



Afrinic

The Internet Numbers Registry for Africa



IPv6 in Africa: The Present Situation

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IPv6 Number Resources Held by AfrinIC

Prefixes	Date Received from IANA	Minimum size issued
2001:4200::/23	JUNE 2004	/32 PA ALLOCATIONS /48 PI ASSIGNMENTS from 2001:43f8::/29
2C00:0000::/12	OCTOBER 2006	/32

- **afpol-v6200407-000** : IPv6 allocation policy (30-06-2004)
- **afpol-v6200701** : IPv6 PI Assignment for End-Sites policy (13-06-2007)

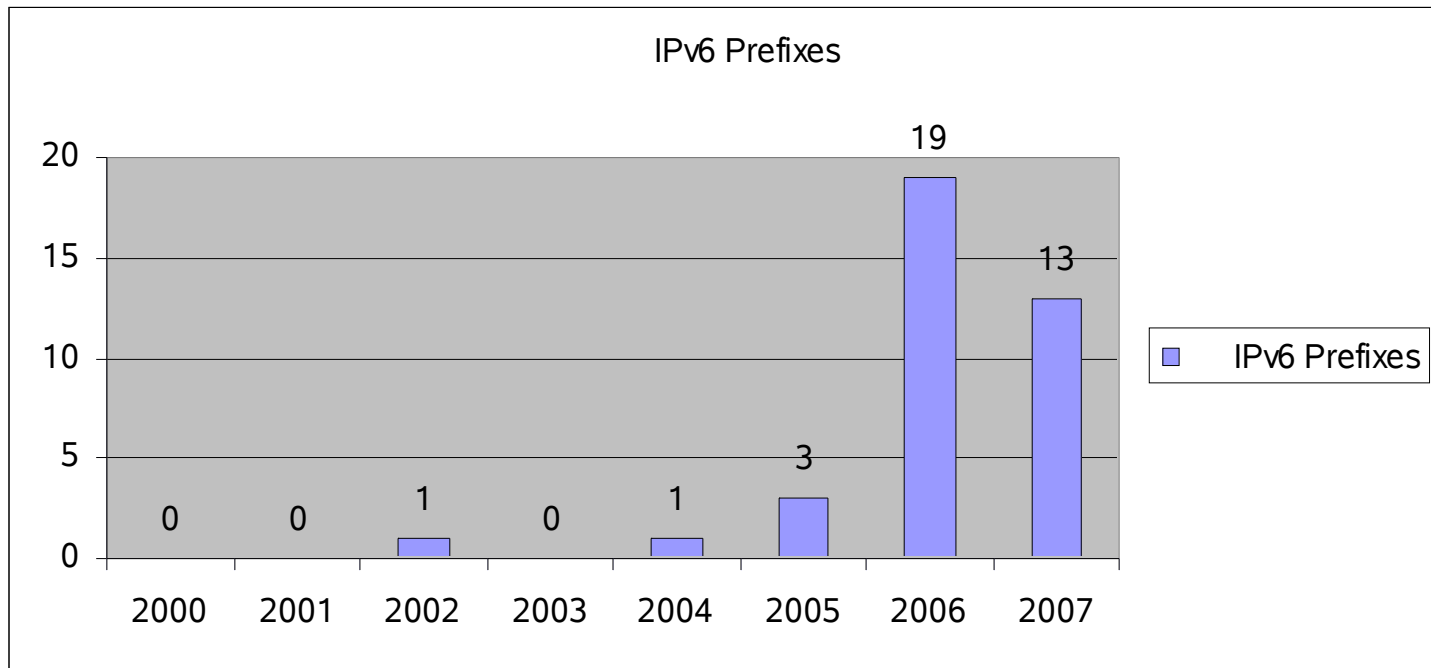
Afrinic Service Region IPv6 statistics(1)

Number of prefixes allocated/assigned from:

