

## About ARIN

The American Registry for Internet Numbers (ARIN) is the nonprofit corporation that distributes Internet number resources, including Internet Protocol (IP) addresses, to Canada, many Caribbean and North Atlantic islands, and the United States.

## What is an IP address?

An *Internet Protocol (IP)* address is a number that identifies a device on a computer network.

No one “owns” IP addresses, so they’re not bought, sold, or traded. ARIN’s fees are only for the services involved in managing and administering Internet number resources.

## Who uses IP addresses?

Anyone that uses the Internet uses an IP address, since every device directly connected to the Internet must have a unique IP address. They are used on things like home computers, web servers and routers, and many handheld computers, cell phones, digital cameras, and other devices.

## What is the difference between an IP address and a domain name?

An IP address is a unique numerical identifier used to move, or route, information on the Internet. An example of an IP address is 199.43.0.202.

A domain name is a label that people use to find points on the Internet without having to remember strings of numbers. An example of a domain name is [www.arin.net](http://www.arin.net).

## How do I get an IP address?

You most likely get an IP address from your Internet Service Provider (ISP). As a home Internet user, your ISP “dynamically” gives your computer a unique IP address to use while you’re on the Internet. Once you’ve closed your session and no longer need the IP address, the ISP may assign the same IP address to another user on the network.

While an IP address is not property and cannot be bought, sold, or traded, a domain name may be considered intellectual property.

In some cases, users with specific needs can get a unique block of IP addresses from an ISP or from a Regional Internet Registry like ARIN.

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**An IP address** is a *number* that a computer uses to move information on the Internet. An example of an **IP address** is 199.43.0.202. Every device directly connected to the Internet must have a unique IP address.

**A domain name** is a *label* that a person uses in place of an IP address. An example of a **domain name** is www.arin.net.

Typing either "199.43.0.202" or "www.arin.net" into a web browser will call the ARIN website.

Computers only understand IP addresses, whereas people generally find it easier to remember words or terms. The Domain Name System (DNS) translates these easily remembered names into their unique IP addresses for the computer to find.

IP ADDRESS	DOMAIN NAME
Locator	Label
Identifies Point on Internet	Identifies IP Address
Computer-friendly	People-friendly
Used to Move Information	Used to Store Information
NOT Property	Intellectual Property

*"A name indicates what we seek.  
An address indicates where it is.  
A route indicates how we get there."*

—Jon Postel, RFC 791

### GOING TO AN AUTO MECHANIC

I find a mechanic's name in the phone book.

I find the mechanic's street address.

I use a map to determine the route to the mechanic's garage.

I follow the map to take my car to the mechanic's garage.

### GOING TO A WEBSITE

I type the domain name (www.arin.net) into my web browser.

My computer uses the DNS to determine the IP address (199.43.0.202) of www.arin.net.

My local router finds the path to 199.43.0.202.

My computer follows the path and connects me to the ARIN website.

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## What is Internet Protocol?

Internet Protocol is a set of technical rules that defines how computers communicate over a network. There are currently two versions: IP version 4 (IPv4) and IP version 6 (IPv6).

## What is IPv4?

IPv4 was the first version of Internet Protocol to be widely used, and still accounts for most of today's Internet traffic. There are just over 4 billion IPv4 addresses. While that is a lot of IP addresses, it is not enough to last forever.

## What is IPv6?

IPv6 is a replacement for IPv4. It was deployed in 1999 and provides far more IP addresses, which should meet the need well into the future.

## What are the major differences?

The major difference between IPv4 and IPv6 is the number of IP addresses. There are just over 4 billion IPv4 addresses. In contrast, there are over 16 billion-billion IPv6 addresses.

The technical functioning of the Internet remains the same in both versions and it is likely that both versions will continue to operate simultaneously on networks well into the future. To date, most networks that use IPv6 support both IPv4 and IPv6 addresses in their networks.

	Internet Protocol version 4 (IPv4)	Internet Protocol version 6 (IPv6)
Deployed	1981	1999
Address Size	32-bit number	128-bit number
Address Format	Dotted Decimal Notation: 199.43.0.202	Hexadecimal Notation: 2001:500:4:1::80
Number of Addresses	$2^{32} = \sim 4$ billion addresses	$2^{128} = \sim 16$ billion-billion addresses

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**Visit the IPv6 Information Center at <http://www.arin.net/v6/v6-info.html>!**

## What Is IPv6?

Every device directly connected to the Internet must have a unique number called an Internet Protocol address. Internet Protocol version 6 (IPv6) is a new numbering system that provides a much larger address pool than the previous version (IPv4), amongst other features.

