

Internet names and numbers - ICANN



Yaovi Atohoun; Director, Stakeholder Engagement & Operations - Africa

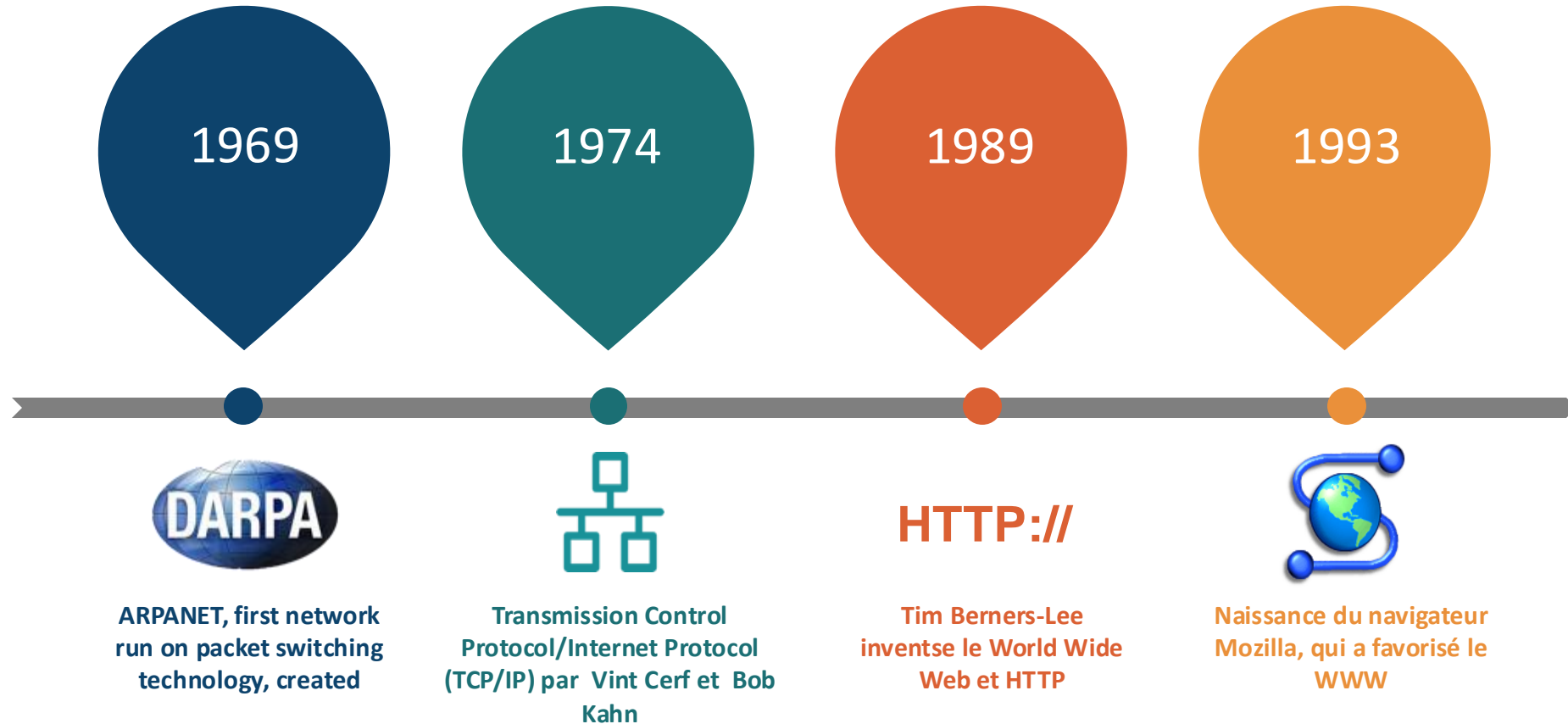
16 November 2024

Africa School of Internet Governance; Ethiopia; Addis-Ababa

Agenda

- Brief history
- What is the Internet
- Domain Names
- IP addresses
- The Domain Name System
- ICANN ecosystem & IANA
- Getting involved

Brief History



1969



ARPANET, first network run on packet switching technology, created

1974



Transmission Control Protocol/Internet Protocol (TCP/IP) par Vint Cerf et Bob Kahn