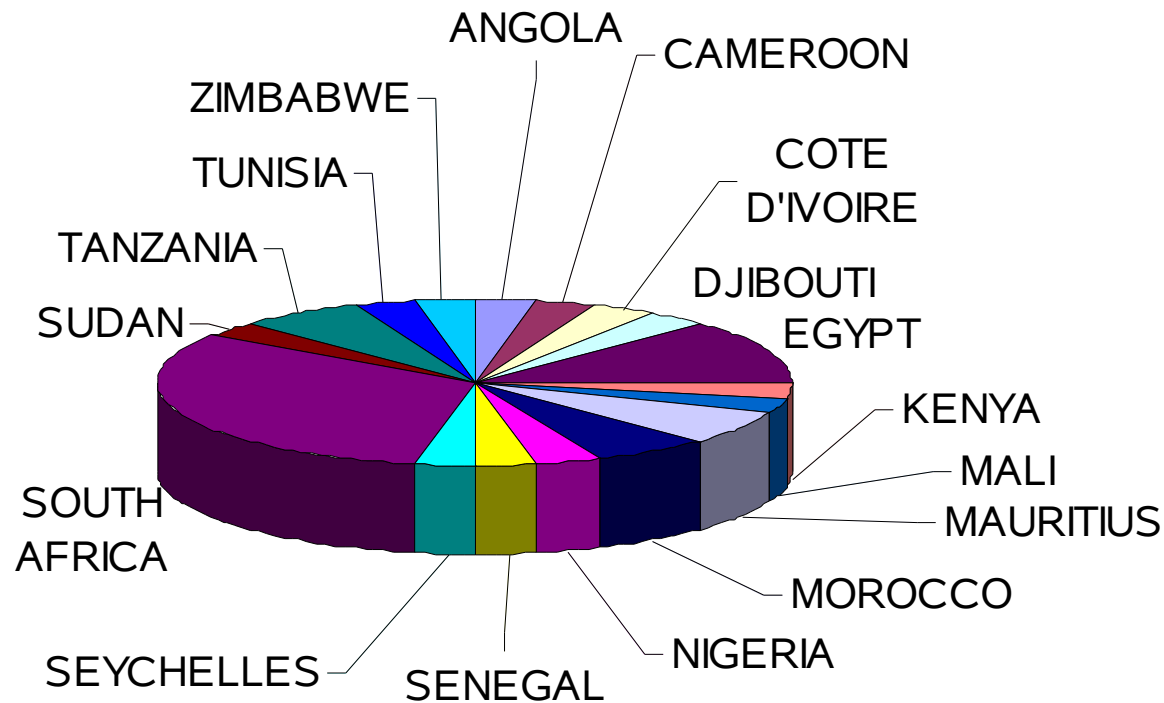
- 2001:4200::/23 = 37
 - 33 PAs
 - 4 PIs
 - 1 IXP

- 2C00::/12 = 0

AfrinIC Service Region IPv6 statistics(2)



Afrinic Service Region IPv6 statistics(3)



Number of /48 prefixes per Country

AfrinIC Service Region IPv6 Routing statistics

- 22 Prefixes did not have a routing entry(61%)
- 14 Prefixes had a routing entry (39%)
 - 12 prefixes originated by ASes in AfrinIC service region
 - 2 prefixes originated by ASes in ARIN service Region

Source: <http://airrs.afrinic.net/bgp/reports6.html/bgp.reports.2007-09-22-2001-4200.html>

V6 Connectivity in AfriNIC Service Region

- End-users are enjoying v6 connectivity through automatic tunnels
 - Free tunnel providers
 - Thanks teredo :-)

- Enterprises and ISP v6 connectivity depends on tunnels
 - Dual stack
 - Inefficient local/regional interconnection :-)
 - See the next two slides.