## What Does This Mean for ISPs and Organizations?

ISPs and organizations that plan to request address space in the future should ensure their network equipment is IPv6-capable and have IPv6 connectivity.

Specific transition needs and costs vary based on many factors, but may involve:

- Obtaining IPv6 addresses and connectivity
- Upgrading operating systems, software, and network management tools
- Updating routers, firewalls, and other hardware
- Training IT staff and customer service representatives

## Why Transition to IPv6?

Networks will use IPv4 and IPv6 simultaneously for the foreseeable future. As people use more Internet-enabled devices, organizations and Internet Service Providers will expand their networks, leading to increased demand for IP addresses. However, the IPv4 pool is running out of addresses. When this pool is depleted, organizations will not be able to get large blocks of IPv4 addresses, but will be able to get large blocks of IPv6 addresses.

## What Does This Mean for Me as a Home User?

Your needs as a home user will vary depending on your computer's operating system. Most operating systems released after 2001 have IPv6 support.

There are three basic scenarios for your computer becoming IPv6 enabled.

- a) You do nothing. Your computer automatically transitions to IPv6, because your operating system enables it by default.
- b) You turn on IPv6 in the operating system. Your computer then completes the transition automatically.
- c) You ensure IPv6 is enabled in your operating system and then you or your ISP manually set up the rest of your network.

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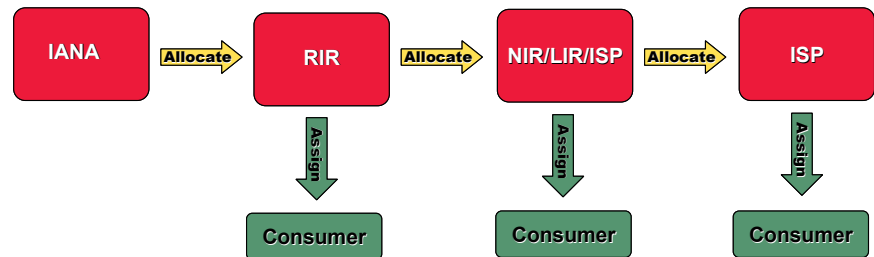
The American Registry for Internet Numbers (ARIN) is the nonprofit corporation that distributes Internet number resources, including Internet Protocol (IP) addresses, to Canada, many Caribbean and North Atlantic islands, and the United States.

### Quick Facts:

- ARIN's minimum IPv4 allocation is generally a /20.
- ARIN's minimum IPv6 allocation is generally a /32.

## Who distributes IP addresses?

IANA distributes large blocks of IP addresses to the five Regional Internet Registries (RIRs). RIRs allocate smaller address blocks within their regions to Internet Service Providers (ISPs), Local Internet Registries (LIRs), and National Internet Registries (NIRs), who then assign IP addresses to consumers.



### IPv4 Example:

To calculate an IPv4 /24:

#### Step 1:

32 (# of bits in an IPv4 address)  
-24 (CIDR block size)  
8

#### Step 2:

$2^8 = 256$

There are 256 unique IPv4 addresses in a /24.

### IPv6 Example:

To calculate an IPv6 /80:

#### Step 1:

128 (# of bits in an IPv6 address)  
-80 (CIDR block size)  
48

#### Step 2:

$2^{48} = 281,474,976,710,656$

There are 281,474,976,710,656 unique IPv6 addresses in a /80.

## How much do RIRs charge for IP addresses?

Nothing. IP addresses cannot be bought or sold because they are not property. However, RIRs help in the technical coordination of the Internet, so they do

charge fees for the services associated with the IP addresses. Fees cover things like database registration to ensure IP address uniqueness and facilitation of the community policy development process. Each regional community sets its own fees and each RIR publishes a complete fee schedule on its website.

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## What Is Routing?

Routing is the act of moving information through a computer network. On the Internet, information is split into “packets,” each individually labeled with its ultimate destination, an IP address.

Specialized devices called routers pass packets from the source computer to its destination by analyzing a routing table to determine the best path.

## What Is a Routing Table?

A routing table is a list of networks stored in a router’s memory. Routing directs packet forwarding on the Internet. The router receives a packet and examines it, then usually forwards the packet toward its destination based on information derived from the routing table.

Because routers have a finite amount of memory and processing power, the size of the routing table must be kept at a manageable size to maintain service quality. The increasing number of computers, mobile handhelds, servers, routers, and other Internet-enabled devices has led to a continually increasing routing table size, creating an ongoing challenge for router manufacturers and network administrators. When a routing table grows to an unmanageable size, packets are lost and do not reach their intended destinations.

