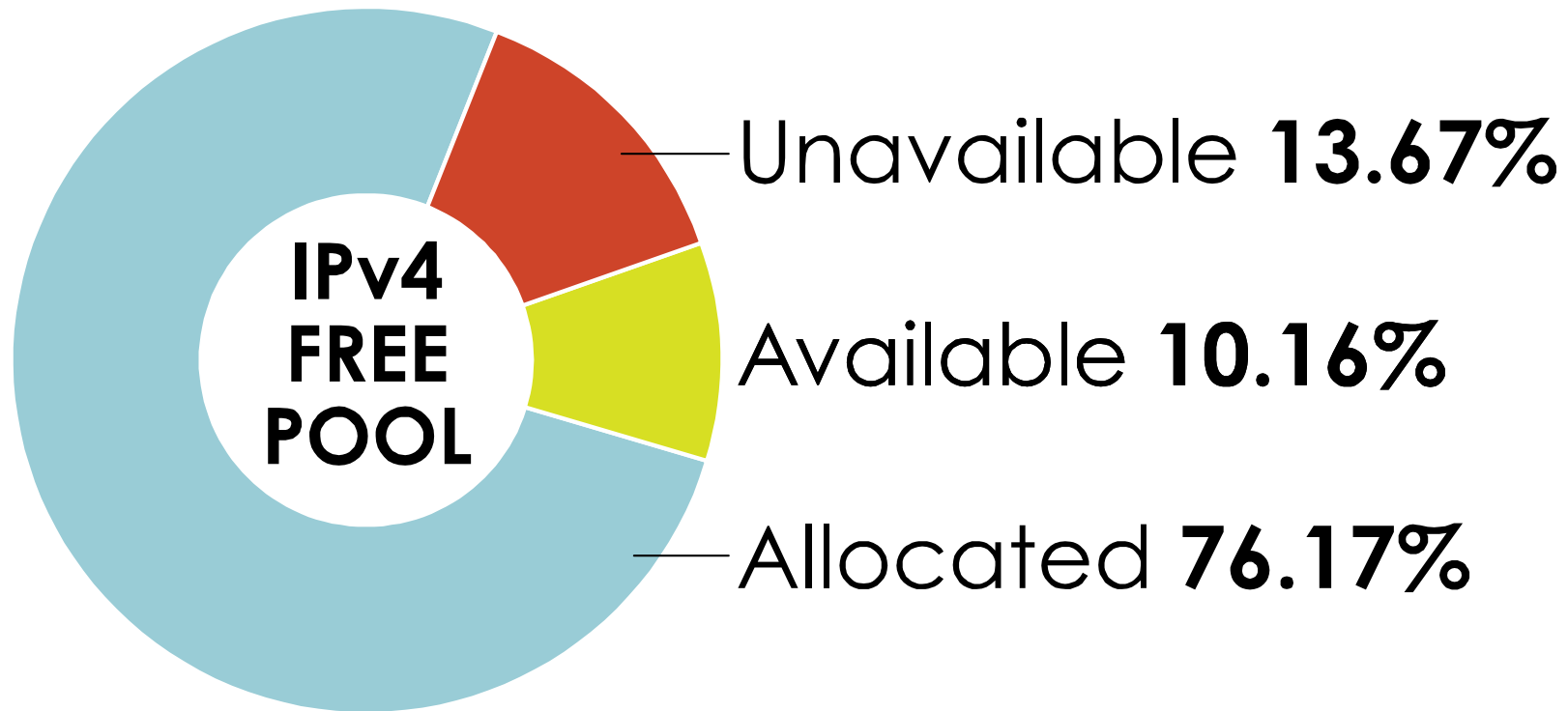




Adopting IPv6- Internet Number Resources and ARIN

Tim Christensen

Available IPv4 /8s from IANA*

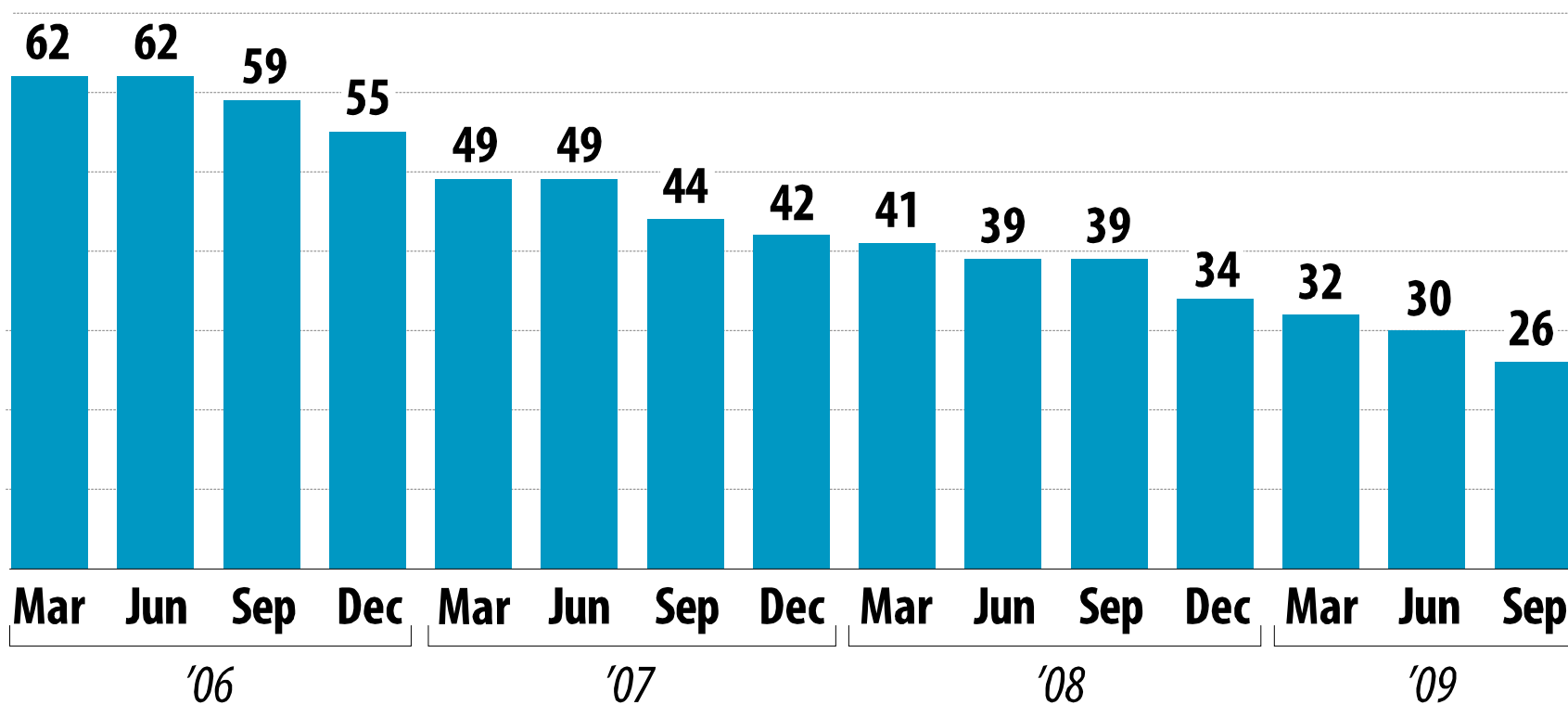


* as of September 2009

What We Know

- RIRs are consistently allocating over 12 /8s each year worldwide
- There are 26 /8s remaining at the IANA as of 30 September 2009
- Demand for IPv4 continues

Remaining IPv4 /8s from IANA



The Bottom Line

- We're running out of IPv4 address space
- IPv6 must be adopted for continued Internet growth
- IPv6 is not backwards compatible with IPv4
- We must maintain IPv4 and IPv6 simultaneously for many years



RIRs have been allocating IPv6 address space since 1999

Thousands of organizations have obtained an IPv6 allocation to date

ARIN has IPv6 distribution policies for both service providers and end-user organizations

Call to Action

Enterprise Customers

Mail and web servers need to be reachable via IPv6 in addition to IPv4 in the future

Open a dialogue with your Internet Service Provider about future IPv6 services

Each organization's decision regarding timeline & investment level will vary

Call to Action

Internet Service Providers

Begin planning to connect customers via both IPv4 and IPv6 now

Communicate with your peers and vendors about IPv6

IPv6 considerations when making purchases

Call to Action

Equipment Vendors

Probably limited demand for IPv6 in the past

Demand will make IPv6 support mandatory
very, very quickly

Introduce IPv6 support into your product cycle
as soon as possible

Call to Action

Content Providers

Content clients must be reachable to newer Internet customers

Begin planning to connect hosting customers via both IPv4 and IPv6 now

Encourage customers to use IPv6 and test their applications over it as soon as possible

