

Domain Name Basics

DNS, Domains, and ICANN

Tobias Sattler
tobiassattler.com

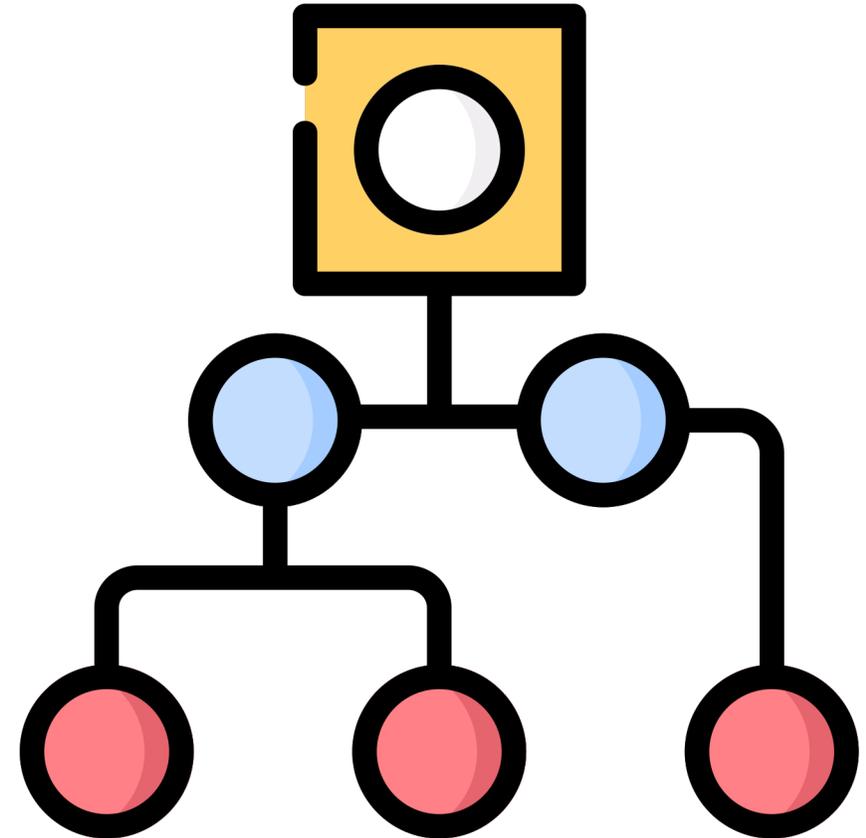
Domain Name System (DNS)

DNS is a hierarchical distributed naming system to **translate domain names** into **IP addresses**, which makes websites easier to remember, such as

- `tobiassattler.com` instead of `78.46.19.133`

The domain namespace is a tree, and its root is a dot.

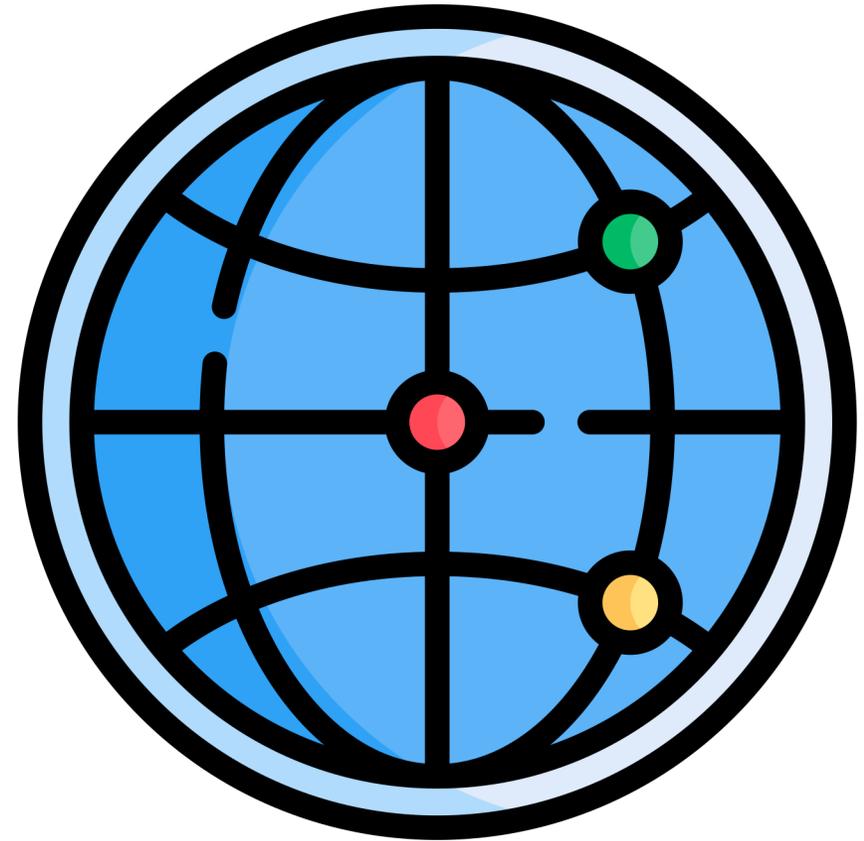
- `www.tobiassattler.com`.