## What Role Does ARIN Play in Routing on the Internet?

ARIN only has an indirect role in routing. Individual network operators set their own rules for routing with no control or oversight from ARIN or any other organization. However, ARIN’s Internet number resource distribution policies may impact the global routing table, affecting all Internet users.

ARIN helps keep the global routing table at a manageable size by allocating large blocks of IP addresses, creating a single entry in the table. Organizations manage their large blocks, further allocating smaller blocks from inside their networks. This allows many entities to use a single large block, rather than each network having its own allocation, and therefore own routing table entry.

If ARIN policy allowed for distribution of smaller blocks to more entities, network operators would have to carry more entries in their routing tables. This may exceed the capacity of their routers and lead to a failure of routing on the Internet.

To minimize routing table growth, the ARIN community considers each proposed policy’s impact on the global routing tables.

## About ARIN

The American Registry for Internet Numbers (ARIN) is the nonprofit corporation that distributes Internet number resources, including Internet Protocol (IP) addresses, to Canada, the United States, and several islands in the Caribbean and North Atlantic Ocean.

## What is a policy?

A policy is a documented decision made by the ARIN community that dictates the management of Internet number resources (IPv4 and IPv6 address space and Autonomous System numbers) in the ARIN region.

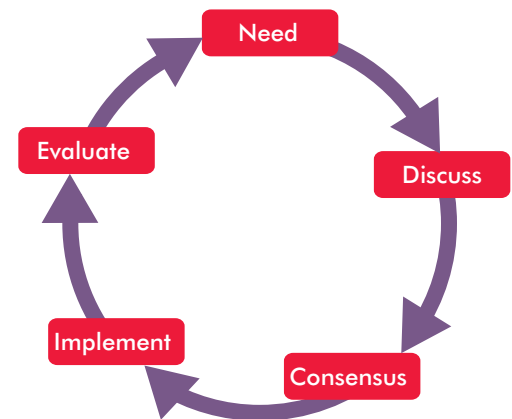
## What is ARIN's policy development process?

The Internet Resource Policy Evaluation Process (IRPEP) is how the ARIN community proposes, discusses, and adopts policies. The IRPEP is cyclical and consists of five basic steps. They are:

- **Need:** A community member submits a proposal after seeing a need for a new or revised policy.
- **Discuss:** The community discusses the proposal on the Public Policy Mailing List and at Public Policy Meeting(s).
- **Consensus:** The Advisory Council evaluates consensus and, if found in favor, recommends ratification by the Board of Trustees. The Board ratifies proposals after ensuring the process was followed and conducting a full legal and fiscal review.
- **Implement:** The new policy takes effect.
- **Evaluate:** ARIN community and staff members evaluate all policies for relevance and unintended consequences based on implementation experience. This continuous review may result in additional needs.

## Who can participate in policy development?

Anyone! Any interested party is welcome and encouraged to participate in ARIN's policy development process.



## How do people participate?

- Subscribe to the Public Policy Mailing List and join the discussions. See more at: [http://www.arin.net/mailling\\_lists/](http://www.arin.net/mailling_lists/).
- Attend Public Policy Meetings or participate remotely through meeting webcasts. Active policy proposals are presented and discussed at each meeting. Meeting information is available at: <http://www.arin.net/meetings/>.
- Submit a proposal to create a new policy or revise current policy. Read the IRPEP at <http://www.arin.net/policy/irpep.html> and follow the instructions to submit a proposal.

