Number Resource Policy Development Activities

Louie Lee
Chair, ICANN ASO Address Council

ICANN 39
Cartagena, Colombia
8 December 2010

Agenda

1. About the ASO: MoU, Global Policy, Address Council
2. RIR PDP: Principles, Roles, Basic Steps
3. Global Process: Overview, Statistics, "Global Coordinated Policy"
4. IANA Update
5. NRO Update
6. Mitigating the Effects of IPv4 Exhaustion
7. Global Number Policy and Global Proposals
8. Regional Activities: AfriNIC, APNIC, ARIN, LACNIC, RIPE
9. Closing: Questions and Answers, How to Participate

Please ask questions at the end of each section.

ASO MoU (dated 21 October 2004)

- Agreement between ICANN and the Numbering Resource Organization (NRO)
- NRO fulfills the role of the ASO
- The NRO Number Council fulfills the role of the ASO Address Council
- Defines the Global Policy Development Process (PDP) as a 15-step process
  - From proposal through adoption by the ICANN Board
  - Based on the RIR's PDPs… "…the global policy proposal [will] be placed on the agenda for next open policy meeting in each region, in accordance with the applicable policy process…"

About the ASO: Global Number Policy

Global Policy

- "Global policies are defined within the scope of this agreement as Internet number resource policies that have the agreement of all RIRs [Regional Internet Registries] according to their policy development processes and ICANN, and **require specific actions or outcomes on the part of IANA** or any other external ICANN-related body in order to be implemented."*
- For the most part global proposals/global policies determine number allocation policy for requests from the RIRs to the IANA (RIRs receive their number resources from IANA)

**Defined in the ASO MoU (dated 21 October 2004)*

About the ASO: The Address Council

Comprised of 15 elected and appointed individuals from all 5 regions

Independent body separate from RIR management and board to:

1. Oversee global policy development
2. Appoint 2 ICANN Board of Directors
3. Serve on ICANN bodies: NomCom, AoC Review Teams
4. Advise ICANN Board on number resource matters

RIR PDP: Principles

Open Forum

- Open Policy Mailing List
- Open Policy Meetings

Transparent

- PDP documented
- Policies documented
- Meetings documented

Bottom Up

- Consensus-based
- RIRs do not dictate policy, they implement

RIR PDP: Roles

Community

- Submit policy proposals
- Discuss policy proposals (in favor or not?)

Consensus Evaluator

- Determine consensus

Board

- Provide fiduciary and process oversight
- Ratify policy

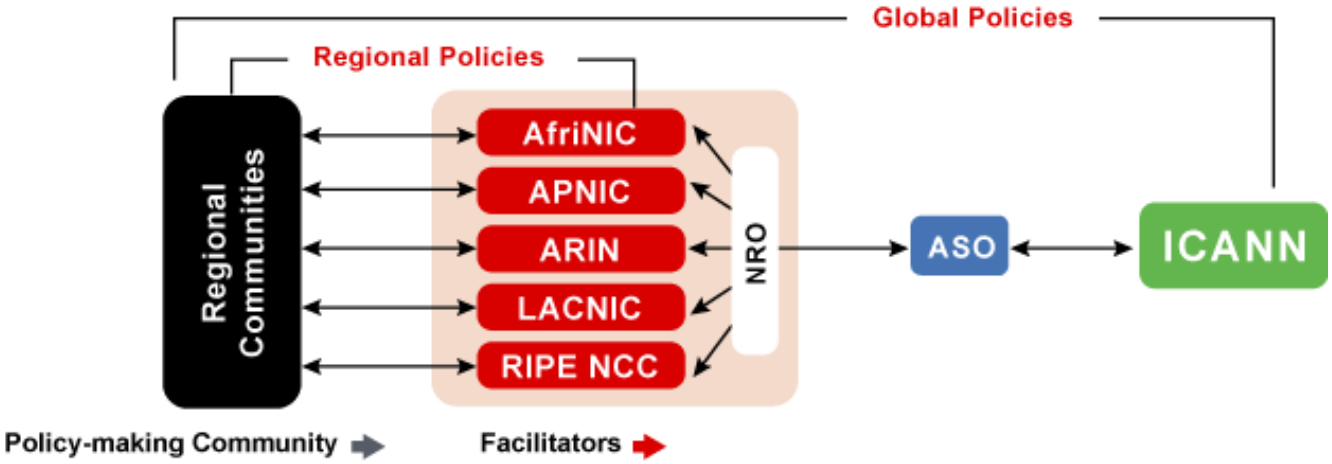
Staff

- Conducts assessments of proposal impacts
- Implement ratified policy

RIR PDP: Basic Steps

1. Community individuals and groups submit a proposal
2. Community discusses the proposal on the mailing list
3. Community discusses the proposal at an open policy meeting
4. Consensus evaluation
5. Last Call
6. Adoption
7. Implementation

Global Process: Overview

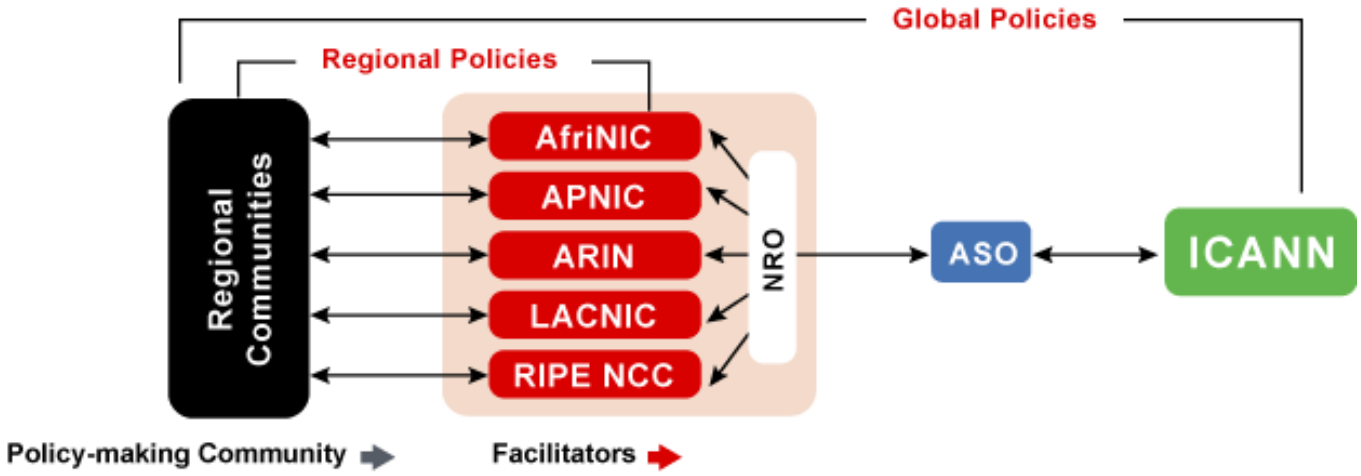


Global proposal discussed/presented at all 5 RIRs per their PDPs

- ASO AC members follow and participate in discussions

After adoption by all 5 RIRs proposal forwarded to the ASO AC

Global Process: Overview (cont.)



ASO AC Proposal Review

- Process (RIR PDP) review
- Common agreement among RIRs on common text
- Adequate consideration of viewpoints

ASO AC forwards proposal to ICANN Board for adoption

ICANN Board adopts, and IANA implements

Global Process: Statistics

8 Global Proposals (since 2001)

- Adopted and implemented as policy = 6
- Under discussion = 1
- Did not become a global policy = 1

Details of these policies/proposals in later presentation

http://nro.net/policy/index.html#regional

Global Process: Globally Coordinated Proposal

Review

- Global Proposal
  - Policy about IANA and RIRs
- RIR Proposal
  - Policy about RIRs and their customers

Globally coordinated proposal

- Same proposal discussed/presented at each of the RIRs
- Normally the goal is to have the same policy worldwide
  - Processed as normal RIR proposals without triggering action by IANA
  - Examples include original IPv6 allocation policy and transition policy to 4-byte AS numbers