Root Name Server

For **resolving domain names**, root name servers are needed. There are **13 root name servers**, which are **load-balanced**; therefore, there are more than hundreds of servers **worldwide**.

The root server zone file **contains** all **top-level domains** (.de, .com, .club) and the respectively **IP addresses** of their authoritative name server.



What is a domain name?

It is a **unique string** within the domain name system (DNS). The DNS is a tree, and its root is a dot.

Most programs, like browsers and email clients, will ignore the point at the end of a domain name, but it is there.

DNS resolves names; It is a method to **translate** domain names to **IP addresses**, to make it easier to remember.

The DNS **zone file** contains **mappings** between domain names and IP addresses and other resources.



What is a top-level domain?

It is the name of the top tier and it is divided in two groups:

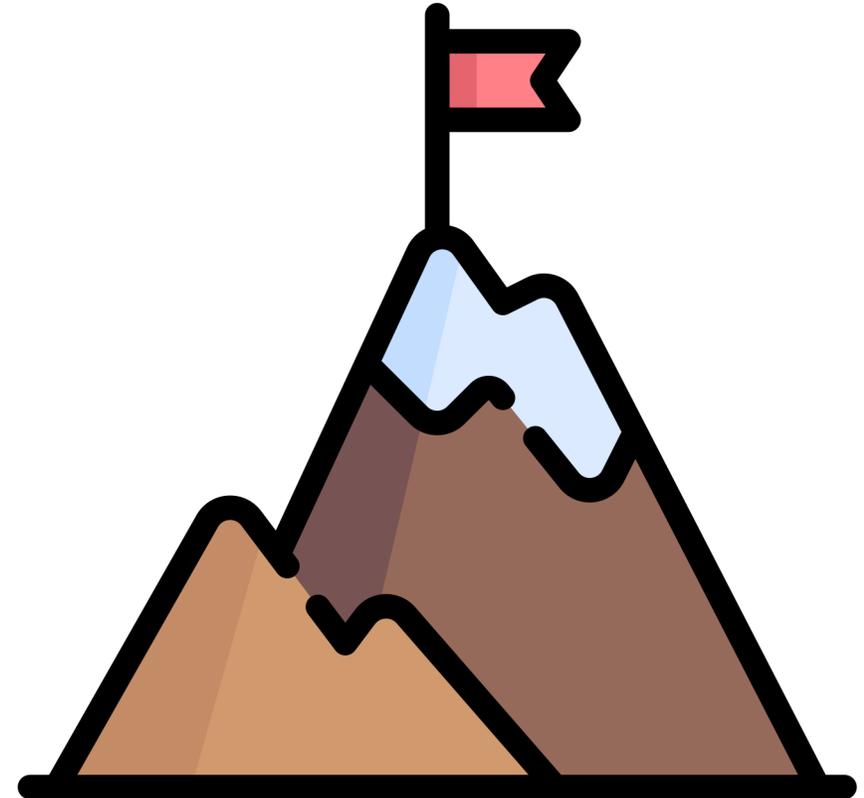
- Generic TLDs (gTLDs) for instance .com, .net, and .org
- Country Code TLDs (ccTLDs) like .de, .io, .uk, and many more.

Actually there are more than **1,200 gTLDs**, among others

- .asia, .berlin, .bike, .cat, .club, .com, .edu, .guru, .info, .jobs, .name, .net, .ngo, .nyc, .org, .post, .tel, .xyz, .xxx

There are over **200 ccTLDs**, such as

- .au, .br, .cn, .co, .de, .fr, .hk, .it, .io, .me, .ru, .uk, .us, .za



Who is maintaining the DNS?

