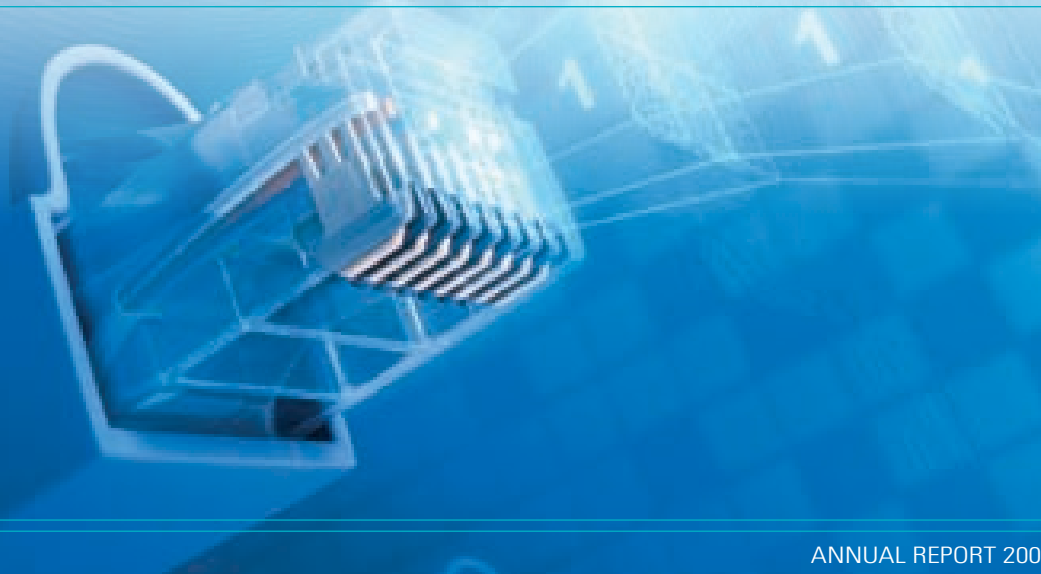


# technical Operations Area

The IP Resource management is one of the critical areas of AfriNIC's activities. 2007 has shown a great growth in its activity through new members and Resources Allocation/Assignment. This service has also migrated to MyAfriNIC back-end in order to use the same interface to track members and their resource usage. Herewith is the 2007 overview from the registration services.

## Quick Highlights

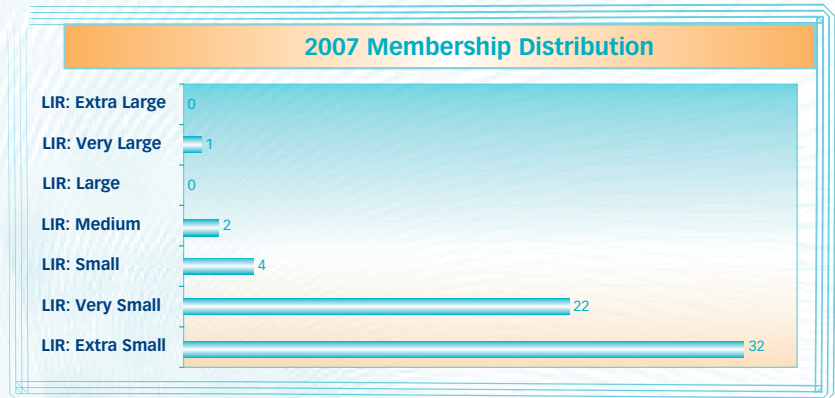
	2006	2007
IPv4 addresses allocated & assigned (x /24)	2,694,912	5,684,408
IPv6 addresses allocated & assigned (x /32)	20	16
AS Numbers assigned	52	69
<b>IANA Allocations:</b>		
IPv4 (x /8)	-	-
IPv6 (x /12)	-	-
ASN (x 1024)	-	-
New Members	73	82
Closed Members	-	13
Tracked e-mail tickets handled	1,080	1,472
Total Staff Count	2	2



