Comments to WGIG on Draft Working Papers Identifying Issues for Internet Governance **Submitted by APNIC** http://www.apnic.net **Contact: Paul Wilson, Director General** **Email: <dg@apnic.net>**
Do you have any comments on the process of determining the issues and their presentation by the WGIG?
At the inception of the WGIG process, it was announced that the required definition of Internet Governance would be allowed to emerge from the deliberations of the Working Group, and this is an approach we support. In the same way we believe that the determination by the WGIG of specific issues for presentation should also be allowed to arise from the deliberations of the group, as well as from public inputs into the process. The list of specific issues, as well as their relative priorities, form an essential component of the definition, and should therefore not be rushed prematurely to completion.

For each paper you wish to comment on (Please repeat as many times as required) Name of the paper: *Draft WGIG Issue Paper on the Administration of Internet Names and IP Addresses*
Has the issue as it applies to the question of Internet Governance been adequately identified? *No*
Comments: *The paper considers IP addresses and Domain names at the same time, and unfortunately contributes to the confusion of issues arising from these very different areas of Internet administration. The paper does not identify specific issues in sufficient detail at this stage, and cannot do so effectively without restructuring.* *In our attached contribution, we argue strongly for the separate consideration by the WGIG of IP addresses and Domain names, through separate discussion papers and separate consideration in the final report.* *We have also noted that the WGIG paper attempts to cover a number of issues in relation to ICANN and certain associated organisations, whereas ICANN is in fact relevant to several other Internet Governance areas under consideration by the working group. We have suggested that the WGIG also consider ICANN separately, to ensure that its issues can be identified and discussed in one place.*
Does the paper cover the topic with sufficient depth and accuracy? *No*
Comments *In our attached contribution, we make a number of specific suggestions to improve depth and accuracy, particularly in the area of IP addressing. We expect that this draft paper will be revised and improved extensively during further deliberations of the working group, taking into account this and other contributions, as well as the necessary expert advice.*
Does the paper achieve a reasonable balance in weighing relevant matters? *Partially*
Comments *The mixing of issues relating to IP addresses and domain names, particularly when those issues are often fundamentally different in nature, makes it difficult if not impossible to weigh priorities at this stage.*
Any other comments
Other comments are included in the attached contribution.

Attachment to Comments to WGIG on Draft Working Papers Identifying Issues for
Internet Governance

Submitted by APNIC
http://www.apnic.net

Name of the paper: *Draft WGIG Issue Paper on the Administration of Internet Names
and IP Addresses*

1. General Comments

We appreciate the efforts which have gone into production of this draft document. It
appears to be a useful first step towards a comprehensive coverage of these issues in
the final WGIG reports.

We feel that the document could be improved generally with further redrafting and
refinement, which is no doubt planned by the Working Group. The document also
requires further work in terms of content, preferably with additional expert input, in
order to improve its clarity and accuracy. More fundamentally, the aims of this
document could be better met, as we argue below, by separating the issues of IP
address and DNS management, and covering them in two distinct documents.

In the following notes we highlight the major issues as we see them, and hope that
these contributions will be accepted by the working group. We look forward to the
opportunity to provide further clarification of these suggestions if that is required, and
also to the opportunity to participate further in the important work of the Group.

2. Confusion of IP addresses and Domain names

As a matter of particular importance, we advise strongly against the attempt to cover
issues of IP addresses and domain names within the same paper. As the document
itself correctly recognises, there are fundamental differences between these systems,
which result in almost entirely distinct sets of governance issues related to each.
There is ongoing confusion among stakeholders between the two addressing systems,
which we hope the WGIG process can help to overcome; but we suggest strongly that
to cover these systems together will not be helpful in that respect.

One general perspective on this distinction is that the DNS is a human-use oriented
identity system that allows the use of name strings to identify internet resources at the
user level; while IP addresses are protocol-specific tokens used by the infrastructure
of the Internet in order to successfully deliver data between communicating endpoints.
Specific examples of confusion between Internet names and numbers arise in the first
section of the document, entitled "Background".

