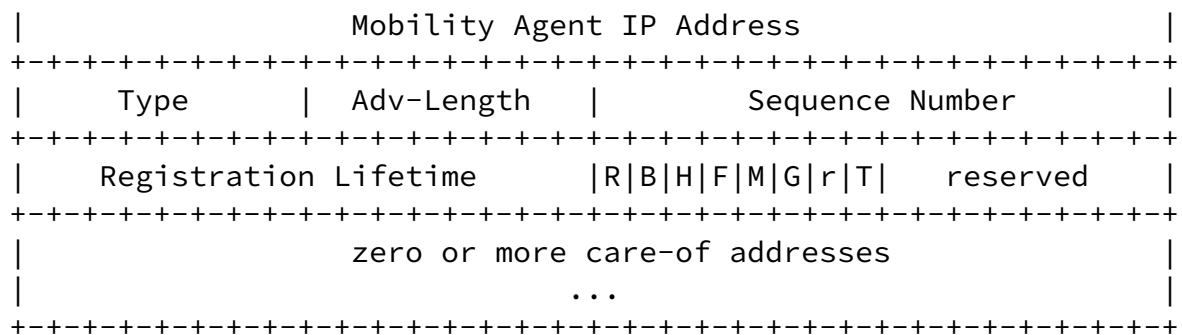
The Mobility Agent Information field shall NOT be terminated with a 255 sub-option. The length N of the DHCP Mobility Agent Information Option shall include all bytes of the sub-option code/length/value tuples. Since at least one sub-option must be defined, the minimum Mobility Agent Information length is two (2). The length N of the sub-options shall be the number of octets in only that sub-option's value field. A sub-option length may be zero. The sub-options need not appear in sub-option code order.

### 3.2 Network Access Identifier Sub-Option

The Network Access Identifier (NAI) defined in [RFC 2486](#) [3] is already used in Mobile IP as an alternative to the home address as an identifier of a mobile node [9].

The Network Access Identifier sub-option of the Mobility Agent Information Option MAY be used by the DHCP client to provide identifying information to the DHCP server, as part of the DHCPDISCOVER message. The server may then use this information in





Option code

DHCP\_MIP\_OPTION (to be assigned by IANA)

Length

Length in bytes of this option, not including the Option code and Length bytes.

Agent IP Address

The address through which the Mobile Node may reach the announced Mobility Agent in order to do a Mobile IP registration.

Type

16. This is the same value as for the type field in a Mobility Agent Advertisement Extension as described in [RFC 3220 \[5\]](#). If other Mobility Agent Advertisement Extensions are defined in the future, this field will make it possible to differentiate between them without using new DHCP option numbers.

Reserved-0

Sent as zero; required to be zero on reception for the option described in this document.

Adv-Length

(6 + 4\*N), where 6 accounts for the number of bytes in the Sequence Number, Registration Lifetime, flags, and reserved fields, and N is the number of care-of addresses advertised for the Mobility Agent.

Sequence Number

The count of Mobility Agent DHCP announcements made since the DHCP server was initialized ([RFC 3220, Section 2.3.2 \[5\]](#)).

## Registration Lifetime

The longest lifetime (measured in seconds) that this agent is willing to accept in any Registration Request. A value of 0xffff indicates infinity.

R

Registration required. Registration with this foreign agent (or another foreign agent listed in this DHCP option) is required even when using a co-located care-of address.

B

Busy. The foreign agent will not accept registrations from additional mobile nodes.

H

Home agent. This agent offers service as a home agent on the link on which this mobility agent announcement is sent.

F

Foreign agent. This agent offers service as a foreign agent on the link on which this mobility agent announcement is sent.

M

Minimal encapsulation. This agent implements receiving tunneled datagrams that use minimal encapsulation [7].

G

GRE encapsulation. This agent implements receiving tunneled datagrams that use GRE encapsulation [6].

r

Sent as zero; ignored on reception. SHOULD NOT be allocated for any other uses.

T

Foreign agent supports reverse tunneling [11].

reserved

Sent as zero; ignored on reception.

Care-of Address(es)

The foreign agent care-of address(es) provided by this foreign agent. An DHCP Mobility Agent Announcement MUST include at least one care-of address if the 'F' bit is set. The number of care-of addresses present is determined by the Length field in the Extension.

#### 4. Mobility Agent Option Usage

The requesting and sending of this option follows the rules for DHCP options in [RFC 2131](#) [1]

#### 5. Security Considerations

DHCP provides an authentication mechanism, as described in [RFC 3118](#) [4], which may be used if authentication is required before offering the Mobility Agent option described here. On the other hand, Mobile IP Agent Advertisements as described in [RFC 3220](#) [5] requires no authentication for Agent Advertisement and Agent Solicitation messages.

By providing Agent Advertisements by means of DHCP as an alternative to extended ICMP Router Advertisement messages it is possible to do so more selectively, and it does not offer any new threat to the internet.

#### 6. IANA Considerations

The value for the DHCP\_MIP\_OPTION code must be assigned from the numbering space defined for public DHCP Options in [RFC 2939](#) [10].

#### 7. Acknowledgements

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