

IP Addresses

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The role of the International Corporation for the Assignment of Names and Numbers (ICANN) in determining policy relating to the management of the Internet's Domain Name System (DNS) is widely known these days. The recent At Large membership drive and the associated election of directors of ICANN produced outcomes that many folk found surprising. Surprising in that so many individuals wanted to sign up as an individual member of ICANN and surprising in that the elections results included candidates that had a platform of activationist reform regarding ICANN.

So what's the problem that ICANN is trying to solve that has generated all this interest? The major issue that they are wrestling with at the moment is the issue of the policies concerning the creation and management of the so-called top level domains of the DNS - those domains that sit at the root of the DNS hierarchy. It's said that all vanity has a cost, and if that's the case the cost of the ultimate Internet vanity, a very short DNS domain name, will indeed be considerable.

But what has this ICANN activity to do with ISPs? Regarding top level DNS names policies, not a whole lot admittedly. However, the reason why ICANN is part of the ISP's landscape is that ICANN also has the responsibility for determining administrative policies regarding the allocation of IP addresses. For this reason ISPs have a deep interest in the affairs of ICANN, and a deep interest in the affairs of the related policy and operational bodies, including the ICANN-related Address Supporting Organization and the Regional Internet Registries. In the same way that a competitive phone service provider requires access to telephone numbers in order to conduct business, and a mobile wireless service requires access to the radio spectrum, an ISP needs access to IP address space. The policies and procedures that determine how an ISP can obtain IP address space have a significant impact on the viability of the ISP business itself.

Cumbersome, slow and expensive procedures inevitably result in high costs to the ISP business, which in turn often favors the larger ISP enterprise over the smaller, allowing the process cost to be distributed over a larger address pool. The slower the process the more the process tends to favor incumbent ISPs over new entrants into a market. At an international level IP address allocation policies can impact national economies. Already we are hearing the argument that IP address allocation policies are part of the digital divide between developed and undeveloped parts of the world. Many, if not all, parts of the developed world have enjoyed the relatively low cost and liberal IP address allocation policies of the past, and this has been an important factor in allowing these countries to build up their initial Internet infrastructure efficiently. Across the digital divide, the developing world is facing the not only the problems of the cost of infrastructure build and the cost of development of electronic markets, but added to this is an effective taxation imposed through the significantly greater cost associated with current IP address distribution policies. No doubt some national economies from this side of the divide will voicing the concern that the lack of IP address space is locking them out of the digital economy altogether. From almost any perspective you choose to take, IP address distribution policies are important, and in the case of IP address we have some way to go, both in the venue of ICANN and elsewhere, to adequately understand the true dimension of the policy debate surrounding IP addresses.

To learn more about IP address distribution policies we need to look no further than the phone numbers and radio spectrum to see both extremes of the policy spectrum. In the case of phone numbers there are national policies, where the policies of one country may differ markedly from another. Despite the potential for great differences in phone number policy, the practice has

been more uniform, and we have generally seen an administrative structure develop where phone number ranges are allocated to phone operators on the basis of conditions associated with a service provider license. The overheads of this administrative process are often funded from the service license fees, and the policies under which the administrative body operates vary between a fully industry self-regulatory model through to a centralized regulation-driven model. Radio spectrum distribution policy is also determined on a national basis, and most recently we have seen a number of countries shift from an administrative model to open auctions. Recent auctions of the so-called 3G spectrum at 3.4GHz have seen the operators place an extremely high value on access to the radio spectrum, with record prices being set in Germany, the Netherlands and Great Britain through the course of 2000. The auction process allows each operator to place their own value on the spectrum and bid accordingly. In theory the most efficient and highest value model of use of the spectrum will emerge as the highest bidder, and if efficiency and utility value are the policy goals of the spectrum allocation process, an auction can certainly implement this, and return a tidy sum to the government's coffers at the same time.

Of course any policy debate is replete with questions and answers and few and far between. As a sampler, here's my pick of the juicier IP address policy questions.

- What do we want from IP addresses?
- Do we need to conserve them for the future, or should we attempt to allocate them all at once to current ISP operators?
- Should IP address be tradable as with any other asset, or should they somehow be an enforced non-transferable license?
- Are global policies for IP address allocation right, or should regions, or countries or individual markets within countries, have the ability to self-determine their own address allocation policies?
- Should they be priced and distributed by auction? If such auctions are to be conducted at a regional or global level what would we do with the money raised in this way? Will an auction result in further widening the digital divide?
- Should we allocate address space in a way that does not cause massive uncontrolled growth in the routing tables, or is this undue interference into various ISP business models?
- Should IP addresses be allocated absolutely and in perpetuity, or should IP addresses be treated as a fixed term lease, returnable to the registry on expiration of the lease?
- And, lastly, who should have a say in determining address space policies and how should a global policy debate be staged?

There are a lot of interested parties out there who can be impacted by the outcome of such a policy debate. If left to the ISP industry alone to conduct the debate, the accusation of leaving the wolf to look after the sheep will surely be made. Governments have a similar problem, in that we have constructed an ISP business model that often spans multiple countries and multiple regions. Leaving the debate to governments to conduct stands the risk of a large number of fragmentary and uncoordinated local IP address policies, which is a certain barrier to an efficient new economy as any you can find. So at present the IP address policy debate is one which is ultimately conducted through the structure of ICANN and the various Regional Internet Registries. Any ISP should consider their position with respect to the IP address policy debate, as IP addresses are one of the critical foundations of every ISP.

Some useful reading for the IP address debate:

ICANN: www.icann.org

The Regional Registries:

APNIC - www.apnic.net

ARIN - www.arin.net

RIPE NCC - www.ripe.net

And some interesting RFC documents:

RFC 2050 - www.rfc-editor.org/rfc/rfc2050.txt

RFC 1744 - www.rfc-editor.org/rfc/rfc1744.txt
