Abstract

Many IETF protocols make use of commonly defined values that are passed within protocol objects. To ensure consistent interpretation of these values between independent implementations, there is a need to ensure that the values and associated semantic intent are uniquely defined. The IETF uses a registry function to record assigned protocol parameter values and their associated semantic intent. For each IETF protocol parameter it is current practice for the IETF to delegate the role of protocol parameter registry operator to a nominated entity. This document describes a description of this delegated function.
1. Introduction

Many IETF protocols make use of commonly defined values that are passed within protocol objects. To ensure consistent interpretation of these values between independent implementations, there is a need to ensure that the values and associated semantic intent are uniquely defined. The IETF uses a registry to register each of the possible values of a protocol parameter and their associated semantic intent. The document describes this registry function as it applies to individual protocol parameters defined by the IETF Internet Standards Process [1].

At the time of writing this document (June 2003) the operation of the majority of the protocol parameter registries is delegated to the Internet Corporation for Assigned Names and Numbers (ICANN) according to the terms and conditions described in RFC 2860 [2]. Not all IETF protocol parameter registries are delegated to ICANN, and at present the operation of the 'e164.arpa' registry has been delegated to the RIPE Network Coordination Center (RIPE NCC) [12].

The term "Internet Assigned Numbers Authority" (IANA), has been used historically to refer to the entire collection of protocol parameter registries. It is noted that there is current general use of this term to refer specifically to the set of registries operated by ICANN under terms of this delegation of function. While IETF documents continue to use the term "IANA Considerations" when referring to specific functions to be performed with respect to a protocol parameter registry [4], it is noted that the use of the term ‘IANA’ in this context does not necessarily imply the delegation to ICANN of the associated role of operation of the protocol parameter registry for the particular protocol parameter so described.

2. Definition of an IETF Protocol Parameter Registry

Using the term ‘IANA’ in the sense of the entire set of IETF protocol parameter registries, the Internet Standards document, STD 2, published in October 1994, defined the role of the IANA as follows:

The Internet Assigned Numbers Authority (IANA) is the central coordinator for the assignment of unique parameter values for Internet protocols. The IANA is chartered by the Internet Society (ISOC) and the Federal Network Council (FNC) to act as the clearinghouse to assign and coordinate the use of numerous Internet protocol parameters.

The Internet protocol suite, as defined by the Internet Engineering Task Force (IETF) and its steering group (the IESG), contains numerous parameters, such as Internet protocol addresses,
domain names, autonomous system numbers (used in some routing protocols), protocol numbers, port numbers, management information base object identifiers, including private enterprise numbers, and many others.

The common use of the Internet protocols by the Internet community requires that the particular values used in these parameter fields be assigned uniquely. It is the task of the IANA to make those unique assignments as requested and to maintain a registry of the currently assigned values. [3]

Again using the term ‘IANA’ in the sense of the entire set of IETF protocol parameter registries, the definition of the protocol parameter registry role is provided in BCP 26:

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 encryption or authentication algorithm for IPSec). To insure that such quantities have consistent values and interpretations in different implementations, their assignment must be administered by a central authority. For IETF protocols, that role is provided by the Internet Assigned Numbers Authority (IANA). [4]

3. Publication of Protocol Parameter Registry Assignments

The current mode of publication of protocol parameter registry assignments undertaken within registries whose operation is currently delegated to ICANN is described in the Informational Document RFC 3232 [5], published in January 2002:

From November 1977 through October 1994, the Internet Assigned Numbers Authority (IANA) periodically published tables of the Internet protocol parameter assignments in RFCs entitled, "Assigned Numbers". The most current of these Assigned Numbers RFCs had Standard status and carried the designation: STD 2. At this time, the latest STD 2 is RFC 1700. Since 1994, this sequence of RFCs have been replaced by an online database accessible through a web page (currently, www.iana.org). The purpose of the present RFC is to note this fact and to officially obsolete RFC 1700, whose status changes to Historic. RFC 1700 is obsolete, and its values are incomplete and in some cases may be wrong. [5]

The mode of publication of the e164.arpa protocol parameter registry
operated by the RIPE NCC is documented in reference [13].

4. The Procedures related to IETF Protocol Parameter Management

IETF Protocol Parameter registry actions are defined through the inclusion of an "IANA Considerations" section in Internet Standards documents, as described in RFC 2434 [4]. There are also RFCs that specifically address IETF protocol parameter considerations for particular protocols, such as RFC 2780 [6], RFC 2939 [7], and RFC 2978 [8].

5. The Operation of IETF Protocol Parameter Registries

As documented in the IAB Charter [9], the role of the Internet Architecture Board includes responsibility for the IETF Protocol Parameter registration function (referred to in the charter as ‘IANA’). The IAB, acting on behalf of the IETF, approves the appointment of an organization to act as a protocol parameter registry operator on behalf of the IETF, and also approves the terms and conditions of this delegation of this function.

The technical direction of the IETF Protocol Parameter registry function is provided by the Internet Engineering Steering Group (IESG) [9].

6. Current IETF Protocol Parameter Assignments

The list of current IETF protocol parameters for which parameter value assignments are registered within registries whose operation is currently delegated to ICANN is listed in reference [10]. In addition there is the e164.arpa registry function, which is listed in reference [13].

With reference to the list contained in reference [10], protocol parameter registries that refer to the unicast IPv4 address space, unicast IPv6 address space, Autonomous System Numbers and the top level delegations within the Domain Name System all use allocation mechanisms that have been delegated to the IANA function operated under the auspices of ICANN. Other bodies are responsible for the development of policies to manage this allocation function.

