

“To provide professional and efficient distribution of Internet number resources to the African Internet community, to support Internet technology usage and development across the continent and strengthen self Internet governance in Africa by encouraging participative policy development.”

Index

-
- Page 2**
IPv6 Where Africa should Stand
-
- Page 3**
Multi-Homing a New Challenge for African ISPs
-
- Page 4**
4 byte ASN what is it?
AfNOG a forum for African Network Scalability
2005 ASO AC/NRO Number Council elections
-
- Page 5**
AfriNIC training report
MyAfriNIC – A New, and User Friendly Web Portal
-
- Page 6 – 7**
RIR updates
- ▶ ARIN
 - ▶ APNIC
 - ▶ RIPE NCC
 - ▶ LACNI
-
- Page 8**
Competitive Addresses Allocation
-
- Page 10**
Deprecating ip6.int
Upcoming Events
2005 Board elections
-
- Page 11**
End of the Second Phase of the WSIS
Policies Under Discussions in AfriNIC region
-

AfriNIC, up and Running



In April 2005, AfriNIC, serving the Africa region, became the

fifth Regional Internet Registry (RIR). Since then, we have taken over the management of Internet resources in our region. The results so far look encouraging. In 2005, we doubled the number of new members compared to the previous year and allocated resources in the same proportion. Our membership has increased from 142 to 197. We have allocated 3185 new /24 IPv4 addresses (815,180 addresses), three new /32 IPv6 addresses (7.92282E+28 addresses) and 34 new ASNs. In total, eight training events have been conducted in the region and, for the first time, we conducted training in a language other than English (French). This allowed Francophone network operators to have access to the same information as their Anglophone counterparts. We are planning to reinforce this area of our activity in 2006 by organising more training. Online training material is being developed with the support of ARIN to give a broader access to the community at large.

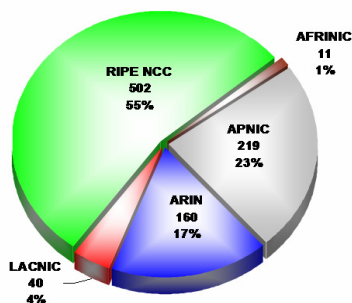
Along with handling the new activities, AfriNIC has had the chance (or the bad luck) to become operational at the same time as the Internet Governance model is being questioned through the World Summit for Information Society (WSIS). The duty to follow the summit and report the process to the community and how we fit in the picture fell onto our shoulders. Although at the end of the process, nothing has changed globally, for our region, a lot has changed: Governments now have a different view of the Internet and are more open to some issues, such as the importance of exchange points and of an inclusive Internet policy definition. These are big steps for the Internet in this part of the world. After the WSIS in Tunis, it is now the time to consolidate these ‘acquisitions’ and reinforce partnerships between the private sector, civil societies and governments.

IPv6 deployment, where should Africa stand?

Adiel A. Akplogan (AfriNIC)

Internet Protocol version 4 (IPv4) is the protocol that has been used to run the Internet since the beginning of its development. In the mid 1980s, with a fear of exhaustion of IPv4 addresses, the Internet Engineering Task Force (IETF) designed a new protocol with more available address space and which enhanced some functionality of IPv4. Since 1997, IPv6 has become a standard protocol. The new protocol has also been designed to handle a transition from IPv4 by integrating several mechanisms. With IPv6, the number of available addresses is multiplied by 2^{96} , giving a theoretical possibility to allocate 6.67×10^{27} **IPv6 addresses per square meter**.

Functionality, such as mobility, automated configuration with an elaborate neighbour discovery process and native encryption headers for security enhancement, has been implemented. Many operators in developed countries have started IPv6 experiments and deployment lately. This has resulted in an increasing number of IPv6 address allocations in other regions.



IPv6 Allocation per RIR region

In April 2005, AfriNIC, as a regional registry, was allocated the IPv6 block 2001:4200::/23. We have already started allocating to organisations in our service region from this block. To encourage LIRs to request IPv6 address space, the AfriNIC board of directors decided to waive all fees associated with IPv6 allocations to all already established LIRs.

The questions now are: how much longer will African operators have to wait before starting to play with IPv6? What are the requirements to enable them to start? Is there a cost associated with moving to IPv6? At AfriNIC, we think that there is no reason for not starting IPv6 deployment. The protocol is quite mature, applications that support IPv6 have appeared and the addresses are available. "I have been amazed at how easy it has been for me to setup an IPv6 platform in my lab with a tunnel connection ... frankly, this cost me nothing," says Alain Aina, CEO of TRSTech, a small consulting company in

Togo.

Although it wouldn't require huge investments in most cases, the idea is not to start offering native IPv6 services right away but to have an incremental deployment plan according to the size of your infrastructure. In Africa, we are lucky enough to still run quite small networks which are easy to upgrade, and where dual stack services are offered, this can generally be done easily. "We have been able to setup native IPv6 services for several small operators in Latin America in a short timeframe, around one day to one week," says Jordi Palet Martinez, a volunteer IPv6 trainer and consultant.

In several cases, the lack of information and an IPv6 showcase in our region has been indicated as the reason for this late move. AfriNIC acknowledges the situation and is committed to increase IPv6 awareness by adding a specific IPv6 module to its training courses. A project called V6Mandela has been launched to drive this awareness and training program. The first IPv6 hands-on training and meeting will be held in Cairo, Egypt during the AfriNIC-3 Public Policy Meeting held from 11 to 14 December 2005.

The better our operators are prepared for the move to IPv6, the less it will cost them. The perception of the costs associated with this transition can also be considered as a discouraging factor. The V6Mandela project aims to help operators to minimize these costs by promoting experience and best practice sharing, tunneling and connection points on the continent. AfriNIC is working with several entities on this project.

