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IPV6 GROUP

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Source: TSB Director

Title: Concerns on IPv4 Address Policy with regard to IPv6 Deployment

In the fourth meeting of the Dedicated Group (DG) on the International Internet-related Public Policy issues, which was held on 17 June 2010, Saudi Arabia Contribution 'Effects of IPv6 rollout delays on public policy regarding IPv4' (WG-WSIS-17/11) was discussed. The report of the fourth Dedicated Group meeting (WG-WSIS-17/15) contains the following parts relevant to this Contribution discussion:

Summary of this Contribution:

2.2 Contribution from Saudi Arabia, WG-WSIS-17/11: Effects of IPv6 rollout delays on public policy regarding IPv4

The contribution could be summarized as follows:

The authors believe that it is important that every effort be made to expedite implementation of IPv6. However, it is also important to recognize that IPv6 will not have been sufficiently implemented when the issuing authorities run out of IPv4 blocks. The growth of the Internet will be able to continue in a stable fashion for some additional period by greater use of schemes such as NAT and by transfers of allocated numbers.

Besides their responsibility for setting international Internet-related public policy, governments also have a responsibility to assure the stability, sustainability and security of the Internet. It is important to ensure that policies are in place to help manage the use and transfer of IPv4 addresses in the interim period until adequate implementation of IPv6 is achieved.

Discussion of this Contribution:

3.2 Contribution from Saudi Arabia, WG-WSIS-17/11: Effects of IPv6 rollout delays on public policy regarding IPv4

1. *The DG took note of the contribution.*

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2. *Several Member States stated that the topic of IP address allocation is already being discussed at the ITU-T/ITU-D IPv6 Group set up by Council 2009, and that the topic discussed in this contribution could be more appropriate for the IPv6 Group.*
3. *Some Member States noted that this contribution is more focused on IPv4 address space allocation where as the Terms of Reference (ToR) of the IPv6 Group is IPv6-focused. Some other Member States clarified that the ToR of the IPv6 Group does not preclude discussions on IPv4 issues and that both issues could be handled by the IPv6 Group in order to avoid duplication of effort.*
4. *Some Member States noted that the topic of this contribution falls within the mandate of the DG, in line with Council 2009 Resolution 1305.*
5. *The Group requested the TSB Director to bring the concerns expressed in this contribution related to the use of IPv4 to the attention of the IPv6 Group in its September 2010 meeting, and to report back to the next meeting of the Dedicated Group.*

Conclusion and Actions as a result of this Contribution discussion

The TSB Director was requested to:

1. *Submit the concerns expressed in this contribution related to the use of IPv4 (WG-WSIS-17/11: Effects of IPv6 rollout delays on public policy regarding IPv4) to the September 2010 meeting of the IPv6 Group.*
2. *To report back on discussions related to this contribution to the next scheduled meeting of the DG and to submit this report via the DG website at least one month before the next scheduled meeting of the Group.*

Member States are requested to take the report of the TSB Director into consideration in further deliberations on this topic at the next scheduled meeting of the DG.

As requested, in this TD the TSB Director presents the concerns related to the use of IPv4 as expressed in WG-WSIS-17/11 (see Annex) to the 2nd meeting of this IPv6 Group.

Annex:

Contribution from Saudi Arabia to the Dedicated Group on Internet-related public policy issues

Effects of IPv6 rollout delays on public policy regarding IPv4

1. Background

It is globally acknowledged that IPv4 addresses are running out. Estimates vary somewhat, but there appears to be consensus that IANA will run out of blocks in 2011 and the Regional Internet Registries (RIRs) will run out in 2012.

The long-term solution is IPv6. However, implementation of IPv6 has been slow. A small percentage of Internet transactions use IPv6, and there is no possibility that the overall Internet infrastructure will be ready for IPv6 in 2012.

There are many reasons for the delay in implementing IPv6, but the key issues appear to be that v4 and v6 are incompatible with each other (so general translation is not feasible) and there is no immediate economic incentive for the operators to convert. Indeed, some observers have noted that early adopters of IPv6 are at an economic and functional disadvantage.

RIRs have no real ability to force operators and ISPs to implement IPv6 on any particular schedule. Even governments have not so far demonstrated any notable success in this area.

2. Implications on IPv4

Because no more "/8" blocks (2^{24} addresses) are available for assignment by IANA or the RIRs does not necessarily mean that IPv4 addresses have been used efficiently. Indeed, original legacy allocations to the US Government, universities, and defense contractors were huge compared to more recent allocations. Many allocation holders have extensive unused blocks, though current rules governing the RIRs do not allow for direct exchanges between block holders. Several of the RIRs are preparing positions on changing these rules.

It appears to be a reasonable assumption that allocation holders will do what is in their economic self-interest, whether it be more efficient use of their existing blocks through schemes such as network address translation (NAT), transfer of allocations between holders or implementation of IPv6.

3. Issues with transfer of allocations

In spite of about 4 billion IPv4 addresses, there are only about 250K routes in the routing tables. This is accomplished through aggregation (being able to restrict the number of digits used to make a routing decision) by assigning operators blocks of contiguous addresses. Any plan to allow transfer of allocations will inevitably increase the number of routing table entries. However, there are limits to the capabilities of routers available now and in the medium term, and it is important that there not be wildly uncontrolled growth in the number of routes, called disaggregation, for fear of disturbing the stability of the Internet.

Any changes to rules for transfers need to avoid black markets. Similarly, though pricing is probably best left to market forces, there is a possibility of windfalls (such as to legacy holders of very large blocks), which could create negative backlashes, and of certain players trying to manipulate the market. Some of these issues might be addressed through leveraging the experience of the RIRs to have them mediate transfers in such a way that appropriately sized blocks are transferred and only to those who have demonstrated need, similar to current allocations of new blocks.

Another issue that needs to be addressed is transfers between RIRs, specifically, determining whether any type of control needs to be implemented which may limit transfers from poor regions to rich regions.

4. Proposal

It is important that every effort be made to expedite implementation of IPv6. However, it is also important to recognize that IPv6 will not have been sufficiently implemented when the issuing authorities, IANA and the RIRs, run out of IPv4 blocks. The growth of the Internet will be able to continue in a stable fashion for some additional period by greater use of schemes such as NAT and by transfers of allocated numbers.

Besides their responsibility for setting international Internet-related public policy, governments also have a responsibility to assure the stability, sustainability and security of the Internet. It is important to ensure that policies are in place to help

manage the use and transfer of IPv4 addresses in the interim period until adequate implementation of IPv6 is achieved, whether through economic necessity or other factors.

It is proposed that the General Secretariat study the issues and the alternatives in more detail and prepare a report for the Dedicated Group for its next meeting. The report should include actions underway within ITU, other intergovernmental organizations and other international organizations, with particular emphasis on IANA and the RIRs. The report should conclude with recommendations on specific policies that should be adopted by the Dedicated Group and disseminated.

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