The Regional Internet Registries

Managing Internet Number Resources

www.afrinic.net

www.apnic.net

www.arin.net

www.lacnic.net

www.ripe.net

A Fair and Stable Platform

Whether typing a domain name into a browser, an email address into a mail client, or dialing a phone number on a Voice over IP (VoIP) system, the Internet relies on a system of numbers called IP addresses (IPv4 and IPv6) to work.

The fundamental operation of the Internet and the indispensable services it provides, such as the World Wide Web, Internet telephony and email, relies on the combined efforts of a number of key organizations. These organizations work collaboratively with the thousands of stakeholders who rely on the Internet's secure, robust, and scalable infrastructure.

Internet Number Resources

Several organizations form a framework for global Internet governance. Together, organizations such as the Regional Internet Registries (RIRs) and the Internet Society (ISOC) work with stakeholders to build Internet standards, facilitate policy development, and conduct training.

Internet number resources are assigned and allocated and managed by the five Regional Internet Registries (RIRs – see page 3), which work collaboratively as the Number Resource Organization (NRO).

Ensuring that Internet number resources are managed responsibly and are available to anyone who needs them is critical to the philosophy of the Internet community. To achieve this, the RIRs use a bottom-up, open and transparent policy development process that gives all stakeholders a voice in deciding how these Internet number resources are managed.

The Regional Internet Registries (RIRs)

The RIRs are not-for-profit, membership-based organizations charged with ensuring the fair distribution of Internet number resources in their respective regions. Each RIR community develops its own policies to manage Internet addresses and Autonomous System (AS) Numbers, as well as working with other RIR communities on policies that require global coordination.

This model of self-regulation has proven to be highly successful in ensuring the stable and reliable operation of the Internet and is an integral part of its future. There are five RIRs:

- AfriNIC, serving Africa
- APNIC, serving the Asia Pacific region
- ARIN, serving Canada, many Caribbean and North Atlantic islands, and the United States
- LACNIC, serving Latin America and the Caribbean
- RIPE NCC, serving Europe, the Middle East and parts of Central Asia

The **Number Resource Organization (NRO)** is a coordinating mechanism for the five RIRs to act collectively on matters relating to the interests of the RIRs. The NRO exists to protect the unallocated Internet number resource pool, to promote and protect the bottom-up policy development process, and to act as a coordinating body that provides global industry partners with a single point of contact with the RIRs.

Domain names are not managed by the RIRs.

IPv4 Exhaustion: Facing a Crucial Challenge

Despite allowing for over four billion unique IP addresses, the IPv4 Internet address scheme is reaching capacity. The massive expansion of the Internet and the introduction of new technologies, such as mobile Internet and Voice over IP (VoIP) services, are rapidly depleting the pool of available IPv4 addresses.

It is impossible to predict exactly when the pool of IPv4 addresses will be exhausted but current estimates point to 2011. Although the Internet will continue to operate after IPv4 addresses are exhausted, the lack of available IPv4 addresses may affect the growth and future of the Internet.

The solution to this is for:
- **Network operators** and **Internet Service Providers** (ISPs) to invest in IPv6-enabled networks and to ensure that their customers can access other IPv6 networks
- **Hardware vendors** to ensure that their products are IPv6 compatible
- **Software producers** to ensure that that their software is IPv6 compliant.

The RIRs: Your Source for Information about IPv6 Deployment and IPv4 Exhaustion

The five Regional Internet Registry (RIR) communities are multi-stakeholder environments, employing bottom-up, self-regulatory processes to achieve best practice policies for Internet addressing.

While the exhaustion of the available pool of IPv4 addresses is of concern, the RIR communities see IPv6 as the longer-term solution for sustained Internet growth and continued stability.

As the organizations responsible for the global allocation of Internet number resources, the RIRs closely monitor Internet address consumption and deployment trends, providing data, analysis, and leadership to assist governments, businesses, and civil society with their IPv6 deployment planning and decision-making.

Each RIR conducts outreach programs in its respective region to promote IPv6 deployment, with special emphasis on supporting capacity-building in developing economies.