IPv6 Adoption Needs

IPv6 address space

IPv6 connectivity (native or tunneled)

Operating systems, software, and network management tool upgrades

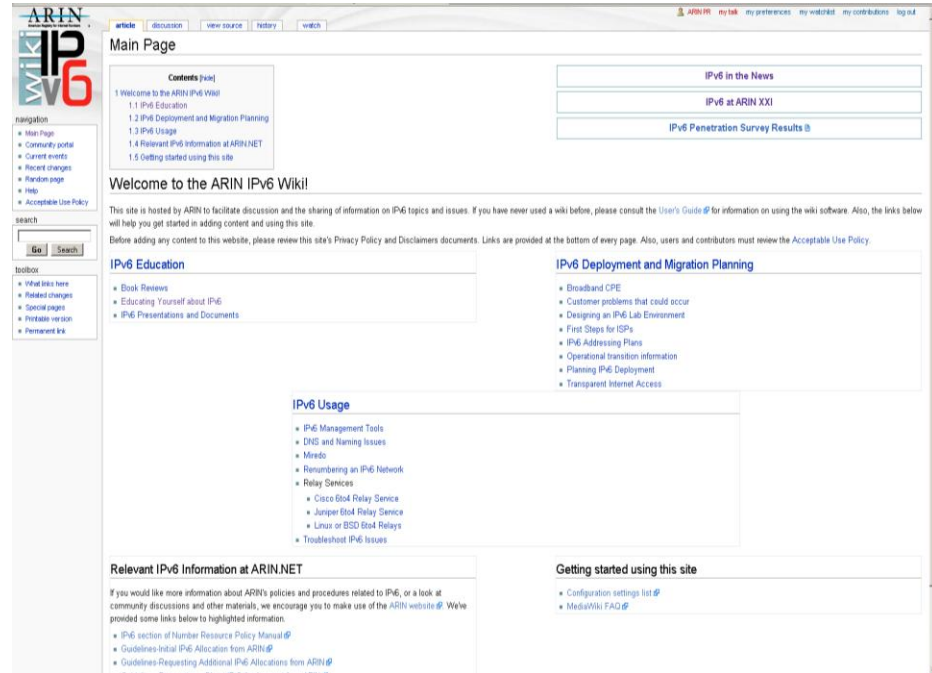
Router, firewall, and other hardware upgrades

IT staff and customer service training

ARIN IPv6 Wiki

Facilitate discussion and information-sharing on IPv6

Includes real-world experience about adopting IPv6



www.getipv6.info

Board Resolution

Encourages IPv6 adoption

Orders more scrutiny of IPv4 resource requests

Requests Advisory Council to consider policy changes

https://www.arin.net/knowledge/about_resources/v6/v6-resolution.html

ARIN Board Advises Internet Community on Transition to IPv6

ARIN and the other Regional Internet Registries have distributed Internet Protocol version 6, IPv6, alongside IPv4 since 1999. To date, ARIN has issued both protocol versions in tandem and has not advocated one over the other. ARIN has closely monitored trends in demand and distribution for both protocol versions with the understanding that the IPv4 available resource pool would continue to diminish.

The available IPv4 resource pool has now been reduced to the point that ARIN is compelled to advise the Internet community that transition to IPv6 is necessary for any applications that require ongoing availability from ARIN of contiguous IP number resources.

On 7 May 2007, the ARIN Board of Trustees passed the following resolution:

RESOLUTION OF THE BOARD OF TRUSTEES OF ARIN ON INTERNET PROTOCOL NUMBERING RESOURCE AVAILABILITY

WHEREAS, community access to Internet Protocol (IP) numbering Resources has proved essential to the successful growth of the Internet; and,

WHEREAS, ongoing community access to Internet Protocol version 4 (IPv4) numbering resources can not be assured indefinitely; and,

WHEREAS, Internet Protocol version 6 (IPv6) numbering resources are available and suitable for many Internet applications,

BE IT RESOLVED, that this Board of Trustees hereby advises the Internet community that migration to IPv6 numbering resources is necessary for any applications which require ongoing availability from ARIN of contiguous IP numbering resources; and,

BE IT ORDERED, that this Board of Trustees hereby directs ARIN staff to take any and all measures necessary to assure veracity of applications to ARIN for IPv4 numbering resources; and,

BE IT RESOLVED, that this Board of Trustees hereby requests the ARIN Advisory Council to consider Internet Numbering Resource Policy changes advisable to encourage migration to IPv6 numbering resources where possible.