# technical Operations Area

## Membership

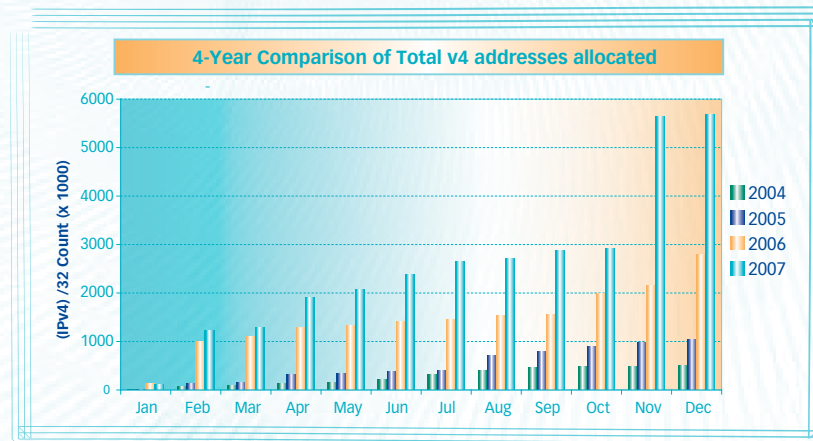
A total of 82 new member applications were successfully approved in 2007, a 12% increase from 2006. There were 62 new LIRs. In the "End-User (EU)" category, there were only 16 Small members, while for the "AS" category, only 4 applications were approved.



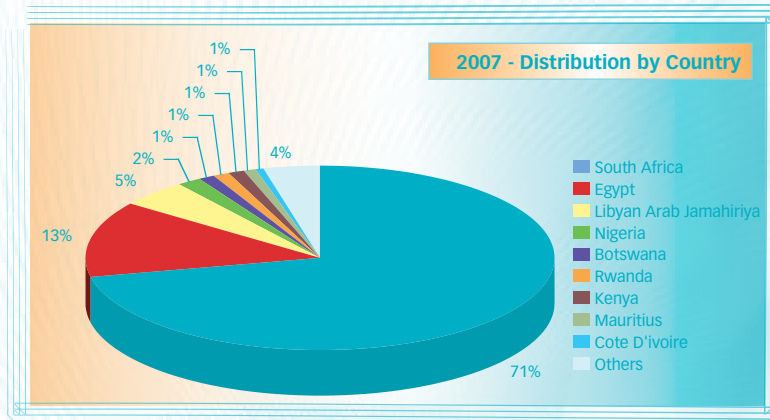
## Number Resources

### IPv4

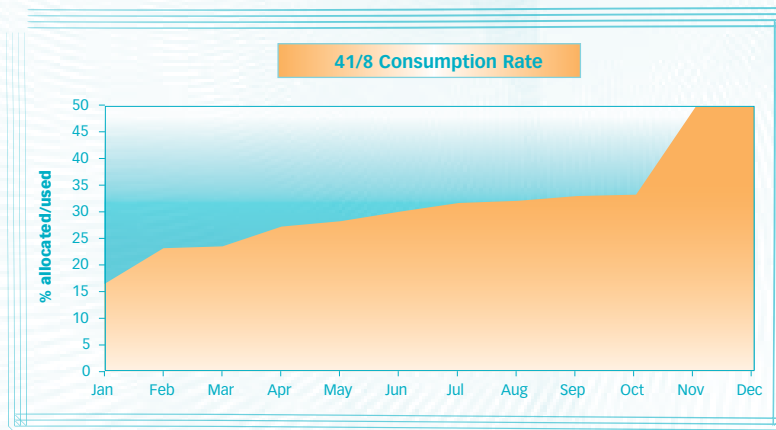
Compared to 2006, the total IPv4 address space issued to our members was significantly higher. There was a 111% increase in allocated IPv4 addresses from 2006 to 2007. As can be seen from the graph below, there is a steep rise in 2007's allocation trend in November as a result of an allocation made to one very large member for replacing their large NAT network with globally routable addresses. This was one of the allocations made in support of discouraging the improper use of NAT by ISPs in our service region.



# technical Operations Area



Under the EU policy for assigning resources to critical Internet infrastructure, we registered and assigned IPv4 address space to 2 Internet Exchange Points. Among the new members were three academic institutions whose IPv4 address requests were evaluated taking into account the MoU signed between AfrinIC and the AAU.

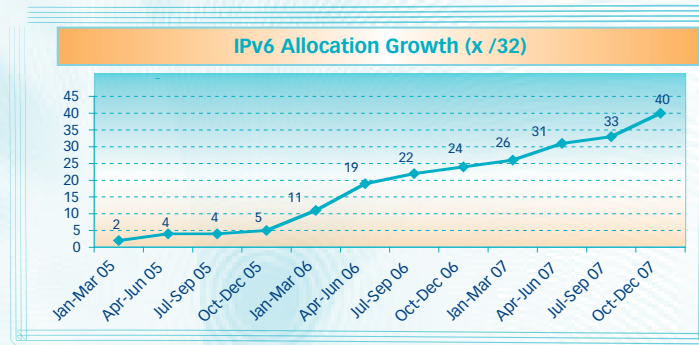


With currently close to 50% consumption of 41/8, we will probably be in position to request a new /8 Block from IANA in 2008

