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Feb 22, 1999

DHCP Options For Host System Characteristics
<draft-dittert-host-sys-char-03.txt>

Status of this Memo

Abstract

The interoperability of configuration services based on the Dynamic Host
Configuration Protocol (DHCP) [1] in an environment of heterogeneous
clients depends on clients accurately identifying themselves and their
relevant characteristics to configuration servers. The class identifier
provided through DHCP option 60 [2] helps in this regard, but such
identifiers essentially only enable clients and servers that are "good
friends" to find each other. This draft proposes the definition of three
options that convey particular, generally useful information about the
client system. This enables all servers to recognize this information,
and is a step toward a richer form of interoperability for configuration
services.

The options in question are
        Option 93 - Client System Architecture
        Option 94 - Client Network Device Interface
        Option 97 - UUID/GUID-based Client Identifier

Subsequent to IANA issuing the above DHCP option numbers, the DHCP Working
Group has determined that use of these options is not appropriate. As a
result, it was agreed in the August 1998 IETF DHCP WG meeting that use of
Options 93, 94, and 97 as described in this draft would be allowed until
August of 2004 (six years), after which time the option numbers would be

made available for new options.

   In the interim, it is expected that systems using Options 93, 94, and 97
   will be redefined to use Options 60 and 61. It is allowable that systems
   may use both methods during the 6 year interim period as a means of
   migrating to exclusive use of Options 60 and 61 for this functionality by
   the end of the interim period.

   The DHCP Working Group has agreed that this draft will be published as
   an Informational RFC to document the expected term of use for Options 93,
   94, and 97 as defined in this ID.

1.0 **Introduction**

   The use of DHCP to provide clients with configuration information in
   general, and boot images in particular can be complicated by several
   circumstances. Among these are
      1) clients in the same service domain with different system
         architectures or hardware configurations
      2) clients in the same service domain for which different software
         configurations are desired
      3) the desire to have clients and servers provided by different
         vendors successfully interact
   (By "clients in the same service domain" we mean clients, requests
   from which can reach the same server.) A key element in enabling the
   successful use of DHCP in such circumstances is the provision of
   mechanisms by which clients can accurately identify themselves and
   their relevant characteristics to a server.

   For identifying characteristics of the client that are relevant to
   the selection of a boot image, the currently available mechanisms are
   the DHCP class identifier option (code 60) and the DHCP vendor
   specific information option (code 43). By definition, the vendor
   specific information option does not address the problem of enabling
   interoperability of clients and servers provided by different
   vendors. Information conveyed by the class identifier option could
   enable interoperability, provided that a sufficiently specific and
   complete set of class identifiers were defined and agreed to.

   We suggest using an alternate approach, in which new, specific
   options are used to convey the characteristics of the client that
   determine which boot image(s) could run on the client, and the class
   identifier is used as a (site-specific) designation of the desired
   software configuration for the client. Section 2 defines two new
   options that are useful for conveying the client's hardware
   configuration.

   For identifying the client as a unique entity, the currently
   available mechanism is the DHCP client identifier option (code 61)

[2]. Section 3 of this draft defines an alternative option (code 97)
   identifier type based on generated GUIDs - identifiers that are
   guaranteed to be, or are very, very likely to be unique across time
   and all clients.

2.0 **Client Characteristics Options**

   The options defined in this section provide the server with explicit
   knowledge about the client system that is generally useful in
   selecting an executable that the client can use as a boot image.

2.1 **Client System Architecture Option**

   DHCP clients SHOULD include this option in DHCPDISCOVER and
   DHCPREQUEST messages. Doing so provides the server with explicit
   knowledge of the client's system architecture.

   DHCP servers that use this option MAY include the option in
   responses that contain a bootfile name. If included, the value of
   the option MUST denote a system architecture for which the bootfile
   named is valid. DHCP servers MUST NOT include this option in
   responses that do not contain a bootfile name.

