

## Internet Articles

*An occasional series of articles on the social and technical evolution of the Internet  
by Geoff Huston*



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### ICANN, the ITU and WSIS and Internet Governance

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It may have taken some three decades to get here, but there's now no doubt that the Internet is now a major public communications utility. That's hardly the most important piece of news you are likely to read today, but the implication of this public role is that there are legitimate issues of public policy to consider when looking at the broad topic of coordination of various aspects of Internet infrastructure. In other words, "Internet Governance" is a matter of significant concern to many.

In this column we will look at the various range of views about ICANN and its rationale and role over its brief history. Of course no look at Internet Governance would be complete without also looking at the role of the International Telecommunications Union (ITU) as well as the broader background to this topic.

It is a large topic and its already been the catalyst for numerous articles. Here I'll try to be as succinct as I can!.

### Data Networking and Public Networks

Whether it was because of its antecedents in the research community, or simply because it was not originally envisaged that the Internet would become a global communications platform in its own right, or for whatever set of reasons, the administration of the Internet's infrastructure was not originally crafted with conventional public network coordination in mind. The retrofitting of a model that incorporates considerations of a public utility role is proving to be a rather involved process.

For example, the original hierarchical name space for the Internet used a set of generic top level root zone names of "edu", "net", "com", "gov" and "mil". Adding country codes to the root of the name space was a later modification. Even then the original country code delegations were undertaken to individuals or entities who appeared to have some form of link to the national internet community, rather than specifically seeking out an appropriate office of the national administration of communications services as the point of delegation. Similarly, IP addresses were structured without any form of national prefix, nor were IP addresses distributed along any national lines. In these respects the Internet was really no different to any other computing networking protocols of the 1980's, such as DECnet, XMS, Appletalk or IBM's SNA, where names and addresses were defined in a limited context of the scope of the network, rather than within some broader public name framework.

There were two notable exceptions to this characterization of computer network protocols, and both were designed with a public communications utility as their primary objective, namely X.25 and OSI. Both these protocols have an indirect bearing on the current situation with the Internet. X.25 and OSI can be regarded as offerings from the data services sector of the established telephone industry. X.25, the earlier of these two protocols, had a very obvious relationship to telephony, complete with the notion of a "call" as the means of establishing a data connection and as the unit of a transaction. The addressing scheme used a structured space that drew heavily on the telephone number structure, complete with a national prefix and nationally defined sub-fields. Like telephony there was no associated name scheme: end systems were identified by their numeric X.25 protocol address. OSI represented a later effort to design a packet

switched network architecture that was intended to reflect an increasing level of experience with this technology. OSI continued to draw heavily on telephony design for the structure of the address space, and still included the concept of a "call" as one of its basic transactions. Much was written about OSI at the time, and it's a diversion to explore it in depth here. However, the salient observation here is that despite the extensive effort invested into its promotion, OSI was a market failure, and whatever its technical merits it was simply not accepted by the communications industry.

OSI was supported by the ITU, and by virtue of this very active sponsorship of this technology, the implication of the aftermath of OSI was that the ITU was seen as being simply out of touch with data networking. It was perceived that the ITU was coming from a mindset that was incapable of engaging with either the data communications industry or the broader consumer market for data services. From the perspective of data networking the failure of OSI was seen as a failure of the ITU itself.

## The ITU and the Internet

Not only was the ITU perceived as being out of touch with the data communications sector, more critically it was perceived as being incapable of making the necessary reforms to its mode of operation and policy setting to bring it back into relevance for the rapidly changing communications industry of the 1990's. The inference that was being drawn was that the ITU was apparently in a state of denial over progressive deregulation of national communications sectors. In many cases the national position had moved to a position of lightweight regulation, relying on strong competitive pressures to enforce regimes of efficiency and effectiveness in the supply of communications services to consumers. The ITU, as an intergovernmental organization, was increasingly being seen as an anachronistic relic of an earlier era of communications service provision.