IANA Status Update

ICANN, Cartagena

Elise Gerich

VP, IANA

December 2010

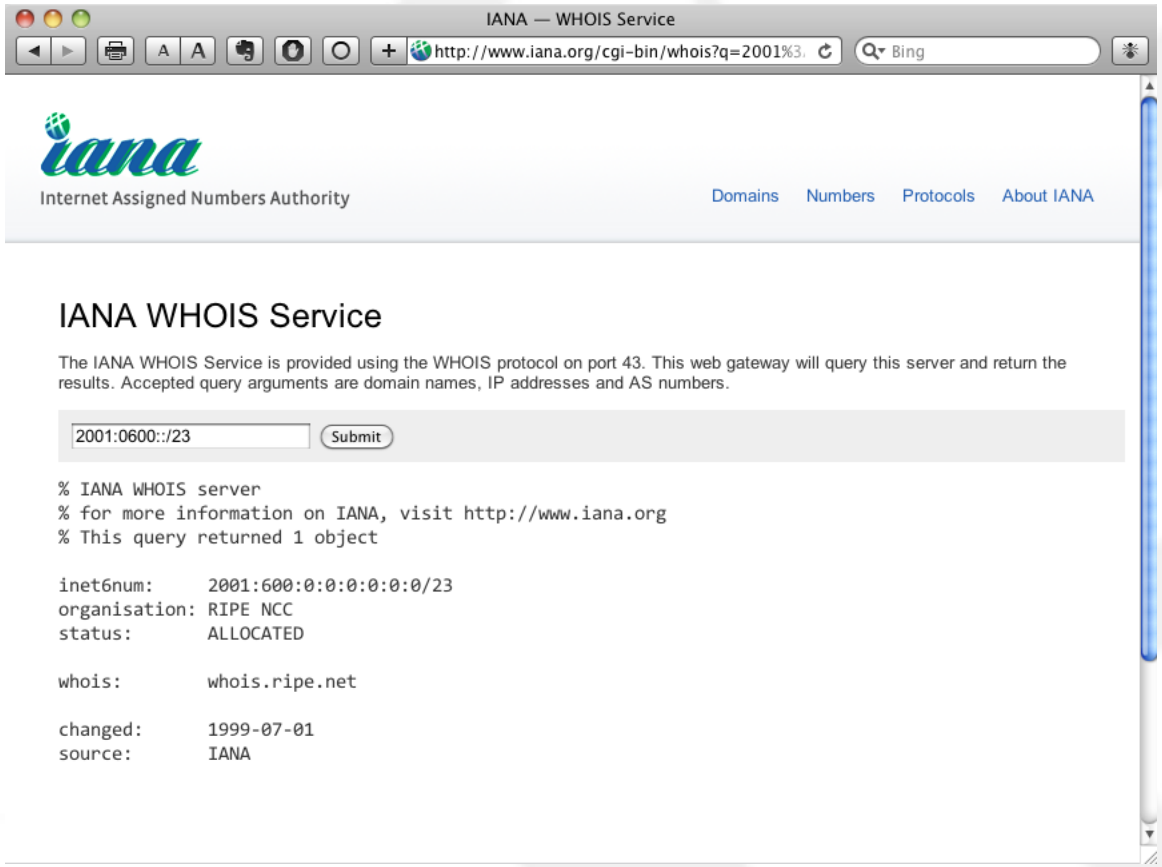
Overview

- New IANA Whois Server
- IDN ccTLDs
- AS Numbers Global Policy
- IPv4 Status
- In other news… multicast

A new whois.iana.org

It now provides responses for:

- Unicast IP addresses
- Multicast registrations
- AS Numbers
- DS records

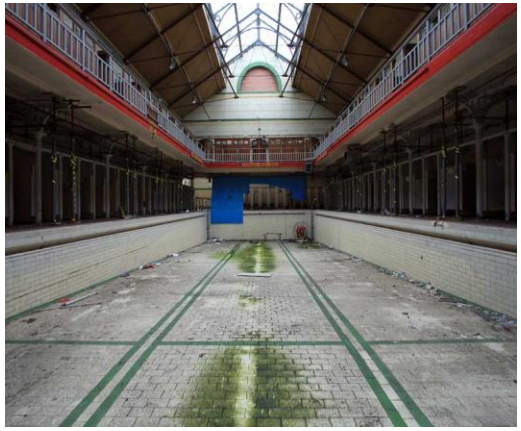


AS Numbers Global Policy

The policy allows each RIR to maintain 2 separate pools of AS Numbers until the end of 2010

- The ASO AC sent a proposal (ripe-496) to the ICANN board
- The public comment period ended on 13 August
- The proposal was ratified in September and is now policy

IPv4 Status 2010



- 19 /8s have been allocated so far this year
- 8 have been allocated to APNIC
- ARIN & RIPE NCC have each received 4
- LACNIC has received 2
- AfriNIC has received 1

IPv4 Status 2010

About 3% of total IPv4 space left in the pool.

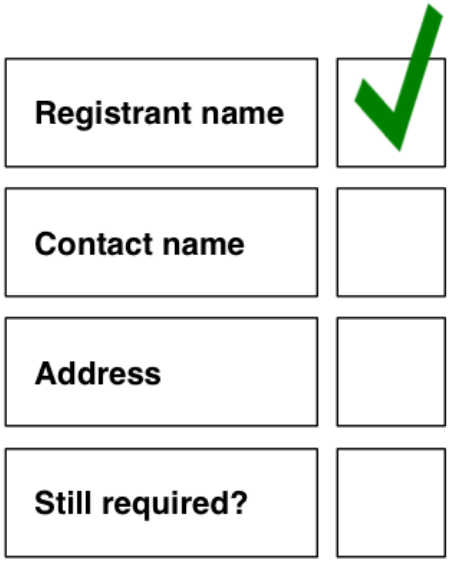
This equals approximately 100 Million unique addresses.

- 7 unallocated /8s remain
- 2 will be allocated under the global policy that was ratified in 2005
- Then the last 5 blocks will be allocated simultaneously as per the special global policy ratified in 2009

In other news… multicast

- draft-ietf-mboned-ipv4-uni-based-mcast-06 approved
- Everyone with a /24 of IPv4 unicast space has also has a multicast /32
- 234/8 is used for this algorithmic assignment mechanism

In other news… multicast



- We are introducing an annual review process for multicast address assignments
- We'll be updating registrant names and contact information as appropriate

Thank you

Questions?

NRO

Number Resource Organization

NRO

INTERNET NUMBER RESOURCE STATUS REPORT

As of 30 September 2010

Prepared by

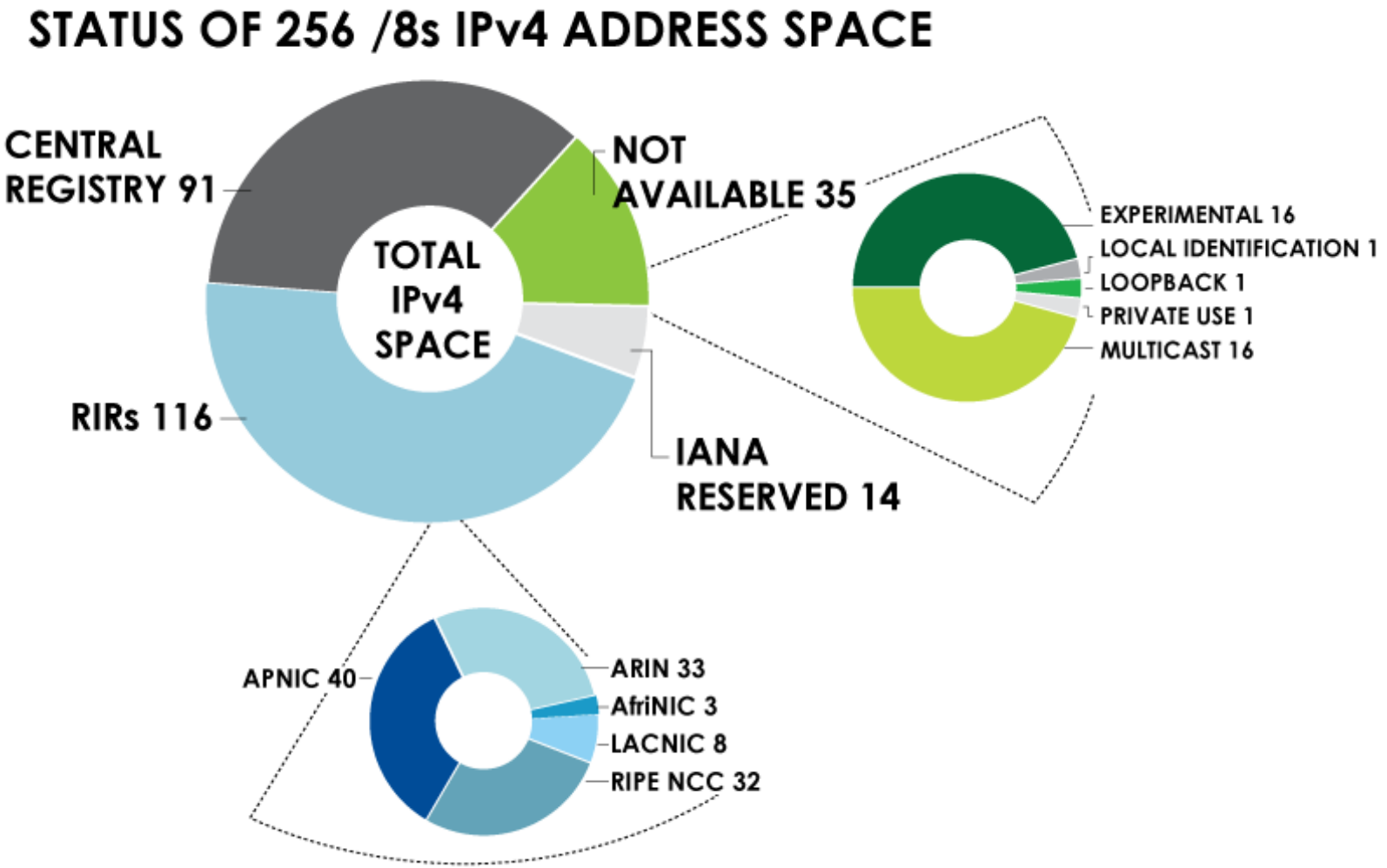
Regional Internet Registries

AfriNIC, APNIC, ARIN, LACNIC and the RIPE NCC

Number Resource Organization

IPv4 ADDRESS SPACE

What is the status of each of the 256 /8s?

