

Domain Names and IP Addresses: The Critical Challenges of Internet Resources

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The Key Resources of the Internet

□ IP Resources

- A Crucial Role in our Internet Navigation
- Depletion of IPv4 by the end of 2011
- Increase in IPv4 address theft

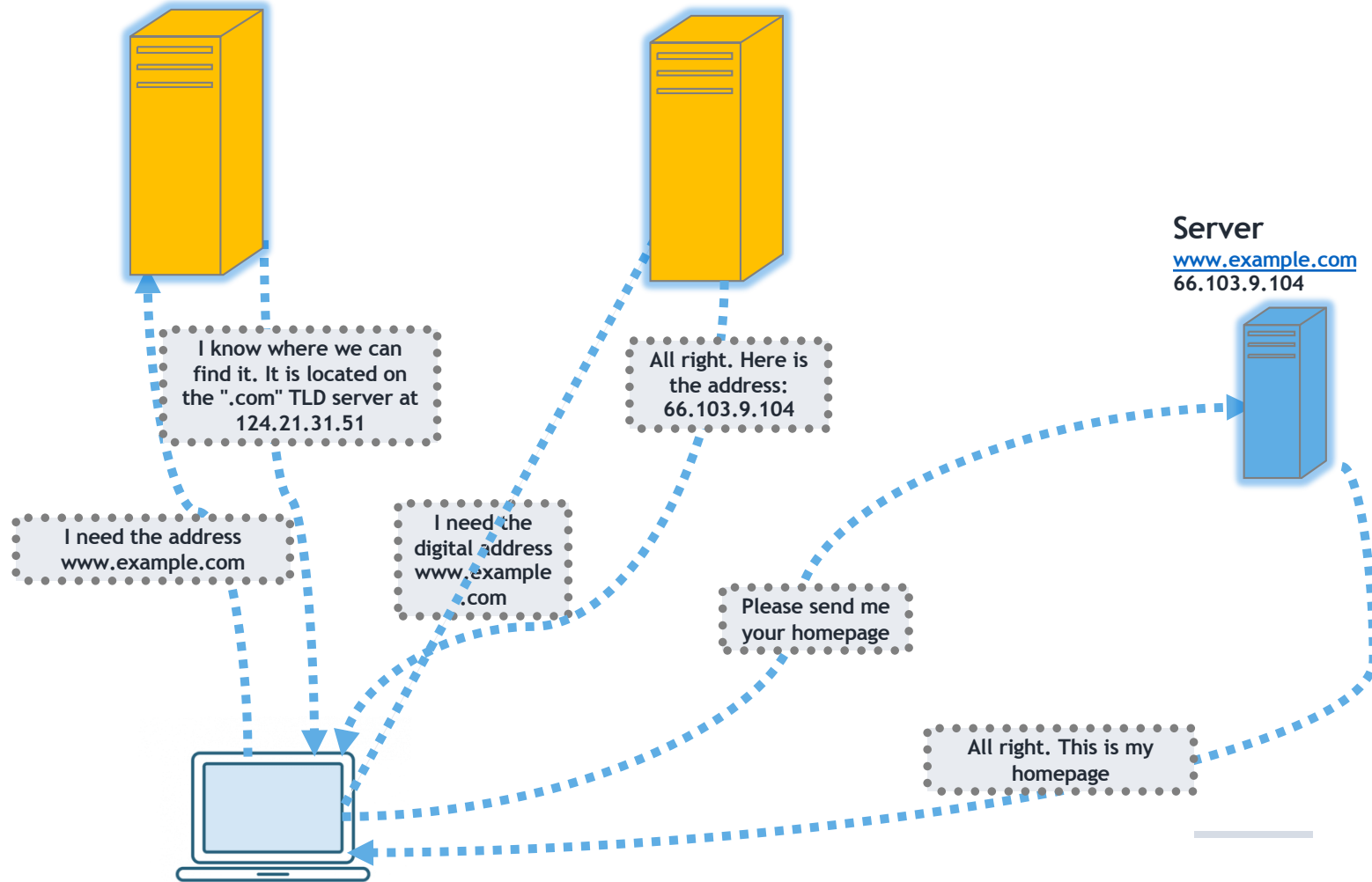
□ Domain Name Resources

- A Crucial Role in Our Internet Navigation
- Originally created solely to replace numbers (John Postel)
- Now envisioned as a Digital Address, increasingly personalized
- Digital Showcase (company, brand, city, community, individual, etc.)

- **ICANN** coordinates these unique identifiers worldwide to ensure a stable, secure, and harmonized global Internet for all users.