The Internet Assigned Numbers Authority (**IANA**) and the Internet Corporation for Assigned Names and Numbers (**ICANN**) maintain the root DNS.

Registries, such as Verisign, donuts, Afilias, etc., maintain the Top-Level domains (TLDs) DNS.

Registrars like GoDaddy, IONOS, united-domains, etc., usually maintain the authoritative domain name servers.

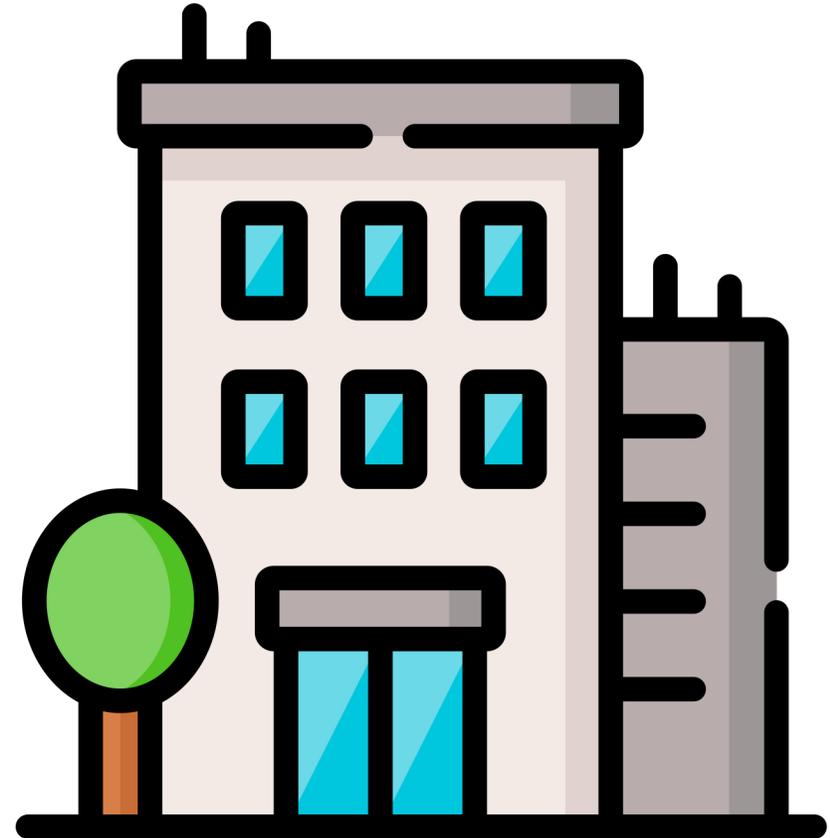


Who are IANA and ICANN?

Internet Assigned Numbers Authority (IANA) is a department of Internet Corporation for Assigned Names and Numbers (ICANN).

IANA is broadly responsible for the **allocation** of globally unique **names** and **numbers** used in Internet protocols published as Request for Comments (RFC) documents.

ICANN is a **nonprofit private organization** and was incorporated in 1998. It **oversees** the root zone management in the Domain Name System (**DNS**), and other essential tasks.



What is ICANN doing?

ICANN's primary role is to **coordinate** the **allocation** of **IP addresses** and **TLDs**.

ICANN is developing policies for gTLD domain names and revises these policies from time to time.

Policies' **development** and **reviews** are always done within working groups. These working groups are composed of staff from any affected and interested party.

Policies have to go through public comment. Everyone is allowed to comment.