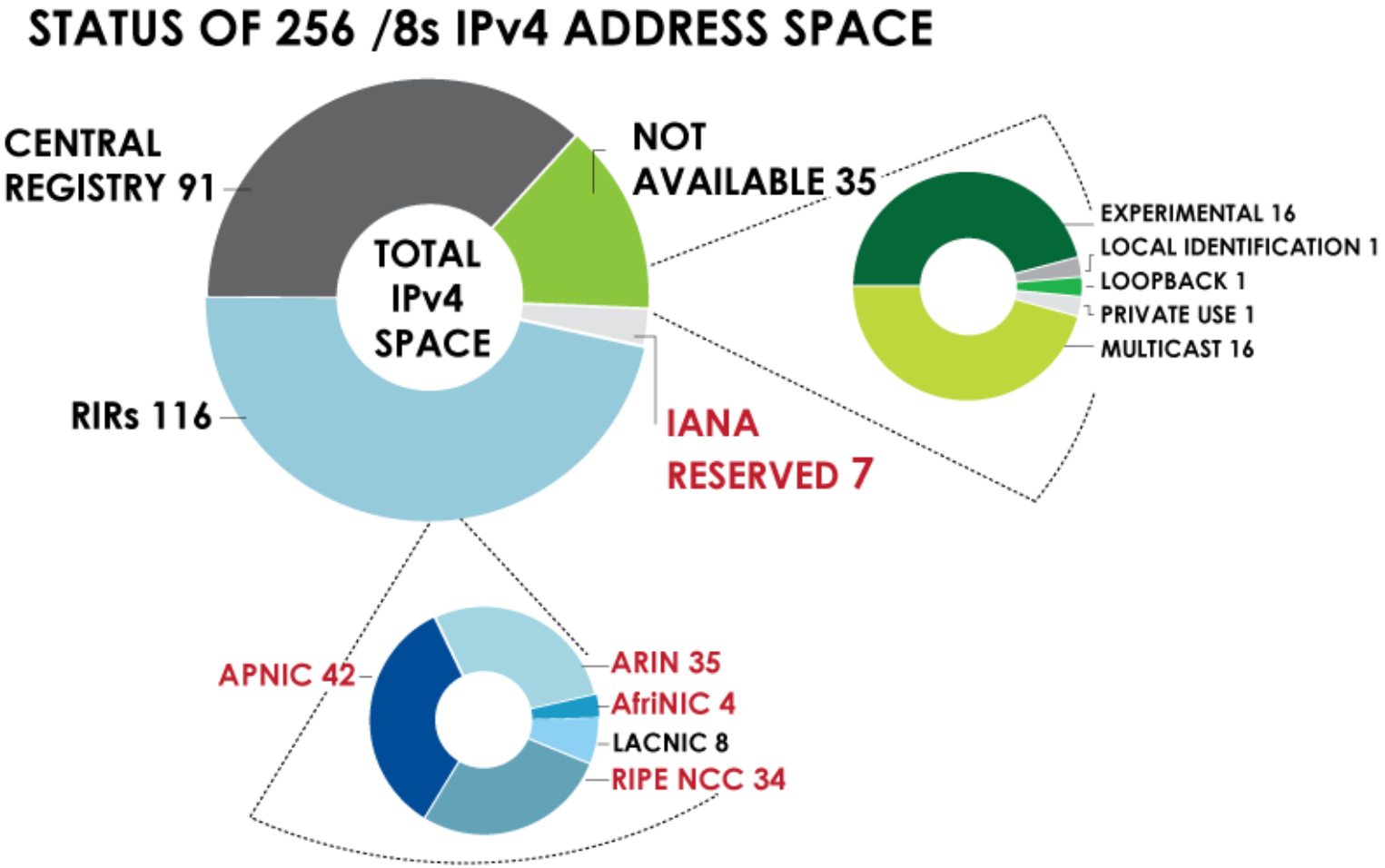


Number Resource Organization

IPv4 ADDRESS SPACE

What is the status of each of the 256 /8s?

*as of December 2, 2010

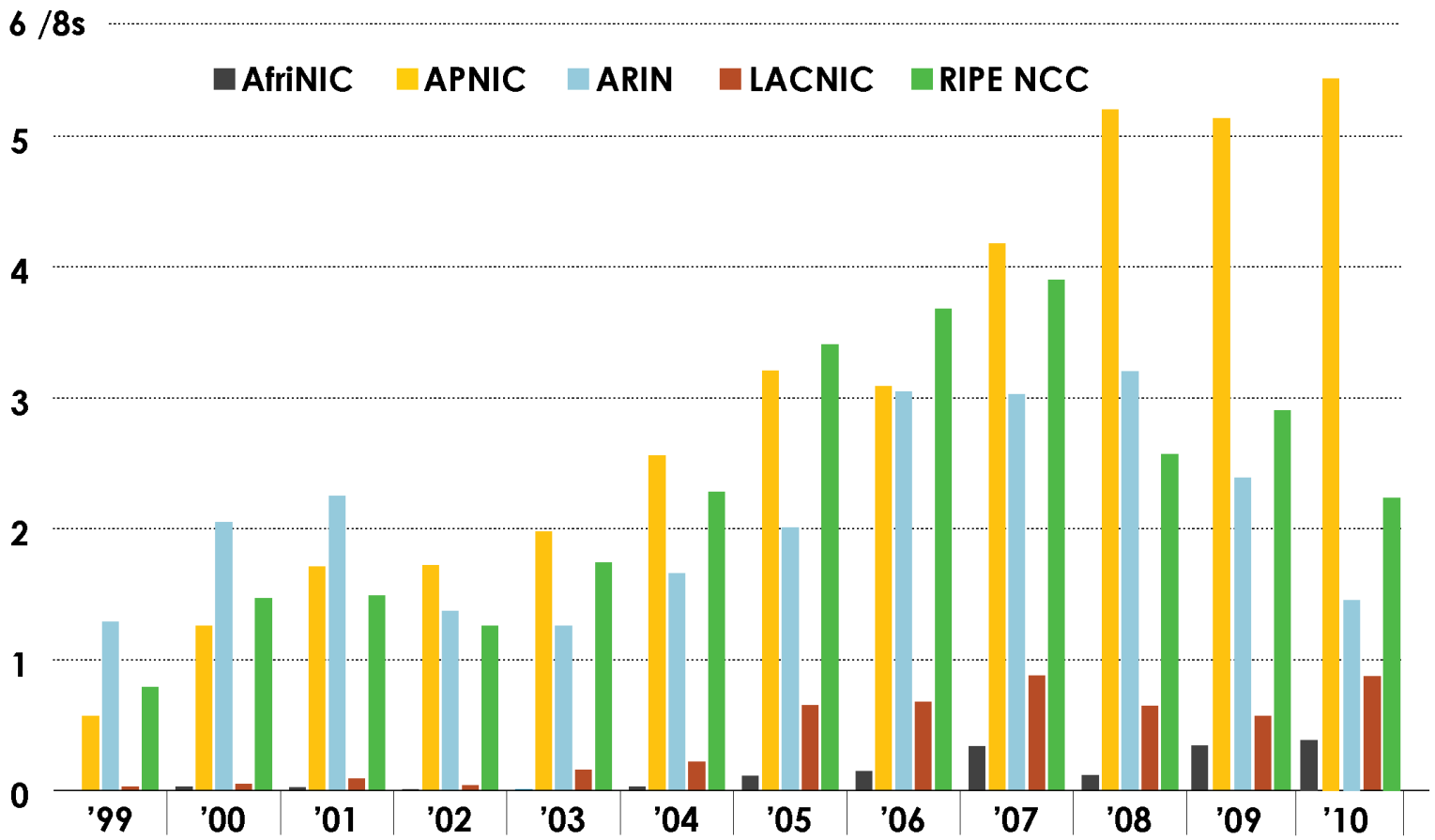


Number Resource Organization

IPv4 ADDRESS SPACE ISSUED

(RIRs TO CUSTOMERS)

In terms of /8s, how much space did each RIR issue by year?

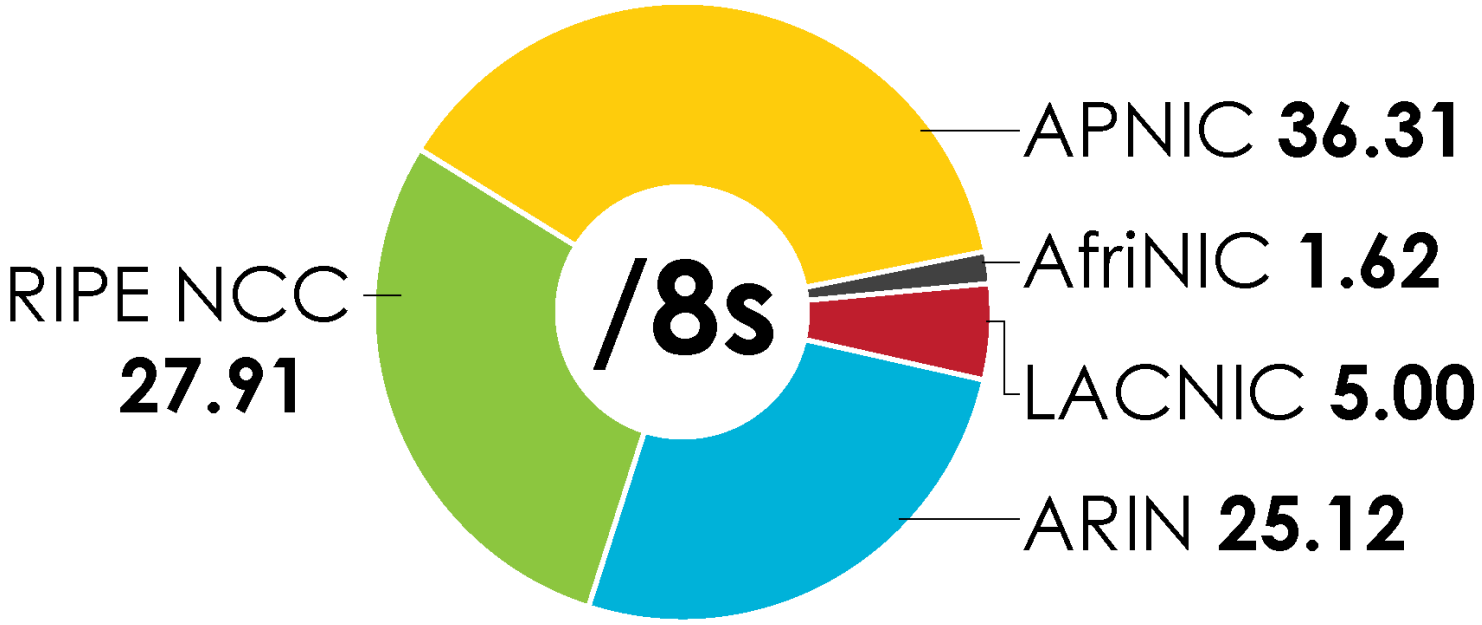


Number Resource Organization

IPv4 ADDRESS SPACE ISSUED

(RIRs TO CUSTOMERS)

