               Procedures and IANA Guidelines for Definition of
                     New DHCP Options and Message Types

Status of this Memo

   This document specifies an Internet Best Current Practices for the
   Internet Community, and requests discussion and suggestions for
   improvements.  Distribution of this memo is unlimited.

Abstract

   The Dynamic Host Configuration Protocol (DHCP) provides a framework
   for passing configuration information to hosts on a Transmission
   Control Protocol/Internet Protocol (TCP/IP) network.  Configuration
   parameters and other control information are carried in tagged data
   items that are stored in the 'options' field of the DHCP message.
   The data items themselves are also called "options".

   DHCP protocol messages are identified by the 'DHCP Message Type'
   option (option code 51).  Each message type is defined by the data
   value carried in the 'DHCP Message Type' option.

   New DHCP options and message types may be defined after the
   publication of the DHCP specification to accommodate requirements for
   conveyance of new configuration parameters or to accommodate new
   protocol semantics.  This document describes the procedure for
   defining new DHCP options and message types.

1. Introduction

   The Dynamic Host Configuration Protocol (DHCP) [1] provides a
   framework for passing configuration information to hosts on a TCP/IP
   network.  Configuration parameters and other control information are
   carried in tagged data items that are stored in the 'options' field
   of the DHCP message.  The data items themselves are also called
   "options" [2].

DHCP protocol messages are identified by the 'DHCP Message Type'
option (option code 51).  Each message type is defined by the data
value carried in the 'DHCP Message Type' option.

This document describes the procedure for defining new DHCP options
and message types.  The procedure will guarantee that:

* allocation of new option numbers and message type numbers is
  coordinated from a single authority,
* new options and message types are reviewed for technical
  correctness and appropriateness, and
* documentation for new options and message types is complete and
  published.

As indicated in, "Guidelines for Writing an IANA Considerations
Section in RFCs", (see references), IANA acts as a central authority
for assignment of numbers such as DHCP option and message type codes.
The new procedure outlined in this document will provide guidance to
IANA in the assignment of new option and message type codes.

This document updates and replaces RFC 2489.

2. Overview and background

   This document specifies procedures for defining new option codes and
   message types.

2.1 New DHCP option codes

   The procedure described in this document modifies and clarifies the
   procedure for defining new options in RFC 2131 [2].  The primary
   modification is to the time at which a new DHCP option is assigned an
   option number.  In the procedure described in this document, the
   option number is not assigned until specification for the option is
   about to be published as an RFC.

   Since the publication of RFC 2132, the option number space for
   publicly defined DHCP options (1-127) has almost been exhausted.
   Many of the defined option numbers have not been followed up with
   Internet Drafts submitted to the DHC WG.  There has been a lack of
   specific guidance to IANA from the DHC WG as to the assignment of
   DHCP option numbers.

   The procedure as specified in RFC 2132 does not clearly state that
   new options are to be reviewed individually for technical
   correctness, appropriateness and complete documentation.  RFC 2132
   also does not require that new options are to be submitted to the
   IESG for review, and that the author of the option specification is

responsible for bringing new options to the attention of the IESG.
Finally, RFC 2132 does not make clear that newly defined options are
not to be incorporated into products, included in other
specifications or otherwise used until the specification for the
option is published as an RFC.

In the future, new DHCP option codes will be assigned by IETF
consensus.  New DHCP options will be documented in RFCs approved by
the IESG, and the codes for those options will be assigned at the
time the relevant RFCs are published.  Typically, the IESG will seek
input on prospective assignments from appropriate sources (e.g., a
relevant Working Group if one exists).  Groups of related options may
be combined  into a single specification and reviewed as a set by the
IESG.  Prior to assignment of an option code, it is not appropriate
to incorporate new options into products, include the specification
in other documents or otherwise make use of the new options.

The DHCP option number space (1-254) is split into two parts.  The
site-specific option codes [2] (128-254) are defined as "Private Use"
and require no review by the DHC WG.  Site-specific options codes
(128-254) MUST NOT be defined for use by any publicly distributed
DHCP server, client or relay agent implementations.  These option
codes are explicitly reserved for private definition and use within a
site or an organization.

