Network Working Group
Request for Comments: 3942
Updates: 2132
Category: Standards Track

B. Volz
Cisco Systems, Inc.

November 2004

Reclassifying Dynamic Host Configuration Protocol version 4 (DHCPv4) Options

Status of this Memo

Copyright Notice

Abstract

This document updates RFC 2132 to reclassify Dynamic Host Configuration Protocol version 4 (DHCPv4) option codes 128 to 223 (decimal) as publicly defined options to be managed by IANA in accordance with RFC 2939. This document directs IANA to make these option codes available for assignment as publicly defined DHCP options for future options.

Table of Contents

1. Introduction

The DHCPv4 [RFC2131] publicly defined options range, options 1 - 127, is nearly used up. Efforts such as [RFC3679] help extend the life of this space, but ultimately the space will be exhausted.

This document reclassifies much of the site-specific option range, which has not been widely used for its original intended purpose, to extend the publicly defined options space.

2. 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].

3. Background

The DHCP option space (0 - 255) is divided into two ranges [RFC2132]:

1. 1 - 127 are publicly defined options, now allocated in accordance with [RFC2939].

2. 128 - 254 are site-specific options.

Options 0 (pad) and 255 (end) are special and defined in [RFC2131].

3.1. Publicly Defined Options Range

The publicly defined options space (1 - 127) is nearly exhausted. Recent work [RFC3679] will buy more time, as several allocated but unused option codes have been reclaimed. A review could be made from time to time to determine whether there are other option codes that can be reclaimed.

A longer-term solution to the eventual exhaustion of the publicly defined options space is desired. The DHC WG evaluated several solutions:

1. Using options 126 and 127 to carry 16-bit options as originally proposed by Ralph Droms in late 1996. However, this significantly penalizes the first option assigned to this new space, as it requires implementing the 16-bit option support. Because of this, options 126 and 127 have been reclaimed [RFC3679].

2. Using a new magic cookie and 16-bit option code format. However, this proposal

   * penalizes the first option assigned to this new space, as it requires significant changes to clients, servers, and relay agents,

   * could adversely impact existing clients, servers, and relay agents that fail to properly check the magic cookie value,

   * requires support of both message formats for the foreseeable future, and

   * requires clients to send multiple DHCPDISCOVER messages -- one for each magic cookie.

3. Reclassifying a portion of the site-specific option codes as publicly defined. The impact is minimal, as only those sites presently using options in the reclassified range need to renumber their options.

3.2. Site-Specific Options Range

The site-specific option range is rather large (127 options in all) and little used. The original intent of the site-specific option range was to support local (to a site) configuration options, and it is difficult to believe a site would need 127 options for this purpose. Further, many DHCP client implementations do not provide a well documented means to request site-specific options from a server or to allow applications to extract the returned option values.

Some vendors have made use of site-specific option codes that violate the intent of the site-specific options, as the options are used to configure features of their products and thus are specific to many sites. This usage could potentially cause problems if a site that has been using the same site-specific option codes for other purposes deploys products from one of the vendors, or if two vendors pick the same site-specific options.

4. Reclassifying Options

The site-specific option codes 128 to 223 are hereby reclassified as publicly defined options. This leaves 31 site-specific options, 224 to 254.

To allow vendors that have made use of site-specific options within the reclassified range to publish their option usage and to request an official assignment of the option number to that usage, the following procedure will be used to reclassify these options:

1. The reclassified options (128 to 223) will be placed in the "Unavailable" state by IANA. These options are not yet available for assignment to publicly defined options.

2. Vendors that currently use one or more of the reclassified options have 6 months following this RFC's publication date to notify the DHC WG and IANA that they are using particular options numbers and agree to document that usage in an RFC. IANA will move these options from the "Unavailable" to "Tentatively Assigned" state.

   Vendors have 18 months from this RFC's publication date to start the documentation process by submitting an Internet-Draft.

   NOTE: If multiple vendors of an option number come forward and can demonstrate that their usage is in reasonably wide use, none of the vendors will be allowed to keep the current option number, and they MUST go through the normal process of getting a publicly assigned option [RFC2939].

3. Any options still classified as "Unavailable" 6 months after the RFC publication date will be moved to the "Unassigned" state by IANA. These options may then be assigned to any new publicly defined options in accordance with [RFC2939].

4. For those options in the "Tentatively Assigned" state, vendors have 18 months following this RFC's publication date to submit an Internet-Draft documenting the option. The documented usage MUST be consistent with the existing usage. When the option usage is published as an RFC, IANA will move the option to the "Assigned" state.

   If no Internet-Draft is published within the 18 months or should one of these Internet-Drafts expire after the 18 months, IANA will move the option to the "Unassigned" state, and the option may then be assigned to any new publicly defined options in accordance with [RFC2939].

Sites presently using site-specific option codes within the reclassified range SHOULD take steps to renumber these options to values within the remaining range. If a site needs more than 31 site-specific options, the site must switch to using suboptions, as has been done for other options, such as the Relay Agent Information Option [RFC3046].

5. Security Considerations

This document in and by itself provides no security, nor does it impact existing DCHP security as described in [RFC2131].

6. IANA Considerations

IANA is requested to

1. expand the publicly defined DHCPv4 options space from 1 - 127 to 1 - 223. The new options (128 - 223) are to be listed as "Unavailable" and MUST NOT be assigned to any publicly defined options.

2. receive notices from vendors that have been using one or more of the options in the 128-223 range that they are using the option and are willing to document that usage. IANA will list these options as "Tentatively Assigned".

3. change the listing of any options listed as "Unavailable" to "Available" 6 months from this RFC's publication date. These options may now be assigned in accordance with [RFC2939].

4. change the listing of any options listed as "Tentatively-Assigned" to "Unavailable" 18 months from this RFC's publication date and periodically thereafter as long as there is an option listed as "Tentatively-Assigned", if no un-expired Internet-Draft exists documenting the usage.

7. Acknowledgements

Many thanks to Ralph Droms and Ted Lemon for their valuable input and earlier work on the various alternatives.

8. References

8.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC2131] Droms, R., "Dynamic Host Configuration Protocol", RFC 2131, March 1997.

[RFC2132] Alexander, S. and R. Droms, "DHCP Options and BOOTP Vendor Extensions", RFC 2132, March 1997.

[RFC2939] Droms, R., "Procedures and IANA Guidelines for Definition of New DHCP Options and Message Types", BCP 43, RFC 2939, September 2000.

8.2. Informative References

[RFC3046] Patrick, M., "DHCP Relay Agent Information Option", RFC 3046, January 2001.

[RFC3679] Droms, R., "Unused Dynamic Host Configuration Protocol (DHCP) Option Codes", RFC 3679, January 2004.

Author's Address

Bernard Volz
Cisco Systems, Inc.
1414 Massachusetts Ave.
Boxborough, MA 01719
USA

Phone: +1 978 936 0382
EMail: volz@cisco.com

Full Copyright Statement

Intellectual Property

Acknowledgement

Funding for the RFC Editor function is currently provided by the Internet Society.