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Reflections on the DNS, RFC 1591, and Categories of Domains

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Abstract

RFC 1591, "Domain Name System Structure and Delegation", laid out the basic administrative design and principles for the allocation and administration of domains, from the top level down. It was written before the introduction of the world wide web (WWW) and rapid growth of the Internet put significant market, social, and political pressure on domain name allocations. In recent years, 1591 has been cited by all sides in various debates, and attempts have been made by various bodies to update it or adjust its provisions, sometimes under pressures that have arguably produced policies that are less well thought out than the original. Some of those efforts have begun from misconceptions about the provisions of 1591 or the motivation for those provisions. The current directions of the Internet Corporation for Assigned Names and Numbers (ICANN) and other groups who now determine the Domain Name System (DNS) policy directions appear to be drifting away from the policies and philosophy of 1591. This document is being published primarily for historical context and comparative purposes, essentially to document some thoughts about how 1591 might have been interpreted and adjusted by the Internet Assigned Numbers Authority (IANA) and ICANN to better reflect today's world while retaining characteristics and policies that have proven to be effective in supporting Internet growth and stability. An earlier variation of this memo was submitted to ICANN as a comment on its evolving Top-level Domain (TLD) policies.

1. Introduction

RFC 1591 [1] has been heavily discussed and referenced in the last year or two, especially in discussions within ICANN and its predecessors about the creation, delegation, and management of top-level domains. In particular, the ICANN Domain Name Supporting Organization (DNSO), and especially its ccTLD constituency, have been the home of many discussions in which 1591 and interpretations of it have been cited in support of a variety of sometimes-contradictory positions. During that period, other discussions have gone on to try to reconstruct the thinking that went into RFC 1591. Those in turn have led me and others to muse on how that original thinking might relate to some of the issues being raised. 1591 is, I believe, one of Jon Postel's masterpieces, drawing together very different philosophies (e.g., his traditional view that people are basically reasonable and will do the right thing if told what it is with some stronger mechanisms when that model is not successful) into a single whole.

RFC 1591 was written in the context of the assumption that what it described as generic TLDs would be bound to policies and categories of registration (see the "This domain is intended..." text in section 2) while ccTLDs were expected to be used primarily to support users and uses within and for a country and its residents. The notion that different domains would be run in different ways --albeit within the broad contexts of "public service on behalf of the Internet community" and "trustee... for the global Internet community"-- was considered a design feature and a safeguard against a variety of potential abuses. Obviously the world has changed in many ways in the seven or eight years since 1591 was written. In particular, the Internet has become more heavily used and, because the design of the world wide web has put domain names in front of users, top-level domain names and registrations in them have been heavily in demand: not only has the number of hosts increased dramatically during that time, but the ratio between registered domain names and physical hosts has increased very significantly.

The issues 1591 attempted to address when it was written and those we face today have not changed significantly in principle. But one alternative to present trends would be to take a step back to refine it into a model that can function effectively today. Therefore, it may be useful to try to reconstruct 1591's principles and think about their applicability today as a model that could continue to be applied: not because it is historically significant, but because many of its elements have proven to work reasonably well, even in difficult situations. In particular, for many domains (some in 1591's "generic" list and others in its "country code" category) the notion of "public service" --expected then to imply being carried out

at no or minimal cost to the users, not merely on a non-profit basis-- has yielded to profitability calculations. And, in most of the rest, considerations of at least calculating and recovering costs have crept in. While many of us feel some nostalgia for the old system, it is clear that its days are waning if not gone: perhaps the public service notions as understood when 1591 was written just don't scale to rapid internet growth and very large numbers of yregistrations.

In particular, some ccTLDs have advertised for registrations outside the designated countries (or other entities), while others have made clear decisions to allow registrations by non-nationals. These decisions and others have produced protests from many sides, suggesting, in turn, that a recategorization is in order. For example, we have heard concerns by governments and managers of traditional, "public service", in-country, ccTLDs about excessive ICANN interference and fears of being forced to conform to internationally-set policies for dispute resolution when their domestic ones are considered more appropriate. We have also heard concerns from registrars and operators of externally-marketed ccTLDs about unreasonable government interference and from gTLD registrars and registries about unreasonable competition from aggressively marketed ccTLDs. The appropriate distinction is no longer between what RFC 1591 described as "generic" TLDs (but which were really intended to be "purpose-specific", a term I will use again below) and ccTLDs but among:

(i) true "generic" TLDs, in which any registration is acceptable and, ordinarily, registrations from all sources are actively promoted. This list currently includes (the formerly purpose-specific) COM, NET, and ORG, and some ccTLDs. There have been proposals from time to time for additional TLDs of this variety in which, as with COM (and, more recently, NET and ORG) anyone (generally subject only to name conflicts and national law) could register who could pay the fees.