To request your own IPv6 addresses in the AfriNIC region, please check that you are eligible. See here for details: <http://www.afrinic.net/rs/eligibility.htm#v6>. Please also read the active IPv6 Allocation Policy in the AfriNIC region at:

<http://www.afrinic.net/docs/policies/afpol-v6200407-000.htm#5>

IPv6 Allocations in Africa (December 2005):

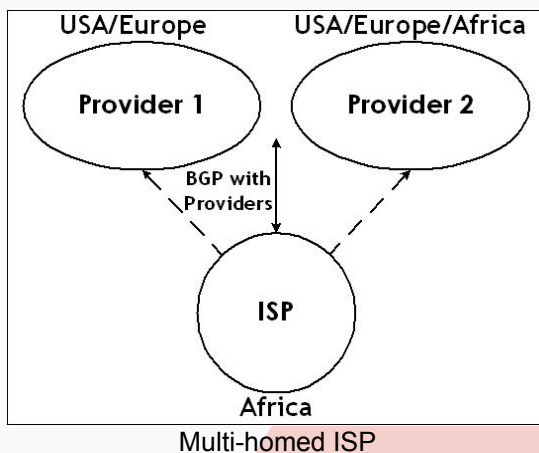
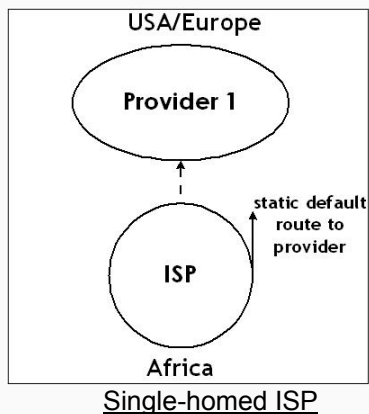
Prefix	Organisation	CC	Date
2001:528::/32	Telkom SA	ZA	24-Oct-02
2001:970::/32	ATI	TN	24-Oct-02
2001:588::/32	UUNET	ZA	11-Feb-03
2001:18B0::/32	IS	ZA	11-Nov-03
2001:19D8::/32	CMC Networks	ZA	21-Sep-04
2001:4820::/32	NIC.MW	MW	21-Dec-04
2001:4300::/32	MCIT	EG	14-Dec-04
2001:4308::/32	ICOZA	ZA	19-May-05
2001:4310::/32	CNRST	MA	27-May-05
2001:4200::/32	TENET	ZA	20-Oct-05

Multihoming – A New Challenge for African ISPs

Alain P. Aina (TRS)

The times of single-homing seem to be in the past for big operators in Africa. Many of them are reinforcing their Internet capacity, traditionally based on a satellite link with a second connection. Some take advantage of submarine cables directly or go through coastal countries which become hubs.

This new situation imposes certain requirements to ISPs. An ISP needs to have its own IP Address space, Autonomous System Number (ASN), and handle Border Gateway Protocol (BGP) and its attributes (AS path, Next hop, local preference, MED, Community, origin, Aggregator,) to achieve traffic engineering with links of different capacities.



For ASN and IP Address space suitable for the size of African ISPs, AfriNIC, the fifth accredited RIR makes things easier. If you meet the technical requirements, Financial conditions to become AfriNIC members and get IP blocks and ASNs are available at:

www.afriNIC.net/docs/billing/afadm-fee200504.htm

Furthermore, AfriNIC organizes periodical training events, in English and French, on the use of their database based on RPSL.

For BGP, the solution seems less obvious. Regarded as a complicated routing protocol for a long time by many operators more familiar with static routing, it has to be faced, discovered and adopted. Simple cases consist of one border router running eBGP with both providers. Others need iBGP between two border routers running each eBGP with a provider. In some countries, links to local Internet Exchange Points (IXP) are added to these configurations. IXPs are in progress on the continent. (http://www.nsrc.org/AFRICA/afr_ix.html). These activities make some operators discover the mirror and routing registries with its objects.

```
aut-num: AS0
as-name: TEST-NET-AS
descr: TEST-NET ASN
import: from AS65534 action pref=100;
       accept ANY
import: from AS65533 action pref=100;
       accept ANY
export: to AS65534 announce AS0
export: to AS65533 announce AS0
admin-c: Admin-AS0
tech-c: Tech-AS0
mnt-by: MAINT-MNT
mnt-lower: MAINT-lower-MNT
mnt-routes: MAINT-routes-MNT
source: TEST
```

An aut-num object from routing registry

```
route: 192.0.2.0/24
descr: TEST-NET
origin: AS0
source: TEST
notify: as0-notify@example.com
mnt-by: MAINT-routes-MNT
changed: nic@example.com 20051015
```

A route object from routing registry

We can now say that the Internet in Africa is at a turning point. More bandwidth is available, national IXPs are increasing and regional hubs are being created. Users are therefore receiving better services.

The times of single-homing seem to be in the past for big operators in Africa. Many of them are reinforcing their Internet capacity, traditionally based on a satellite link with a second connection.

Useful links

www.ws.afnog.org/afnog2005/e2/40-bgp/bgp.ppt
www.nanog.org/mtg-0505/pdf/smith.pdf
www.bgp4.as
www.ripe.net/db/irr.html

4 byte ASN - What is it?

Autonomous System Numbers (ASN) are numbers from 1 to 64,511 (excluding 23,456, these are for public infrastructure) and from 64,512 – 65,553 (these are for private use) used to identify networks (sets of routers) under the same technical administration. This pool of numbers is drawn from a 16 bit number field (2 bytes). As the Internet is growing, its consumption is also growing very fast. According to some projections, the actual pool will be exhausted sometime around 2010. To prevent network expansions from getting stuck due to the ASN exhaustion, it has been suggested that the number of bits used to define ASNs be increase from 16 to 32, extending the available number of ASNs to 4,294,967,296. The Internet Engineering Task Force (IETF) draft for comment defines how this new 4 byte ASN works and how it will be integrated into the BGP routing protocol. You can read this document: <http://www.ietf.org/internet-drafts/draft-ietf-idr-as4bytes-11.txt>

AfNOG: A forum for African Network scalability

Dr. Nii Quayor (NCS)

AfNOG is a forum for technical coordination and cooperation among African Internet Service Providers (ISP) and network engineers from the region's universities, research institutions, and industries.

