Mobile IPv4 Extension for Configuration Options Exchange
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Abstract

This document describes the mechanism for providing the host configuration information during Mobile IP registration. One or more Configuration Options Exchange Extensions may be included in the registration message to provide the Mobile Node the configuration parameters needed for network service (e.g. DNS).

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1. Introduction

Mobile IPv4 lacks the capability to dynamically configure the interface parameters (e.g. home subnet mask) and network service elements (e.g. DNS servers) on the Mobile Node. This information are required to be manually configured today. There are mechanisms such as DHCP for the mobile node to configure information from the foreign network, but not from the home network when the mobile node is not attached to the home network.

This document defines a new extension that can be used to carry configuration parameters from the Foreign Agent and/or Home Agent during Mobile IPv4 registration. This configuration parameters include DHCP option (Parameter Request List) defined in [RFC2132].

1.1. Glossary of Terms

- DNS - Domain Name System [RFC1035]
- DHCP - Dynamic Host Configuration Protocol [RFC2131]

1.2. Conventions used in this document

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 [RFC2119].
2. Configuration Options Exchange Extension

The Mobile IPv4 extension has the format shown in this section to carry configuration information. This extension MAY be included as a part of Mobile IP Registration Request or Registration Reply.

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|     Type      |    Length     | Entity-Type   |   Sub-Type    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|   Config-Data |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Figure 1: Configuration Options Exchange Extension

Type

Configuration Options Exchange Extension

Length

Indicates the length (in bytes) of the data field within this Extension. The length does NOT include the Type and Length bytes. This field MUST be set to 2 plus the total length of the Config-Data field.

Entity-Type

This field indicates which Mobility Agent is requested to provide configuration information when the extension is present in a Registration Request and which Mobility Agent inserted the extension in a Registration Reply. The Home Agent or Foreign Agent may include the extension in the Registration Reply, whereas the Mobile Node may append the extension in the Registration Request to ask the Home Agent and/or Foreign Agent for configuration information. Currently the following types are defined:

0: Reserved.

1: Home Agent.

2: Foreign Agent.
Sub-Type

At this time the following values are defined:

0: Reserved.

1: DHCP Options.

All other values reserved for future use.

Config-Data

The configuration parameters are packed in DHCP-based formats in the Config-Data field. Since the size of the Config-Data field is limited to 253 bytes, the Mobility Agent needs to add multiple extensions with this subtype when the configuration information exceeds the boundary. The DHCP option must be contained within one extension and never split up across multiple extensions.
3. Processing of Configuration Options Exchange Extension

The Mobile Node may request values for specific configuration parameters from the Home Agent and/or Foreign Agent by including the ‘Parameter Request List’ option (defined in [RFC2132]) in the Registration Request. The list of requested parameters is specified as a string of octets, where each octet is a valid DHCP option code as defined in [RFC2132]. If this extension is included in the Registration Request, the Home Agent or Foreign Agent (indicated in the Entity-Type field) should provide requested information in the Registration Reply. The Configuration Options Exchange extension should be repeated in the Registration Request for parameter(s) request based on the Entity-Type. If there are no Configuration Options Exchange Extension in the Registration Request, it’s up to the Home Agent or Foreign Agent to decide which configuration parameter to include in the Configuration Options Exchange extension. The configuration parameter(s) should not be overwritten by the Foreign Agent if the Home Agent has included them in the Configuration Options Exchange extension. The Entity-Type field is set to the Mobility Agent that appended the extension in the Registration Reply.

When a Mobile IP entity (i.e. Mobile Node, Mobility Agent) adds a Configuration Options Exchange Extension to a Registration Request or Registration Reply message, this extension MUST appear prior to any authentication extensions added by that entity.

Example:

Mobile Node wants to obtain the home network prefix mask and DNS servers’ IP addresses from its Home Agent during registration. The Registration Request would contain the following values in the Configuration Options Exchange Extension. The OpCode is set to Parameter Request List (55) used to obtain the Subnet Mask (1) and Domain Name Server (6); see [RFC2132].

```
0               1                   2               3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
|     <Type>    |     <Len>=6   |    <Ent>=1    |    <DHCP>=1   |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
|  <OpCode>=55  |   <OpLen>=2   |  <NetMask>=1 |    <DNS>=6    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
Figure 2: Requested Configuration Parameters
```

Home Agent sends a Registration Reply that contains the following values in the Configuration Options Exchange Extension. The Subnet
Mask (1) and Domain Name Server (6) options are embedded in the extension.

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Type | Len=18 | Ent=1 | Rsv=0 |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| OpCode=1 | OpLen=4 | Home Network Prefix |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
... | OpCode=6 | OpLen=8 |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Primary DNS Server Address |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Secondary DNS Server Address |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Figure 3: Configuration Values in Response
4. IANA Considerations

This draft defines new Mobile IPv4 extension, the Configuration Options Exchange Extension, as defined in Section 2 of this document. This value MUST be assigned by IANA from the Mobile IP numbering space for skippable extensions.

A new number space is to be created for enumerating Sub-Type of the Configuration Options Exchange Extension defined in Section 2. For Sub-Type, IANA should assign value 0 as Reserved and value 1 for the DHCP Options. New values of Sub-Type of the Configuration Options Exchange Extension, other than values 0-1 must be approved by Designated Expert.

A new number space is to be created for enumerating Entity-Type of the Configuration Options Exchange Extension defined in Section 2. For Entity-Type, IANA should assign value 0 as Reserved, value 1 for the Home Agent and value 2 for the Foreign Agent. New values of Entity-Type of the Configuration Options Exchange Extension, other than values 0-2 must be approved by Designated Expert.
5. Security Considerations

There is no confidentiality provided for this extension. The information carried in the Configuration Options Exchange Extension is from the Home Agent and/or Foreign Agent and is transferred unencrypted. If sensitive information is sent for host configuration purposes, it may need to be protected by other means outside the scope of this document.
6. Acknowledgments

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7. Normative References


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