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IANA Registration and the End to End Principle

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Abstract

This memo describes what IANA registration means and does not mean.

1. IANA registration

Various protocols have fields values in which must be interpreted equally by all the parties of communications.

To promote better interoperability, IANA is the place, recognized by those who developed the protocols, to register interpretations of various values of the protocol fields.

IANA assigns unique values and make lists of the assigned values and their meaning with references to more detailed information.

However, IANA registration does not mean that IANA provides collision management nor automatic identification of the registered values. The registration, either, does not assure the interoperability of the protocols.

IANA assignment of values, neither, overrides any intellectual property rights such as trademark or copyright.

The Internet works based on the end to end principle [ARCH] that, parties, that is, end systems or hosts, of a communication are required to have an interpretation of values common only to them. The interpretation may be different from that registered to IANA.

As such, when many or most hosts in the Internet share an interpretation of protocol values, some protocol fields have defact interpretations different from IANA registered ones.

Because of the end to end principle, there, principally, can be no mechanism to enforce IANA registrations.

It should be noted that the argument above is not applicable to values to identify end systems, namely, IP addresses and domain names. IP addresses are essential to routers while domain names offer a lot more human friendly identification.

2. IANA Assignments of IP Addresses

Of course, some community can use IP addresses not authorized by IANA.

However, end systems in the community can not be reached through the Internetworking layer from the Internet.

The IP network of the community is isolated from the Internet, a loosely coupled collection of ISPs, which respect address assignments by IANA.

Because of the global connectivity principle of the Internetworking layer, end systems must have globally unique IP addresses for global communication.

The whole routing system of the Internet is the enforcement mechanism of IANA IP address assignment.

3. IANA Assignments of Domain Names

The enforcement mechanism of IANA domain name assignment is DNS [DNS] tree rooted by set of root name servers, IP addresses of which are recognized by IANA.

The DNS maintains the IANA name space of tree shaped realtime database of domain names, relying on the name servers identified by IP addresses.

Most of the hosts in the Internet use the name space.

Most of the hosts in the Internet does not use other name spaces.

Of course, a host does not have to be registered in the name space.

The host may be registered in some name space other than that of IANA.

However, most of the hosts in the Internet can not refer the host using domain name, which means that the host is isolated from the Internet from human perspective.

Thus, most of the hosts in the Internet are registered to the name space of IANA.

4. References

[ARCH] RFC1958.

[DNS] RFC 1034, RFC 1035.

5. Security Considerations

It should be noted that security, in general, is an end to end issue that arguments in section 1 is applicable to security related values.

Authentication of identification can be performed end to end after end systems are identified by possibly insecure IP addresses or domain names.

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