Founded in 1999, the annual series of AfNOG training programs can trace its roots back to the Internet Society's annual INET/Network Training Workshop model. A number of the core developers and instructors for AfNOG's educational programs were participants in one or more of ISOC's annual training workshops, and have extended the model to meet today's training needs in the African region. AfNOG works closely with the Network Startup Resource Center (NSRC), a non-profit organization that has helped develop and deploy numerous computer networks in several countries. The NSRC collaborated with a group of African instructors and workshop organizers to develop the initial curriculum and launch the lab-based technical training programs.

The inaugural AfNOG workshop and meeting took place in Cape Town, South Africa in May 2000, and was subsequently held annually in Ghana 2001, Togo 2002, Uganda 2003, Senegal 2004 and Mozambique 2005. The Cape Town Event in 2000 was followed by Africa's first regional network operators' meeting, and a one-day AfriNIC meeting, which was AfriNIC's first general assembly to establish an African IP address registry. AfriNIC meetings continue to be held in conjunction with AfNOG's annual program. The five-day, lab-based training workshops are typically followed by one or two days of technical tutorials on topics such as engineering wireless networks, Border Gateway Protocol (BGP) and multi-

homing, and IPv6. The AfNOG meetings consist of a variety of short technical presentations and interactive discussions that provide a forum for the entire African networking community to share experiences and challenges in the region and devise a way forward.

Over 310 network operators from 34 African countries have participated in the workshops over the years. Many participants are operators from ISPs, university and research institutions, and non-governmental organizations (NGOs) in their respective countries. About 600 Africans and several dozen partners from the international community have participated in the AfNOG and AfriNIC meetings that follow the one-week workshop each year. The Afnog 2006 Workshop and Meetings will be held in Nairobi, Kenya from 7 – 17 May 2006. For more information, please see <http://www.afnog.org>

In collaboration with International Development Research Centre (IDRC), Network Startup Resource Center (NSRC), the Internet Society, and our many international partners, AfNOG will continue to make available and transfer the necessary tools, technology, information, and training required for strengthening African networking operations and mechanisms for continued Internet development throughout the region.

2005 ASO EC/NRO Number Council election

During the AfriNIC-2 meeting, the ASO AC/NRO NC election was held to elect representatives for the AfriNIC region. Jean Robert Houtomey and Sylvia Geha were elected for 3 and 2 year terms respectively. Alan Barrett was appointed by the board for 1 year term according to ICANN ASO Memorandum of Understanding (MoU). The mandate of the African region representatives is as follows:

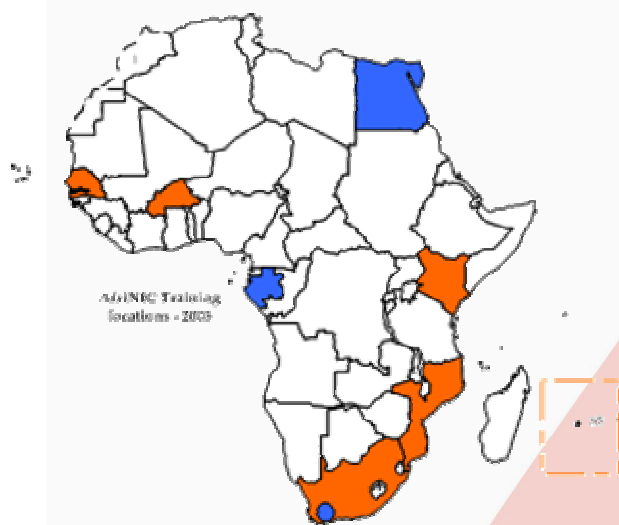
	Mandate	
	Start Date	End date
Jean Robert Houtomey	Apr-2004	Dec-2008
Sylvia Geha	Apr-2004	Dec-2007
Alan Barrett	Apr-2004	Dec-2006

All the new elected representatives have taken their seats and are actively involved in the NRO NC/ASO AC work. For more information about the NRO NC and the ASO AC, see: <http://www.nro.net/about/number-council.html> or <http://aso.icann.org>

AfriNIC Training Report

In our effort to inform and train our members and the local community about AfriNIC and IP resource management in particular, we have setup an active training plan during our first ten months of existence. We have conducted seven training events around the region in both French and English. **Burkina Faso (FR), Tanzania (EN & FR), South Africa (EN), Kenya (EN), Mauritius (EN) and Senegal (FR)**. The training mainly focused on how to request IP resources from AfriNIC and how to interact with our public whois database. In total, 110 people have been trained from various entities, such as ISPs, Telecom companies, Corporations, Regulatory bodies, Governments, etc. The feedback from participants has been very positive so far and for 2006, we are planning to continue the program with more dedicated resources. The new training program will include more hands-on training and will also address some of the innovative IP related issues such IPv6 and DNSSEC.

To be able to reach a broader public, we are working on a Computer Based Training tool which will be available in English at the end of 2005 and in early 2006 in French.



Upcoming Training Courses for 2006

Location	Date	Module
Cairo	11-Dec-2005	LIR
Cairo	12-Dec-2005	IPv6
Cape Town	19-Dec-2005	LIR

For further information about AfriNIC's Training program, please go to <http://www.afrinic.net/training/> or contact our training team at training@afriNIC.net. The 2006 training plan will be online soon. If you are interested in attending a training session in your region, do not hesitate to contact us at training@afriNIC.net.