(ii) purpose-specific TLDs, in which registration is accepted only from organizations or individuals meeting particular qualifications, but where those qualifications are not tied to national boundaries. This list currently includes INT, EDU, the infrastructure domain ARPA, and, arguably, the specialized US Government TLDs MIL and GOV. There have been proposals from time to time for other international TLDs of this variety, e.g., for medical entities such as physicians and hospitals and for museums. ICANN has recently approved several TLDs of this type and describes them as "sponsored" TLDs.

(iii) Country domains, operated according to the original underlying assumptions of 1591, i.e., registrants are largely expected to be people or other entities within the country. While external registrations might be accepted by some of these, the country does not aggressively advertise for such registrations, nor does anyone expect to derive significant fee revenue from them. All current domains in this category are ccTLDs, but not all ccTLDs are in this category.

These categories are clearly orthogonal to the association between the use of the IS 3166-1 registered code list [2] and two-letter "country" domain names. If that relationship is to be maintained (and I believe it is desirable), the only inherent requirement is that no two-letter TLDs be created except from that list (in order to avoid future conflicts). ICANN should control the allocation and delegation of TLDs using these, and other, criteria, but only registered 3166-1 two letter codes should be used as two-letter TLDs.

2. Implications of the Categories

If we had adopted this type of three-way categorization and could make it work, I believe it would have presented several opportunities for ICANN and the community more generally to reduce controversies and move forward. Of course, there will be cases where the categorization of a particular domain and its operating style will not be completely clear-cut (see section 3, below). But having ICANN work out procedures for dealing with those (probably few) situations appears preferable to strategies that would tend to propel ICANN into areas that are beyond its competence or that might require significant expansion of its mandate.

First, the internally-operated ccTLDs (category iii above) should not be required to have much interaction with ICANN or vice versa. Once a domain of this sort is established and delegated, and assuming that the "admin contact in the country" rule is strictly observed, the domain should be able to function effectively without ICANN intervention or oversight. In particular, while a country might choose to adopt the general ICANN policies about dispute resolution or name management, issues that arise in these areas might equally well be dealt with exclusively under applicable national laws. If a domain chooses to use ICANN services that cost resources to provide, it should contribute to ICANN's support, but, if it does not, ICANN should not presume to charge it for other than a reasonable fraction of the costs to ICANN of operating the root, root servers, and any directory systems that are generally agreed upon to be necessary and in which the domain participates.

By contrast, ccTLDs operated as generic domains ought to be treated as generic domains. ICANN dispute resolution and name management policies and any special rules developed to protect the Internet public in multiple registrar or registry situations should reasonably apply.

3. Telling TLD types apart

If appropriate policies are adopted, ccTLDs operated as generic domains (category (i) above) and those operated as country domains (category (iii) above) ought to be able to be self-identified. There are several criteria that could be applied to make this determination. For example, either a domain is aggressively seeking outside registrations or it is not and either the vast majority of registrants in a domain are in-country or they are not. One could also think of this as the issue of having some tangible level of presence in the jurisdiction - e.g., is the administrative contact subject, in practical terms, to the in-country laws, or are the registration rules such that it is reasonably likely that a court in the jurisdiction of the country associated with the domain can exercise jurisdiction and enforce a judgment against the registrant.

One (fairly non-intrusive) rule ICANN might well impose on all top-level domains is that they identify and publish the policies they intend to use. E.g., registrants in a domain that will use the laws of one particular country to resolve disputes should have a reasonable opportunity to understand those policies prior to registration and to make other arrangements (e.g., to register elsewhere) if that mechanism for dispute resolution is not acceptable. Giving IANA (as the root registrar) incorrect information about the purpose and use of a domain should be subject to challenge, and should be grounds for reviewing the appropriateness of the domain delegation, just as not acting consistently and equitably provides such grounds under the original provisions of RFC 1591.

In order to ensure the availability of accurate and up-to-date registration information the criteria must be consistent, and consistent with more traditional gTLDs, for all nominally country code domains operating as generic TLDs.

4. The role of ICANN in country domains

ICANN (and IANA) should, as described above, have as little involvement as possible in the direction of true country [code] domains (i.e., category (iii)). There is no particular reason why

these domains should be subject to ICANN regulation beyond the basic principles of 1591 and associated arrangements needed to ensure Internet interoperability and stability.

ICANN's avoiding such involvement strengthens it: the desirability of avoiding collisions with national sovereignty, determinations about government legitimacy, and the authority of someone purportedly writing on behalf of a government, is as important today as it was when 1591 was written. The alternatives take us quickly from "administration" into "internet governance" or, in the case of determining which claimant is the legitimate government of a country, "international relations", and the reasons for not moving in that particular direction are legion.

5. The role of governments

The history of IANA strategy in handling ccTLDs included three major "things to avoid" considerations:

* Never get involved in determining which entities were countries and which ones were not.

* Never get involved in determining who was, or was not, the legitimate government of a country. And, more generally, avoid deciding what entity --government, religion, commercial, academic, etc.-- has what legitimacy or rights.

