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Guidelines for Writing an IANA Considerations Section in RFCs

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Abstract

Many protocols make use of identifiers consisting of constants and other well-known values. Even after a protocol has been defined and deployment has begun, new values may need to be assigned (e.g., for a new option type in DHCP, or a new authentication algorithm). To insure that such quantities have unique values, their assignment must be administered by a central authority. In the Internet, that role is provided by the Internet Assigned Numbers Authority (IANA).

In order for the IANA to manage a given numbering space prudently, it needs guidelines describing the conditions under which new values can be assigned. If the IANA is expected to play a role in the management of a numbering space, the IANA must be given clear and concise

instructions describing that role. This document discusses issues that should be considered in formulating an identifier assignment policy and provides guidelines to document authors on the specific text that must be included in documents that place demands on the IANA.

Contents

1. Introduction

Many protocols make use of fields that contain constants and other well-known values (e.g., the Protocol field in the IP header [IP] or MIME types in mail messages [MIME-REG]). Even after a protocol has been defined and deployment has begun, new values may need to be assigned (e.g., a new option type in DHCP [DHCP] or a new authentication algorithm for IPSec [IPSEC]). To insure that such fields have unique values, their assignment must be administered by a central authority. In the Internet, that role is provided by the Internet Assigned Numbers Authority (IANA).

In order for the IANA to manage a given numbering space prudently, it needs guidelines describing the conditions under which new values should be assigned. This document provides guidelines to authors on what sort of text should be added to their documents, and reviews issues that should be considered in formulating an appropriate policy for assigning identifiers.

Not all name spaces require centralized administration. In some cases, it is possible to delegate a name space in such a way that further assignments can be made independently and with no further (central) coordination. In the Domain Name System, for example, the IANA only deals with assignments at the higher-levels, while subdomains are administered by the organization to which the space has been delegated. As another example, Object Identifiers (OIDs) as defined by the ITU are also delegated [ASSIGNED]. When a name space

can be delegated, the IANA only deals with assignments at the top level.

2. Issues To Consider

The primary issue to consider in managing a numbering space is its size. If the space is small and limited in size, assignments must be made carefully to insure that the space doesn't become exhausted. If the space is essentially unlimited, on the other hand, it may be perfectly reasonable to hand out new values to anyone that wants one. Even when the space is essentially unlimited, however, it is usually desirable to have a minimal review to prevent hoarding of the space. For example, if the space consists of text strings, it may be desirable to prevent organizations from obtaining large sets of strings that correspond to the "best" names (e.g., existing company names).

A second consideration is whether it makes sense to delegate the name space in some manner. This route should be pursued when appropriate, as it lessens the burden on the IANA for dealing with assignments.

In most cases, some review of prospective allocations is appropriate, and the first question to consider is who should perform the review. In some cases, reviewing requests is straightforward and requires no subject subjective decision making. On those cases, it is reasonable for the IANA to review prospective assignments, provided that the IANA is given specific guidelines on what types of requests it should grant, and what information must be provided before a request of an assigned number will be considered. Note that the IANA will not define an assignment policy; it should be given a set of guidelines that allow it to make allocation decisions with little subjectivity. The following are example policies, some of which are in use today:

Local Use - For local use only, with the type and purpose defined by the local site. No attempt is made to prevent multiple sites from using the same value in different (and incompatible) ways. There is no need for IANA to review such assignments and assignments are not generally useful for interoperability.

Examples: Site-specific options in DHCP [DHCP] have significance only within a single site.

Hierarchical allocation - Delegated managers can assign identifiers provided they have been given control over that part of the identifier space. IANA controls the higher levels of the namespace according to one of the other

policies.

Examples: DNS names, Object Identifiers

First Come First Served - Anyone can obtain an identifier, so long as they provide a point of contact and a brief description of what the identifier would be used for. For numbers, the exact value is generally assigned by the IANA, with names, specific names are usually requested.

Examples: vnd. MIME types [MIME-REG], TCP and UDP port numbers.

Specification Required - Values and their meaning must be documented in an RFC or other permanent and readily available reference, in sufficient detail so that interoperability between independent implementations is possible.

Examples: SCSP [SCSP]

IETF Consensus - New values are assigned through the IETF consensus process. Specifically, new assignments must be approved by the IESG. Typically, the IESG will seek input on prospective assignments from appropriate persons (e.g., a relevant Working Group if one exists).

Examples: SMTP extensions [SMTP-EXT], BGP Subsequent Address Family Identifiers [BGP4-EXT].

Standards Action - Identifiers are assigned only for Standards Track RFCs approved by the IESG.