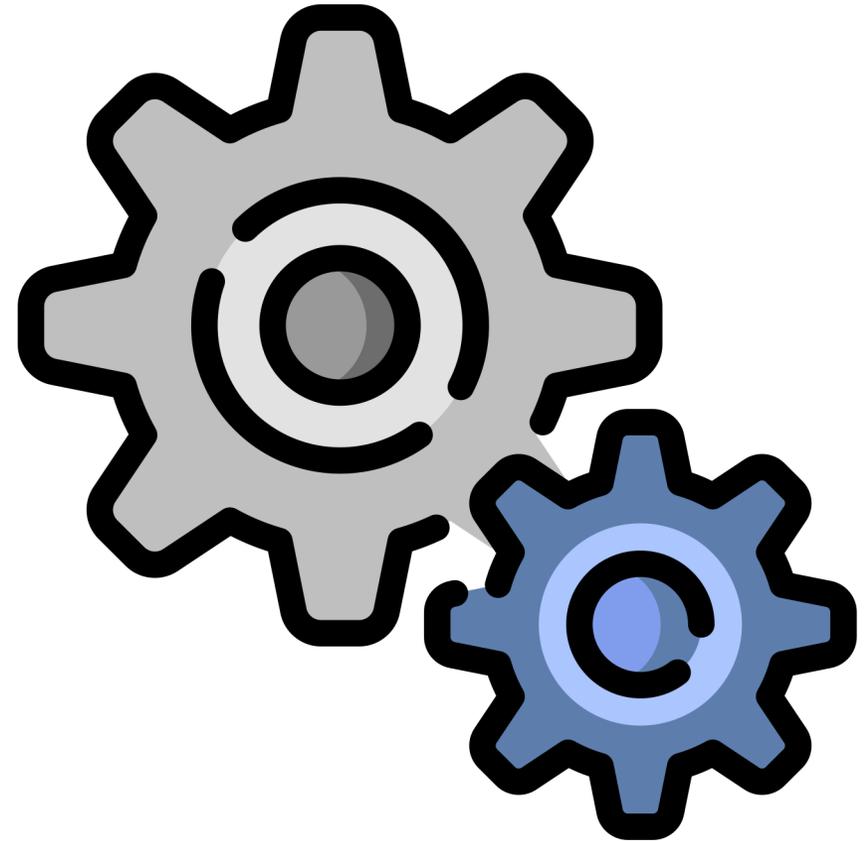


How is ICANN organized?

ICANN has **multiple bodies**, and their duties are defined in the bylaws.

This list is not exhaustive, but the essential bodies besides the Board of Directors are the Address Supporting Organization (**ASO**), Country Code Names Supporting Organization (**ccNSO**), Generic Names Supporting Organization (**GNSO**), Advisory Committees (**AC**) and Nominating Committee (**NomCom**).

gTLD Registries and Registrars are part of the GNSO and have direct contracts with ICANN.

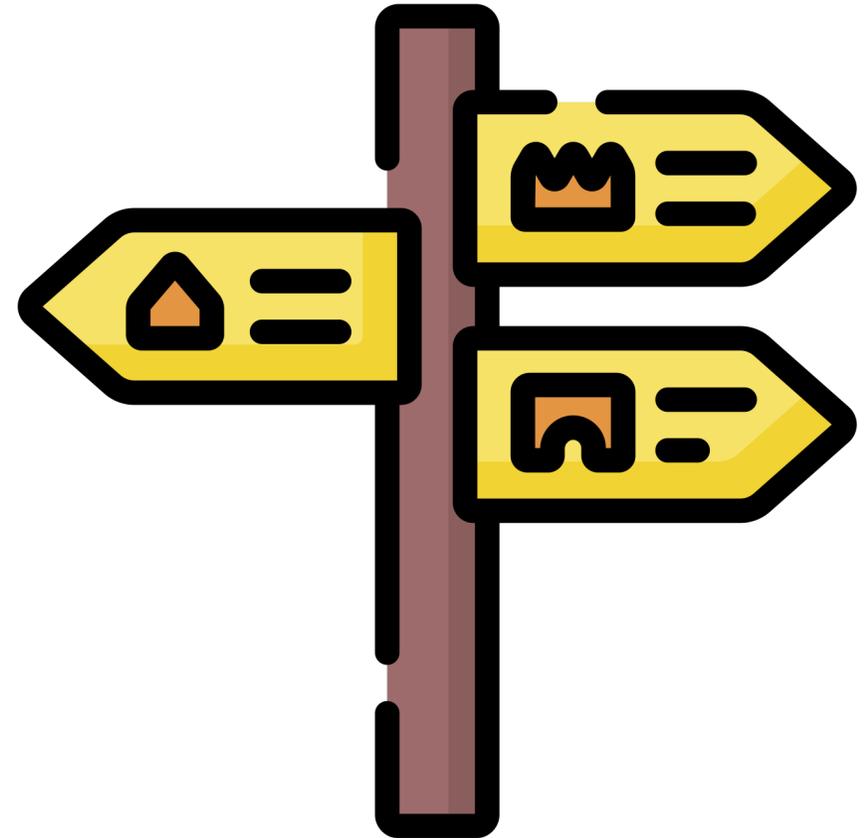


Address Supporting Organization

Represents the Regional Internet Registries (**RIRs**), which are **responsible** for the allocation of **IP address** blocks. IP addresses are **necessary** for all Internet **communications**.