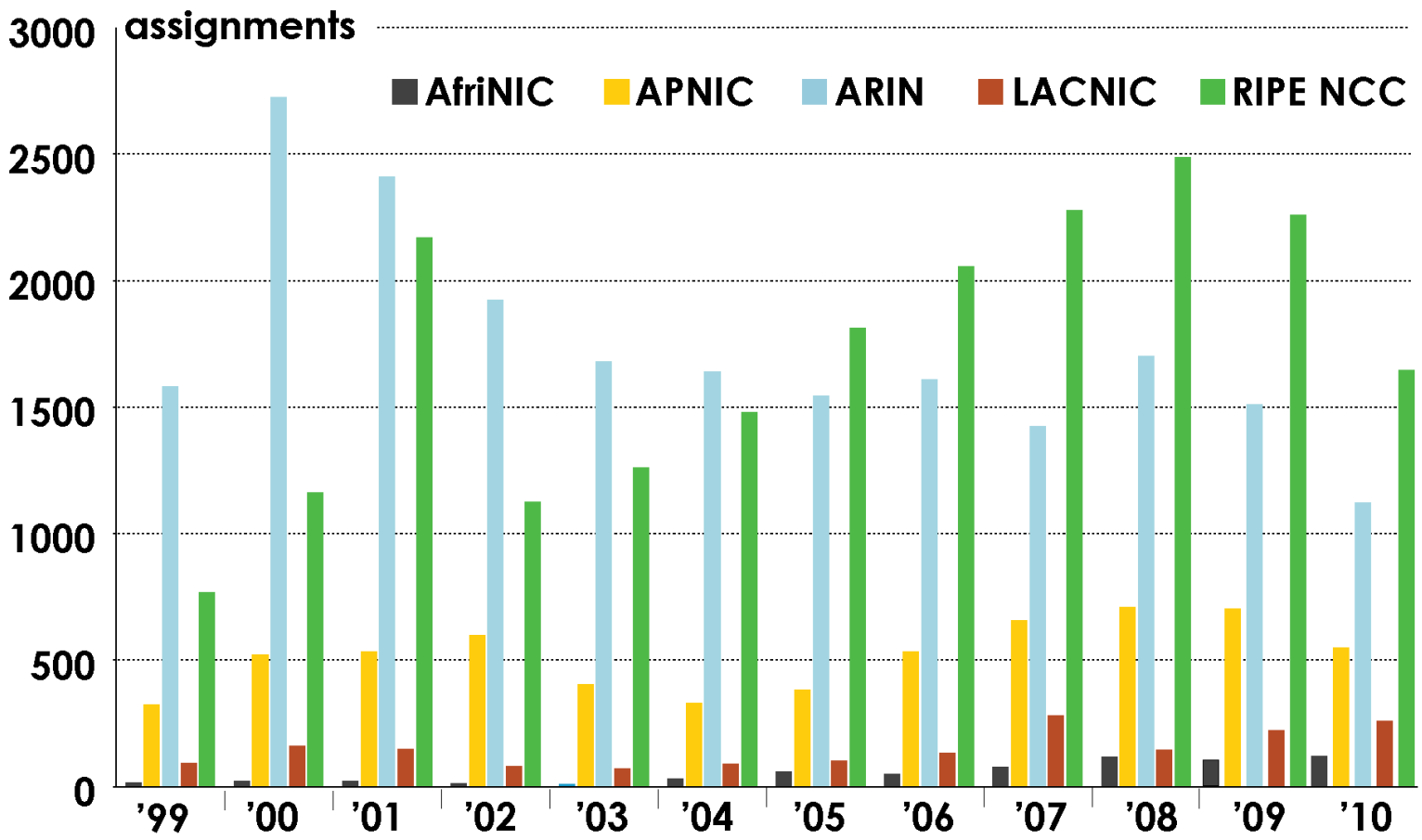
In terms of /8s, how much total space has each RIR issued?
(Jan 1999 – Sept 2010)



Number Resource Organization

ASN ASSIGNMENTS (RIRs TO CUSTOMERS)

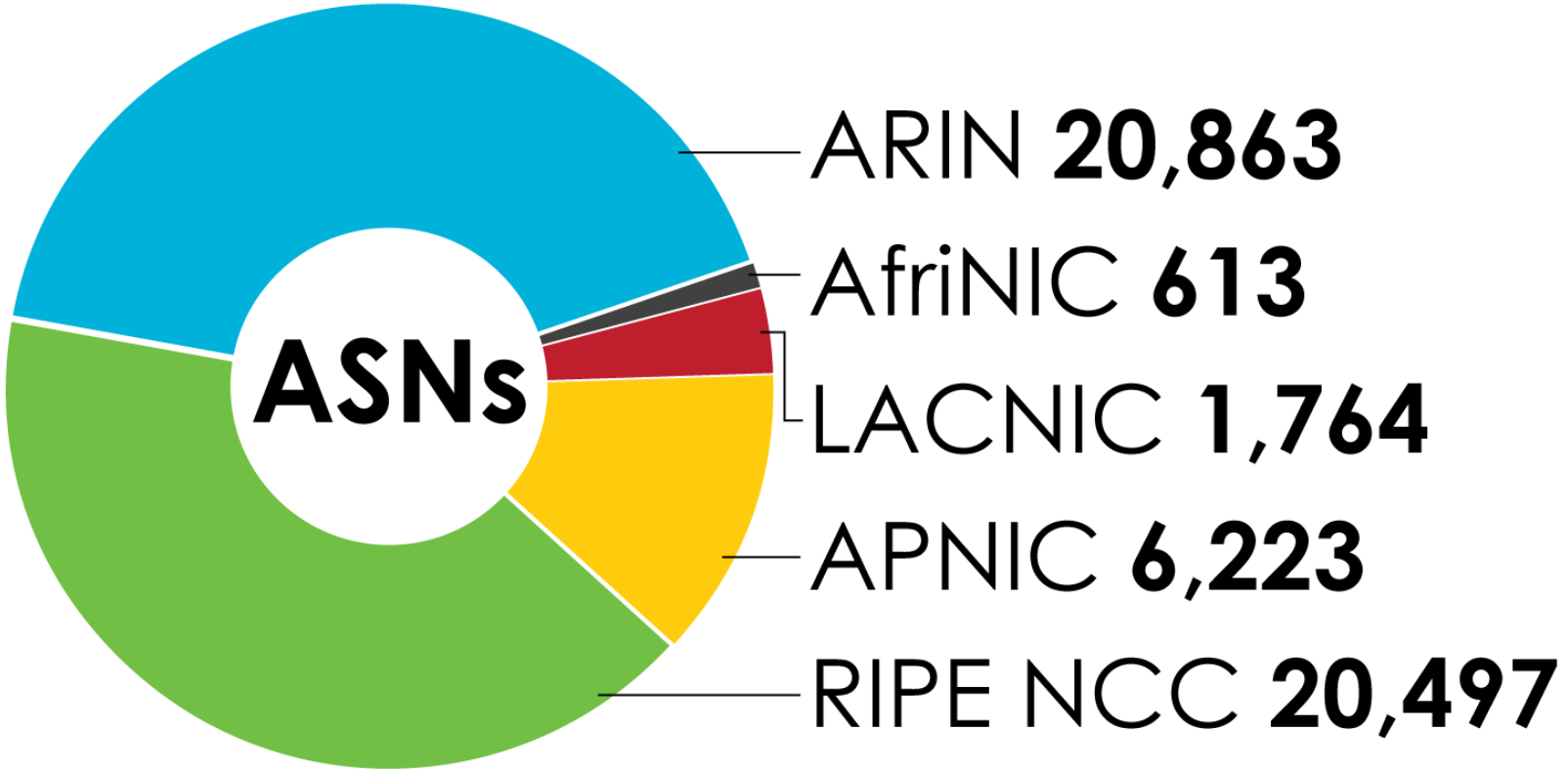
How many ASNs has each RIR assigned by year?