The public option codes (0-127, 255) are defined as "Specification
Required" and new options must be reviewed prior to assignment of an
option number by IANA.  The details of the review process are given
in the following section of this document.

2.2 New DHCP message types

   RFC 2131 does not specify any mechanism for defining new DHCP message
   types.  In the future, new DHCP message types will be documented in
   RFCs approved by the IESG, and the codes for these new message types
   will be assigned at the time the relevant RFCs are published.

   Typically, the IESG will seek input on new message types from
   appropriate sources (e.g., a relevant Working Group if one exists).
   Prior to assignment of a message type code, it is not appropriate to
   incorporate new message types into products, include the
   specification in other documents or otherwise make use of the new
   message types.

3. Procedure

   The author of a new DHCP option or message type will follow these
   steps to obtain approval for the option and publication of the
   specification of the option as an RFC:

   1. The author devises the new option or message type.

   2. The author documents the new option or message type, leaving the
      option code or message type code as "To Be Determined" (TBD), as
      an Internet Draft.

      The requirement that the new option or message type be documented
      as an Internet Draft is a matter of expediency.  In theory, the
      new option or message type could be documented on the back of an
      envelope for submission; as a practical matter, the specification
      will eventually become an Internet Draft as part of the review
      process.

   3. The author submits the Internet Draft for review by the IESG.
      Preferably, the author will submit the Internet Draft to the DHC
      Working Group, but the author may choose to submit the Internet
      Draft directly to the IESG.

      Note that simply publishing the new option or message type as an
      Internet Draft does not automatically bring the option to the
      attention of the IESG.  The author of the new option or message
      type must explicitly forward a request for action on the new
      option to the DHC WG or the IESG.

   4. The specification of the new option or message type is reviewed by
      the IESG.  The specification is reviewed by the DHC WG (if it
      exists) or by the IETF.  If the option or message type is accepted
      for inclusion in the DHCP specification, the specification of the
      option or message type is published as an RFC.  It may be
      published as either a standards-track or a non-standards-track
      RFC.

   5. At the time of publication as an RFC, IANA assigns a DHCP option
      code or message type code to the new option or message type.

4. 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] Droms, R. and K. Fong, "NetWare/IP Domain Name and Information",
       RFC 2142, November 1997.

   [4] Narten, T. and  H. Alvestrand, "Guidelines for Writing an IANA
       Considerations Section in RFCs", BCP 26, RFC 2434, October 1998.

   [5] Droms, R., "Procedure for Defining New DHCP Options", RFC 2489,
       January 1999.

5. Changes from RFC 2489

   This document extends the procedures for defining new DHCP options
   specified in RFC 2489 [5] to include the definition of new DHCP
   message types.  The language reserving site-specific option codes has
   been strengthened to emphasize the requirement that site-specific
   option codes must not be encoded in publicly distributed DHCP
   implementations.

6. Security Considerations

   Information that creates or updates an option code or message type
   code assignment needs to be authenticated.

   An analysis of security issues is required for all newly defined DHCP
   options or message types.  The description of security issues in the
   specification of new options or message types must be as accurate as
   possible.  The specification for a new option or message type may
   reference the "Security Considerations" section in the DHCP
   specification [1]; e.g., (from "NetWare/IP Domain Name and
   Information" [3]):

      DHCP currently provides no authentication or security mechanisms.
      Potential exposures to attack are discussed in section 7 of the
      DHCP protocol specification [RFC 2131].

7. IANA Considerations

   RFC 2132 and RFC 2489 provided guidance to the IANA on the procedure
   it should follow when assigning option numbers for new DHCP options
   or message types.  This document updates and replaces those
   instructions.  In particular, IANA is requested to assign DHCP option
   codes or message type codes only for options or message types that
   have been approved for publication as RFCs; i.e., documents that have
   been approved through "IETF consensus" as defined in RFC 2434 [4].

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9.  Full Copyright Statement

Acknowledgement