There are 5 RIRs:

- Réseaux IP Européens Network Coordination Centre (RIPE NCC)
- American Registry for Internet Numbers (ARIN)
- Asia-Pacific Network Information Centre (APNIC)
- Latin American and Caribbean Internet Addresses Registry (LACNIC)
- African Network Information Centre (AfriNIC)



Country Code Names Supporting Organization

The Country Code Names Supporting Organization (**ccNSO**) is a body within the ICANN structure created for and by ccTLD managers, with about 150 members.

They supply and provide a platform for technical cooperation and a forum for ccTLD related problems and issues.

They **advise** the **ICANN Board** on global policies related to ccTLD issues.

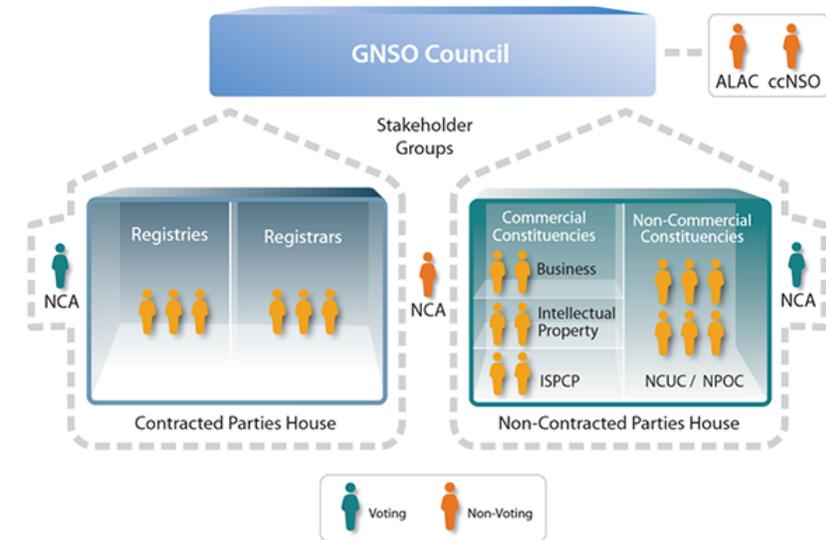


Generic Names Supporting Organization

The **GNSO** develops **policies** and **recommendations** for all **gTLDs**.

The GNSO consists of 4 stakeholder groups:

- Commercial Stakeholder Group (CSG)
- Non-Commercial Stakeholder Group (NCSG)
- Registry Stakeholder Group (RySG)
- Registrar Stakeholder Group (RrSG)