Number Resource Organization

ASN ASSIGNMENTS (RIRs TO CUSTOMERS)

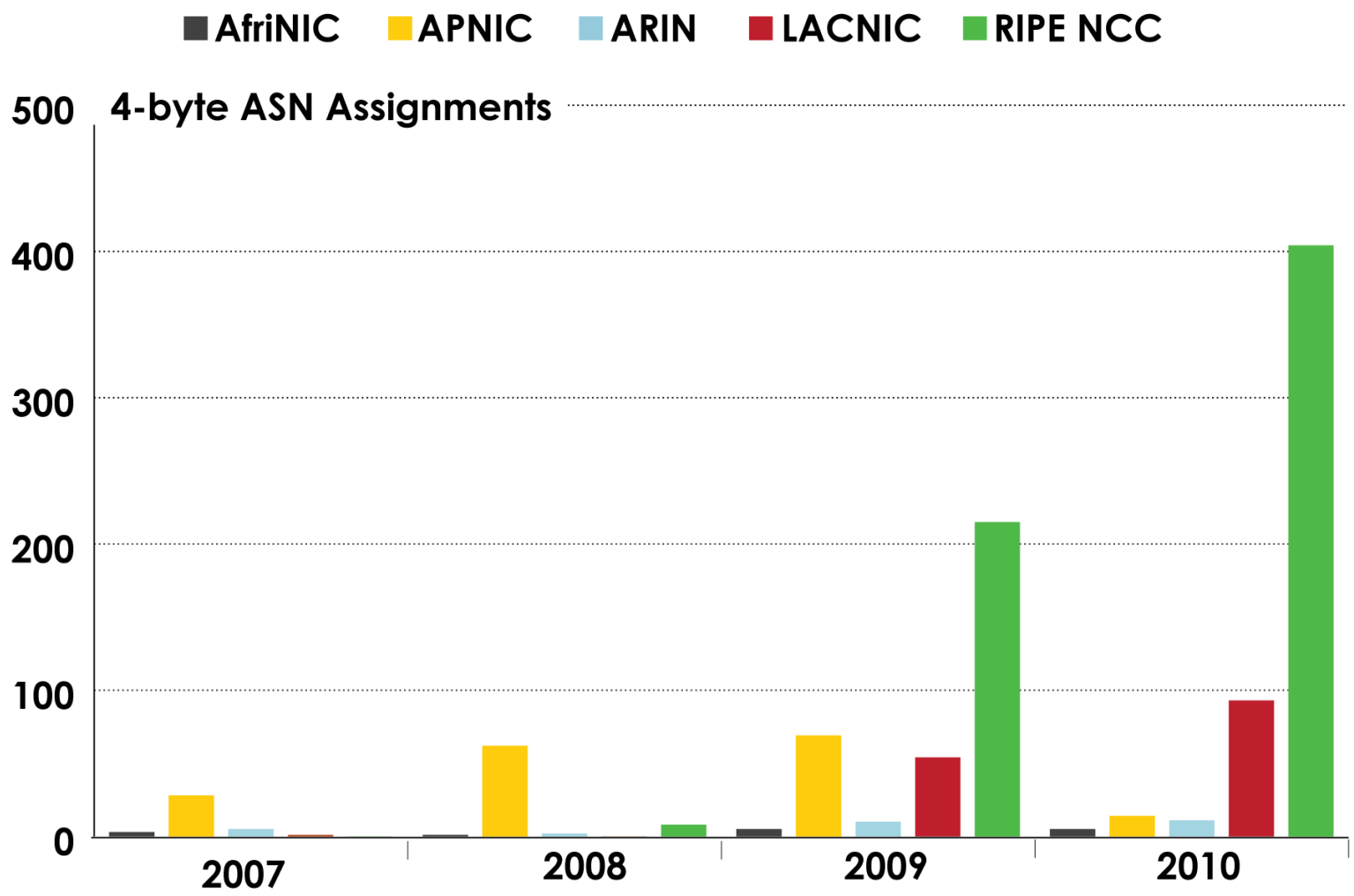
How many total ASNs has each RIR assigned?
(Jan 1999 – Sept 2010)



Number Resource Organization

4-BYTE ASN ASSIGNMENTS

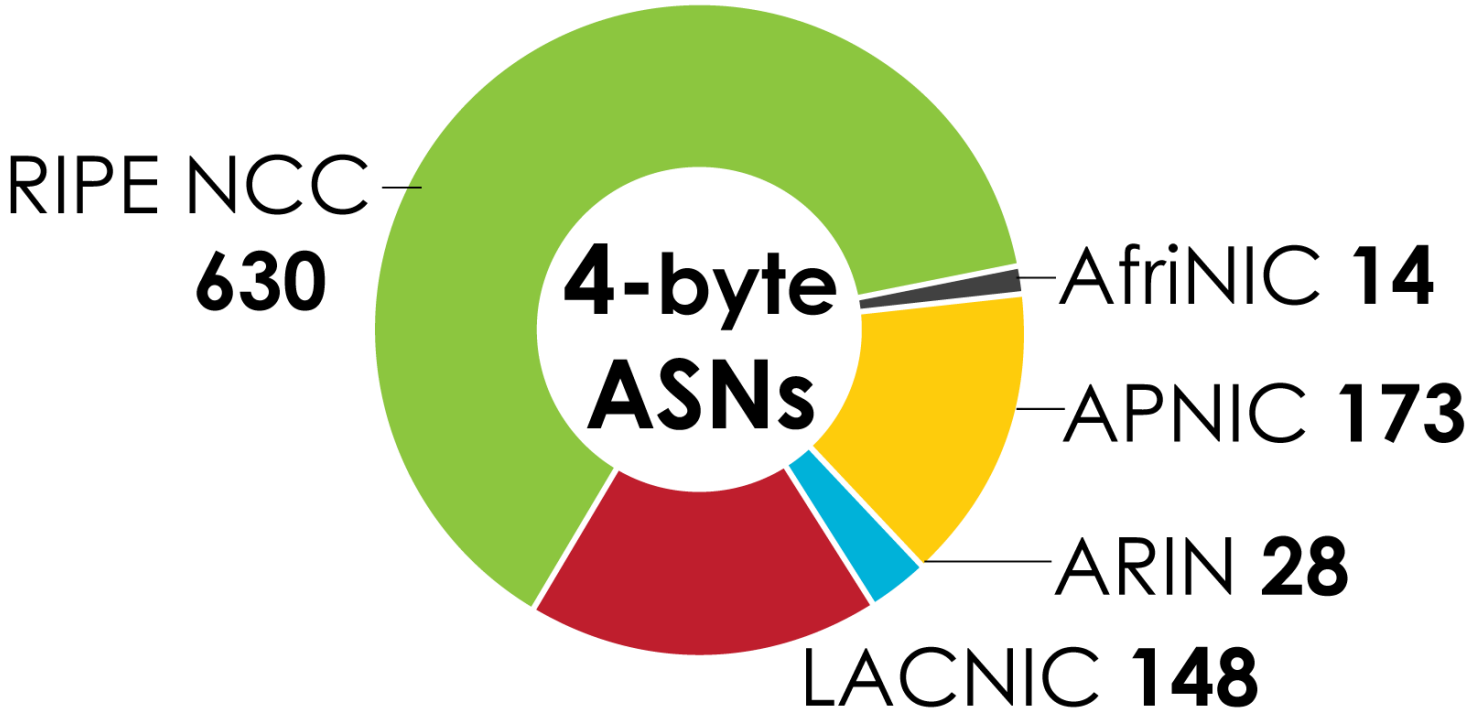
How many 4-byte ASNs has each RIR assigned by year?



Number Resource Organization

4-BYTE ASN ASSIGNMENTS

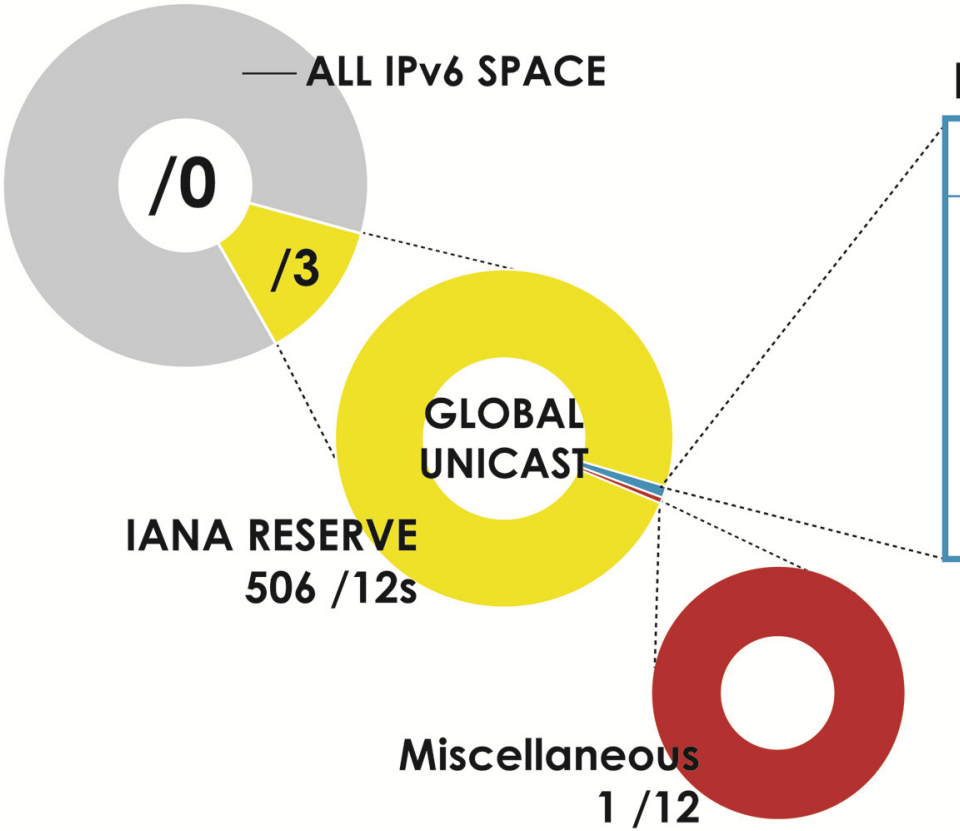
How many total 4-byte ASNs has each RIR assigned?
(Jan 2007 – Sept 2010)



Number Resource Organization

IPv6 ADDRESS SPACE

How much has been allocated to the RIRs?