MyAfriNIC: A New, User-Friendly Portal

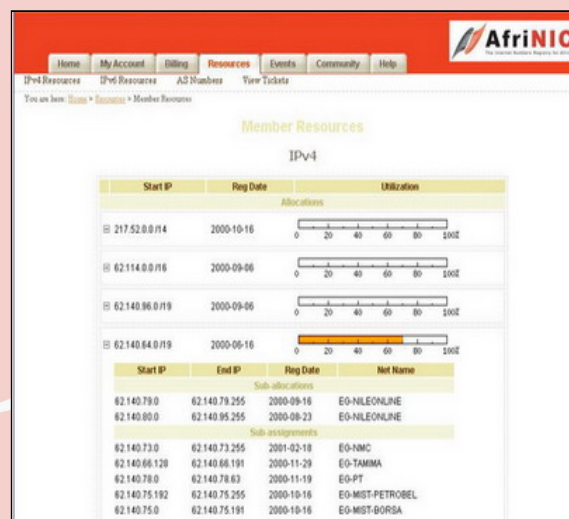
Frank Nnebe (AfriNIC)

MyAfriNIC is a new web-based portal which will be launched in early 2006. It will provide members with a graphical, interactive, user-friendly interface to manage their AfriNIC membership.

Through the portal, members will be able to view their IPv4, IPv6 and AS Number resources, request or make changes to their assignments and allocations, add or maintain up-to-date information on organization contacts, and view and pay their bills online.

In addition, MyAfriNIC will provide members with an enhanced level of technical service and support. Members have the ability to instantly view and track the workflow of requests made to AfriNIC technical staff, such as the correspondence history and status of all open tickets/requests. Members will also have instant access to FAQs and help guides.

MyAfriNIC will make it easy for members to register for meetings, training sessions, vote in AfriNIC elections or policy proposals and manage their subscriptions to AfriNIC mailing lists.



Screenshot of the MyAfriNIC Interface

We will soon call for volunteers to help us test the beta version of the portal and get some feedback on its functionalities.

If you are interested in becoming a beta tester for MyAfriNIC, please contact myafriNIC-test@afriNIC.net. Please note that you must be an active LIR to be able to do so. More Information is available at: <http://www.afrinic.net/myafriNIC>

RIR Updates

APNIC

APNIC Launches ICONS

As part of its commitment to serving the Asia Pacific Internet community, APNIC recently launched ICONS, the Internet Community of Operational Networking Specialists. Built on the open source Mambo software, ICONS is a dynamic web resource which will allow the global Internet community to share information about networking topics that are affecting ISPs and network operators. The site boasts a range of features to promote this exchange of information, including a discussion forum, documents, presentations, and relevant links.

The APNIC Secretariat has seeded the site with links, articles, and presentations, and it is envisaged that through community involvement ICONS will grow into a dynamic live resource. APNIC encourages all users in the AP region and beyond with an interest in networking to contribute to the site. In this way, the range of information available to everyone will grow based on the collective needs and knowledge of the community.

You can contribute by becoming a registered user, which will allow you to participate in the discussion forum, post articles, upload documents such as training materials, or simply add to the collection of useful links. You do not have to register to view the site or download the available material. Over time, ICONS will grow into a valuable source of information for the broader Internet community.

Visit the site and make your contribution to the project at: <http://icons.apnic.net>

APNIC 21

Members of the global Internet community are invited to attend the APNIC 21 meeting, which will be held in conjunction with APRICOT 2006 in Perth, Australia, from 28 February to 3 March, 2006. As well as providing a forum for policy development and decision-making in the Asia Pacific, the APNIC meeting also provides a range of educational and networking opportunities. More information on the APNIC 21 programme, including tutorials, workshops, informational presentations, and social events, will be available shortly on the APNIC meeting website, at:

<http://www.apnic.net/meetings/>

ARIN

The ARIN XVI Public Policy and Member Meeting took place October 26-28, 2005, in Los Angeles, California. The meeting featured two roundtable discussions, talks about seven active policy proposals, and reports from ARIN department directors, legal counsel, the Board of Trustees, Advisory Council, and Treasurer.

John Curran, ARIN's Chairman of the Board, moderated a roundtable discussion on "The Future of IPv4" on October 26. KC Claffy, Tony Hain, Geoff Huston, and Thomas Narten discussed IPv4 exhaustion and IPv6 uptake. KC Claffy presented statistics on previous IPv4 allocations and the business capital and processes needed for IPv6 innovation and adoption. Tony Hain and Geoff Huston presented differing statistics on when the pool of IPv4 space will be fully depleted, in terms of IANA's last allocation to an RIR and in terms of the RIRs' last allocations to LIRs and end-users. Finally, Thomas Narten presented information on differences between IPv4 and IPv6 in routing and addressing.

The ARIN Advisory Council met after the Public Policy Meeting and decided to revise two proposals (2005-1: Provider-independent IPv6 Assignments for End Sites and 2005-8: Proposal to amend ARIN IPv6 assignment and utilisation requirement). The AC also forwarded three proposals to last call (2005-4: AfriNIC Recognition Policy; 2005-5: IPv6 HD ratio; and 2005-7: Rationalize Multi-Homing Definition and Requirement), and abandoned one proposal (2005-6: IPv4 Micro-allocations for Anycast Services). In addition, one proposal was withdrawn by its author (2005-2: Directory Services Overhaul).

Two seats on the Board of Trustees and five seats on the Advisory Council are up for election this year. There were four Board candidates, with two present in Los Angeles to give short speeches. There were eleven candidates for the Advisory Council, with nine giving speeches to attendees at ARIN XVI. Candidate biographies and statements of support were available on the website starting October 13. Voting closed on November 4 and election results were announced on November 11. In addition, one seat on the NRO Number Council was appointed by the Board of Trustees during ARIN XVI. Martin Hannigan was appointed to serve a three-year term beginning January 1, 2006.

