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Mobile Node Identifier Option for Mobile IPv6
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Abstract

This document defines new mobility option to identify mobility entities using identifiers other than the home IP address. This option can be used in messages containing a mobility header.

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1. Introduction

The base specification of Mobile IPv6 [[RFC3775](#)] identifies mobility entities using an IPv6 address. A mechanism is needed where in mobility entities can be identified using other identifiers (for example, a network access identifier (NAI) [[RFC_2486bis](#)], International Mobile Station Identifier (IMSI), an application/deployment specific opaque identifier etc). Using other identities for a mobile node (MN) permits various applicabilities, e.g. authentication using existing infrastructure (AAA (Authentication, Authorization and Accounting), HLR/AuC (Home Location Register/Authentication Center)), dynamic allocation of a mobility anchor point, dynamic allocation of an address etc.

This document defines an option with subtype number which identify a specific type of identifier. One instance of subtype, the NAI is defined in [Section 3.1](#). It is expected that other types of identifiers will be defined by other documents in the future.

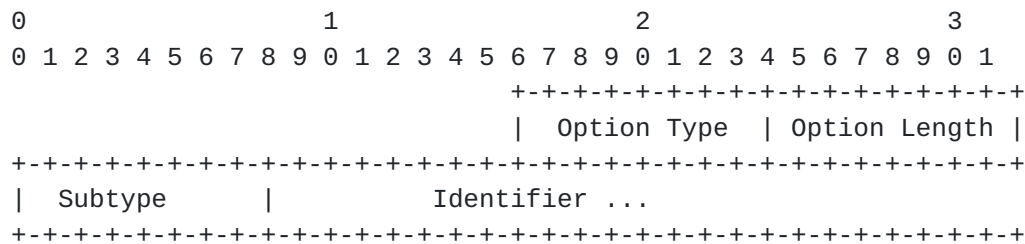
2. Terminology

The keywords "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](#).

3. Mobile Node Identifier option

This section defines the Mobile Node Identifier option. Various forms of identifiers can be used to identify a MN. Some examples include a Network Access Identifier (NAI) [[RFC 2486bis](#)], an opaque identifier applicable to a particular application, etc. The sub-type field in the option defines the specific type of identifier.

This option can be used in mobility messages containing a mobility header. The subtype field in the option is used to interpret the specific type of identifier.



Option Type:

MN-ID-OPTION-TYPE to be defined by IANA. An 8-bit identifier of the type mobility option.

Option Length:

8-bit unsigned integer, representing the length in octets of the Subtype and Identifier fields.

Subtype:

Subtype field defines the specific type of identifier included in the identifier field.

Identifier:

A variable length identifier of type as specified by the subtype field of this option.

This option does not have any alignment requirements.

3.1 MN-NAI mobility option

The format of the MN-NAI mobility option is as defined in [Section 3](#). This option uses the subtype value of 1. The MN-NAI mobility option

is used to identify the mobile node.

The MN-NAI mobility option uses an identifier of the form user@realm [[RFC 2486bis](#)].

3.2 Processing Considerations

When present, this option MUST appear before any authentication related option in a message containing a mobility header.

4. Security Considerations

Mobile IPv6 already contains one mechanism for identifying mobile nodes, the Home Address Option [[RFC 3775](#)]. As a result, the vulnerabilities of the new option defined in this document are similar to those that already exist for Mobile IPv6. In particular, the use of a permanent, stable identifier may compromise the privacy of the user, making it possible to track a particular device or user as it moves through different locations.

In addition, since an NAI reveals the home affiliation of a user, it may assist an attacker in determining the identity of the user, help the attacker in targeting specific victims, or assist in further probing of the username space.

These vulnerabilities can be addressed through various mechanisms, such as those discussed below:

- o Encrypting traffic at link layer such that other users on the same link do not see the identifiers. This mechanism does not help against attackers on the rest of the path between the mobile node and its home agent.
- o Encrypting the whole packet, such as when using IPsec to protect the communications with the home agent [[RFC 3776](#)].
- o Using an authentication mechanism that enables the use of privacy NAIs [[RFC 2486bis](#)] or temporary, changing "pseudonyms" as identifiers.

In any case, it should be noted that as the identifier option is only needed on the first registration at the home agent and subsequent registrations can use the home address, the window of privacy vulnerability in this document is reduced as compared to the [RFC 3775](#). In addition, this document is a part of a solution to allow dynamic home addresses to be used. This is an improvement to privacy as well, and affects both communications with the home agent and the correspondent nodes, both of which have to be told the home address.

5. IANA Considerations

IANA services are required for this document. The values for new mobility options must be assigned from the Mobile IPv6 [[RFC3775](#)] numbering space.

The values for Mobility Option types MN-ID-OPTION-TYPE as defined in [Section 3](#) need to be assigned. The suggested value is 7 for the MN-ID-OPTION-TYPE.

IANA should record a value for this new mobility option.

In addition, the IANA needs to create a new namespace for the subtype field of the Mobile Node Identifier Option. The currently allocated values are as follows:

NAI (defined in this document)	[1]
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New values for this namespace can be allocated using Standards Action [[RFC 2434](#)].

6. Acknowledgements

The authors would like to thank Basavaraj Patil for his review and suggestions on this draft. Thanks to Jari Arkko for review and suggestions regarding security considerations and various other aspects of the document.

7 Normative References

[RFC3775] Johnson, D., Perkins, C. and J. Arkko, "Mobility Support in IPv6", [RFC 3775](#), June 2004.

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