ROOT SERVERS (13 worldwide)

SERVER TLD (.com)
124.21.31.51

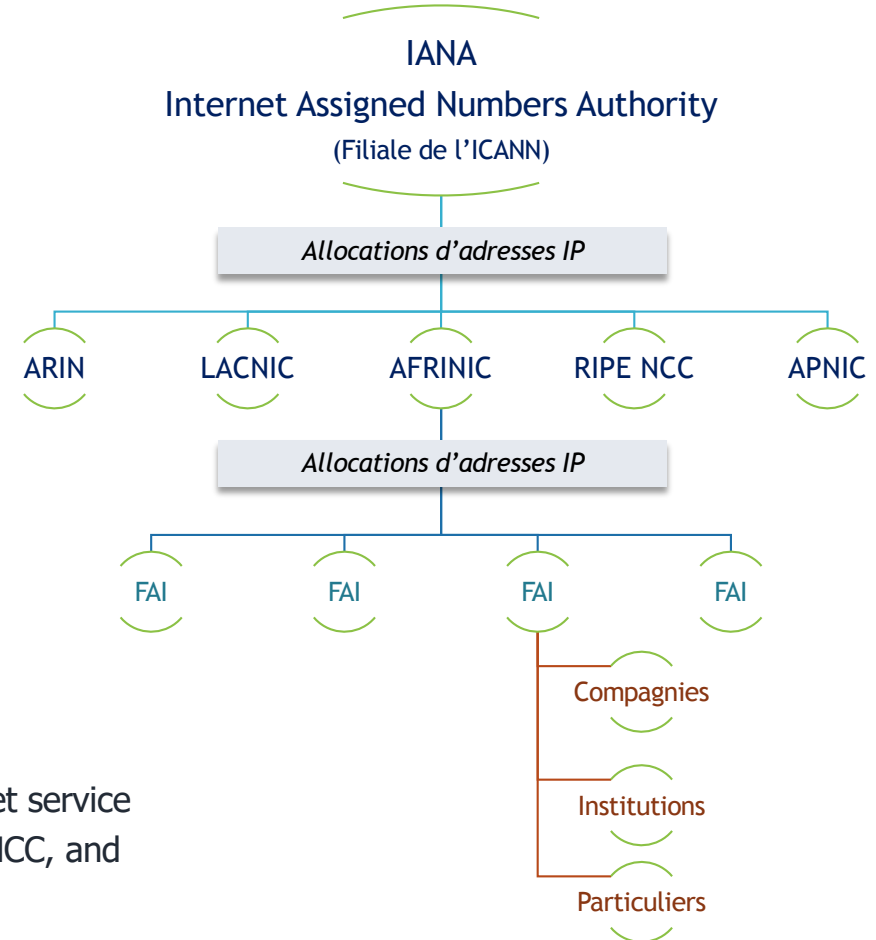


Transmission Control Protocol/Internet Protocol (TCP/IP)

- ❑ An IP address in its version 4 is coded on 4 bytes (octets) with 8 bits each.
- ❑ A series of digits each having a value between 0 and 255.
- ❑ Example : 172 . 16 . 1 . 20
 - 👉 IPv4 is a 32B address (10101100 00010000 00000001 00010100)
 - 👉 The reserve of IP addresses (under IPv4): 4 billion addresses / Depletion at the end of 2011 (GSM, PDA, game consoles, IoT, household appliances, etc.)
- ❑ Taken measures:
 - 👉 Introduction of IPv6 (new version of the IP protocol) which offers a much larger number of IP addresses: 43,000,000,000,000,000
 - 👉 Nearly 340 sextillions of addresses per square millimeter of the Earth's surface.



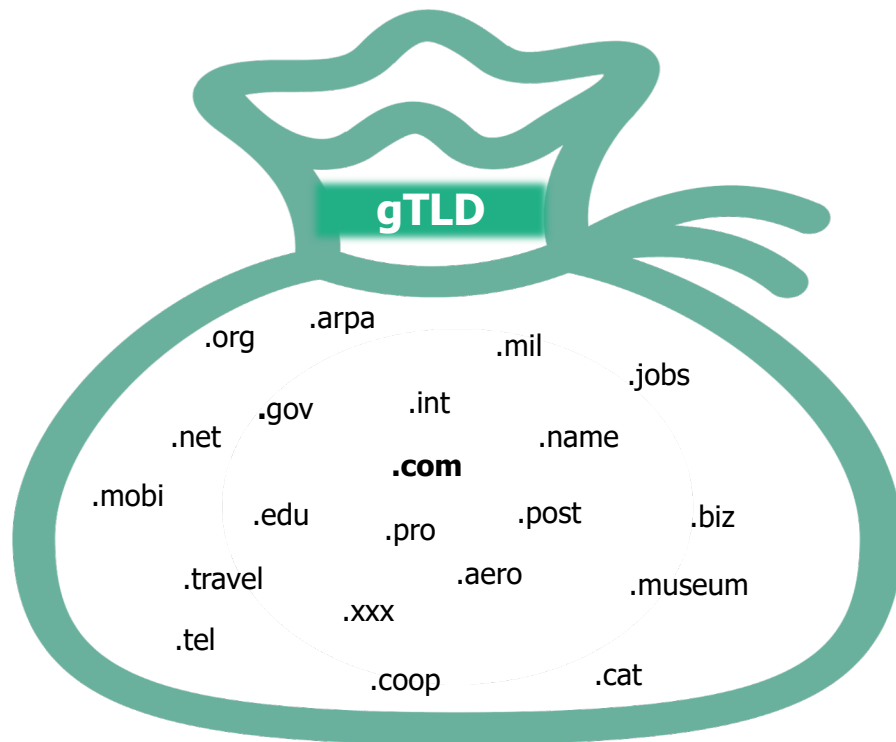
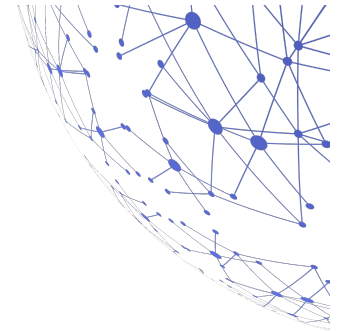
Allocations des Adresses IP