* If possible, never become involved in in-country disputes. Instead, very strongly encourage internal parties to work problems out among themselves. At most, adopt a role as mediator and educator, rather than judge, unless abuses are very clear and clearly will not be settled by any internal mechanism.

All three considerations were obviously intended to avoid IANA's being dragged into a political morass in which it had (and, I suggest, has) no competence to resolve the issues and could only get bogged down. The first consideration was the most visible (and the easiest) and was implemented by strict and careful adherence (see below) to the ISO 3166 registered Country Code list. If an entity had a code, it was eligible to be registered with a TLD (although IANA was free to apply additional criteria-most of them stated in 1591). If it did not, there were no exceptions: the applicant's only recourse was a discussion with the 3166 Registration Authority (now Maintenance Agency, often known just as "3166/MA") or the UN Statistical Office (now Statistics Bureau), not with IANA.

There are actually five ccTLD exceptions to the strict rules. One, "UK", is historical: it predates the adoption of ISO 3166 for this purpose. The others --Ascension Island, Guernsey, Isle of Man, and Jersey --are arguably, at least in retrospect, just mistakes. Regardless of the historical reasons (about which there has been much speculation), it is almost certainly the case that the right way to handle mistakes of this sort is to acknowledge them and move on, rather than trying to use them as precedents to justify more mistakes.

This, obviously, is also the argument against use of the "reserved" list (technically internal to the 3166 maintenance activity, and not part of the Standard): since IANA (or ICANN) can ask that a name be placed on that list, there is no rule of an absolute determination by an external organization. Purported countries can come to ICANN, insist on having delegations made and persuade ICANN to ask that the names be reserved. Then, since the reserved name would exist, they could insist that the domain be delegated. Worse, someone could use another organization to request reservation of the name by 3166/MA; once it was reserved, ICANN might be hard-pressed not to do the delegation. Of course, ICANN could (and probably would be forced to) adopt additional criteria other than appearance on the "reserved list" in order to delegate such domains. But those criteria would almost certainly be nearly equivalent to determining which applicants were legitimate and stable enough to be considered a country, the exact decision process that 1591 strove to avoid.

The other two considerations were more subtle and not always successful: from time to time, both before and after the formal policy shifted toward "governments could have their way", IANA received letters from people purporting to be competent government authorities asking for changes. Some of them turned out later to not have that authority or appropriate qualifications. The assumption of 1591 itself was that, if the "administrative contact in country" rule was strictly observed, as was the rule that delegation changes requested by the administrative contact would be honored, then, if a government _really_ wanted to assert itself, it could pressure the administrative contact into requesting the changes it wanted, using whatever would pass for due process in that country. And the ability to apply that process and pressure would effectively determine who was the government and who wasn't, and would do so far more effectively than any IANA evaluation of, e.g., whether the letterhead on a request looked authentic (and far more safely for ICANN than asking the opinion of any particular other government or selection of governments).

Specific language in 1591 permitted IANA to adopt a "work it out yourselves; if we have to decide, we will strive for a solution that is not satisfactory to any party" stance. That approach was used successfully, along with large doses of education, on many occasions over the years, to avoid IANA's having to assume the role of judge between conflicting parties.

Similar principles could be applied to the boundary between country-code-based generic TLDs and country domains. Different countries, under different circumstances, might prefer to operate the ccTLD either as a national service or as a profit center where the "customers" were largely external. Whatever decisions were made historically, general Internet stability argues that changes should not be made lightly. At the same time, if a government wishes to make a change, the best mechanism for doing so is not to involve ICANN in a potential determination of legitimacy (or even to have ICANN's Government Advisory Committee (GAC) try to formally make that decision for individual countries) but for the relevant government to use its own procedures to persuade the administrative contact to request the change and for IANA to promptly and efficiently carry out requests made by administrative contacts.

6. Implications for the current ICANN DNSO structure.

The arguments by some of the ccTLD administrators that they are different from the rest of the ICANN and DNSO structures are (in this model) correct: they are different. The ccTLDs that are operating as generic TLDs should be separated from the ccTLD constituency and joined to the gTLD constituency. The country ccTLDs should be separated from ICANN's immediate Supporting Organization structure, and operate in a parallel and advisory capacity to ICANN, similar to the arrangements used with the GAC. The DNSO and country TLDs should not be required to interact with each other except on a mutually voluntary basis and, if ICANN needs interaction or advice from some of all of those TLDs, it would be more appropriate to get it in the form of an advisory body like the GAC rather than as DNSO constituency.

7. References

[1] Postel, J., "Domain Name System Structure and Delegation", RFC 1591, March 1994.

[2] ISO 3166. ISO 3166-1. Codes for the representation of names of countries and their subdivisions - Part 1: Country codes (1997).

8. Acknowledgements and disclaimer

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9. Security Considerations

This memo addresses the context for a set of administrative decisions and procedures, and does not raise or address security issues.

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