The first paragraph of this section states that "It is the Domain Name System (DNS)
that ensures the universal resolvability of the two parts of the addressing system".
This implies that the IP addressing system is in some way dependent upon the DNS
for "resolvability", which is entirely untrue. On the contrary, "resolution" of IP
addresses takes place in the transport layer of the Internet, and depends upon

protocols such as ARP (Address Resolution Protocol) and BGP (Border Gateway Protocol), neither of which have any connection whatsoever with the DNS.

In the second paragraph of the "Background" section, it is stated that an objective of the DNS is the requirement that "every computer on the Internet has a unique numerical address". Again this is untrue. The primary objective of the DNS is to ensure that every domain name is translated predictably (but not necessarily uniquely) to an IP address. The uniqueness of IP addresses themselves is an entirely different matter, and entirely independent of any aspect of the DNS.

We find that through the rest of this section there is substantial content that refers exclusively to DNS or IP addressing. The interweaving of these often unrelated passages supports the case that this content can be conveyed most clearly and systematically in separate documents. The footnotes contain references to RFC documents, yet none of these are relevant to both the DNS and IP addressing. Figure 1 itself supports this case clearly by showing no interaction between the two systems below the ICANN level. Finally, the "SWOT analysis" section reached completely different conclusions with respect to names and addresses, which are again only confused by being artificially bundled together.

Regarding Figure 1, there is indeed one important aspect in which the DNS and IP addressing systems are linked, and that is in terms of ICANN's oversight role. However once again we find that ICANN has quite distinct roles with respect to IP addresses and DNS names, which are better described separately. The treatment of the ICANN by WGIG is another matter, which is dealt with separately below.

We do recognise that in November 2004 the WGIG set out a structure for its report in which IP addressing and Domain names are linked, however we do not feel that this early decision should be considered irreversible. In the final WGIG report, we urge you to address these issues separately, to ensure that the report has the necessary accuracy and clarity.

3. IPv6

It is commonly perceived that IPv6 carries with it a number of Internet Governance issues, and this perception is often based on a belief that IPv6 features many critical improvements. This perception is strongly supported in this document, with the statement that "IPv6 also adds many improvements to IPv4". However this assertion warrants some detailed consideration, in order to properly prioritise IPv6 within the spectrum of issues we face.

By way of example, footnote 18 asserts that "IPv6 introduced QoS or at least the possibility of QoS". This is incorrect, in that QoS signalling was previously defined for use with IPv4, and IPv6 makes no fundamental advance in this regard. The capability of IPv6 in the areas of support for secure communications and auto-configuration of end devices is largely equivalent.

The single major feature of IPv6, and its critical feature, is in fact its larger address space. That said, the description of this address space as "practically inexhaustible" is

misleading, particularly when it is implied (in footnote 16) that distribution mechanisms may by themselves determine the outcome. While distribution mechanisms have a role, the practical issue which drives effective address space exhaustion is not one of the exhaustion of the supply of addresses, but the inability to add further addresses into the Internet's routing system. The scarce resource in terms of the deployment of IP addresses is one of routability of addresses, and the evolution of operational practices that optimise routability according to available technologies is the critical factor in terms of assessing the effective exhaustion point of the address space. Distribution mechanisms are determined by policies which, rather than leading these operational routing practices, actively follow them, through industry-based development processes. It is misleading to suggest that distribution mechanisms can in themselves address fundamental architectural and technology issues, and particularly so when at the same time citing theoretical and unachievable indicators of address space size (namely the statement that "IPv6 gives approximately 665,570,793,348,866,943,898,599 IP addresses per square meter of the surface of the planet Earth").