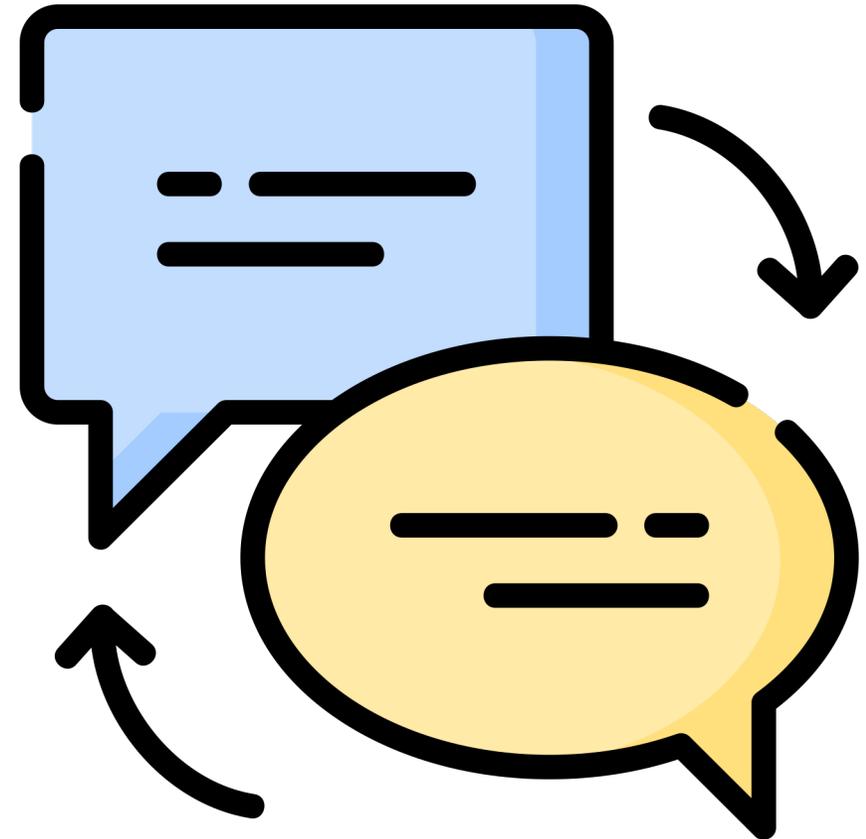


Source: <http://gns0.icann.org/en/about/gns0-council.htm> - Effective 03/2016

Advisory Committees #1

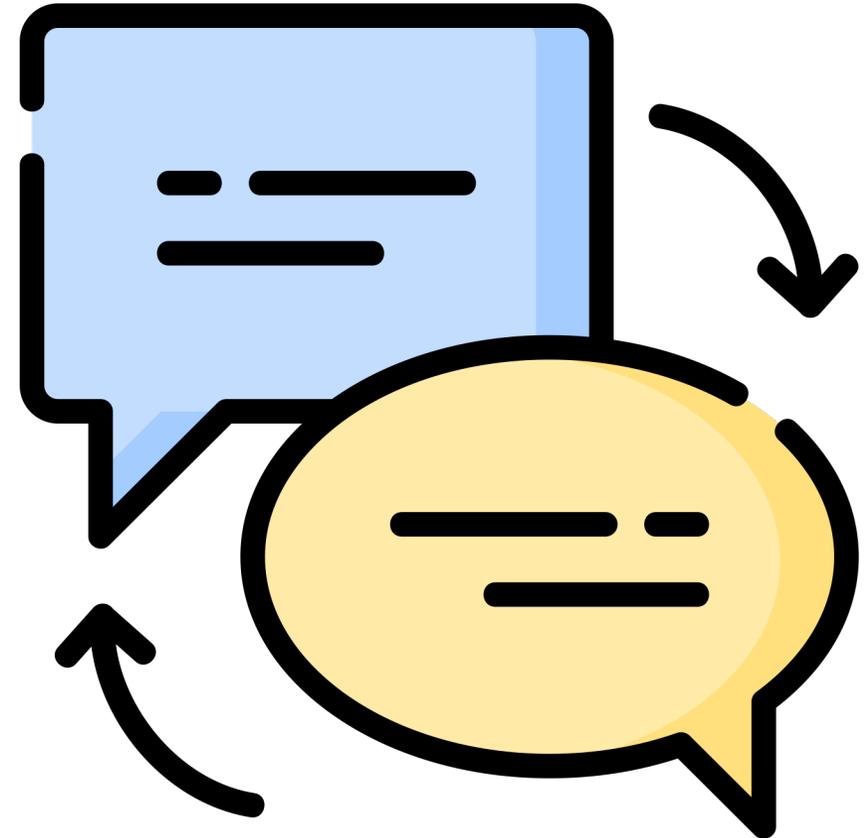
Governmental Advisory Committee (**GAC**) membership consists of national governments and, usually, in an observer capacity, multinational governmental and treaty organizations and public authorities, such as the ITU, UNESCO, and WIPO. There are more than 160 members organized within the GAC.

At-Large Advisory Committee (**ALAC**) is the primary organizational home within ICANN for individual Internet users. There are over 190 members, such as Wikimedia and ISOC.



Advisory Committees #2

Security and Stability Advisory Committee (**SSAC**) and Root Server System Advisory Committee (**RSSAC**) provide recommendations about security and technical risks.



Nominating Committee

The Nominating Committee (**NomCom**) is an independent committee **tasked** with **selecting** key ICANN **members**, including the Board of Directors, the ALAC, the ccNSO Council, and the GNSO Council.



Thank you!