The next ARIN Public Policy and Member Meeting will take place April 9-12, 2006, in Montreal, Quebec, Canada.

<http://www.arin.net>

RIPE NCC

RIPE NCC E-Learning Centre: The RIPE NCC launched its E-Learning Centre on 1 November 2005. The E-Learning Centre is a free resource available to members of the RIPE NCC and non-members.

The E-Learning Centre will:

- ✓ Enable users to learn in their own space and at their own pace
- ✓ Supplement the training courses provided by the RIPE NCC
- ✓ Provide users with an understanding of how the RIPE NCC and the RIPE Whois Database work
- ✓ Allow users to contact the RIPE NCC trainers for additional help and support

The E-Learning Centre launched with an introduction to creating and updating basic RIPE Database objects. A second module, covering the RIPE Policy Development Process (PDP), is due to be added in January 2006. Plans are already underway for additional modules covering subjects such as IPv6 for LIRs, DNS for LIRs, Advanced Database Objects, IRRToolset and much more. For more information about the E-Learning Centre, visit <http://e-learning.ripe.net>.

RIPE Policy Development Process (PDP): The RIPE community has recently produced a document formalising the PDP used by the RIPE community. The Policy Development Process document is available at:

<http://www.ripe.net/ripe/docs/pdp.html>

A list of current policy proposals and their status is available at:

<http://www.ripe.net/ripe/policies/proposals/>

World Summit on Information Society (WSIS): The RIPE NCC and the other Regional Internet Registries (RIRs) have been actively involved in the WSIS from the first phase of the summit in December 2003. The RIRs, acting together through the Number Resource Organization (NRO), continued to represent the needs of their members and communities at the second phase of the summit in Tunisia in November 2005. The NRO was also actively involved in the Working Group on Internet Governance (WGIG).

The NRO's comments on the WGIG report is available at:

<https://www.nro.net/documents/nro26.html>

LACNIC

From June 27 to June 30 LACNIC VIII was held in Lima, Peru. On this opportunity the scope of the meeting was highly ambitious, as it not only included the Public Policy Forum, but also LACNIC's Annual Member Assembly, the Fourth Annual Latin American NAPs Regional Meeting (NAPLA), the third Latin American IPv6 Forum (FLIP-6) and the Latin America and the Caribbean IPv6 Task Force Meeting (LAC TF IPv6).

This latest edition of NAPLA concluded with an agreement between its operators on the importance of an interconnecting backbone among the region's NAPs. This agreement establishes the guidelines for the development of this regional project.

During the Public Policy Forum, the global policy proposal on IPv6 Address Space Allocations from IANA to RIR was discussed and approved. This proposal has been ratified by LACNIC's Board of Directors. In addition, proposals were analyzed for recovering non-utilized Internet resources and for evaluating additional IPv4 address allocations to ISPs with presence in different countries within the region covered by LACNIC. Finally, the issue of prefix size in IPv6 reassignment was discussed. No decision was made regarding the latter proposals, therefore their discussion continues on the lists.

The Annual Member Assembly authorized new modifications to LACNIC's fee structure, reducing the cost of LACNIC's minimum size allocations, established as a /21, and deciding to cancel the IPv6 space fee for those organizations that are already covering their membership by the allocation of IPv4 space. These changes aim at improving the accessibility of Internet resources in Latin America and the Caribbean. The Assembly also approved the 2004 annual report, which includes the activities carried out by LACNIC staff and budget execution.

Continuing with the promotion of IPv6 adoption in our region, during LACNIC VIII the IPv6 Tour was officially announced. During the following five months the Tour has visited eight cities in eight different Latin American countries with the purpose of providing information and promoting the IPv6 protocol. Until now the Tour has reached more than 1800 attendants.

Lastly, LACNIC IX will be held on the week between May 22 and May 26, 2006, at a location yet to be decided.

Competitive Addressing

*Paul Wilson (APNIC),
Geoff Huston (APNIC)*

In recent months, proposals have been made for the introduction of competition into the system of allocation of IP addresses. In particular, calls have been made for new IP address registries to be established which would compete with the existing Regional Internet address Registries (RIRs). Specific proposals have been made by Houlin Zhao of the ITU-T and by Milton Mueller of the Internet Governance Project, both of which propose that the ITU itself could establish such a registry group, operating as a collection of national registries. It would appear that part of the rationale for these proposals lies in the expectation that the introduction of competition will naturally lead to outcomes of “better” or “more efficient” services the address distribution function. This article is a commentary on this expectation, looking at the relationship between a competitive supply framework and the role of address distribution, and offering some perspective on the potential outcomes that may be associated with such a scenario for IP addresses, or indeed for network addresses in general.

The implicit goal with these proposals for competition in the address distribution function appears to be that such measures are intended to provide the Internet Service Provider with more efficient or easier access to larger quantities of address space, and the consumer with a more efficient, capable and presumably cheaper Internet service. There are two assumptions being made in these proposals that need to be examined: firstly that “better service” as a result of such measures is objectively defined and desired by all stakeholders; and secondly that apparent barriers to access to the efficient operation of address distribution in the existing RIR system (i.e. “bad service” according to the first assumption) are a result of structural inefficiencies that only the discipline of competitive supply channels will rectify.

The explicit goal of the RIR system is to support an address distribution system of a finite pool of addresses that is objective, fair and equitable, while avoiding some of the pitfalls associated with various forms of excessive wastage of addresses ...

Under the current RIR system, access to address space is governed by policies which must necessarily pose a barrier to unfettered or unconstrained resource distribution. Internet resource management is not a ‘free-for-all’ without any form of constraint. The policies that constrain resource allocations are intended to ensure that the resources are readily available now,

and in an anticipated future, to meet demonstrated needs, and the policies also describe how that “demonstrated need” is to be documented and assessed.

