Internet Engineering Task Force (IETF)
Request for Comments: 5719
Updates: 3588
Category: Standards Track
ISSN: 2070-1721

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January 2010

Updated IANA Considerations for Diameter Command Code Allocations

Abstract

The Diameter base specification, described in RFC 3588, provides a number of ways to extend Diameter, with new Diameter commands (i.e., messages used by Diameter applications) and applications as the most extensive enhancements. RFC 3588 illustrates the conditions that lead to the need to define a new Diameter application or a new command code. Depending on the scope of the Diameter extension, IETF actions are necessary. Although defining new Diameter applications does not require IETF consensus, defining new Diameter commands requires IETF consensus per RFC 3588. This has led to questionable design decisions by other Standards Development Organizations, which chose to define new applications on existing commands -- rather than asking for assignment of new command codes -- for the pure purpose of avoiding bringing their specifications to the IETF. In some cases, interoperability problems were an effect of the poor design caused by overloading existing commands.

This document aligns the extensibility rules of the Diameter application with the Diameter commands, offering ways to delegate work on Diameter to other SDOs to extend Diameter in a way that does not lead to poor design choices.

Status of This Memo

This is an Internet Standards Track document.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on Internet Standards is available in Section 2 of RFC 5741.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at http://www.rfc-editor.org/info/rfc5719.

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1. Introduction

The Diameter Base specification, described in [RFC3588], provides a number of ways to extend Diameter, with new Diameter commands (i.e., messages used by Diameter applications) and applications as the most extensive enhancements. [RFC3588] illustrates the conditions that require the definition of a new Diameter application or a new command. Depending on the scope of the Diameter extension, IETF actions are necessary. Although defining new Diameter applications does not require IETF consensus, defining new Diameter commands requires IETF consensus per RFC 3588. This has led to questionable design decisions by other Standards Development Organizations (SDOs), which chose to define new applications on existing commands -- rather than asking for assignment of new command codes -- for the pure purpose of avoiding bringing their specifications to the IETF. In some cases, interoperability problems were an effect of poor the design caused by overloading existing commands.

This document aligns the extensibility rules for Diameter command codes with those defined for Diameter application identifiers and offers a consistent way to delegate work on Diameter to other SDOs to extend Diameter in a way that does not lead to poor design choices.

This is achieved by splitting the command code space into ranges and providing different allocation policies to them: the first range is reserved for RADIUS backward compatibility, allocation of a command code in the second number range requires IETF review, the third range is utilized by vendor-specific command codes, and finally the last range is for experimental commands. Section 4 provides more details about the command code number ranges, and the different allocation policies are described in [RFC5226].

A revision of RFC 3588 is currently in development in the IETF DIME WG [RFC3588bis]; when approved, it will obsolete RFC 3588 as well as this document. A goal of this document is to provide in advance the change in the command codes allocation policy, so that interoperability problems like the ones described above are avoided as soon as possible.

2. Conventions Used in This Document

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. Security Considerations

This document modifies the IANA allocation of Diameter command codes in relationship to RFC 3588. This process change itself does not raise security concerns, but the command code space is split into a standard command code space and a vendor-specific command code space, the latter being allocated on a First Come, First Served basis by IANA at the request of vendors or other standards organizations. Whenever work gets delegated to organizations outside the IETF, there is always the chance that security reviews will be conducted in different manner and that the criteria and style of those reviews will be different than the reviews performed in the IETF. The members of the DIME working group are aware of the risks involved in using different security and quality review processes and of the desire to offload work (e.g., to reduce the workload in the IETF) to other organizations. Other organizations are therefore made responsible for the quality of the specifications they produce.

4. IANA Considerations

This section describes changes to the IANA Considerations sections outlined in RFC 3588 regarding the allocation of command codes by IANA.

The command code namespace is used to identify Diameter commands. The values 0 - 255 (0x00 - 0xff) are reserved for RADIUS backward

compatibility and are defined as "RADIUS Packet Type Codes" in [RADTYPE]. Values 256 - 8,388,607 (0x100 - 0x7fffff) are for permanent, standard commands allocated by IETF Review [RFC5226]. [RFC3588] defines the command codes 257, 258, 271, 274, 275, 280, and 282; see Section 3.1 in [RFC3588] for the assignment of the namespace in that specification.

The values 8,388,608 - 16,777,213 (0x800000 - 0xfffffd) are reserved for vendor-specific command codes, to be allocated on a First Come, First Served basis by IANA [RFC5226]. The request to IANA for a vendor-specific command code SHOULD include a reference to a publicly available specification that documents the command in sufficient detail to aid in interoperability between independent implementations. If the specification cannot be made publicly available, the request for a vendor-specific command code MUST include the contact information of persons and/or entities responsible for authoring and maintaining the command.

The values 16,777,214 and 16,777,215 (hexadecimal values 0xfffffe - 0xffffff) are reserved for experimental commands. As these codes are only for experimental and testing purposes, no guarantee is made for interoperability between Diameter peers using experimental commands, as outlined in [RFC3692].

5. Acknowledgements

The content of this document is the result of the work in the IETF Diameter Maintenance and Extensions (DIME) working group. We would therefore like to thank all the working group members who were involved in that discussion. While it appears to be a fairly small change in the allocation policy, the effect on implementations is rather dramatic.

We would like to thank Mark Jones for his review comments.

6. References

6.1. Normative References

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

[RFC3588] Calhoun, P., Loughney, J., Guttman, E., Zorn, G., and J. Arkko, "Diameter Base Protocol", RFC 3588, September 2003.

[RFC3692] Narten, T., "Assigning Experimental and Testing Numbers Considered Useful", BCP 82, RFC 3692, January 2004.

[RFC5226] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 5226, May 2008.

6.2. Informative References

[RADTYPE] IANA, "Radius Types", <http://www.iana.org>.

[RFC3588bis] Fajardo, V., Arkko, J., Loughney, J., and G. Zorn, "Diameter Base Protocol", Work in Progress, September 2009.

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