                    The Name Service Search Option for DHCP

Status of this Memo

   This document specifies an Internet standards track protocol for the
   Internet community, and requests discussion and suggestions for
   improvements. Please refer to the current edition of the "Internet
   Official Protocol Standards" (STD 1) for the standardization state
   and status of this protocol. Distribution of this memo is unlimited.

Abstract

   This document defines a new Dynamic Host Configuration Protocol
   (DHCP) option which is passed from the DHCP Server to the DHCP Client
   to specify the order in which name services should be consulted when
   resolving hostnames and other information.

Introduction

   The Dynamic Host Configuration Protocol (DHCP)[1] provides a
   framework for passing configuration information to hosts on a TCP/IP
   network. RFC 2132 [2] allows DHCP servers to specify configuration
   information for various kinds of name services to be passed to DHCP
   clients. Many clients use multiple name services and have crafted
   their own conventions that allow an individual host to express the
   order among the various name services with which lookups are done.
   However, no search order can be specified via DHCP. The purpose of
   this document is to allow DHCP servers to specify the search order to
   be used by DHCP clients. To avoid the need for inventing and
   maintaining a separate name space for this option, we rely on the
   existence of previously-defined DHCP options that specify the IP
   address(es) of servers which provide name services whose order we
   wish to express.

Definitions

   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 [3]. This
   document also uses the following terms:

      "DHCP client"

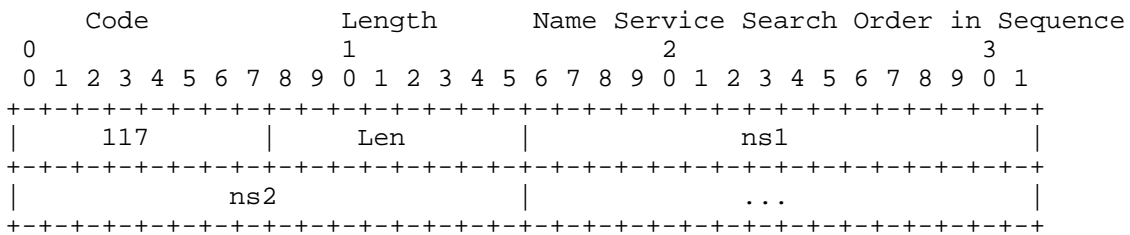   DHCP client or "client" is an Internet host using DHCP to
         obtain configuration parameters such as a network address.

      "DHCP server"

         A DHCP server or "server" is an Internet host that returns
         configuration parameters to DHCP clients.

 Name Service Search Option Format

   The code for this option is 117, and its minimum length is 2 bytes.
   A DHCP server SHOULD return, in its preferred order, the 16-bit,
   network byte order (big-endian [4]) integer option code for the
   name services (the earlier in the list, the more preferred the name
   service).

```
     Code             Length      Name Service Search Order in Sequence
 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
 +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 |    117       |    Len        |           ns1                 |
 +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 |           ns2                |            ...                |
 +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```
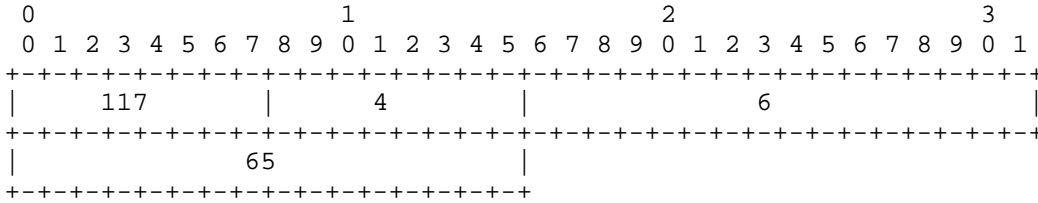
   In the above diagram, ns1 and ns2 are 16-bit integers corresponding
   to two DHCP options which specify the IP addresses of two different
   types of name server. The current list of name services and their
   DHCP option codes, taken from RFC 2132, includes

      Name Service   Value

      Domain Name Server Option   6
      Network Information Servers Option   41
      NetBIOS over TCP/IP Name Server Option   44
      Network Information Service+ Servers Option   65

A name service option code of 0 is used to indicate that the
client should refer to local naming information (e.g., an
/etc/hosts file on a UNIX machine).

A DHCP server wishing to express that a client should first search
DNS, then NIS+, would send

```
 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|      117      |       4       |               6               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|              65               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

DHCP Client Behavior

The DHCP client will use this option to create a search list for
name resolution. The client may receive name services in this
option that it does not support or has not been configured to
access. Likewise, a client may receive an option that lists name
services for which no corresponding DHCP option was supplied.
Clients will interpret this option in a system-specific manner
whose specification is outside the scope of this document.

Security Considerations

DHCP currently provides no authentication or security mechanisms.
Potential exposures to attack are discussed in section 7 of the DHCP
protocol specification [1].

IANA Considerations

IANA has assigned a value of 117 for the DHCP option code described
in this document.

References

    [1] Droms, R., "Dynamic Host Configuration Protocol", RFC 2131, March
        1997.

    [2] Alexander, S. and R. Droms, "DHCP Options and BOOTP Vendor
        Extensions", RFC 2132, March 1997.

    [3] Bradner, S., "Key words for use in RFCs to indicate requirement
        levels", BCP 14, RFC 2119, March 1997.

    [4] Cohen, D., "On Holy Wars and a Plea for Peace", Computer, IEEE,
        October 1981.

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Acknowledgement