# technical Operations Area

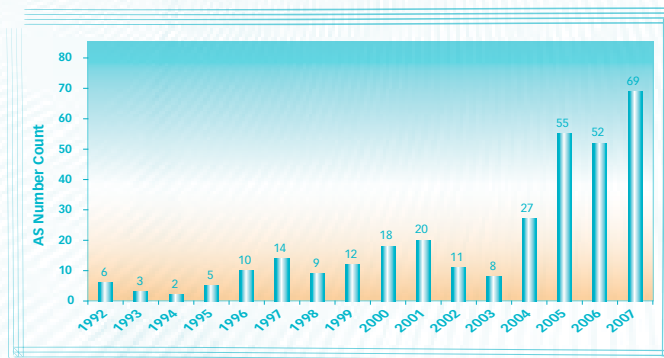
Not all of the allocated v6 address space was publicly announced and that became one focus of the registration service in order to improve it. We have started sending periodic reminders to members so that they fulfill their commitment by announcing their IPv6 prefix in the 12 months following an allocation. This action yielded some positive results as several prefixes appeared on the v6 Internet following these reminders.

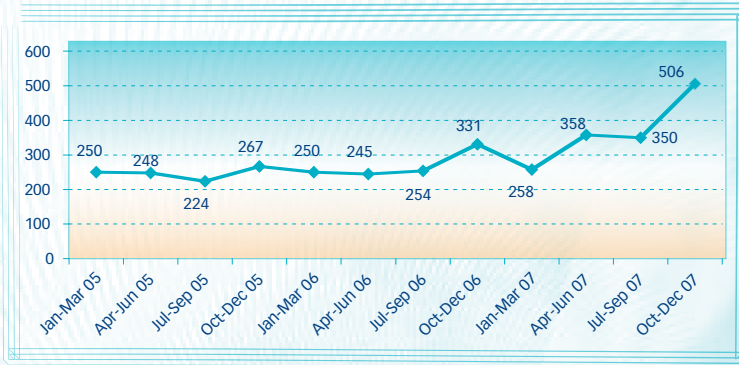
There are still a few ARIN and one RIPE /32s that have not been returned (for renumbering into 2001:2300::/23), and we have temporarily put this issue on hold as we think that enough reminders have already been sent to the holders.



## AS Numbers

We assigned 69 2-byte AS Numbers in 2007, which is a 33% increase from 2006. Regarding 4-byte AS numbers, only 4 were assigned. This is probably because not many vendors support 4-byte AS numbers. Routing tests with 4-byte ASNs using *quagga* and *Cisco* gear were all successfully conducted. 4-byte ASNs will probably pick up after 1 January 2009, since, according to the 4-byte ASN policy, we are requested to assign a 4-byte ASN to any applicant that does not explicitly specify a 2-byte ASN in the request.





### Ticketed E-Mail Correspondence

There were a total of 1,472 e-mails that were processed through the incident tracking system (RT) in 2007, an increase of 36% from 2006 - 80% of these being on the *hostmaster* queue. On average, more than half of the IPv4 and ASN resource requests we received were approved.

### Member Closures and Resource Returns

Members were closed last year according to the following classification:

LIR: 11  
EU (AS): 3

All the 3 EU (AS) members willingly returned the resources as unused, while all the LIRs were closed for non-payment.

AS Numbers and several disparate IPv4 allocations were reclaimed from the closed members. Among these resources include some outside 41/8 and 196/8 which will be returned to the parent RIR after 12 months from the date of member closure.

# technical Operations Area

## Software & Engineering Department

### About SED

The Software & Engineering Department (SED) is responsible for the system infrastructure, software and services provided to the internet community in the AfriNIC service region.

We administer the Whois service, Reverse DNS zones, membership registration, ticketing support system, community mailing lists and create a variety of online tools and services. We also provide technical support and organize trainings at AfriNIC meetings.

The SED is a member of the Engineering Coordination Group (ECG) which is formed by the Number Resource Organization (NRO) Executive Council to undertake joint engineering activities. Through the ECG, we meet once a month via teleconference and for face-to-face meetings at the IETF which are held three times yearly.

### Engineering Coordination Group (ECG) Activities

The main focus of the ECG in 2007 was resource certification and we participated in various online discussions and IETF workshops towards creating a draft business and functional specification of the joint NRO resource certification architecture. In 2008 we expect to implement resource certifications jointly with other RIRs.

### AfriNIC Engineering Projects

During 2007, the Engineering department developed and executed the following projects:

#### *IPv6 Support for Public Services*

As IPv4 exhaustion nears, AfriNIC has proactively sought to promote a smooth transition towards IPv6 and to ensure support for it in our community. As a result, IPv6 support was added to our website and DNS server, support was added to the Whois service for IPv6 Assigned PI resources registrations and work will be underway in the first quarter of 2008 to ensure that all other AfriNIC public services are equally IPv6-capable.