The explicit goal of the RIR system is to support an address distribution system of a finite pool of addresses that is objective, fair and equitable, while avoiding some of the pitfalls associated with various forms of excessive wastage of addresses and the possibility of hoarding of address space by those who would profit later when scarcity drives the address value up. To determine whether a claimed need is genuine (or is “demonstrated”) is a non-trivial exercise, necessarily involving the collection and analysis of information received from the applicant, and the application of a set of evaluation criteria in a uniform manner such that the same set of evaluation constraints are applied to the address distribution function in every individual case. These constraints are expressed as policies, which in turn are generated by industry players and related stakeholders, so that the constraints are the expression of common objectives. This is by no means a unique arrangement, and this structure is a very typical example of industry self-regulation as seen in many other activity sectors.

Is this address distribution function one that could benefit from the introduction of competitive suppliers?

... it is clear that if competitive supply systems were introduced to address space management, the basis of that competition would be in terms of policy differentiation, or, in other words competition in the relative ease of access to address space.

In general terms this is an instance of a very common area of study of markets of suppliers and consumers. Competition in markets for undifferentiated commodities cannot be based on differentiation of the goods themselves precisely because they are undifferentiated commodities. This is certainly the case in address distribution, as one address value is undistinguishable from any other. Nor can the competition be based on efficiency of production processes and the resultant marginal cost of production of the commodity, given that the good is not the outcome of any production process. The only other attribute where competitive differentiation is possible within this type of market is that of competitive differentiation of the constraining policies themselves. In other words the competitive differentiation is expressed in terms of policy shopping, where a consumer transacts with a particular supplier on the basis that the supplier will accede to the consumer’s request. Here the competitive impetus is that a supplier is incited to dilute the constraints in order to gain a larger customer base, leading initially to accelerated consumption and decreased efficiency of usage, and

ultimately to the removal of all constraint , resulting inevitably in premature exhaustion.

Applying this economic perspective to the distribution of Internet addresses, it is clear that if competitive supply systems were introduced to address space management, the basis of that competition would be in terms of policy differentiation, or, in other words competition in the relative ease of access to address space.

It appears likely that the initial outcome of such a competitive supply structure would be the introduction of differences in the form of constraints applied by the competing address suppliers. What we would probably see is policy divergence within competing management systems. By contrast, at present we have one single globally cohesive Internet, which results not only from the ubiquity of the Internet Protocol, but also from the consistency of the policies under which various Internet resources are managed. The global consistency of address management policies and specifically of the associated aspect of the use of addresses in the context of a functioning global Internet routing system is a necessary and vital part of the cohesive bonds that link together thousands of individual networks into a single global Internet.

There is no natural constraint that individual IP addresses have to remain firmly rooted in any particular national environment, nor any natural imposition that such national address registries are constrained to offer services only to their national community, particularly if competition in an open market is the desired outcome.

It seems intuitive that differentiation of address policy in a competitive environment would not naturally result in an increase in the level of constraint placed on the address distribution function. Indeed the opposite is the more probable case, where the outcome of such competitive address distribution systems would be the progressive relaxation of associated policies and procedures, and a continuing acceleration in address space allocation rates, leading to early exhaustion of the entire address pool, even one as large as the IPv6 address space. This outcome would appear to compromise the fundamental goals of responsible stewardship of a finite common public resource.

The five Regional Internet Registries cooperate closely to ensure consistency of policies that are developed in their regions. Other competitors would not necessarily do so, nor would they be strongly motivated to do so under a competitive discipline. A necessary characteristic of these competitive supply proposals is that suppliers should be able to manage address space in a relatively autonomous fashion, which implies not one additional address management system, but up to 200 or so such national entities. Close coordination

among these various regimes would be difficult or even impossible, even if such an arrangement were to be fully and genuinely intended by all participants, particularly if open competition is the intended framework. It is also clear that competition would not be constrained to that competition between each national supply system and the relevant regional registry. As we have seen in the Domain Name business the market would likely open out across national systems. There is no natural constraint that individual IP addresses have to remain firmly rooted in any particular national environment, nor any natural imposition that such national address registries are constrained to offer services only to their national community, particularly if competition in an open market is the desired outcome. This is then not a duopoly of supply within any national regime between the national address registry and the associated regional address registry, but one of diverse competitive pressure brought about by hundreds of actors, where the competitive pressure is ultimately expressed as the removal of any form of constraint in making address allocations. The term “headlong stampede to resource exhaustion,” or perhaps more often termed a “race to the bottom” comes to mind to describe the consequences of such an environment.

The results of divergent address management policies would have global impact, for instance in terms of the size or stability of global routing tables, which could certainly threaten global Internet stability and routability. The irony of this form of outcome is that routing table effects would heavily impact smaller ISPs and particularly those in developing nations, which are less likely to have the latest high capacity hardware and related routing capacity, and it is this same community who are said to be in the greatest need of this form of competitive access to IP addresses.

If this is a natural outcome of multiple providers in a commodity market, why have we not seen such outcomes of market distortions from the existing RIR system, where there are 5 separate entities performing this supply function? While the RIRs are regarded as service organizations, the goal of the RIR system is not to remove all forms of supply constraint on the availability of access to IP address space at the expense of the viability of the network itself. Within the constraints imposed by address management policies, the RIRs have the common objective of ensuring that service quality is maximized and the operators of networks have access to addresses to support their deployment of network infrastructure. Indeed, as membership based organizations, RIRs are subject to the scrutiny of their members, industry players and wider community of stakeholders, through regular open policy meetings and associated processes. This self-control structure ensures that the constraints applied at any time are an expression of the common desire for a fair and transparent set of constraints that foster an efficient and effective communications network. This is indeed the manner in which self-regulatory frameworks are intended to operate, in ensuring that through

effective balancing of a full spectrum of interests, a common position of responsible constraint works in the longer term interests of the ultimate funding source of the entire industry – the end user of the Internet.