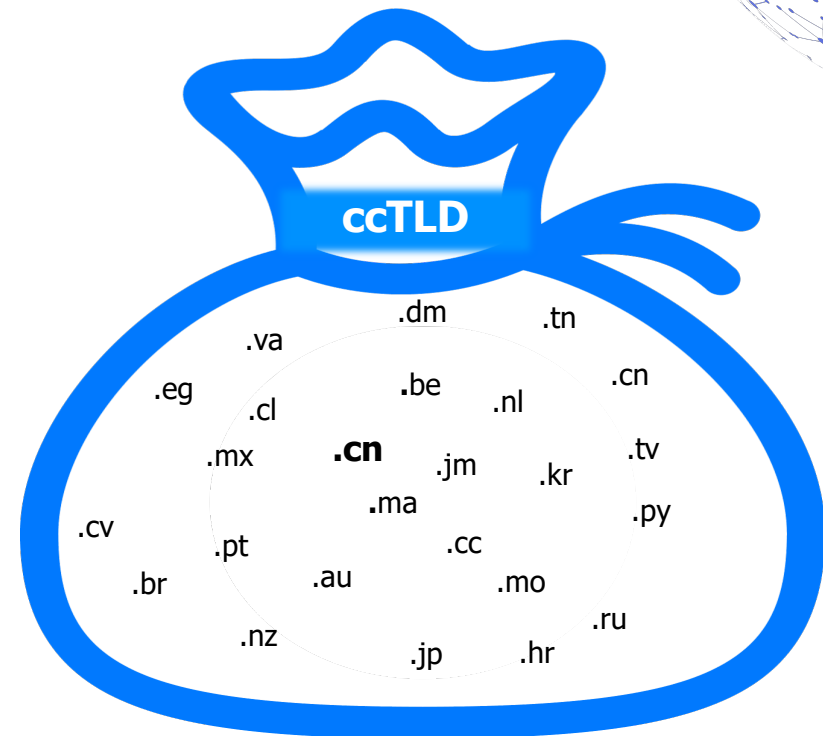
- **RIR** : Manages the distribution of IP addresses and autonomous system numbers in each region of the world.
- **Before 2005**: The dedicated Internet Registry for Africa, internet service providers and users on the continent had to rely on : ARIN, RIPE NCC, and APNIC—for obtaining internet number resources.

Internet Top Level Domains (TLDs)

