                    An option for FQDNs in DHCP options
                        <draft-ietf-dhc-fqdn-opt-02.txt>

Status of this Memo

   This document is an Internet-Draft. 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.''

   To learn the current status of any Internet-Draft, please check the
   ``1id-abstracts.txt'' listing contained in the Internet-Drafts Shadow
   Directories on ftp.is.co.za (Africa), nic.nordu.net (Europe),
   munnari.oz.au (Pacific Rim), ds.internic.net (US East Coast), or
   ftp.isi.edu (US West Coast).

Abstract

   DHCP [DHCP] can be used to automate the process of configuring TCP/IP
   host computers. However, some of the DHCP options carry IP addresses
   rather than Fully Qualified Domain Names (FQDN). Use of IP addresses
   constrains the DHCP client to use the addresses that were in use at
   the time the client received its configuration information; these
   addresses may change over time, (e.g., a server may be assigned a new
   IP address), so that the IP addresses used by the client may become
   invalid.

   An alternative to passing IP addresses is to pass FQDNs instead of
   (numeric) IP addresses. Doing this allows to defer binding between a
   particular network entity (e.g., a server) and its IP address until
   run time. As stated in [Carpenter:96], "Deferring the binding avoids
   the risk of changed mapping between IP addresses and specific network
   entities (due to changing addressing information). Moreover,
   reliance on FQDNs (rather than IP addresses) also localizes to the
   DNS the changes needed to deal with changing addressing information
   due to renumbering."

This document defines a new DHCP option that allows the use of FQDNs
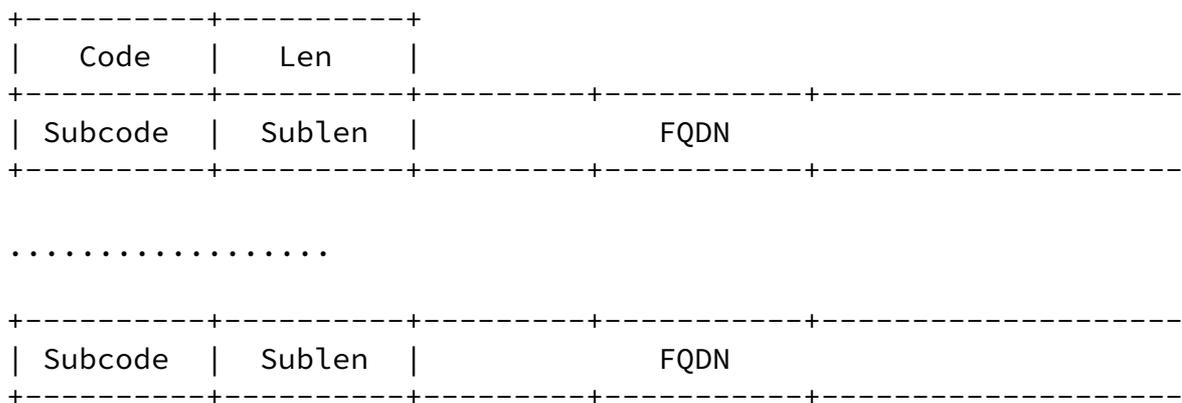instead of IP addresses in DHCP options.

1. FQDN Option

The FQDN option allows the use of FQDNs rather than IP addresses in
DHCP options. The FQDN option contains other DHCP options, which
then carry FQDNs rather than IP addresses as data.

The code for the FQDN option is 89. The Len field gives the total
length of all of the DHCP options contained in the FQDN option. The
Code, Len, Subcode and Sublen are all one octet long. The FQDN field
is variable length.

For each subcode carried in the FQDN option, the IP address in the
option represented by the subcode is replaced by a FQDN.

The Sublen field shall be set to the length (in octets) of the FQDN
carried in the option. The FQDN field carries the FQDN itself.


```
  +----------+----------+
  |   Code   |   Len    |
  +----------+----------+---------+----------+-------------------
  | Subcode  |  Sublen  |             FQDN
  +----------+----------+---------+----------+-------------------

  ................

  +----------+----------+---------+----------+-------------------
  | Subcode  |  Sublen  |             FQDN
  +----------+----------+---------+----------+-------------------
```


1.1 DHCP options containing a list of parameters

More that one triple with a given subcode may appear within a single
FQDN option. The FQDNs contained in triples with the same subcode
should be treated as a list of parameters for the DHCP option
represented by the subcode.

Because FQDNs are variable length, lists of FQDNs cannot be encoded
in DHCP options within the FQDN option. DHCP Options that can carry
a list of IP addresses should be coded as multiple subcodes in the
FQDN option, to differentiate among the variable-length FQDNs.

   This option only allows the use of FQDNs for options that have been
   elsewhere defined to carry IP addresses.

1.2 Example

   The following illustrates how the FQDN option could be used to carry
   FQDNs for 2 LPR Servers with FQDNs lpr1.xxx.org and lpr2.yy.org, and
   one Network Information Server with FQDN nis.zzzz.org.


```
   +---+---+
   |xx |41 |
   +---+---+---+---+---+---+---+---+---+---+---+---+---+---+
   |41 |12 | n | i | s | . | z | z | z | z | . | o | r | g |
   +---+---+---+---+---+---+---+---+---+---+---+---+---+---+
   | 9 |12 | l | p | r | 1 | . | x | x | x | . | o | r | g |
   +---+---+---+---+---+---+---+---+---+---+---+---+---+---+
   | 9 |11 | l | p | r | 2 | . | y | y | . | o | r | g |
   +---+---+---+---+---+---+---+---+---+---+---+---+
```


2. Security Considerations

   Security issues are not discussed in this document.

3. References

   [Carpenter:96] Carpenter, B., Rekhter, Y., "Renumbering needs work",
   RFC1900, February 1996.

   [DHCP] Droms, R., "Dynamic Host Configuration Protocol", RFC1541,
   October 1993.

4. Acknowledgments

5. Author Information

    Yakov Rekhter
    cisco Systems, Inc.
    170 Tasman Dr.
    San Jose, CA 95134
    Phone: (914) 528-0090
    email: yakov@cisco.com

    Ralph Droms
    Computer Science Department
    323 Dana Engineering
    Bucknell University
    Lewisburg, PA 17837
    Phone: (717) 524-1145
    email: droms@bucknell.edu