It was also evident that this critical view of the ITU was most strongly held within the US, and in particular those parts of the US administration and industry that were involved with the growth of the Internet. It was perhaps no coincidence that in these growth industries of personal computer technologies and the related internet industry it was US enterprises that were the poster children of this new model of industry-lead deregulated communications services. Their consequent rapid expansion into a massive global undertaking of the global Internet was perhaps the most eloquent form of statement about the effectiveness of deregulation, and the degree to which the previous regulatory model had simply not managed to encompass the burgeoning demand for data services in a timely fashion.

From this perspective it should be no surprise to observe that when the transition of the IANA function from a fully federally funded research activity to some form of new foundational base was being considered by the US administration, it appears that the ITU was never seriously contemplated as a viable home for this function. If the Internet was a child of deregulation and industry initiative taking on the outcomes of research activity, then the appropriate progression of the IANA function was also from a research context into an enterprise context. IANA should be responsive to industry needs, and to best achieve this the IANA function itself should be undertaken as a task housed within the deregulated private enterprise sector, rather than establishing yet another public bureaucracy, or using existing bureaucracies for the role. ICANN was the embodiment of this aspiration on the part of the US administration.

## The Formation of ICANN

Whatever the original motivation in creating ICANN to administer the IANA responsibilities, it is now apparent that ICANN was deliberately structured to confront the industry with an alternative structure of governance within national and international communications sectors to that of the ITU. The critical difference is that ICANN has not placed governments at the forefront of visible activity, but instead placed industry needs and the operation of a competitive deregulated international communications sector as being the major thrust of coordination activities.

As with any novel model of public policy determination, ICANN's acceptance has ranged from cautious to highly sceptical. Even within the US Administration ICANN has not been "unleashed", and it continues to operate under the terms of a Cooperative Agreement with the National Telecommunications and

Information Administration of the US Department of Commerce under a sole source cooperative agreement. Formally, the US Administration has not yet passed any authority to ICANN, or admitted it any true autonomy of operation. As per the US General Auditor's Office report on ICANN, ICANN continues to be an advisory body to the US National Telecommunications and Information Administration (NTIA) in the matter of functions performed by the NTIA in the administration of Internet infrastructure elements. In this light ICANN appears to be a cautious step in a bold direction.

ICANN undertakes activities of management of Internet protocol infrastructure in the areas of the content of the root of the DNS and the identification of parties to whom are delegated administrative and operational control of the top level domains and the associated specification of terms and conditions of this delegation. ICANN, through IANA, also manages the pool of unallocated IP addresses (IPv4 and IPv6 addresses and AS numbers), and also manages the protocol parameter registries as defined by IETF Standards Actions.

## ICANN Mki

The initial structure of ICANN had three "supporting organizations", focusing on:

- coordination of the DNS with the Names Supporting Organization (NSO),
- coordination of address policies with the Address Supporting Organization (ASO) and
- operation of Internet protocol parameter registries with the assistance of the Protocol Supporting Organization (PSO).

The intended role of these supporting organizations were to provide a venue where interested parties could develop and consider policy proposals, leaving the task of ultimate identification of broad support for particular policy initiatives to the ICANN Board.

As has been evident to any observer of the ICANN process, things did not proceed within the parameters of that particular plan.

The PSO was placed under strong pressure to include the ITU-T and ETSI, and the W3C was also enlisted, in addition to the IETF. If the objective of the PSO was oversight and policy formulation concerning the role of protocol parameter registration of IETF protocols, then this enlarged membership of the PSO was unwarranted. Even within the terms of consideration of the PSO as a source of standards-based technical advice to the ICANN Board, the presence of these additional organizations was somewhat puzzling in terms of the match of resultant structure of the PSO to its intended role. The PSO, however, had a role in seating individuals onto the Board of ICANN, and it was likely that this aspect of the PSO had been the reason for the interest in broader institutional membership. Uncertainty about the extent of role of ICANN saw many groups attempting to gain access to Board seats.