We also question the statement in footnote 16, that "In the future a new upgrade may be an alternative if IPv6 addresses are used up", which carries a rather cavalier and unrealistic tone. Given the enormous complexity and cost of the current transition from IPv4 to IPv6, and the fact that this process may continue for at least 10-20 years, the prospect of undertaking yet another technology transition is one which simply cannot be contemplated at present.

The conclusion reached by the addressing community in general is that, while IPv6 address space is certainly very large, in terms of its practical deployment capability it is certainly also exhaustible, and inevitably so due to fundamental limitations not of the distribution system but of the technology of routing of addresses in the network. Careful and considered management of IPv6 address space must therefore be undertaken from the earliest stage in address deployment, and not left as an afterthought to be solved by future generations.

4. ICANN and other Actors

As mentioned above, we wish to stress that ICANN's responsibilities and activities with respect to IP addresses and DNS names are almost entirely distinct. For instance in the former case, ICANN, under general technical direction provided by the IETF, provides an ongoing service to RIRs of supply of IP addresses, according to specific policies which are unique to that process, and not applicable to DNS management or any other ICANN activity. In the latter, ICANN has assumed a complex set of responsibilities in relation to dispute resolution, expansion of the DNS name space, delegation of ccTLD domain names, and ongoing management of the registry/registrar model; and likewise none of these have any bearing on IP address management.

In addition to its role in these areas, ICANN has responsibilities in other areas which are of interest to the WGIG, for instance in relation to the DNS rootserver system, technical standards, and internationalisation. This role has been covered in some of

the related WGIG drafts, but not in others, and this coverage may need to be addressed in future drafts.

In the section of the document entitled "Actors", we find that several organisations are described of which little or no mention is made in the rest of the document. These include NTIA, ISOC and IAB, and while these are clearly important actors in the overall area of Internet governance, they are not well placed in this document. On consideration, there seems to be a case for the WGIG to produce a single document which covers ICANN and all associated or related organisations, describing them and their interrelated responsibilities in a structured way. We offer this suggestion for your consideration.

5. SWOT Analysis

This is a section of the document which requires more consideration, and which will change very substantially if the above suggestions are accepted. Rather than making specific suggestions at this stage, we will look forward to monitoring the progress of these documents, and making contributions through future mechanisms.

6. Adequacy Measured Against Criteria

We are surprised to find that while the preceding parts of the document attempt to describe issues and processes related specifically to IP address and DNS management, this section relates exclusively to ICANN and its processes. In redrafting this section, we encourage the working group to address all of the various processes involved in management of IP addresses and Domain names (some of which are mentioned in other parts of the document), and recognise that these operate in parallel with but independently from ICANN. The WGIG may hold the view that ICANN itself needs to be assessed in terms of performance outcomes as measured by various criteria, but as its performance has impacts on a broader set of issues than addresses and names, we suggest again that such an analysis of ICANN should be covered by the WGIG as a separate issue in its own right, and not as a rather ill-fitting attachment to the topics of IP address and Domain Name administration

7. Other Issues

In no particular order the following specific corrections are offered.

a) In footnote 10, APNIC is described as founded in 1996. The correct year is 1993.

b) In figure 1, we suggest to describe LIRs as follows:

"LIRs: ISPs which receive IP addresses from an RIR, and redistribute those addresses to customer networks."

c) In footnote 4 it is asserted that the IESG decides on RFC publication. This is not entirely correct, as the RFC Editor has the discretion to publish individually submitted

RFCs. The correct formulation of the RFC document series is that documents that are the outcome of the Internet Standards Process of open peer review in the IETF are published under the direction of the IESG, while individual submissions to the RFC Editor may also be published at the Editor's discretion, but without any imprimatur of standing as an Internet Standard.

d) In the description of "Actors" a note is made that the IANA is chartered by the Internet Society. This is not the case. The IANA function is one performed by ICANN to operate a set of protocol registries defined by the IETF, and under the direction of the IETF. RFC2860 describes this particular relationship.