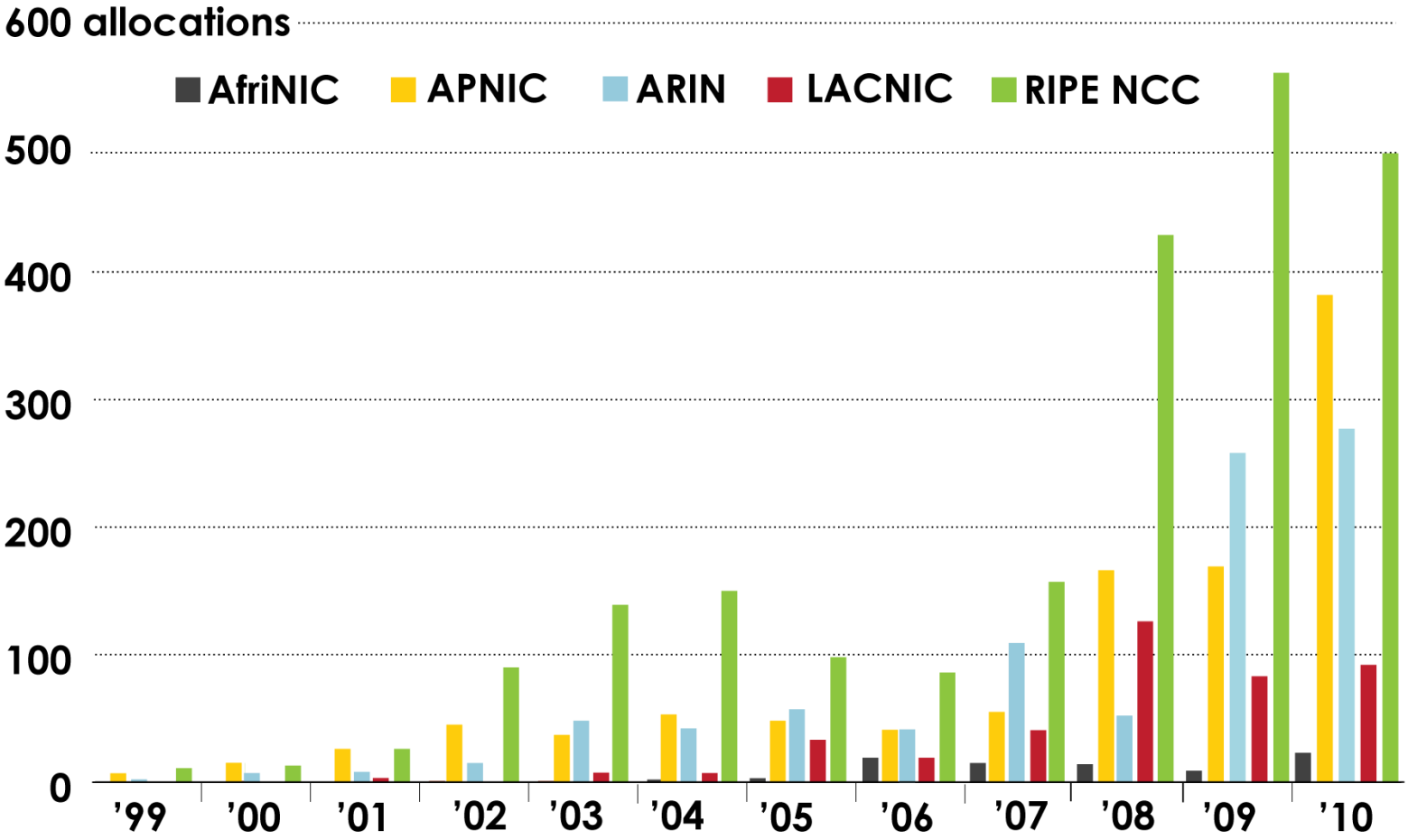
RIRs 5 /12s (October 2006)

RIR	IPv6 ADDRESS
AfriNIC	2C00:0000::/12
APNIC	2400:0000::/12
ARIN	2600:0000::/12
LACNIC	2800:0000::/12
RIPE NCC	2A00:0000::/12

Number Resource Organization

IPv6 Allocations RIRs to LIRs/ISPs

How many allocations have been made by each RIR by year?

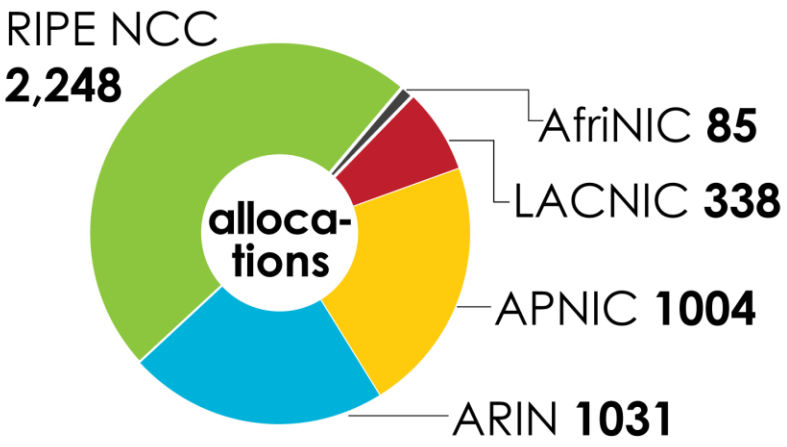


Number Resource Organization

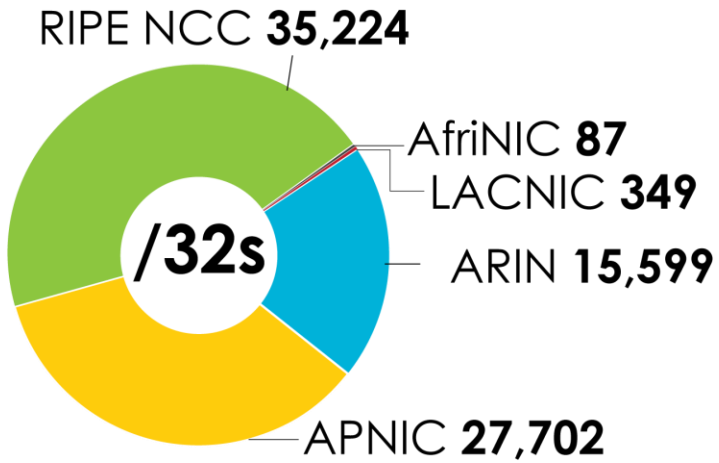
IPv6 ALLOCATIONS RIRs to LIRs/ISPs

(Jan 1999 – Sept 2010)

How many total allocations have been made by each RIR?

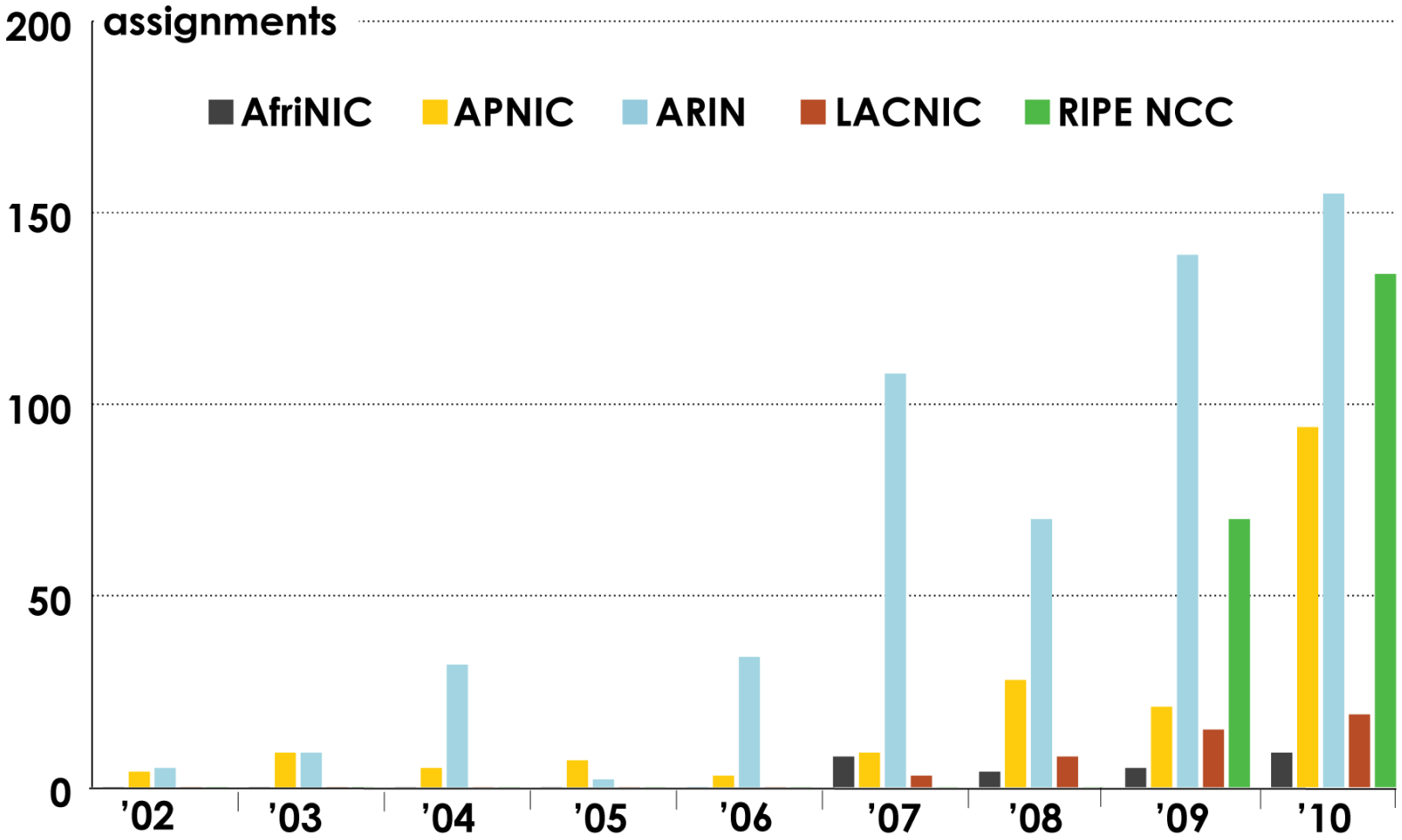


In terms of /32s, how much total space has each RIR allocated?