# technical Operations Area

## MyAfriNIC Membership Portal

MyAfriNIC (<http://my.afrinic.net>) our membership portal was officially launched at the AfriNIC-7 meeting in Durban, South Africa as a user-friendly interface for members to manage their contact information, billing, resources, and requests for support.

Between the launch date of September 27 and December 31, 2007 a total of 122 individual contacts from 116 member organizations signed up to use MyAfriNIC.

## Systems & Infrastructure

During 2007, we explored various measures to improve both our external and internal systems infrastructure to provide our community and users with more efficient service and support. Notably, we have implemented:

- Better network traffic and systems monitoring;
- LAN security measures; and,
- Increased spam control through greylisting, sender address verification, RBL and image spam handling.

We have also begun the process of improving backup and redundancy of mission-critical services such as our website, ftp site, whois service, DNS and ticketing system, and in 2008 we will put into place measures to ensure a more robust and fault tolerant infrastructure.

## VOIP

A VOIP system was setup to improve inter-office connectivity, provide staff with low-cost voice communications and to hold staff meetings.

In 2008, we plan to officially rollout VOIP for both internal and external communications, and interconnect with other RIRs to promote an easier means to reach our colleagues by internet phone globally.

## Staff

Yaovi Ahadjitse, a Togolese national with 7 years experience as a Database Administrator in Togo served as the Database Administrator and Software Developer in 2007 at the AfriNIC office in Mauritius.

Hari Kurup, a Ugandan national with 5 years experience in the ISP industry in Uganda served as AfriNIC's Systems Administrator in 2007 at our engineering offices in Pretoria, South Africa.

# technical Operations Area

## AIRRS - African Internet Resources' and Routing Statistics

AIRRS (African Internet Resources' and Routing Statistics) is an AfriNIC-conducted project that provides the community with informational reports and statistics about the allocated IPv4/IPv6 addresses along with useful routing data for these number resources.

Results of the hard work from the AIRRS project team members include the following:

- Statistics and data on allocated and assigned IPv4/IPv6 addresses and AS Numbers;
- A weekly report on the routing status of the allocated IPv4 addresses; and,
- Weekly BGP reports for the following AfriNIC region address prefixes:
  - IPv4: 196/8 and 41/8
  - IPv6: 2001:4200::/23 and 2C00::/12

Other than using the publicly and freely available RIR resource allocation and assignment statistics, all routing and BGP reports are automatically generated using data collected from direct peering with Internet Solutions – [www.is.co.za](http://www.is.co.za), and the *routeviews project* – [www.routeviews.org](http://www.routeviews.org). The reports are then e-mailed to the usual community mailing lists on Mondays.



# technical

## Operations Area



In line with the company's mission: "... to ... strengthen self Internet governance in Africa by encouraging a participative policy development.", AfriNIC implements policies that are developed by the community through a bottom-up policy development process. Because some of the implemented policies impact the way modern-day IP networks run, AfriNIC conducts research and tests after such policies have been implemented and feedback collected from members in order to inform the community of the impacts of these policies on the operation of the Internet. Two of such policies for which the AIRRS team conducted research and tests are:

- *4-byte AS Numbers*: After the IETF agreed to extend the AS Number standard to 32bits, all RIR communities devised and adopted the appropriate policies for assigning these ASNs to network operators in their respective communities. We ran some tests on the usage and routability of 4-byte AS Numbers, and the objectives of these tests were to check BGP session initialisation, check AS\_PATH propagation in 2-byte, 4-byte and mixed networks, and finally, to check the 4-byte AS route propagation on the Internet. A report on these tests was produced and availed to the community.
- *IPv6 PI address assignments*: After implementation of the policy that allows AfriNIC to assign IPv6 addresses to end-sites in /48 prefixes, we conducted tests to establish routability and reachability of such prefixes. Indeed, members of the community had reported routing difficulties with these addresses. The tests were done to identify the causes of the problems and possible solutions were devised. Results from these experiments were published for the community's reference.

Another AIRRS activity is to plan transitioning the AfriNIC network infrastructure to IPv6. We have been helping in this critical area, since AfriNIC – as an IPv6 evangelist, must lead the community by example towards moving to this next generation IP protocol. We analysed the potential impact on the quality of service that could be created by the introduction of IPv6 in the infrastructure and the measurement and analysis of IPv6 traffic.

The project website – <http://airrs.afrinic.net> contains reports from the activities listed above and much more.

