            DHCPv6 Extension for On Demand Mobility exposure
                draft-moses-dmm-dhcp-ondemand-mobility-11

Abstract

   Applications differ with respect to whether or not they need IP
   session continuity and/or IP address reachability. Networks
   providing the same type of service to any mobile host and any
   application running on the host yields inefficiencies. This document
   describes extensions to the DHCPv6 protocol to enable mobile hosts to
   indicate the required mobility service type associated with a
   requested IP prefix and to allow networks to indicate the type of
   mobility service associated with the allocated IP prefix in return.

Status of This Memo

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

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   time. It is inappropriate to use Internet-Drafts as reference
   material or to cite them other than as "work in progress."

   This Internet-Draft will expire on August 1, 2019.

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1. Introduction

[I-D.ietf-dmm-ondemand-mobility] defines different types of mobility-associated services provided by access networks to mobile hosts with regards to maintaining IPv6 prefix continuity after an event of the host moving between locations with different points of attachments within the IP network topology. It further specifies means for applications to convey to the IP stack in the mobile host, their requirements regarding these services.

This document defines extensions to the DHCPv6 protocol ([RFC3315]) and [RFC3633] in the form of a new DHCP option that specifies the type of mobility services associated with an IPv6 prefix. The IP stack in a mobile host uses the DHCP client to communicate the type of mobility service it wishes to receive from the network. The DHCP server in the network uses this option to convey the type of service that is guaranteed with the assigned IPv6 prefix in return.
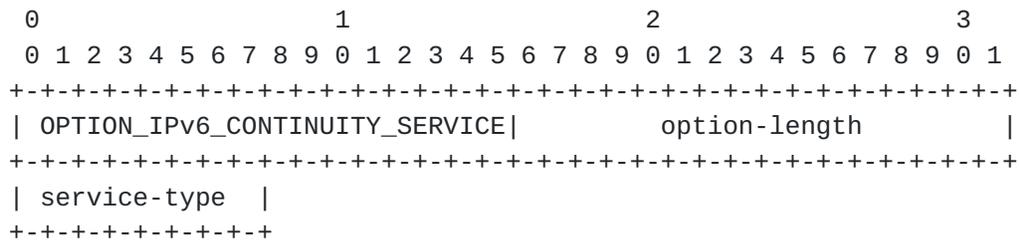
2. Notational Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 , [RFC2119] [RFC8174] when, they appear in all capitals, as shown here.

3. IPv6 Continuity Service Option

   The IPv6 Continuity Service option is used to specify the type of
   continuity service associated with a source IPv6 prefix. The IPv6
   Continuity Service option MUST be encapsulated in the IAprefix-
   options field of the IA_PD prefix option.

   The format of the IPv6 Continuity Service option is:

```
 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 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| OPTION_IPv6_CONTINUITY_SERVICE|          option-length         |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| service-type  |
+-+-+-+-+-+-+-+-+
```

   option-code   OPTION_IPv6_CONTINUITY_SERVICE (TBD)

   option-len   1

   service-type   one of the following values:

                  Non-Persistent -   a non-persistent IP prefix (1)

                  Session-Lasting -   a session-lasting IP prefix (2)

                  Fixed -   a fixed IP prefix (3)

                  Graceful-replacement -   a graceful-replacement IP
                             prefix (4)

                  Anytype -   Anyone of the above (0)

   The definition of these service types is available in
   [I-D.ietf-dmm-ondemand-mobility].

   All other values (5-255) are reserved for future use. If the
   OPTION_IPv6_CONTINUITY_SERVICE option is received and its service-
   type is equal to one of the reserved values, the option SHOULD be
   ignored.

When a message is sent from a client to a server, the value of the
IPv6 Continuity Service option indicates the type of continuity
service required for the IPv6 prefix requested by the client.

When a message is sent from a server to a client, the value of the
IPv6 Continuity Service option indicates the type of continuity
service committed by the network for the associated IPv6 prefix. The
value 'AnyType' SHOULD only appear in the message sent from the
client to the server to indicate that the client has no specific
preference. However, it cannot appear in a message sent from the
server.

Once an IPv6 prefix type is requested and provided, any subsequent
messages involving this prefix (lease renewal - for example) MUST
include the IPv6 Continuity Service option with the same service type
that was assigned by the server during the initial allocation.

If a server receives a request to assign an IPv6 prefix with a
specified IPv6 Continuity service, but cannot fulfill the request, it
MUST reply with the NoPrefixAvail status.

A server that does not support this option will ignore it and respond
without taking into account the desired session continuity service.
The response will not include the Continuity Service option
encapsulated in the IAprefix-options field of the IA_PD prefix
option.

The missing Continuity Service option in the response serves as an
indication to the client that this feature is not supported by the
server. It MAY use the allocated prefix knowing it does not
necessarily support the desired Continuity service, or perform any
other action.

A server MUST NOT include the IPv6 Continuity Service option in the
IAprefix-options field of an IA_PD Prefix option, if not specifically
requested previously by the client to which it is sending a message.

If a client receives an IA_PD Prefix option from a server with the
IPv6 Continuity Service option in the IAprefix-options field, without
initially requesting a specific service using this option, it MUST
discard the received IPv6 prefix.

If the mobile device (host or router) has no preference regarding the
type of continuity service it uses the 'AnyType' value as the
specified type of continuity service. The Server will allocate an
IPv6 prefix with some continuity service and MUST specify the type in
IPv6 Continuity Service option encapsulated in the IAprefix-options

field of the IA_PD Prefix option. The method for selecting the type
of continuity service is outside the scope of this specification.

4. Correlation between Session Continuity Service and Lifetime Values

The values to be used in the Preferred-lifetime and Valid-lifetime
fields in the IA Prefix Option are out of the scope of this
specification and left to implementation. It is RECOMMENDED to
provide longer lifetime values for Fixed and Session-lasting prefixes
compared to the lifetime values of Non-persistent and Graceful-
replacement prefixes because the network has guaranteed their
validity regardless of the link to which the host is attached.

For clients using Graceful-replacement services, the network MAY
obsolete a Prefix and allocate a new one from time to time especially
in a mobility-related event. On such occasions, the network SHOULD
provide a graceful period (lifetime) in which the obsoleted prefix
can still be used and a new (longer) lifetime with the new prefix.

It is NOT RECOMMENDED using 0xFFFFFFFFFF (infinity) values for the
lifetime of Fixed prefixes. Even though they are fixed, it is still
safer to Rebind periodically. The lifetime value can be relatively
long to reduce message exchange overhead.

Section 18.2 - Client Behavior of [I-D.ietf-dhc-rfc3315bis] specifies
that when a client detects that it may have moved to a new link, it
uses Rebind if it has delegated prefixes. It is worth clarifying
that a client does not HAVE to Rebind the prefixes if they are Fixed
or Session-lasting prefixes.

5. Security Considerations

There are no specific security considerations for this option.

6. IANA Considerations

TBD

7. References

7.1. Normative References

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            Requirement Levels", BCP 14, RFC 2119,
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7.2. Informative References

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   [RFC3633]   Troan, O. and R. Droms, "IPv6 Prefix Options for Dynamic
               Host Configuration Protocol (DHCP) version 6", RFC 3633,
               DOI 10.17487/RFC3633, December 2003,
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   [RFC7934]   Colitti, L., Cerf, V., Cheshire, S., and D. Schinazi,
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               RFC 7934, DOI 10.17487/RFC7934, July 2016,
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