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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.

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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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