



IANA FUNCTIONS: THE BASICS



When you want to visit a website, you type or paste the site's **domain name** into your browser, or click on an html link.

That domain name is sent to a server which translates the name into a series of numbers – the Internet Protocol or **IP Address** - which the server uses to direct your request to the website's physical location. ***This all happens in the blink of an eye.***



192.0.32.7

Those names and numbers are called “**unique identifiers**” and are aligned with a standard set of **protocol parameters** that ensure computers can talk to and understand each other.



These are part of the **IANA functions**, which are managed by **ICANN**, the **Internet Corporation for Assigned Names and Numbers**.

These functions aren't just limited to browsing the Internet - they also enable you to send an email or backup photos to the cloud, amongst other tasks.

1

THE HISTORY

Internet Assigned Numbers Authority

The acronym was developed when Jon Postel was administering the ARPANET, a U.S.-government-funded Department of Defense network. It was originally called **The IANA**, as it was just one person performing the functions.

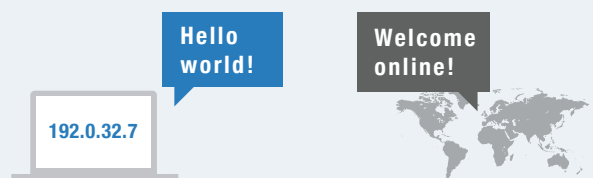
Since then, the Internet has grown tremendously. The IANA functions are no longer managed by just one person. Instead, they are managed by ICANN.

2

THE IANA FUNCTIONS ONLINE

Coordinating the unique identifiers that make the Internet run is an important IANA function.

When a computer or device comes online, it needs to know how to talk to the other devices that are online. It is able to do so because there are standards set in place, and each device has a unique identifier.



3

NAMES AND NUMBERS

The Internet is designed to be user-friendly and simple to navigate. In performing the IANA functions, ICANN coordinates Domain Names, like www.icann.org. Each Domain Name points to a specific IP address.

icann.org } DOMAIN NAME

192.0.32.7 } IP ADDRESS

4

THE INTERNET ECOSYSTEM

The IANA functions are a major part of the Internet ecosystem, but they are just one part. Other actors play a vital role in the operation of the Internet.

ICANN, in performing the IANA functions, coordinates the unique identifiers.

ICANN performs these functions under a contract with the **NTIA**.

Verisign edits and publishes the authoritative root zone file.



NUMBER RESOURCES

A key IANA function is the global coordination of the Internet Protocol addressing systems, commonly known as IP Addresses. There are two types of IP addresses in active use:

IPv4

192.0.2.53

IPv6

2001:db8:582::ae33

The allocation of blocks of AS numbers to Regional Internet Registries (RIRs) is another part of this function. AS numbers are used to identify the networks that control their own routing by connecting to multiple networks controlled by other organizations.

The allocation of IP addresses and AS numbers to RIRs are made according to global policies. The five RIRs, each of which serves a continental region, establish consensus-based global policies.



- ARIN
- LACNIC
- AFRNIC
- RIPE NCC
- APNIC

Regional Internet Registries (RIRs)

Non-profit corporations that administer and register IP address space numbers within a defined region.

PROTOCOL ASSIGNMENTS

ACAP Response Codes
AUTH-TOO-WEAK
ENCRYPT-NEEDED
INVALID
MODIFIED
NOEXIST
PERMISSION
QUOTA
REFER

The Protocol Parameters management function involves maintaining many of the codes and numbers used in Internet protocols. This is done in coordination with the IETF.

ACRONYM CHEAT SHEET

- IANA: Internet Assigned Numbers Authority
- ICANN: Internet Corporation for Assigned Names and Numbers
- IETF: Internet Engineering Task Force
- NTIA: National Telecommunications and Information Administration
- DNS: Domain Name System
- DNSSEC: Domain Name System Security Extensions
- AS number: Autonomous System Number
- TLD: Top-Level Domain

DOMAIN NAMES

.uk
.org
.net
.MOH
.tattoo
.世界



Maintaining the Root Zone Database is a key IANA function. It contains the authoritative record of all the TLDs.

.uk
.org
.net
.MOH
.tattoo
.世界
.ruhr



Part of that function is processing routine updates for TLD operators, as well as adding new TLDs into the root of the DNS.



The Root DNS Key Signing Key allows people to verify DNS answers from the root zone. DNSSEC is critical to the security of the Internet.

WHAT IS DNSSEC?

DNSSEC is a technology that digitally 'signs' DNS answers so you can know they are valid. To be sure of an answer's validity, a digital signature is needed at each stage in the hierarchy from the root zone to the final domain name (e.g., www.icann.org). DNSSEC does not encrypt DNS queries or answers. It lets you know whether a DNS answer is valid.

THE IANA FUNCTIONS

NTIA

IANA Contract
The Contractor shall provide the services necessary for the operation of the Internet Assigned Numbers Authority (IANA) in accordance with the attached statement of work.

NTIA

ICANN currently performs the IANA functions on behalf of the global Internet community under a contract from the United States' Department of Commerce.

NTIA, an agency of the Department of Commerce, performs a process check before authorizing changes to the DNS's authoritative root zone file.