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Principles for Operation of Internet Assigned Numbers Authority (IANA) Registries

Abstract

This document provides principles for the operation of Internet Assigned Numbers Authority (IANA) registries.

Status of This Memo

This document is not an Internet Standards Track specification; it is published for informational purposes.

This document is a product of the Internet Architecture Board (IAB) and represents information that the IAB has deemed valuable to provide for permanent record. It represents the consensus of the Internet Architecture Board (IAB). Documents approved for publication by the IAB are not candidates for any level of Internet Standard; see Section 2 of RFC 7841.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at https://www.rfc-editor.org/info/rfc8720.

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1. Introduction

The Internet Engineering Task Force (IETF) and its predecessors have traditionally separated the publication of protocol specifications in immutable Request for Comments (RFCs) and the registries containing protocol parameters. Traditionally, the registries are maintained by a set of functions known collectively as the Internet Assigned Numbers Authority (IANA). Dating back to the earliest days of the Internet, specification publication and the registry operations were tightly coupled: Jon Postel of the Information Sciences Institute (ISI) of the University of Southern California (USC) was responsible for both RFC publication and IANA registry operation. This tight coupling had advantages, but it was never a requirement. Indeed, today, the RFC Editor and IANA registry operation are provided by different entities.

Internet registries are critical to the operation of the Internet because they provide a definitive record of the value and meaning of identifiers that protocols use when communicating with each other. Almost every Internet protocol makes use of registries in some form. At the time of writing, the IANA maintains more than two thousand protocol parameter registries.

Internet registries hold protocol identifiers consisting of constants and other well-known values used by Internet protocols. These values can be numbers, strings, addresses, and so on. They are uniquely assigned for one particular purpose or use. Identifiers can be maintained in a central list (such as a list of cryptographic algorithms), or they can be hierarchically allocated and assigned by separate entities at different points in the hierarchy (such as IP addresses and domain names). To maximize trust and usefulness of the IANA registries, the principles in this document should be taken into consideration for centralized registries as well as hierarchically delegated registries. In hierarchically delegated registries, entries nearest to top level have broad scope, but lower-level entries have narrow scope. The Internet Architecture Board (IAB) will encourage support for these principles in all delegations of Internet identifiers.

The registry system is built on trust and mutual cooperation. The use of the registries is voluntary and is not enforced by mandates or certification policies. While the use of registries is voluntary, it is noted that the success of the Internet creates enormous pressure to use Internet protocols and the identifier registries associated with them.

This document provides principles for the operation of IANA registries, ensuring that protocol identifiers have consistent meanings and interpretations across all implementations and deployments, thus providing the necessary trust in the IANA registries.

2. Principles for the Operation of IANA Registries

The following key principles underscore the successful functioning of the IANA registries, and they provide a foundation for trust in those registries:

Ensure Uniqueness:
: The same protocol identifier must not be used for more than one purpose.

Stable:

Protocol identifier assignment must be lasting.

Predictable:
The process for making assignments must not include unexpected steps.

Public:
The protocol identifiers must be made available in well-known locations in a manner that makes them freely available to everyone.

Open:
The process that sets the policy for protocol identifier assignment and registration must be open to all interested parties.

Transparent:
The protocol registries and their associated policies should be developed in a transparent manner.

Accountable:
Registry policy development and registry operations need to be accountable to the affected community.

3. Discussion

The principles discussed in Section 2 provide trust and confidence in the IANA registries. This section expands on these principles.

3.1. Ensuring Uniqueness, Stability, and Predictability

Protocol identifier assignment and registration must be unique, stable, and predictable. Developers, vendors, customers, and users depend on the registries for unique protocol identifiers that are assigned in a stable and predictable manner.

A protocol identifier may only be reassigned for a different purpose after due consideration of the impact of such a reassignment and, if possible, with the consent of the original assignee.

Recognizing that some assignments involve judgment, such as those involving a designated expert [RFC8126], a predictable process does not require completion in a predetermined number of days. Rather, it means that no unexpected steps are introduced in the process of making an assignment.

3.2. Public

Once assigned, the protocol identifiers must be made available in a manner that makes them freely available to everyone without restrictions. The use of a consistent publication location builds confidence in the registry. This does not mean that the publication location can never change, but it does mean that it must change infrequently and only after adequate prior notice.

3.3. Open and Transparent

The process that sets the policy for protocol identifier assignment and registration must be open to all interested parties and must operate in a transparent manner.

When a registry is established, a policy is set for the addition of new entries and the updating of existing entries. While making

additions and modifications, the registry operator may expose instances where policies lack clarity. When this occurs, the registry operator should provide helpful feedback to allow those policies to be improved. In addition, the registry operator not being involved in establishing registry policy avoids the risks associated with (perceptions of) favoritism and unfairness.

Recognizing that some assignments involve judgment, such as those involving a designated expert [RFC8126], the recommendations by designated experts must be visible to the public to the maximum extent possible and subject to challenge or appeal.

3.4. Accountable

The process that sets the policy for IANA registries and the operation of the registries must be accountable to the parties that rely on the protocol identifiers. Oversight is needed to ensure these are properly serving the affected community.

In practice, accountability mechanisms for the registry operator may be defined by a contract, memoranda of understanding, or service level agreements (SLAs). An oversight body uses these mechanisms to ensure that the registry operator is meeting the needs of the affected community. The oversight body is held accountable to the affected community by vastly different mechanisms -- for instance, recall and appeal processes.

For protocol parameters [RFC6220], the general oversight of the IANA function is performed by the IAB as a chartered responsibility from [RFC2850]. In addition, the IETF Administration Limited Liability Company (IETF LLC), as part of the IETF Administrative Support Activity (IASA), is responsible for IETF administrative and financial matters [RFC8711]. In that role, the IETF LLC maintains an SLA with the current registry operator, the Internet Corporation for Assigned Names and Numbers (ICANN), thereby specifying the operational requirements with respect to the coordination, maintenance, and publication of the protocol parameter registries. Both the IAB and the Board of the IETF LLC are accountable to the larger Internet community and are being held accountable through the IETF NomCom process [RFC8713].

For the Internet Number Registries [RFC7249], oversight is performed by the Regional Internet Registries (RIRs) as described RFC 7020 [RFC7020]. The RIRs are member-based organizations, and they are accountable to the affected community by elected governance boards. Furthermore, per agreement between the RIRs and ICANN, the policy development for the global IANA number registries is coordinated by a community-elected number council and subject to process review before ratification by the ICANN Board of Trustees [ASOMOU].

4. Security Considerations

Internet registries are critical to elements of Internet security. The principles described in this document are necessary for the Internet community to place trust in the IANA registries.

5. Changes since RFC 7500

Section 3.4 has been updated to align with the restructuring of the IETF Administrative Support Activity (IASA). Under the new structure, the IETF LLC maintains an SLA with the protocol parameter registry operator. Under the old structure, the SLA was maintained by the IETF Administrative Oversight Committee (IAOC).

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