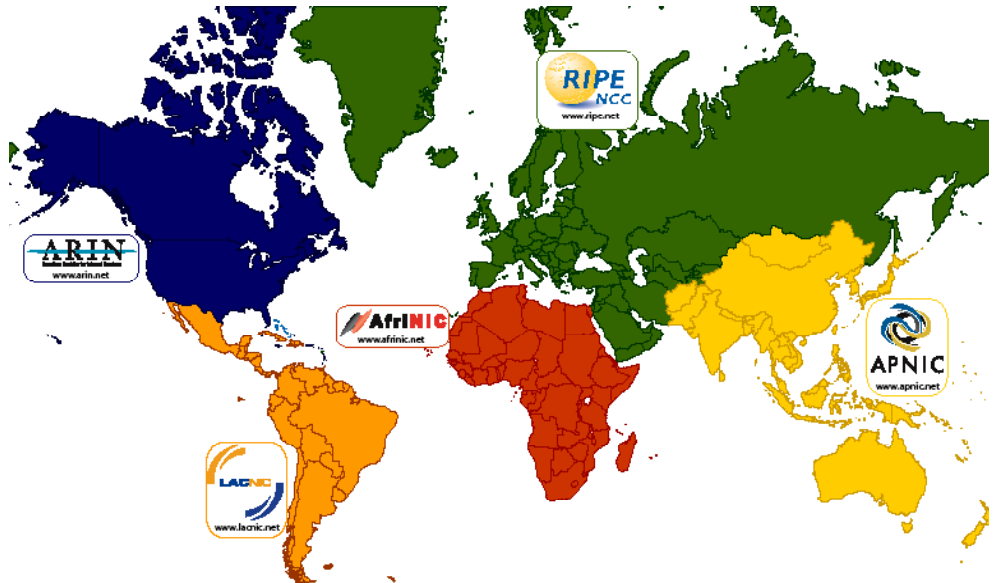
## About ARIN

The American Registry for Internet Numbers (ARIN) is the nonprofit corporation that distributes Internet number resources, including Internet Protocol (IP) addresses, to Canada, many Caribbean and North Atlantic islands, and the United States.

There are five Regional Internet Registries, or RIRs. All RIRs are nonprofit, membership-based, community-regulated organizations that, on a regional basis:

- Distribute Internet number resources, including IPv4 and IPv6 address space and Autonomous System numbers

- Facilitate the policy development process
- Disseminate information and provide education



### All RIRs are:

- **Nonprofit:** RIRs charge fees for services they provide, not for Internet number resources. They are all fully funded by their regional communities.
- **Membership-based:** RIRs are open, transparent, and include participants from the private sector, civil society, and governments.
- **Community-regulated:** RIRs are governed by member-elected

executive boards and adhere to policies that are created by their regional communities.

The five RIRs together form the Number Resource Organization (NRO), which exists to protect the unallocated number resource pool, to promote and protect the bottom-up policy development process, and to act as a focal point for Internet community input into the RIR system.

# ARIN At A Glance

**ARIN**

American Registry for Internet Numbers

## Mission Statement

*Applying the principles of stewardship, ARIN, a nonprofit corporation, allocates Internet Protocol resources; develops consensus-based policies; and facilitates the advancement of the Internet through information and educational outreach.*

**Established:** 1997

## Headquarters

3635 Concorde Parkway  
Suite 200  
Chantilly, VA 20151  
Tel: +1.703.227.9840

## Home Page

[www.arin.net](http://www.arin.net)

## Member Services

[info@arin.net](mailto:info@arin.net)

## Registration Services

[hostmaster@arin.net](mailto:hostmaster@arin.net)

## Financial Services

[billing@arin.net](mailto:billing@arin.net)

## Mailing Lists

[http://www.arin.net/mailing\\_lists](http://www.arin.net/mailing_lists)

## Statistics

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

## Overview

ARIN manages the distribution of Internet number resources (IPv4 and IPv6 address space and Autonomous System Numbers) in Canada, many Caribbean and North Atlantic islands, and the United States.

ARIN is one of five Regional Internet Registries (RIRs) in the world. Like the other RIRs, ARIN:

- Provides services related to the technical coordination and management of Internet number resources
- Facilitates policy development by its members and stakeholders
- Participates in the international Internet community
- Is a nonprofit, community-based organization
- Is governed by an executive board elected by its membership

## Services

### Registration

- Resource distribution
- Record maintenance
- Resource transfers
- WHOIS
- Routing information
- Reverse DNS

### Organization

- Elections
- Members' meetings
- Education and training
- Publications
- Communications

### Policy Development

- Policy process facilitation
- E-mail discussion lists
- Public policy meetings
- Policy documents

## Organizational Structure

ARIN consists of the Internet community within its region, its members, a 7-member Board of Trustees, a 15-member Advisory Council, and a professional staff of approximately 40.

## Registration Services

For information on requesting Internet number resources from ARIN, see [www.arin.net/registration](http://www.arin.net/registration). This section includes the request templates, specific distribution policies, and guidelines for requesting and managing Internet number resources.



## Policy Development

All ARIN policies are set by the community. Everyone is encouraged to participate in the policy development process at public policy meetings and on the Public Policy Mailing List ([ppml@arin.net](mailto:ppml@arin.net)). The ARIN Board of Trustees ratifies policies only after: (1) discussion on mailing lists and at meetings; (2) ARIN Advisory Council recommendation; (3) community consensus in favor of the policy; and (4) full legal and fiscal review.

The community develops policies by following the Internet Resource Policy Evaluation Process, or IRPEP (<http://www.arin.net/policy/irpep.html>). The Number Resource Policy Manual, ARIN's complete set of current policies, is available at <http://www.arin.net/policy/nrpm.html>.