Number Resource Organization

IPV6 ASSIGNMENTS RIRS TO END-USERS



Number Resource Organization

LINKS TO RIR STATISTICS

- RIR Stats:
  www.nro.net/statistics

- Raw Data/Historical RIR Allocations:
  www.aso.icann.org/stats
  www.iana.org/assignments/ipv4-address-space
  www.iana.org/assignments/as-numbers
  www.iana.org/assignments/ipv6-unicast-address-assignments

Number Resource Organization

NRO

thank you

Number Resource Organization

Mitigating the Effects of IPv4 Exhaustion

IPv4 activities

- Transfer policies
  - Between organizations within a region
  - Between RIRs
- Soft landing policies
  - Setting aside special-use address blocks for transition mechanisms (e.g. NAT, infrastructure)
  - Reducing maximum size address blocks to be allocated
- Return to and redistribution by IANA – Global policy
  - Allows IANA to receive address space from the RIRs
  - Allows IANA to allocate space back to the RIRs

Mitigating the Effects of IPv4 Exhaustion

IPv6 activities

- Remove certain requirements for obtaining space directly from RIRs
- Add alternate means of justification
- IPv6 education and outreach

Overall education and outreach

- In-person outreach: industry conferences, conventions, ISOC events, etc.
- Online education: "how-to"s, compatibility lists, etc.

Break….

Global Number Policy and Global Proposals

Louie Lee
Chair, ICANN ASO Address Council

Existing Global Policy

Criteria for Establishment of New Regional Internet Registries (ICP-2* "Internet Coordination Policy")

- Adopted by ICANN Board per ASO AC recommendation on 4 June 2001
- October 2002 LACNIC was recognized by ICANN as an RIR
- April 2005 AfriNIC was recognized by ICANN as an RIR

Global policy on IANA Allocation of IPv4 address space to the Regional Internet Registries

- IPv4 allocations from IANA to the RIRs (unit is /8s, 18-month needs)
- Adopted by ICANN Board per ASO AC recommendation on 8 April 2005

Global Policy for Allocation of IPv6 Address Space

- IPv6 allocations from IANA to the RIRs (unit is /12s, 18-month needs)
- Adopted by ICANN Board per ASO AC recommendation 7 September 2006

*ICP-1 and ICP-3 are DNS policies

Existing Global Policy (cont.)

Global Policy for Allocation of ASN Blocks to Regional Internet Registries

- Autonomous System Numbers allocations from IANA to the RIRs (unit is blocks of 1024 AS numbers)
- Adopted by the ICANN Board per ASO AC recommendation 31 July 2008

Global Policy for the Allocation of the Remaining IPv4 Address Space

- The last five /8s are reserved, one /8 per RIR from the IANA at the end
- Adopted by the ICANN Board per ASO AC recommendation on 6 March 2009

Global IANA Policy for Allocation of ASN Blocks to RIRs

- Modified the global ASN policy to allow IANA to process separate 2-byte and 4-byte requests through 2010.
- Adopted by the ICANN Board per ASO AC recommendation on 22 July 2010

Global Proposals

Global Policy for Allocation of IPv4 Blocks to RIRs (2009/2010 timeframe)

- Passed in 5 RIRs, but passed in one with revised text
- Does not meet the criteria to be advanced by the NRO EC to the ASO AC in its current state

Global Proposals (cont.)

Global Policy for IPv4 Allocations by the IANA Post Exhaustion

- Allows IANA to receive address space from the RIRs
- Allows IANA to allocate space back to the RIRs
- Status: (Slightly different versions are under discussion)
  - AfriNIC – Discussed/presented and sent back to the list for more discussion
  - APNIC – Discussed/presented and sent back to the list for more discussion
  - ARIN – Recommendation to adopt (revised, Nov. 2010)
  - LACNIC – Discussed/presented and sent back to the list for more discussion
  - RIPE – Discussed/presented and sent back to the list for more discussion

AfriNIC Policies and Proposals

Alan Barrett
AfriNIC representative, ICANN ASO Address Council

AfriNIC Policy Development Process

Anybody can propose a policy

Discussion on Resource Policy Discussion mailing list

- Anybody can participate

Discussion at public policy meeting

- Two meetings per year

Consensus

Last call on mailing list

Ratification by Board

AfriNIC IPv4 Policies Discussed in 2010

IPv4 Soft Landing Proposal (AFPUB-2010-GENv4-005)

- Deals with IPv4 after the last /8 block is allocated by the IANA
- Going to Last Call

Global Policy for IPv4 Allocations by the IANA Post Exhaustion (AFPUB-2010-v4-006)

- Under Discussion

AfriNIC ASN Policy Discussed in 2010

IANA Policy for Allocation of ASN Blocks to RIRs (AFPUB-2009-ASN-001)

- Global policy, dealing with the transition from 16-bit to 32-bit AS numbers
- Adopted

AfriNIC Other Policies Discussed in 2010

Policy Development Process (AFPUB-2010-GEN-005)

- Minor changes to the policy development process
- Adopted

Abuse Contact Information (AFPUB-2010-GEN-006)

- Making it easier to report abuse
- Going to Last Call

Addition of Real Contact Email into ASN Whois Bulk Data (AFPUB-2010-GEN-007)

- Changing the way email addresses are published
- Under Discussion

Participate in AfriNIC Policy Development

View policies and proposals on web page

- http://www.afrinic.net/policy.htm

Discuss on Resource Policy Discussion mailing list

- https://lists.afrinic.net/mailman/listinfo.cgi/rpd

Discuss at Public Policy Meetings

- Next meeting is in Dar es Salaam, Tanzania, 4 to 9 June 2011

Open to everybody

- You do not need to be a member of AfriNIC
- You do not need to live in Africa

Thank you

Alan Barrett
apb@cequrux.com
AfriNIC representative, ICANN ASO Address Council

APNIC Policies and Proposals

Naresh Ajwani

APNIC representative, ICANN ASO Address Council

APNIC Recently Implemented IPv4 & IPv6 Policies

Removed IPv4 prefix exchange policy

- Permits resource holders to exchange three or more non-contiguous IPv4 blocks in return for a single, larger, contiguous block

Removed aggregation requirement from the IPv6 initial allocation policy

- Reduces overall requirements to obtain IPv6 addresses
- Other RIR communities are discussing removing aggregation requirements from their policies
- Implemented July 2010

Other Recently Implemented Policies

Removed Abuse contact information

- Mandatory reference to IRT objects in the inetnum, inet6num, and aut-num objects in the APNIC Whois Database

APNIC IPv4 Proposals Under Consideration

Distribution of IPv4 addresses once the final /8 period starts

- To handle any IPv4 address space received by APNIC after the final /8 policy

Eligibility for critical infrastructure assignments from the final /8

- Each account holder to request & receive a single assignment from the remaining /8 worth of space

Global Policy for IPv4 Allocations by the IANA Post Exhaustion

APNIC IPv6 Proposals Under Consideration

IPv6 address allocation for deployment purposes

- Adds alternative criteria for receiving larger than /32 initial IPv6 during deployment phase.

Alternative criteria for subsequent IPv6 allocations

- Account holders with existing IPv6 allocations to receive subsequent IPv6 allocations for use in networks that are not connected to the initial IPv6 allocation.

APNIC Other Proposals Under Consideration

Frequent whois information update request

– Accuracy of Member's database.

ASO
ICANN Address Supporting Organization

For more information about APNIC's activities, please see:

http://www.apnic.net/policy

Next APNIC Open Policy Meeting
APNIC 31

Thank You!

ARIN Policy and Proposals

Martin Hannigan
ARIN representative, ICANN ASO Address Council

ARIN IPv4 Policies Implemented in 2010

IPv4 Equitable IPv4 Run-Out (2009-8)

- Reduces the size of allocations to providers after ARIN receives its last /8

/24 End User Minimum Assignment Unit (2010-2)

- Makes it easier for end users to get IPv4 address space (/24s)

ARIN IPv6 Policy Implemented in 2010

IPv6 for Community Networks (2008-3)

- Makes it easier for community networks to request IPv6 space

IPv6 Multiple Discrete Networks (2009-5)

- Makes it easier for providers to request multiple/additional IPv6 allocations

Rework of IPv6 allocation criteria (2010-4)

- Makes it easier for providers to get initial IPv6 allocations

ARIN Other Policy Implemented in 2010

POC Validation (2008-7)

- Helps to increase the accuracy of POC records

Simplified M&A transfer policy (2010-6)

- Makes it simpler to accomplish M&A transfers
- Reiterates that unused space must be returned to ARIN

IANA Policy for Allocation of ASNs to RIRs (2009-6)

- Extends IANA's ability to process separate 2-byte and 4-byte ASN requests for the RIRs through 2010

ARIN Proposal Highlights in 2010

Rework of IPv6 assignment criteria (2010-8)

- Makes it easier for end users to obtain larger portions of IPv6 address space
- Last call

IPv6 Subsequent Allocation (2010-12)

- Makes it easier for providers to obtain additional IPv6 address space (eg. for 6rd)
- Moving towards adoption

Global Policy for IPv4 Allocations by the IANA Post Exhaustion (2010-10)

- Allows returns to IANA and allows IANA to issue smaller blocks to the RIRs
- Moving towards adoption

ARIN - Brand New Proposals

Globally Coordinated Transfer Policy (PP 119)

- RIR to RIR transfers
- "Any RIR's resource registrant may transfer IPv4 addresses to the resource registrant of another RIR as long as the two RIRs agree and exercise Internet stewardship and the values expressed in RFC 2050."

