What is the DNS? - how it works

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Agenda

1. What is the Domain Name System?
2. How does the Domain Name System Work?
3. Stakeholders in the Domain Name System.
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What is the Domain Name System (DNS)?
What is the Domain Name System?

- The **Domain Name System or DNS** maps domain names to IP addresses. eg. [www.example.com](http://www.example.com) -----> 192.168.23.1

- Domain names must be unique.

- The DNS is a distributed database
Let’s look at a typical domain name.

www.example.com

- “com” is the First Level Domain or Top Level Domain (TLD)
- “example” is the Second Level Domain
- “www” is the Third Level Domain
● Each Top Level Domain (TLD) is managed by a specific organization called a Registry Operator under contract with ICANN.

● Top Level Domains (TLDs) are divided into two types;
● gTLDs -- Generic Top Level Domains and
● ccTLDs -- Country Code Top Level Domains
Structure of the Domain Name System

- The DNS processes domain names following their hierarchical structure. At the highest level of the domain name system is the Root zone. This root zone is managed by ICANN.
How does the Domain Name System work?
How the Domain System work?

What happens when I type **www.example.com** in my browser?

The simplified domain name lookup process;

1. Your Internet Service Provider’s (ISP’s) DNS server queries the “**root servers**” for the information. There are 13 root servers which have copies distributed around the world.
2. The root server will refer the DNS server to the “**.com**” Top Level Domain (TLD) nameservers.
3. The .com TLD server will refer us to the DNS servers responsible or authoritative for “**example.com**”
4. The DNS servers authoritative for example.com will give us the IP address for **www.example.com**
5. The ISP DNS server tells your browser the IP address of **www.example.com** and saves this reply in case another user on the ISP’s asks the same question.
6. Your browser asks the IP address to download a webpage
The domain name lookup process

1. where is www.iana.org?
2. don’t know, ask the org servers
3. where is www.iana.org?
4. don’t know, ask the iana.org servers
5. where is www.iana.org?
6. www.iana.org is at 192.0.2.0
Stakeholders in the Domain Name System.
The role of ICANN

To ensure the continued interoperability of the Internet’s unique identifier systems, ICANN performs a number of functions.

● management of the Internet’s unique identifiers.

● coordination of policies determined by the five RIRs for allocating and assigning sets of unique numerical identifiers needed to make the IP system work consistently around the world.

● managing (through PTI) the distribution and allocation of IP address “blocks” to the RIRs.

Therefore, ICANN oversees the assignment of both IP addresses and domain names.
ICANN is made up of different communities, representing different interests on the Internet and all contribute to any final decisions that ICANN makes.
Public Technical Identifiers (PTI) is an affiliate of ICANN that is responsible for performing the IANA functions and delivering the IANA Services, on behalf of ICANN.
Other Stakeholders
Domain Registry Operators
Responsible for maintaining the registry for each TLD under their management e.g VeriSign is the Registry Operator for the .com TLD.

Registrars
Organizations accredited by ICANN and certified by the registry operators to sell domains.

Registrant
End customers who registers domain names.
Thank You and Questions
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Engage with ICANN