This commentary should not be read as a diatribe against all forms of competition as a mechanism of market control. Indeed, one view of the Internet itself is that it is a very eloquent statement of the power of competitive frameworks where suppliers are incited to continually innovate and refine their offering to offer their customers a superior service in terms of quality and price. Failure to do so on the part of any single supplier leads to the ascendancy of competitive suppliers who are capable of performing their service role in a more efficient and innovative manner. But competition is not a panacea and there are a large number of situations where unfettered competition in the supply of a resource can lead to various destructive outcomes that may completely destroy the value of the resource itself. This is often seen in aspects of environmental economics where the balancing factors of an open market often cannot take into consideration the longer term interests in conserving the exploitable value of a renewable resource.

In the case of the Internet, addressing lies at the very heart of the network. Without a framework of stable, unique and ubiquitous addresses there is no single cohesive network. Without a continuing stable supply of addresses further growth of the network simply cannot be sustained. Without absolute confidence in the continuing stability in this supply chain the communications industry will inevitably be forced to look elsewhere for a suitable technology platform for the needs of networked data communications. If the industry is pushed into such an uncomfortable position of turning its attention elsewhere simply because the Internet is incapable of operating its infrastructure in a stable and cost effective manner, this would be a most unfortunate unintended outcome for the Internet and its billions of current and future users of this uniquely valuable common resource.

Deprecating ip6.int

As **in-addr.arpa** is the domain for reverse mapping of IPv4 addresses to names, **ip6.int** has been the zone used at the beginning for IPv6 address reverse mapping. In 2004, it was decided by the IETF to stop using the domain **ip6.int** and move the IPv6 reverse mapping to **ip6.arpa**, making it consistent with its predecessor. The deprecation of the domain **ip6.int** will come into effect on January 1st 2006. Starting then, none of the RIRs will provide or support reverse on IPv6 allocated address within the **ip6.int**. In the AfriNIC region, we do not have any IPv6 reverse AfriNIC delegated in that zone. Hence this deprecation will have no effect in our region.

Upcoming Events

Event	Date	Location
SANOG 7	16-24 Jan-2006	Mumbai (IN)
APNIC 21	20-Feb - 03-Mar-2006	Perth (AU)
APRICOT 2006	20-Feb - 03-Mar-2006	Perth (AU)
IETF 65	19-24 Mar-2006	TBD
ICANN	27-31 Mar-2006	Wellington (NZ)
ARIN-XVII	09-12 Apr-2006	Montreal (CA)
RIPE-52	24-28 Apr-2006	Istanbul (TK)
AFNOG 7	07-15 Mai-2006	Nairobi (KE)
AfriNIC-4	16-17 Mai-2006	Nairobi (KE)
LACNIC-IX	22-26 Mai-2006	TBD
ICANN	26-30 Jun-2006	Marrakech (MA)
IETF 66	09-14 Jul-2006	TBD
SANOG 8	27-Jul-04 - Aug-2006	Karachi (PK)
RIPE-53	TBD	Amsterdam (NL)
ARIN-XVIII	October	TBD
AfriNIC-5	November	Mauritius
IETF 67	05-10-Nov-2006	TBD

2005 Board Elections

During the AfriNIC-2 meeting in Maputo, seats 5 and 6 of the AfriNIC Board of Directors were open for renewal. Following the elections, they were filled as follows:

Central Africa	Indian Ocean
Didier R. Kasolé	Viv Padayatchy
Gäetan Bouraga	Kenneth Yiptong

End of the Second Phase of the WSIS

Adiel Akplogan (AfriNIC)

Phase two of the WSIS ended November 18 with quite a positive result for the stability of the Internet. The final document doesn't call for a reinvention of the Internet governance system as it is today, but encourages all stakeholders to better collaborate and cooperate on Internet governance matters. The document also calls for the reinforcement of the actual regional organisation by an increased participation from all stakeholders including governments to the policy development process.

"We are very pleased that the policy development processes of the Regional Internet Registries (RIR) have been recognized and reinforced by the Tunis Agenda. Over the coming months and beyond, we will continue our ongoing efforts to reach out to governments, as well as to other stakeholders, in order to exchange views on the Tunis outcomes and to develop priorities for the future" said Axel Pawlik, chairman of the NRO.

AfriNIC fully endorses this view of the NRO and will continue its effort to reach out to governments and all our stakeholders around the continent.

The conclusion of this last phase of the summit should not be seen as the end but the beginning of a long process where the actual Internet Governance mechanism must see more involvement from all the stakeholders and particularly from governments.

In our region, we can say that the WSIS process also had a very positive impact on governments and policy makers as it brings their attention to the 'other side of the Internet', the governance side, and its possible impact on the countries' economies.

AfriNIC, as one of the Internet governance players in Africa, will continue to work closely with other stakeholders to reinforce Africa's participation in the Internet Governance mechanism and debates so that our region's voice is heard where needed. We will further continue to follow the debates and initiatives on the digital divide including those related to Internet Governance.

For more information about the WSIS:

WSIS Official Web site:
<http://www.wsis.org>

The NRO and the WSIS
<http://www.nro.net/wsis/>

Policies under discussion in AfriNIC region

AfriNIC policies are developed through a bottom up process where policy changes and new proposals come from the community. The following policies are presently under discussion on the AfriNIC policy working group mailing list and will be on the agenda of the meeting in Cairo.

■ Temporary Assignments & assignments for critical establishments (like IXPs).

Policy Affected: New
 Date: 16-Apr-2005

The proposal defines the policy that AfriNIC will use to assign IP Addresses for temporary use. (Alain Aina)

■ Direct/PI Assignments from AfriNIC to end-user organisations.