V4 traceroute from a node in .za to afrinIC

- Traceroute to www.afrinic.net (196.216.2.1), 30 hops max, 46 byte packets

```
1 cispos2.posix.co.za (160.124.48.254) 0.803 ms 0.858 ms 0.848 ms
2 cisrb1-cispos2.posix.co.za (160.124.1.53) 25.961 ms 41.111 ms 12.691 ms
3 168.209.89.53 (168.209.89.53) 12.593 ms 12.561 ms 12.495 ms
4 cp1-jinx-gi0-1.rtr.isnet.net (196.26.0.253) 13.432 ms 13.123 ms 12.479 ms
5 ge0-3.br1.jnb7.alter.net (196.30.228.241) 13.010 ms 12.955 ms 13.240 ms
6 ge0-2.cr1.jnb7.alter.net (196.31.17.161) 13.958 ms 15.593 ms 15.440 ms
7 srp3-0-0.gw2.jnb6.alter.net (196.30.156.4) 17.841 ms 17.197 ms 17.849 ms
  MPLS Label=85 CoS=0 TTL=0 S=0
8 vlan9.hr5.jnb6.alter.net (196.30.156.139) 17.077 ms 15.770 ms 16.689 ms
9 gtw-out-afrinic.afrinic.net (196.30.227.66) 16.294 ms 24.693 ms 16.095 ms
10 ns1.afrinic.net (196.216.2.1) 17.460 ms 16.767 ms 16.644 ms
```

V6 traceroute from the same node to AfrinIC

- Traceroute to `www.afrinic.net` (`2001:42d0::200:80:1`) from `2001:42a0:1000:ff02:20e:cff:fe3e:99ca`, 30 hops max, 24 byte packets
- 1 `cispos2-fe0-0.posix.co.za` (`2001:42a0:1000:ff02::1`) 0.841 ms 0.947ms 0.823 ms
 - 2 `cisrb1-cispta2.posix.co.za` (`2001:42a0:0:ff01::1`) 13.832 ms 13.858ms 13.646 ms
 - 3 `cisldn1-cisrb1.posix.co.za` (`2001:42a0:1:ff01::2`) 197.47 ms 313.796ms 214.204 ms
 - 4 `ae0-112.lon11.ip6.tiscali.net` (`2001:668:0:3::4000:51`) 195.477 ms 191.338 ms 224.729 ms
 - 5 `so-0-0-0.ams11.ip6.tiscali.net` (`2001:668:0:2::1:181`) 289.653 ms 261.461 ms 235.211 ms
 - 6 `e0-0-0.6b2.AMS7.Alter.net` (`2001:7f8:1::a501:2702:1`) 258.502 ms 255.465 ms 219.348 ms
 - 7 `6b1.jnb6.za.uu.net` (`2001:600:8:3::2`) 419.708 ms 422.217 ms 475.687 ms
 - 8 `www.afrinic.net` (`2001:42d0::200:80:1`) 445.819 ms 424.772 ms 448.075 ms**

OPEN ISSUES(1)

- **61% of the v6 prefixes not announced to the Internet**
 - Some have been in that situation for more than 12 months in violation of the policies
- **PI assignments reachability**
 - /48 PI Prefixes seem to have limited routing “scope”
 - Are they being filtered ?
 - <http://www.sixxs.net/tools/grh/dfp/afrinic/>

OPEN ISSUES(2)

inet6num: 2001:43f8:0040::/48
netname: AIIRS
descr: -----
descr: Testing Reachability for PI /48s
descr: -----
country: MU
org: ORG-AFNC1-AFRINIC
admin-c: TEAM-AFRINIC
tech-c: TEAM-AFRINIC
status: ASSIGNED PI
notify: sysadmin@afrinic.net
mnt-by: AFRINIC-HM-MNT
mnt-lower: AFRINIC-HM-MNT
mnt-domains: AFRINIC-HM-MNT
changed: ernest@afrinic.net 20070921
source: AFRINIC
parent: 2001:4200::/23

Challenges to IPv6 deployment

- Lack of incentives
 - lack of customer demand
 - lack of competitive advantage
 - lack of public sector mandates
 - Lack of information
 - Cost
-

- Many awareness campaigns
- Many technical training events on the continent
 - English and French
- Just launched an IPv6 portal
 - <http://www.afrinic.net/IPv6/index.htm>
- Reduction of IPv6 fees
 - See next slide

AfriNIC and IPv6(2)

To encourage and promote IPv6 usage in the Region, the AfriNIC board has decided the following temporary measures

