Dynamic Prefix Allocation for NEMOv4
draft-ietf-mip4-nemov4-dynamic-03.txt

Abstract

The base NEMOv4 specification defines extensions to Mobile IPv4 for mobile networks. This specification defines a dynamic prefix allocation mechanism.

Status of this Memo

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

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

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."

The list of current Internet-Drafts can be accessed at http://www.ietf.org/ietf/1id-abstracts.txt.

The list of Internet-Draft Shadow Directories can be accessed at http://www.ietf.org/shadow.html.

This Internet-Draft will expire on May 12, 2010.

Copyright Notice

Copyright (c) 2009 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to BCP 78 and the IETF Trust’s Legal Provisions Relating to IETF Documents
1. Requirements notation

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. Introduction

3. Dynamic Mobile Prefix allocation

The following extension is defined according to this specification.

3.1. Mobile Client Considerations

[RFC5177] defines that the prefix field of the mobile network request extension cannot be set to zero. This mechanism works only in combination with the explicit mode of operation defined in [RFC5177].

According to this specification, a mobile client MAY include one or more mobile network request extensions with the prefix field set to zero. Such mobile network request extensions indicate that the mobile client requests mobile network prefix(es) to be assigned to it by the home agent. In this case, the mobile client MAY set the prefix length field of such extensions to zero or to a length of its choice as a hint to the home agent. According to this specification, mobile network request extensions with the prefix field set to zero MAY be included in a registration request message either during initial registration or during a subsequent registration.

When a mobile client receives a registration reply it MUST process it as defined in MIPv4 [RFC3344] and [RFC5177]. If one or more network acknowledgement extension are included with the Code field set to "Success" the mobile client SHOULD treat the prefixes in the corresponding prefix fields as allocated prefixes and create the appropriate bindings as defined in [RFC5177].

If in response to a registration request with a mobile network request extension with the prefix field set to zero, a mobile client receives a registration reply with a network acknowledgement extension including Code field set to 1 "invalid prefix", it may use it as a hint that the home agent does not support dynamic prefix allocation.

3.2. Home Agent Considerations

A home agent receiving a mobile network request extension with the prefix field set to zero MAY return a mobile network acknowledgement extension [RFC5177] with the prefix field set to the prefix allocated to the mobile client. The length of that prefix is at the discretion of the home agent. The home agent MAY take into account the prefix length hint if one is included in the mobile network request extension. Once the home agent allocates a prefix it MUST maintain the prefix registration table as defined in [RFC5177]. Alternatively the home agent MAY return a mobile network acknowledgement extension with the Code field set to one of the negative codes defined in [RFC5177].
Dynamic mobile prefix allocation as defined in this specification MAY be combined with dynamic home address allocation as defined in [RFC5177]. In other words the home address field of the registration request message MAY be set to zero while the message also includes one or more mobile network request extensions with the prefix field also set to zero.

Once the home agent allocates a prefix it MUST maintain the prefix registration table as defined in [RFC5177]. The lifetime of the allocated prefix will be equal to the lifetime of the binding cache entry.

For dynamic prefix allocation the mobile client’s home address MAY be used to identify the client if it is not set to zero. Otherwise, as defined in the NAI extension [RFC2794] of MIPv4 [RFC2794], the NAI extension needs to be included in the registration request, in which case the same extension SHOULD be used to identify the mobile client for prefix allocation purposes.
4. Security Considerations

This specification operates in the security constraints and requirements of MIPv4 [RFC3344], NAI [RFC2794] and [RFC5177].

Home agent implementations SHOULD take steps to prevent address exhaustion attacks. One way to limit the effectiveness of such an attack is to limit the number and size of prefixes any one mobile router can be allocated.
5. IANA Considerations

This document has no actions for IANA
6. Normative References


Authors’ Addresses

George Tsirtsis
Qualcomm
Email: tsirtsis@googlemail.com

Vincent Park
Qualcomm
Phone: +908-947-7084
Email: vpark@qualcomm.com

Vidya Narayana
Qualcomm
Phone: +858-845-2483
Email: vidyan@qualcomm.com

Kent Leung
Cisco
Phone: +408-526-5030
Email: kleung@cisco.com