   The format for this option is as follows:

            Code   Len   System Arch Code
          +-----+-----+-----+-----+
          | 93 | 2 | s1 | s2 |
          +-----+-----+-----+-----+

   The currently defined types and their codes are

        System Architecture   Code
        -------------------   ----
        Intel Architecture PC   0
        NEC PC-9800   1
        Intel Architecture 64 PC   2
        DEC Alpha   3
        ARCx86   4
        Intel Lean Client   5

2.2 **Client Network Device Interface Option**

   DHCP clients SHOULD include this option in DHCPDISCOVER and
   DHCPREQUEST messages. Doing so provides the server with explicit
   knowledge of the client's network device.

   DHCP servers that use this option MAY include the option in
   responses that contain a bootfile name. If included, the value of
   the option MUST denote a network device for which the bootfile named
   is valid. DHCP servers MUST NOT include this option in responses
   that do not contain a bootfile name.

   Three types of network device specifications are defined for use with
   this option:
        * devices that support the Universal Network Driver Interface
          (UNDI), as described in "Network PC System Design Guidelines: A
          Reference for Designing Net PC Systems for Use with the
          Microsoft Windows and Windows NT Operating Systems" [3]
        * Plug-and-Play devices [5]
        * PCI devices [6]

   Each device that supports (UNDI) MUST be specified as an UNDI
   device, regardless of whether it is also a Plug-and-Play device or a
   PCI device. To specify an UNDI device, the option contains a type
   code of 1 and the major and minor UNDI version numbers:

     Code Len   Type Major Minor
    +-----+-----+-----+-----+-----+
    | 94 | 3 | 1 | m1 | m2 |
    +-----+-----+-----+-----+-----+

   To specify a PCI network device, a type code of 2 is used, and the
   vendor ID, device ID, class code, and revision are included:

     Code Len   Type Vendor ID   Device ID   Class code   Rev
    +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
    | 94 | 9 | 2 | v1 | v2 | d3 | d4 | c1 | c2 | c3 | r1 |
    +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+

   To specify a Plug-and-Play network device, a type code of 3 is used,
   and the EISA device ID and the class code are included:

     Code Len   Type EISA device ID   Class code
    +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
    | 94 | 8 | 3 | e1 | e2 | e3 | e4 | c1 | c2 | c3 |
    +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+

3.0 **Unique Client Identifier**

   This option (code 97) provides a unique client identifier. Type 0 of
   this identifier is defined to be in UUID/GUID format. A client
   identifier option containing a type code of 0 MUST contain a 128-bit
   UUID as follows:

     Code   Len   Type Client UUID
    +------+------+-----+------+------+------+
    | 97 | 17 | 0 | g1 | g2 | ... |
    +------+------+-----+------+------+------+

The format and content of the UUID MUST be as specified in the RPC
   Specification from the Open Group [4].

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   A client machine providing this option MUST use the same UUID value
   each time the option is used. That is, the UUID MUST be static.

   DHCP clients SHOULD include this option in all DHCP messages. Doing so
   provides the server with a unique and static identifier for the client
   platform.

4.0 **References**

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

   [2]   Alexander,S. and Droms, R., "DHCP Options and BOOTP Vendor

           Extension" RFC 2132.

   [3]   "Network PC System Design Guidelines: A Reference for
           Designing Net PC Systems for Use with the Microsoft Windows
           and Windows NT Operating Systems",
           http://www.intel.com/managedpc

   [4]   CAE Specification
           DCE 1.1: Remote Procedure Call
           Document Number: C706
           Universal Unique Identifier Appendix
           Copyright (c) 1997 The Open Group
           http://www.opengroup.org/onlinepubs/9629399/toc.htm

   [5]   Intel Corp. and Microsoft Corp., "Plug and Play ISA
           Specification", Version 1.0a, May 5, 1994

   [6]   Peripheral Component Interconnect Special Interest Group,
           "Peripheral Component Interconnect Specification", Revision
           2.1, available through PCISIG,
           http://www.pcisig.com/specs.html

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