Two main categories of TLDs



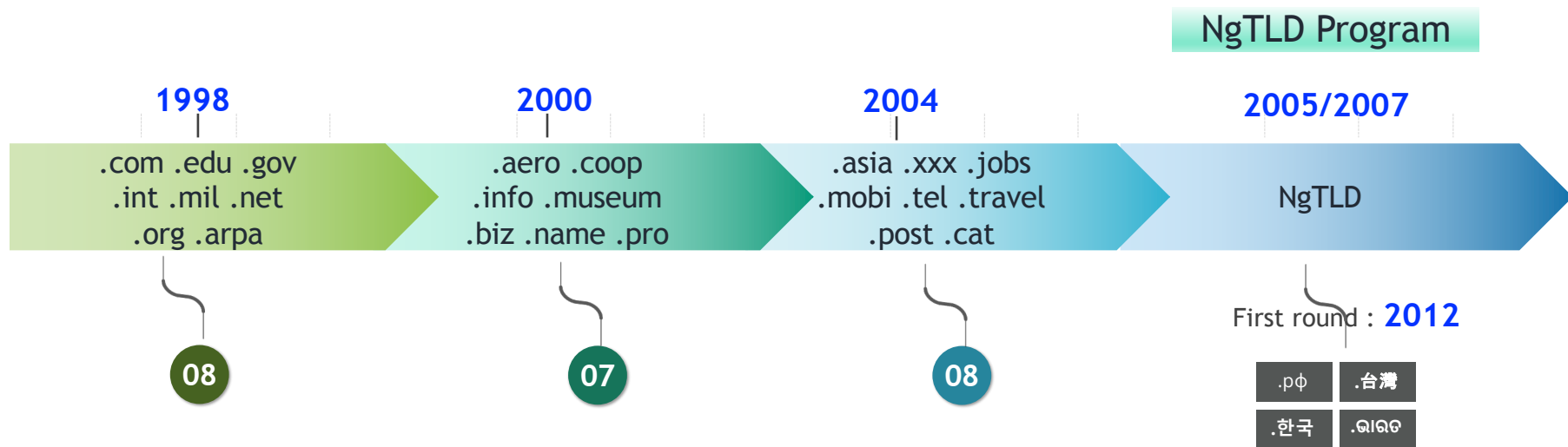
Open to the registration of Internet users from all over the world



Two-letter codes, they correspond to a country or a geographical area (ISO 3166 standard)

gTLDs: History

1998: Creation of ICANN



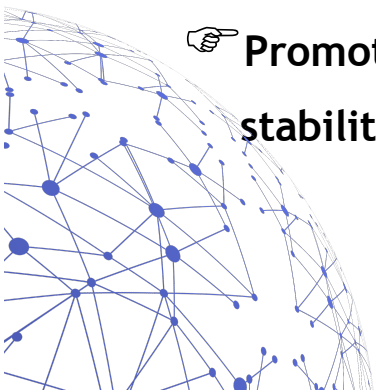
- ❑ Business Opposition to Adding Other gTLDs (Brand Protection) (Cyber-squatting),
- ❑ Dispute resolution: Adoption of the UDRP procedure (Uniform Dispute Resolution Policy)

Introduction of New NGTLD Int

ICANN Consultation,

Objective sought:

- ☞ Create new opportunities for consumers in the marketplace and bring more innovation, choice and change to the Internet's addressing system,
- ☞ Increase the choice for the Internet user and allow better targeting of the Web (your company will no longer be called `www.company.com` but directly `www.company`)
- ☞ Promote competition in the domain name market while ensuring the security and stability of the Internet.



Introduction of New NGTLD

- ❑ Many new extensions have emerged in recent years:
 - **Geographical** : .eu, .africa, .Quebec,
 - **Cities** : .paris, .berlin, .NYC, .BCN,..
 - **Brands** : .brand
 - **Communities** : .arabe, .bzh, .Kurd, .gal, ...
 - **Themes** : .eco, .food, .sport, .Shop, ...
 - **Generics** : extensions constituées de termes génériques

- ❑ Names of countries, territories or places as well as the languages and names of national, territorial or regional peoples, will be attributed subject to the agreement of the competent governments or authorities,



Domain Name: Statistics

- 👉 **1760** top-level domains (TLD) according to the IANA including **260** national ones
 - **68** are unassigned (revoked), **8** are withdrawn, **11** test domains.
- 👉 **350.5** Million domain name registered on the Internet at the end of the first quarter of 2022 (Verisign).
- 👉 Rise of the market as a whole in 2022 after a “dead time” of 2020 and 2021.
- 👉 The **.COM** TLD Maintains its Momentum (**161.6** Million Registered Domain Names)
- 👉 The **.cn** : **20.3** MM domain names registered domains

Source : Verisign



Internationalized Domain
Names
(IDN)

**Domain Names in Non-Latin
Characters**

Domain Names in Non-Latin Characters (IDN)

Revolution, that of Internationalized Domain Names

- ❑ People who only know their own languages will be able to write URLs in their browser with their own alphabet and thus benefit from the use of the Internet for their development.
- ❑ Internet users can surf the Internet in their native language, under an extension written in their native language
- ❑ IDNs have been ratified by ICANN after many years of work to develop and make reliable the specific technologies necessary for their operation.
- ❑ Introducing an IDN policy has been one of ICANN's main challenges, testing its pro-integrative international approach.

Acceptance Universelle : Domain Names in Non-Latin Characters (IDN)

- ❑ UA crucial role in the evolution and stability of the Internet.
- ❑ UA ensures the fairness of access to the Internet and the management of domain names, making them non-discriminatory for all users.
- ❑ UA adopts an inclusive approach towards users from all regions of the world, regardless of their language, culture, or technological development level.
- ❑ By promoting Universal Acceptance, ICANN aims to prevent any form of exclusion or fragmentation of the Internet.



شكرا !

MERCI !

Thank you !