Examples: MIME top level types [MIME-REG]

In some cases, it may be appropriate for the IANA to serve as a point-of-contact for publishing information about numbers that have been assigned, without actually having it evaluate and grant requests. For example, it is useful (and sometimes necessary) to discuss proposed additions on a mailing list dedicated to the purpose (e.g., the ietf-types@iana.org for media types) or on a more general mailing list on which (e.g., that of a current or former IETF Working Group). Such a mailing list may serve to give new registrations a public review before getting registered, or give advice for persons who want help in understanding what a proper registration should contain.

Since the IANA cannot participate in all of these mailing lists and

cannot determine if or when such discussion reaches a consensus, the IANA in all cases relies on a designated subject matter expert to advise it in these matters. That is, the IANA must be directed to forward the requests it receives to a specific point-of-contact (one or a small number of individuals) and act upon the returned recommendation from the designated subject matter expert. In all cases, it is the designated subject matter expert that the IANA relies on for an authoritative response. In those cases where wide review of a request is needed, it is the responsibility of the designated subject matter expert to initiate such a review (e.g., by engaging the relevant mailing lists). In no cases will the IANA allow general mailing lists (e.g., that of a former or existing IETF Working Group) to fill the role of the designated subject matter expert.

In some cases, it makes sense to partition the number space into several categories, with assignments out of each category handled differently. For example, the DHCP option space [DHCP] is split into two parts. Option numbers in the range of 1-127 are globally unique and assigned according to the Specification Required policy described earlier, while options number 128-254 are "site specific", i.e., Local Use.

3. Registration maintenance

Registrations sometimes contain information that needs to be maintained; in particular, point of contact information may need to be changed, claims of freedom from security problems may need to be modified, or new versions of a registration may need to be published.

A document must clearly state who is responsible for such maintenance. It is appropriate to:

- Let the author update the registration, subject to the same constraints and review as with new registrations

- Allow some mechanism to attach comments to the registration, for cases where others have significant objections to claims in a registration, but the author does not agree to change the registration.

- Designate the IESG or another authority as having the right to reassign ownership of a registration. This is mainly to get around the problem when some registration owner cannot be reached in order to make necessary updates.

4. What To Put In Documents

The previous section presented some issues that should be considered in formulating a policy for assigning well-known numbers and other protocol constants. It is the Working Group and/or document author's job to formulate an appropriate policy and specify it in the appropriate document. In some cases, having an "IANA Considerations" section may be appropriate. Such a section should state clearly:

- who reviews an application for an assigned number. If a request should be reviewed by a designated subject matter expert, contact information must be provided.

- who has authority to replace the designated subject matter expert, should a replacement be needed (e.g., if multiple attempts to reach the designated subject matter fail). The specific procedure to appoint the person should also be indicated; it may often be appropriate to let the relevant IESG Area Director designate the subject matter expert when a replacement is necessary.

- If the request should also be reviewed by a specific public mailing list (such as the ietf-types@iana.org for media types), that mailing address should be specified. Note, however, that a designated subject matter expert must also be specified.

- if the IANA is expected to review requests itself, sufficient guidance must be provided so that the requests can be evaluated with minimal subjectivity.

It should also be noted that the following are unacceptable:

- listing a Working Group mailing list as the designated subject matter expert

- specifying that "the current Working Group Chairs of the FooBar Working Group" are the designated subject matter experts, since Working Groups eventually close down. However, it is acceptable to list the current WG Chairs individually.

Finally, it is quite acceptable to pick one of the example policies cited above and refer to it by name. For example, a document could say something like:

> numbers are allocated as First Come First Served as defined in [IANA-CONSIDERATIONS]

For examples of documents that provide good and detailed guidance to

the IANA on the issue of assigning identifiers, consult [MIME-REG, MIME-LANG].

5. Security Considerations

Information that creates or updates a registration needs to be authenticated.

Information concerning possible security vulnerabilities of a protocol may change over time. Consequently, claims as to the security properties of a registered protocol may change as well. As new vulnerabilities are discovered, information about such vulnerabilities may need to be attached to existing registrations, so that users are not mislead as to the true security properties of a registered protocol.

An analysis of security issues is required for for all types registered in the IETF Tree [MIME-REG]. A similar analysis for media types registered in the vendor or personal trees is encouraged but not required. However, regardless of what security analysis has or has not been done, all descriptions of security issues must be as accurate as possible regardless of registration tree. In particular, a statement that there are "no security issues associated with this type" must not be confused with "the security issues associated with this type have not been assessed".

Delegations of a name space should only be assigned to someone with adequate security.

6. Acknowledgements

Jon Postel and Joyce Reynolds provided a detailed explanation on what the IANA needs in order to manage assignments efficiently. Brian Carpenter provided helpful comments on earlier versions of the document. One paragraph in the Security Considerations section was borrowed from [MIME-REG].

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