Implementation of this resolution will include both internal and external components. Internally, ARIN will review its resource request procedures and continue to provide policy experience reports to the Advisory Council. Externally, ARIN will send progress announcements to the ARIN community as well as the wider technical audience, government agencies, and media outlets. ARIN will produce new documentation, from basic introductory fact sheets to FAQs on how this resolution will affect users in the region. ARIN will focus on IPv6 in many of its general outreach activities, such as speaking engagements, trade shows, and technical community meetings.

Visit the IPv6 Information Center at www.arin.net/v6/v6-info.html,
or visit the ARIN IPv6 wiki at www.getipv6.info.

ARIN Letter to CEOs

Raises awareness of IPv4 depletion

Encourages active adoption of IPv6

As of 18 May 2009, ARIN requires that all applications for IPv4 address space include an attestation of accuracy from an officer of the organization

<https://www.arin.net/announcements/2009/20090420.html>



ARIN's Policy Development Process

Policy Development Process

The regional community decides how ARIN will manage and administer Internet number resources.

Anyone may participate in the process.

The ARIN Board of Trustees ratifies policies only after:

- discussion on mailing lists and at biannual Public Policy meetings;
- the ARIN Advisory Council recommends adoption after finding consensus in favor of a proposal.

Policy Development Process

Participation includes:

- Subscribing to the Public Policy Mailing List (PPML) and joining in the discussions
- Attending biannual Public Policy Meetings or participating remotely through meeting webcasts
- Submitting a policy proposal to create new policy or revise current policy

Current Policy:

IPv6 – Initial Allocation to ISPs

- Criteria
 - Be an LIR (an ISP), and not an end site
 - Plan to provide IPv6 connectivity to organizations and route the aggregate prefix
 - Plan to make at least 200 assignments to customers within five years OR be a well known ISP in the ARIN region
- Minimum allocation is /32
 - larger allocations may be justified; based on number of existing v4 users and org's infrastructure

Current Policy:

IPv6 – Subsequent Allocation to ISPs

- Criteria
 - ISP must achieve acceptable utilization of its allocated space; measured in terms of /56 assignments using the HD Ratio (RFC 3194) of .94
 - e.g. One /32 has 16,777,216 /56s
 - 6,183,533 /56s would have to be assigned in order to request more IP address space
- Based on 2 year need

Current Policy: IPv6 Assignments to End-users

- Criteria
 - not be an IPv6 LIR; and
 - qualify for an IPv4 assignment or allocation from ARIN under the IPv4 policy currently in effect
- Initial assignment size is /48

Need Space?

- www.arin.net/resources/request/
- hostmaster@arin.net
- +1.703.227.0660
7AM – 7PM ET

ARIN XXIV Policy Discussions

- **Draft Policy 2009-8,
“Equitable IPv4 Run-Out”**
 - Would slow down IPv4 distribution.
 - Would reduce the amount of address space an ISP gets from a one-year supply down to six months and then three months.
 - Would reduce the maximum amount of address space ARIN can issue at any given time to an organization.
- **OUTCOME: Returned to AC for more work.**

ARIN XXIV Policy Discussions

- **Draft Policy 2009-7,
“Open Access To IPv6”**
 - Would make IPv6 available to any ISP that requests it, reducing existing requirements to get IPv6 address space.
- **OUTCOME: Sent to last call (revised to remove the requirement to route the single aggregate).**

ARIN XXIV Policy Discussions

- **Draft Policy 2009-5,
“IPv6 Multiple Discrete Networks”**
 - Would allow organizations to request additional address space separately for each discrete network they operate
- **OUTCOME: Sent to last call.**

ARIN XXIV Policy Discussions

- **Draft Policy 2009-3 (Global), “Allocation of IPv4 Blocks to Regional Internet Registries”**
 - States that ARIN and the other RIRs should return address space to the IANA for later redistribution back to RIRs in fixed, evenly-sized allocation units.
- **OUTCOME: Sent to last call (with some small revisions)**

Learn More and Get Involved

Learn more about IPv6

www.arin.net

www.getipv6.info

Get Involved in ARIN

Public Policy Mailing List

Attend a Meeting

<http://www.arin.net/participate/>

Thank You