The five RIRs also undertake many activities to ensure a smooth transition to IPv6 in the coming years:

- IPv6 address allocation, management, and deployment measurement
- Research, education, and information distribution about IPv6
- Community outreach and liaison
- Representation in forums, such as the ITU, OECD, the Internet Governance Forum (IGF), and ICANN

Transparent, open, bottom-up policy development in all the RIR regions ensures that the policies by which Internet number resources are allocated and assigned are developed by those who use the resources. Anyone can participate in policy development by becoming involved in the global and regional policy development processes.

Next Steps:
Educate ▸ Plan ▸ Participate ▸ Implement

Educate ▸

Build your knowledge of IPv6 to prepare for your next generation network.

Research: The five RIRs produce regular reports and statistics on IPv4 and IPv6 usage. Expert members of the RIR community are referenced by bodies such as ICANN, the ITU, and the OECD.

RIR Meetings: Each RIR holds open meetings, usually once or twice a year. These meetings offer presentations, discussion forums, panel sessions, and relevant training or seminar sessions.

IPv6 Training: All the RIRs operate training programs in their respective regions, many combining face-to-face education with online e-learning options. Find more information on the website of your local RIR, listed on the back page.

Plan ▸

Start planning for your IPv6 deployment today.

Assess Your Needs: Your deployment plan should address the specific needs of your organization and customers. A "dual stack" approach, where your network and services support both IPv4 and IPv6, is likely to be a key element of your deployment strategy.

Set a Timetable: The deployment of IPv6 can be factored into your current IT upgrade cycle. Actively engage your vendors and suppliers and ensure that they are aware of your needs. The sooner you can inform them of your intentions, the more likely you will find competitive suppliers ready to assist you.

Apply For IPv6 Addresses: You will need to obtain IPv6 address space for your IPv6 network. Contact your RIR to find out more about how to obtain Internet number resources and gain access to tools to effectively manage them.

Participate ‣

Attend an RIR Meeting: RIR meetings are your opportunity to take part in developing Internet number resource allocation and assignment policy. They are open to anyone and are particularly relevant to Internet Service Providers (ISPs), Internet equipment vendors, governments and regulators. These meetings also offer remote participation, so you can participate online if you are unable to attend in person.

Discuss IPv4 and IPv6 Policy: Each RIR also facilitates policy discussion using mailing lists. The distribution of the remaining free pool of IPv4 address space and handling the IPv4 environment beyond that point are key priorities for the RIR community. It is important to take part in the ongoing process of deciding how these Internet number resources will be shared globally and in your region. Each RIR community has also developed and continues to refine a range of policies that are designed to encourage the adoption of IPv6 and ensure fair and equitable access to IPv6 address space.

Implement ‣

Eventually, you will need to deploy IPv6 on your own core IP network.

IPv6 Transit/Tunneling: Because there is no way for IPv4-only and IPv6-only networks to directly communicate with each other, various technologies exist to ensure the interoperability of IPv4 and IPv6 networks. You may also need to access an IPv6 transit exchange. Check with your ISP or an Internet Exchange (IX) in your region.

Website Content: Access to web servers, both internal and external-facing, will require support for both IPv4 and IPv6 connections. Take the opportunity to showcase your IPv6 availability and secure a competitive advantage.

Upgrade Your Infrastructure: Ensure your IPv6 DNS services are in place and functioning correctly. Your DNS server should be accessible over both IPv4 and IPv6. Review your internal address management systems and customer-facing provisioning systems and update as necessary.

Links and Information

Contact Your RIR:

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ARIN – for Canada, many Caribbean and North Atlantic islands, and the United States: **www.arin.net**
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Find Out More About IPv6 Deployment:

AfriNIC's IPv6 Virtual Lab:
www.afrinic.net/projects/cvl.htm

APNIC's IPv6 Program:
www.apnic.net/community/ipv6-program

ARIN's IPv6 Wiki:
www.getipv6.info

LACNIC's IPv6 Information Center:
portalipv6.lacnic.net/en

RIPE NCC's IPv6 Act Now:
www.ipv6actnow.org

Contact the NRO:

The Number Resource Organization:
www.nro.net

Statistics on global Internet number resource distribution:
www.nro.net/statistics

Information on global policy development:
www.nro.net/policy