Policy Affected: New
 Date: 16-Apr-2005

The proposal defines the policy for Provider Independent (PI) IPv4 Assignments to end-user organisations in the AfriNIC region (Mark Tinka).

■ Criteria for assignment of AS Numbers.

Policy Affected: afpol-as200407-000
 Date: 16-Apr-2005

The proposal defines minor changes to the criteria for ASN assignments in the AfriNIC region (Mark Tinka).

*** Section 4 of the policy document*

■ Global policy for IPv6 Allocation from IANA to RIRs.

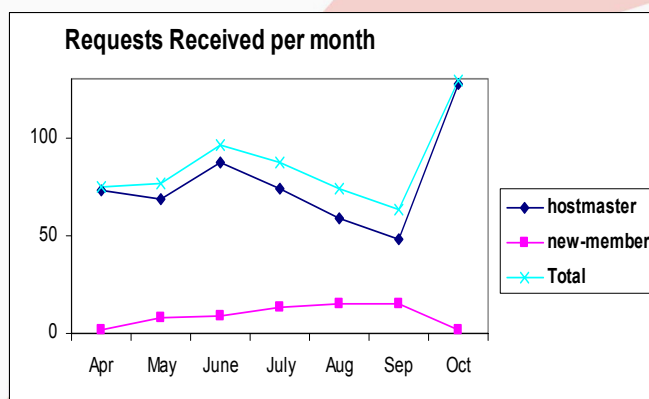
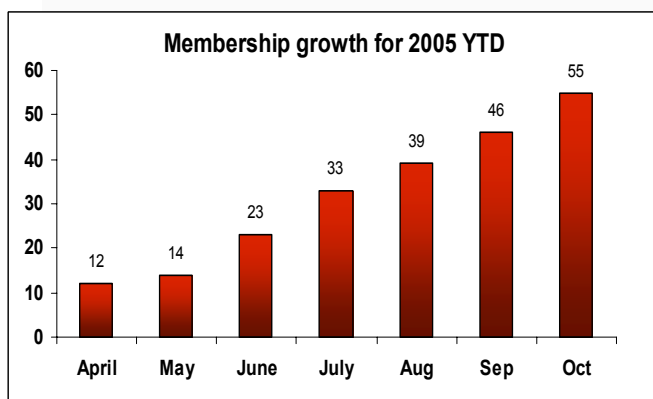
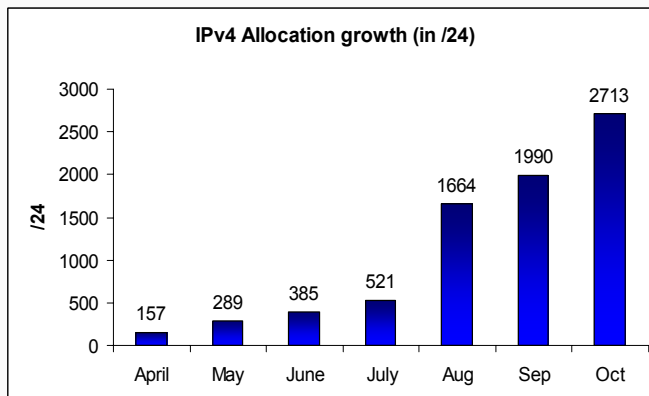
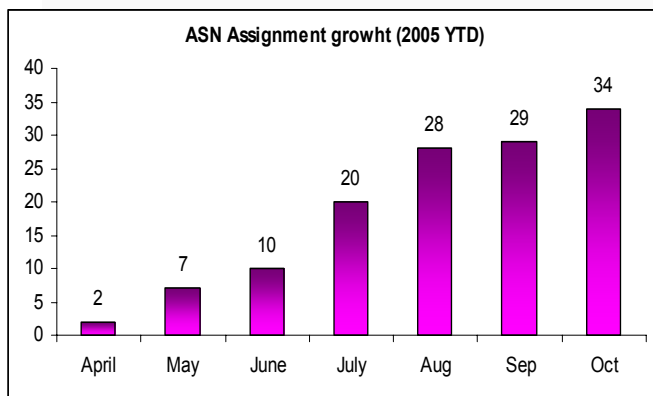
Policy Affected: New
 Date: 16-Apr-2005

This proposal describes the policy governing the allocation of IPv6 address space from the IANA to the Regional Internet Registries (RIRs). This document does not stipulate performance requirements in the provision of services by IANA to an RIR in accordance with this policy. Such requirements will be specified by appropriate agreements between ICANN and the NRO (Alan Barrett).

For more information about AfriNIC Policy development processes, please go to:
<http://www.afrinic.net/pdp.htm>

You can participate to policy discussions by subscribing to the policy-wg@afriNIC.net mailing list.

Some Statistics from AfriNIC the Registration Service



AfriNIC mailing lists

Mailing lists are the main discussion tool for the AfriNIC community. Anybody can participate to our process by subscribing to one of the public mailing lists listed below. **To subscribe, you need to send an empty e-mail to {name_of_the_list-request}@afriNIC.net with the word 'subscribe' in the subject line.**

Mailing list	Description
afriNIC-discuss@afriNIC.net	General discussion and announcements on AfriNIC activities
policy-wg@afriNIC.net	Policy discussion mailing list (All policy proposals must be made on this list)
afriNICv6-discuss@afriNIC.net	IPv6 technical discussions
training-discuss@afriNIC.net	Discussions on training related issues and feedback

AfriNIC Office Address

Address: 03B3, 3 rd Floor, Ebène Cyber Tower, Cyber City, Ebène, Mauritius

Phone: +230 466 6616

Fax: +230 466 6758

E-mail contacts

General: contact@afriNIC.net

AfriNICNews: afriNICnews@afriNIC.net

Ressources Allocations (IP Analysts): hostmaster@afriNIC.net

Billing: billing@afriNIC.net

Database Help: afriNIC-dm@afriNIC.net

Training: training@afriNIC.net