The ASO was formed within the parameters of a different model. The Regional Internet Registries had already developed a considerable history of working within their communities, and being widely accepted by these communities as an appropriate means of coordination of activity in the role of number resource administration and distribution. The ASO was formed with membership of the associated Council based on processes determined by each RIR. Even then it was unclear as to the relationship between the RIRs' already well established open policy development process and the ASO and ICANN. The RIRs were unwilling to pass all regionally-developed policies to ICANN for a second round of consideration and potential alteration. They insisted that only those policies that were considered to be 'global', in that they were common to all the RIRs, would be passed into this ICANN sphere.

The NSO struck problems due to the diversity of interests that were encompassed with the DNS domain, including emerging national and regional interests in the country code top level domains, the operators of the generic top level domains, the trademark and intellectual property collection of interests, the emerging industry of registrars and a continual interest of individuals who maintained that they had legitimacy of inclusion by virtue of their representation of interests of end users and consumers, or, to use an emerging ICANN lexicon, the 'at large' constituency.

Missing from this mosaic of diverse interests was the inclusion of various national public communications sector entities who also felt that they had clear legitimacy to undertake an active role within the ICANN policy development process, and in response the Government Advisory Committee (GAC) was formed.

## ICANN Evolution and Reform

If a camel is a horse designed by a committee, then it's unclear whether ICANN was a three-humped camel or a three and three quarter-humped camel as a result of all this, but camel it undoubtedly was.

- The PSO was dysfunctional and missing any tangible agenda of activity. A fracture was apparent in the relationship between ICANN and the IETF. Attempts to create an agreement between ICANN and the IETF over the IANA function were not recognised by the US administration, who continued to insist that, formally, the IANA function for the IETF was undertaken at the behest of the US Department of Commerce rather than the IETF. This was not a view shared by the IETF.
- The ASO was accused by ICANN itself of being insufficiently "representative" of the addressing community, and the ICANN Board established its own ad hoc advisory committee on addresses, and is so doing alienating the RIR community from the entire ICANN framework.
- The NSO was hopelessly wedged into factional-based politics.
- The GAC decided at the outset that it would operate behind closed doors, in contrast to ICANN's continuing efforts to operate in an open and transparent manner. ICANN was unable to exercise any formal control over the operators of the DNS Root Servers and a formal contract or agreement between these operators and ICANN was not looking as if it would happen any time soon.
- The "At Large" election process undertaken by ICANN appeared to be of dubious validity due to problems in establishing a reliable constituency database of individuals who had an interest of ICANN, and a direct election process was attempted only once.

Not surprisingly ICANN fell into some disarray under these pressures, and by early 2002 the CEO of ICANN at the time, Stuart Lynn, was warning all who cared to listen that ICANN was paralysed, dysfunctional and in danger of an imminent demise. Whether this was a message directed to a fractious ICANN Board, or to a fractious set of communities that had some intersection with ICANN, or to the US Administration who had been influential in determining the original ICANN structure, was not entirely clear to any observer of the process.

However, given that ICANN had been set up as an example of a new form of international coordination of communication infrastructure support activities that was based on private sector activity rather than governmental fiat, this message of imminent failure was interpreted both as a potential failure of ICANN and a sign of failure of this new model of coordination of international activity. ICANN was seen as a point of vulnerability with respect to the US Administration's diplomatic efforts to reform this international activity sector. The ITU-T's activities in this same area were re-invigorated, with considerable support from national sectors who saw their national interests being potentially advantaged in a ITU-lead international environment.

## ICANN MkII

While still firmly positioned as a private sector activity, and while still making no concessions in the direction of the ITU, ICANN has managed to reorganize its structure through a protracted evolution and reform process.

- With respect to the ASO, The Regional Internet Registries formed their own coordination entity, the Number Resource Organization, and have proposed this entity to ICANN as the means of interfacing between the addressing community and ICANN's policy development activities
- The PSO was abolished, to be replaced by a Technical Liaison Group which, apart from its function of seating an individual on the ICANN Board, is a group without an obvious agenda.