*MEMBERSHIP IS NOT REQUIRED to participate in ARIN's policy development process or to apply for Internet number resources.*

## Membership

Membership is open to everyone by submitting an application and paying an annual fee. Entities that receive IP address space allocations directly from ARIN are automatically accorded membership. For further information see <http://www.arin.net/membership>.

## ARIN Meetings

ARIN holds biannual Public Policy and Members Meetings throughout its region. Members may send two representatives free of charge. Additional representatives from member organizations and nonmembers may attend for a small fee. Webcasting and remote participation are also available. Information about future and past meetings is available at <http://www.arin.net/meetings>.

## International Community

### Internet Community Organizations

ARIN is active in the international Internet community, working with and attending meetings of organizations such as ICANN, IETF, ISOC, and NANOG. See <http://www.arin.net/community> for more information about these organizations.

### Number Resource Organization

The RIRs often work together to coordinate joint activities, including technical tasks and the global management of Internet number resources. Recognizing this, the five RIRs formed the Number Resource Organization (NRO). More information on the NRO can be found on its website at <http://www.nro.net>.

# ARIN Community Participation

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## Meetings

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

## Mailing Lists

[www.arin.net/ mailing\\_lists](http://www.arin.net/ mailing_lists)

## Educational Resources

[www.arin.net/education](http://www.arin.net/education)

## Internet Resource Policy Evaluation Process

[www.arin.net/policy/irpep.html](http://www.arin.net/policy/irpep.html)

## Attend Public Policy and Members Meetings

ARIN welcomes the entire Internet community to its biannual Public Policy and Members Meetings. Meetings are held in various locations throughout the ARIN region, providing participants the opportunity to:

- Engage in policy discussions
- Attend tutorials and workshops
- Visit the onsite Registration Services and Billing help desks
- Network with colleagues
- Discuss operational and financial matters
- Review membership issues

## Subscribe to ARIN Mailing Lists

There are four active mailing lists:

- **Public Policy Mailing List ([ppml@arin.net](mailto:ppml@arin.net))**  
Public forum to raise and discuss issues surrounding existing and proposed policies. The PPML is an integral part of ARIN's Internet Resource Policy Evaluation Process. Opinions expressed here are reviewed to determine consensus for a policy proposal.
- **ARIN Announce Mailing List ([arin-announce@arin.net](mailto:arin-announce@arin.net))**  
Read-only list that provides information on issues affecting the community. Issues include elections, meetings, policy updates, training opportunities, and other ARIN events.
- **ARIN Discussion Mailing List ([arin-discuss@arin.net](mailto:arin-discuss@arin.net))**  
Members-only list that provides a forum for members to discuss ARIN-specific issues such as fee structures and internal policies.
- **Consultation Mailing List ([consult@arin.net](mailto:consult@arin.net))**  
Open list used in conjunction with the ARIN Consultation and Suggestion Process to gather comments. This list is open only when there is a call for comments.

See [http://www.arin.net/ mailing\\_lists](http://www.arin.net/ mailing_lists) for subscription information and list archives.



## Participate in Policy Discussions

Policy development is an open and transparent process. The ARIN Board of Trustees ratifies policies only after:

- (a) Discussion on mailing lists and at meetings
- (b) ARIN Advisory Council recommendation
- (c) Evidence of community consensus in favor of the policy
- (d) Full legal and fiscal review

To participate, subscribe to the Public Policy Mailing List and join the discussions. Recent policy discussions have included IPv4 and IPv6 allocations and assignments, micro-allocations, and privacy.

## Develop a Policy Proposal

Anyone may propose creation of a new policy or revision of an existing policy by submitting a proposal template. See <http://www.arin.net/policy> for more information on ARIN's policy development process, including the current Number Resource Policy Manual and the Internet Resource Policy Evaluation Process.

## Become an ARIN Member and Participate in Elections

Membership is open to everyone by submitting an application and paying an annual fee. Entities that receive IP address space allocations directly from ARIN are automatically accorded membership. For further information see <http://www.arin.net/membership>.

ARIN's General Members nominate and vote in the Board of Trustees and Advisory Council elections. Anyone, regardless of membership status, may serve on the Board of Trustees or the Advisory Council. The Board of Trustees is responsible for the business affairs and financial health of ARIN. The Advisory Council serves in a consultative capacity to the Board of Trustees on IP allocation policy and related matters.

## Participate in Global Mailing List Discussions

Each of the five Regional Internet Registries (RIRs) maintains mailing lists to discuss items of interest in its region. See <http://www.arin.net/community/involvement.html> for more information and subscription information.

The Number Resource Organization maintains two mailing lists of its own and posts information for global mailing lists hosted by the RIRs. See <http://www.nro.net/interact> for more information and subscription information.