Protecting Number Resources (PP 120)

- IPv4 reclamation
- "ARIN shall use any reasonable and practical methods to proactively look for fraudulently obtained or abandoned number resources and seek the return of those resources to ARIN."

ARIN - Brand New Proposals (cont.)

Sensible IPv6 Allocation for ISPs (PP 121)

- Current policy means many requests for /32s.
- Easier to get larger IPv6 allocations (nibble boundaries)

Reserved Pool for Future Policy Development (PP 122)

- Current policy reserves an IPv4 /10 to facilitate IPv6 deployment (when ARIN gets its last /8).
- Keeps the /10 reserved, but more discussion needs to happen to decide how to use it.

Reserved Pool for Critical Infrastructure (PP123)

- Reserves an IPv4 /16 for critical infrastructure (exchange points, TLD servers, etc.).

ARIN - Brand New Proposals (cont.)

Clarification of Section 4.2.4.4 (PP 124)

- Currently ISPs can request a 12-month supply of IPv4 address space. At the moment ARIN gets its last /8, supply period reduced to 3-months.
- Grandfathers in process requests (lets them get 12-month supply)

Efficient Utilization of IPv4 Requires Dual-Stack (PP 125)

- Current policy does not require dual-stack.
- Portion of policy text, "All new IPv4 addresses assigned, allocated or transferred to an organization must be deployed on dual-stacked interfaces along with IPv6 addresses."

Thank you

Martin Hannigan
marty@akamai.com
ARIN representative, ICANN ASO Address Council

LACNIC Policy and Proposals

Francisco Obispo
ICANN ASO Address Council

LACNIC IPv6 Policies Discussed in 2010

LAC-2007-01 Modifications to the IPv6 Prefix Initial Allocation Policy

- The proposal consisted on eliminating the requirement of announcing an IPv6 without the possibility of disaggregation.
- Approved and ratified by the board.

LACNIC IPv4 Policies Discussed in 2010

LAC-2009-04 Transfers of IPv4 Blocks within the LACNIC Region

- This proposal enables and defines the rules for performing IPv4 address block transfers between ISPs or end users within the LACNIC region.
- Approved and ratified by the board.

LAC-2009-09 Modification: 2.3.3.3. Direct Allocations to Internet Service Providers

- To allow ISPs to obtain blocks of their own in those cases that require establishing interconnections with other providers.
- Didn't reach consensus. Was presented again at LACNIC XIV.

LACNIC IPv4 Policies Discussed in 2010 (cont.)

LAC-2010-05 Initial allocation and assignment of IPv4 addresses for ISPs

LAC-2010-06 Assignment to End Users with need of interconnection

- To update the "Multihoming" requirement with a more flexible one like "Interconnection Needs".
- Consensus reached

LAC-2010-04 Global Policy for IPv4 Allocation by the IANA post exhaustion

- This is a proposal to create a policy allowing for the allocation of IPv4 address space after the depletion of the IANA IPv4 address pool.
- Returned to discussion by Policy Forum chairs. Requires more discussion

LACNIC Other Policies Discussed in 2010

LAC-2010-01 One Public Policy Forum Chair per linguistic community

- That the Public Policy Forum be moderated by three chairs, each belonging to one of the linguistic communities corresponding to LACNIC's three working languages: Spanish, Portuguese and English.
- Didn't reach consensus. Was abandoned by the proposer.

LAC-2010-02 Election of Chairs through electronic mechanisms

- To change the process for electing Public Policy Forum Chairs so that they are elected by electronic means and later ratified by those in attendance at the Public Policy Forum.
- Approved and ratified by the board.

LACNIC Other Policies Discussed in 2010 (cont.)

LAC-2010-03 Inclusion of ASN in the whois when available

- Inclusion of origin ASN (provided that it is available) in the information of WHOIS of all the LACNIC's received prefixes.
- Consensus reached

How to participate…

Public policy mailing list.
https://mail.lacnic.net/mailman/listinfo/politicas

List is totally open

In order to submit a policy, you first have to subscribe to the list

Proposals must be submitted using the following web form:

http://lacnic.net/cgi-bin/formpoliticas/sp/formpoliticas.cgi

Thank you

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ICANN ASO Address Council

RIPE Policies and Proposals

Wilfried Woeber
RIPE representative, ICANN ASO Address Council

RIPE IPv4 Policy Implemented in 2010

Run Out Fairly (2009-03)

- IPv4 address space will be allocated/assigned based on a decreasing allocation/assignment period
  - 9months (now)
  - 6 months (from January 2011)
  - 3 months (from July 2011)

80% Rule Ambiguity Cleanup (2010-04)

- clarification of the '80% rule' for sub-allocation requests
- 80% of the utilisation ratio is calculated on all the already allocated space

RIPE Other Policy Implemented in 2010

Direct Assignment to End User from the RIPE NCC (2007-01)

- Defines mandatory for IPv4 assignments the contractual relationship between End Users and IR (LIRs or RIPE NCC)

IANA Policy for Allocation of ASNs to RIRs (2009-07)

- IANA and the RIRs will operate ASN allocations from an undifferentiated 4-byte ASN allocation pool from 1 January 2011

RIPE Proposal Highlights in 2010

Temporary Internet Number assignment Policies (2010-01)

- Collects under only one policy section all the rules for temporary assignments
- Last call

Allocations from the last /8 (2010-02)

- Defines the distribution of IPv4 address space from the final /8 available
- Last Call

Global Policy for IPv4 Allocations by the IANA Post Exhaustion (2010-05)

- Some changes to the text were presented at RIPE 61
- The new text is available and will enter the PDP

RIPE - Brand New Proposals

Registration Requirements for IPv6 End User Assignments (2010-06)

- Creates an improved and structured registration in the RIPE database for multiple IPv6 sub-allocation
- Will enter the Review Phase with the new proposal version

Ambiguity Cleanup on IPv6 Address Space Policy for IXP (2010-07)

- Clarifies the conditions for an IXP to receive IPv6 allocations
- Will enter the Review Phase

RIPE - Brand New Proposals

Abuse Contact Information (2010-8)

- Defines rules to improve the registration and the availability of the abuse contact data in the RIPE database
- Discussed at RIPE 61, proposal text will be revised

Globally Coordinated Transfer Policy

- Presented by authors at RIPE 61
- Plans to start the PDP

Thank you

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RIPE representative, ICANN ASO Address Council

Closing: Questions and Answers

Louie Lee
Chair, ICANN ASO Address Council

How to Participate

Watch the ASO AC site for news about new global proposals

- http://aso.icann.org/

Participate in the Policy Discussions in your RIR region

- Global proposals are discussed on the RIR's policy mailing lists and at open policy meetings
- Subscribe and participate on the appropriate list and attend open public policy meetings (remote participation enabled)
  - Open, no membership requirements
  - State your opinion

Participation is Easy!

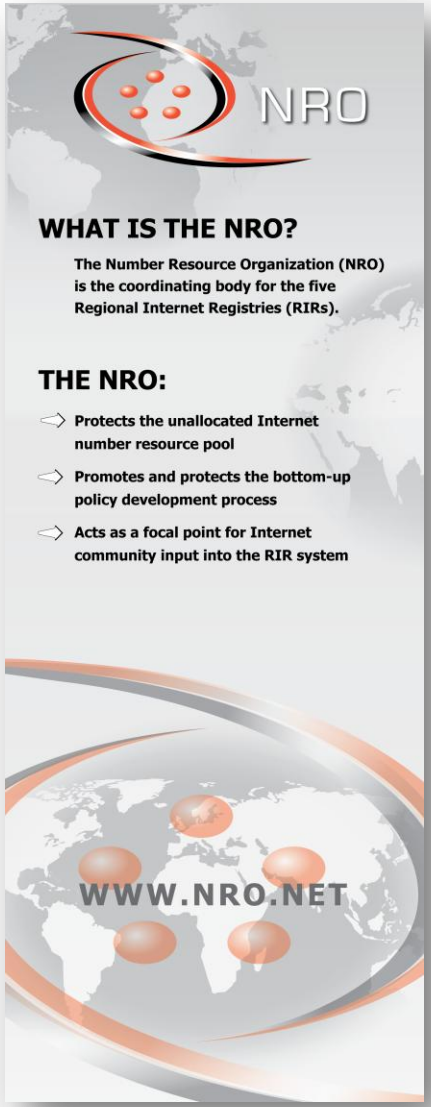
Subscribe to the RIR policy list(s)

- No membership requirements

Attend RIR meetings

- In person (open, nominal fee)
- Remote (free)

Visit the NRO Booth



Thank you.
Questions?

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