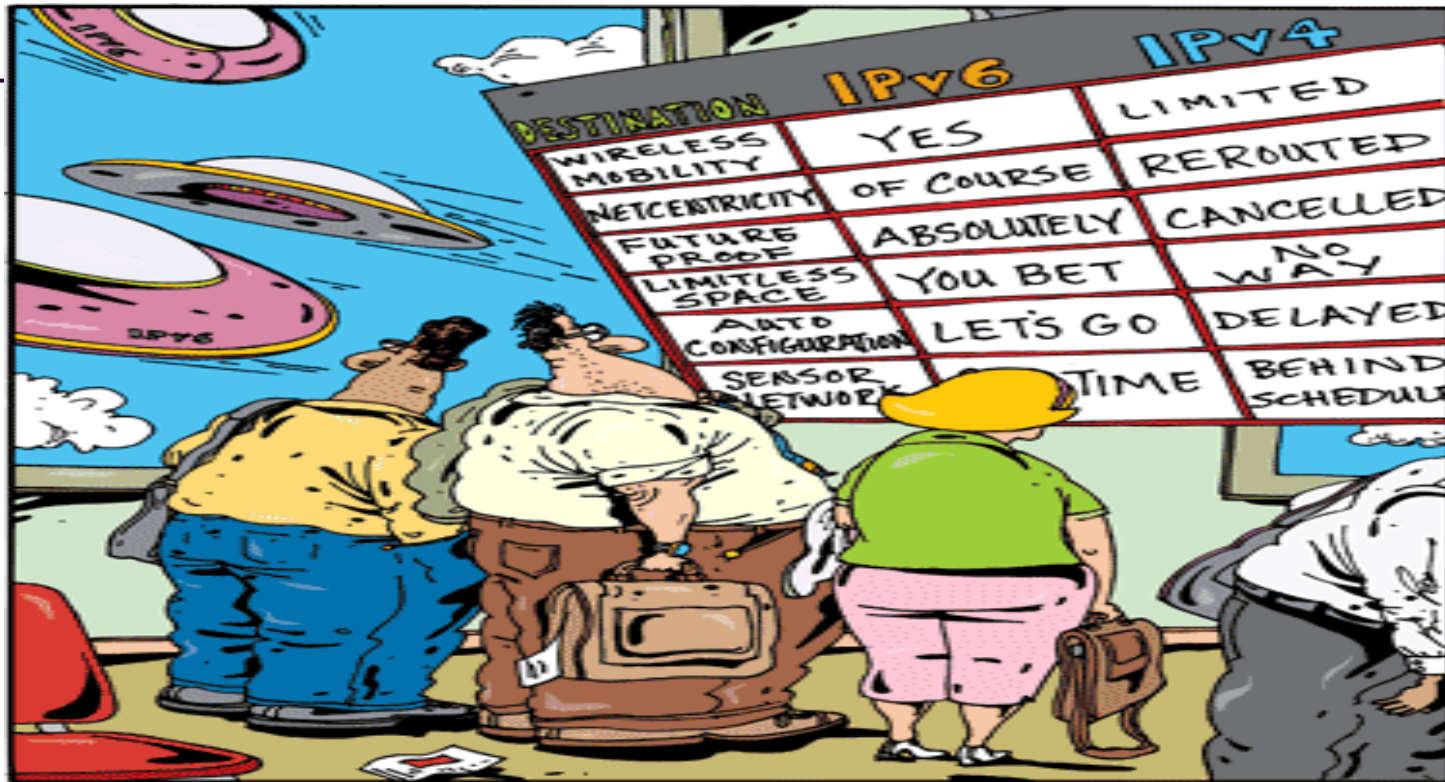
- For already established LIRs (with IPv4 allocation(s)):

Not to count the IPv6 prefix allocation in calculating the category of already established LIRs.

- For New LIRs:

- Allow 50% discount on the initial setup fee and 100% discount on the first year's membership fee for a LIR with IPv6 only allocation.

- Allow respectively 75%, 50%, 25% discount on the membership fee for the three subsequent years.



Suddenly, it dawned on Ronald that he needed to be on the right flight plan and IPv6 seemed to be just the ticket.

Thank you for your attention