7. A Description of the Role and Responsibilities of an IETF Protocol Parameter Registry Operator

This section describes the operation and role of a delegated IETF Protocol Parameter Registry Operator. This section also includes a description of the roles of related bodies with reference to this function.
7.1 Introduction

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 encryption or authentication algorithm for IPSec). To insure that such quantities have consistent values and interpretations in different implementations, their assignment must be administered by a central authority. For IETF protocols, that role is provided by a delegated Protocol Parameter Registry operator. For any particular protocol parameter there is a single delegated registry operator.

7.2 Protocol Parameter Registry Operator Role

A IETF Protocol Parameter registry function is undertaken under the auspices of the Internet Architecture Board (IAB).

The roles of the Protocol Parameter registry operator are as follows:

- **Review and Advise**
  - The registry operator may be requested to review Internet-Drafts that are being considered by the Internet Engineering Task Force Steering Group (IESG), with the objective of offering advice to the IESG regarding the need for an "IANA Considerations" section, whether such a section, when required, is clear in terms of direction to the registry operator and whether the section is consistent with the current published registry operator guidelines.

- **Registry**
  - To operate a registry of protocol parameter assignments.
  - The delegated registry operator registers values for the protocol parameter Internet protocol parameters only as directed by the criteria and procedures specified in RFCs, including Proposed, Draft and full Internet Standards and Best Current Practice documents, and any other RFC that calls for protocol parameter assignment, and only for those protocol parameters specified by the IAB. If they are not so specified, or in case of ambiguity, the registry operator will continue to assign and register only those protocol parameters that have already been delegated to the operator, following past and current practice for such assignments, unless otherwise directed in terms of operating practice by the IESG.
* For each protocol parameter, the associated registry includes:

  + a reference to the RFC document that describes the parameter and the associated "IANA Considerations" concerning the parameter, and

  + for each registration of a protocol parameter value, the source of the registration and the date of the registration.

* If in doubt or in case of a technical dispute, the registry operator will seek and follow technical guidance exclusively from the IESG. Where appropriate the IESG will appoint an expert to advise the registry operator.

* The registry operator will work with the IETF to develop any missing criteria and procedures over time, which the registry operator will adopt when so instructed by the IESG.

* Each protocol parameter registry operates as a public registry, and the contents of the registry are openly available to the public, on-line and free of charge.

* The registry operator assigns protocol parameter values in accordance with the policy associated with the protocol parameter. (Some policies are listed in RFC2434 [4]).

  o Mailing Lists

    * The registry operator maintains public mailing lists as specified in IANA Considerations. Such lists are designated for the purpose of review of assignment proposals in conjunction with a designated expert review function.

  o Liaison to IESG

    * The registry operator will nominate a liaison point of contact. The registry operator, though this liaison, may be requested to provide advice to the IESG on IETF protocol parameters as well as the IANA Considerations section of Internet-drafts that are being reviewed for publication as an RFC.

  o Reporting

    * The registry operator will submit periodic reports to the IAB concerning the operational performance of the registry function.

    * At the request of the chair of the IETF, the registry operator
will undertake periodic reports to the IETF Plenary concerning the status of the registry function.

* The registry operator will publish an annual report describing the status of the function and a summary of performance indicators.

o Intellectual Property Rights and the Registry Operator

* All assigned values are to be published and made available free of any charges and free of any constraints relating to further redistribution, with the caveat that the assignment information may not be modified in any redistributed copy.

* Any intellectual property rights of the IETF Protocol Parameter assignment information, including the IETF Protocol Parameter registry and its contents, are to be held by the IETF and ISOC, and all IETF Protocol Parameter registry publications relating to assignment information are to be published under the terms of Section 10 of RFC2026, and are to include the copyright notice as documented in Section 10.4 (C) of RFC2026 [1].

7.3 IAB role

An operator of an IETF Protocol Parameter registry undertakes the role as a delegated function under the auspices of the Internet Architecture Board (IAB).

The IAB has the responsibility to, from time to time, review the current description of the registry function and direct the registry operator to adopt amendments relating to its role and mode of operation of the registry according to the best interests of the IETF.

The IAB has the responsibility to select an organization to undertake the delegated functions of the Protocol Parameter registry for each IETF protocol parameter.

The IAB has the responsibility to determine the terms and conditions of this delegated role. Such terms and conditions should ensure that the registry operates in a manner that is fully conformant to the functions described in this document. In addition, such terms and conditions must not restrict the rights and interests of the IETF with respect to the registry function.

7.4 IESG Role
The IESG is responsible for the technical direction of the IETF Protocol Parameter registries. Such technical direction is provided through the adoption of IETF RFC documents within the "IANA Considerations" section of such documents, or as stand-alone "IANA Considerations" RFC documents.

The IESG shall ensure that the review of Internet-Drafts that are offered for publications as RFCs ensures that IANA Considerations sections are present when needed, and that IANA Considerations sections conform to the current published guidelines.

At the discretion of the IESG, the registry operator may be required to designate a non-voting liaison to the IESG to facilitate clear communications and effective operation of the registry function.

### 7.5 Internet Society Role

Any intellectual property rights of IETF Protocol Parameter assignment information, including the registry and its contents, and all registry publications, are to be held by the Internet Society on behalf of the IETF.

### 8. Acknowledgement

This document is adapted from RFC2434 [4], and has been modified to include explicit reference to Intellectual Property Rights, and the roles of the IAB and IESG in relation to the IETF Protocol Parameter registry function.

The Internet Architecture Board acknowledges the assistance provided by reviewers of earlier drafts of this document, including Scott Bradner.

### 9. Security Considerations

This document does not propose any new protocols, and therefore does not involve any security considerations in that sense.

### Informative References


2, October 1994.


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Internet Architecture Board

Appendix A. IAB Members

Internet Architecture Board Members at the time this document was published were:
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