- The NSO was forced to recognize the fundamental difference between the generic top level domains, which fall under a more direct relationship with ICANN and its processes, and the country code domains, who have from the outset been quite wary of ICANN. From the ICANN reform process emerged the Country Code Name Supporting Organization (CCNSO) and the Generic Names Supporting Organization (GNSO), as a recognition that these two groupings are so dissimilar that they have almost nothing in common.
- In addition, an At Large Advisory Committee was formed. This was a curious move, in that the role of representing the interests end user in international domains has traditionally been that of government, and the current role of the At Large Advisory Committee appears to be somewhat opaque to the outside observer.

Staffing of ICANN has increased significantly, as has ICANN's level of expenditure.

The reform process has had some more tangible outcomes, in that formal open meetings of the ICANN Board of Directors have managed to be progressively refined from efforts at direct dialogue and debate into highly structured events with many formalisms and appropriate quantities of ceremony.

## ICANN Today

Despite the effort to encompass coordination activities in the areas of names, addresses and protocol parameters, ICANN has been largely captured by the names industry, and ICANN's agenda, activity focus and outcomes are by and large concentrated in the name domain.

In this activity domain the track record of ICANN is very mixed. To its credit, it has managed to:

- dismantle the most objectionable parts of the monopoly hold over the generic top level domains,
- create an operational model that makes a clear distinction between registry operators and registrars,
- impose price and business control on the registry operation as a means of controlling the natural tendency for the registry operation to reflect its unique position in the form of monopoly rentals, and
- assist in the creation of a global network of competitive enterprises, with the expectation that competition will instil operational and price efficiency in the registrar business.

In addition, ICANN has been successful in not only introducing new gTLDs to compete with the established brands of .com, .net and .org, but also in moving .org and .net to new registry operations (.net is underway at the time of writing this article).

Despite these positive achievements, it is not clear that this new regime has been entirely successful.

True competition in the name space is still some way off, with the recently introduced gTLD brands failing to gain any leverage within the market. The name market itself remains one where the role of name speculators continues to play a significant role in terms of proportion of registered names. The dominance of .com as a brand has continued.

The nature of the relationships between the IETF, ICANN and the US Administration over the protocol parameter registries remains unresolved. There is also the lingering set of concerns that if ICANN were once more explore positioning itself on the brink of imminent demise, the collective task of picking up the pieces and continuing to support the operation of the Internet is one that appears to have an uncomfortable level of uncertainty.

The DNS Root Server Operators continue to operate as an independent group. The recent moves to dramatically increase the number of DNS root servers and improve the overall robustness of DNS resolution through anycasting root servers and distributing anycast instances across the globe has been an initiative that has been well received. The fact this has occurred without any form of ICANN involvement is an interesting commentary on the ability of ICANN to engage with the operational parts of the Internet's infrastructure. Comparable activities to improve the DNS in terms of resolution services

within the ICANN sphere have become protracted exercises that impose a very heavy burden on the patience of the players. The moves to introduce IPv6 AAAA records into the DNS root have been anticipated for many years, and the response to the recent ICANN announcement is, in general, of the tenor "why didn't this happen some years ago". The continuing frustration to get the DNS root to include DNSSEC key information continues to illustrate a perspective that the ICANN process appears to be unresponsive to technical needs and end user imperatives.

The situation today is that ICANN appears to enjoy a mixed level of success. It has managed to establish itself as a means of administering the infrastructure elements of the Internet Protocol in a manner that is reflective of the deregulated nature of the Internet industry. It has managed to reform parts of the landscape and generate an industry structure that uses open competition as the major control mechanism. ICANN has managed to bring much of the discussion about the administration of Internet infrastructure out into the open. All of these are major milestones, and it is to the credit of many dedicated individuals that ICANN has managed these impressive set of outcomes. However, it has been able to achieve all this with the continued sponsorship of the US Administration, and the question of whether it can firmly establish itself in its own right in the coming years remains today perhaps a matter of speculation rather than absolute certainty.

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### **About the Author**

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