1989

HTTP://

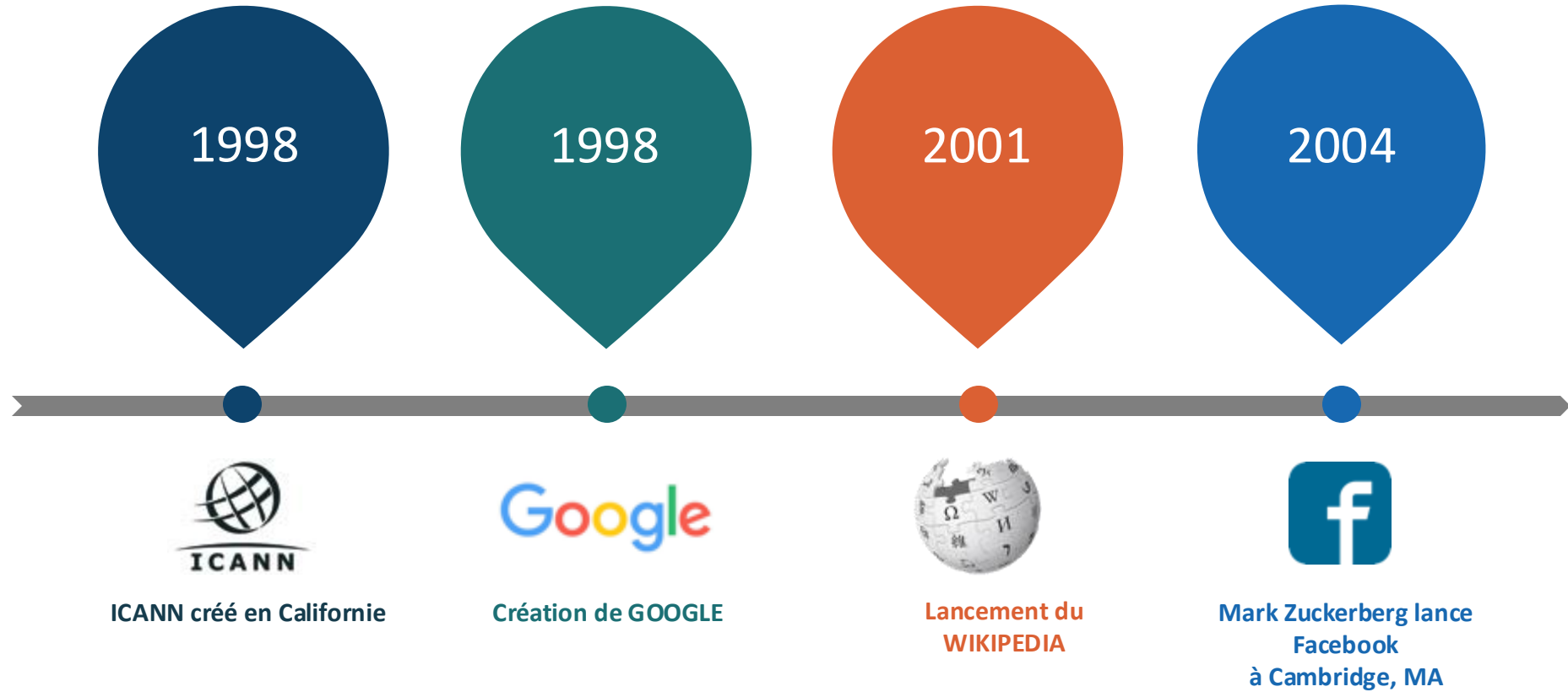
Tim Berners-Lee invente le World Wide Web et HTTP

1993

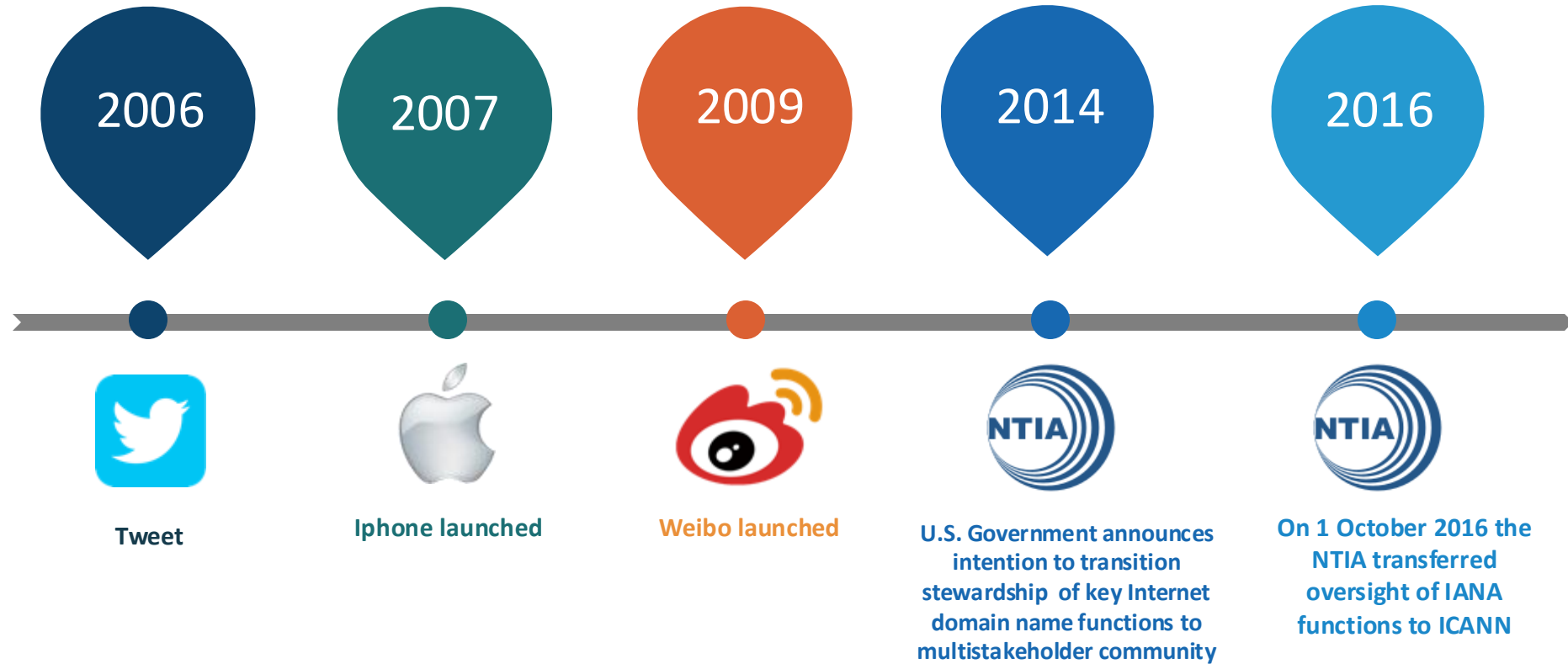


Naissance du navigateur Mozilla, qui a favorisé le WWW

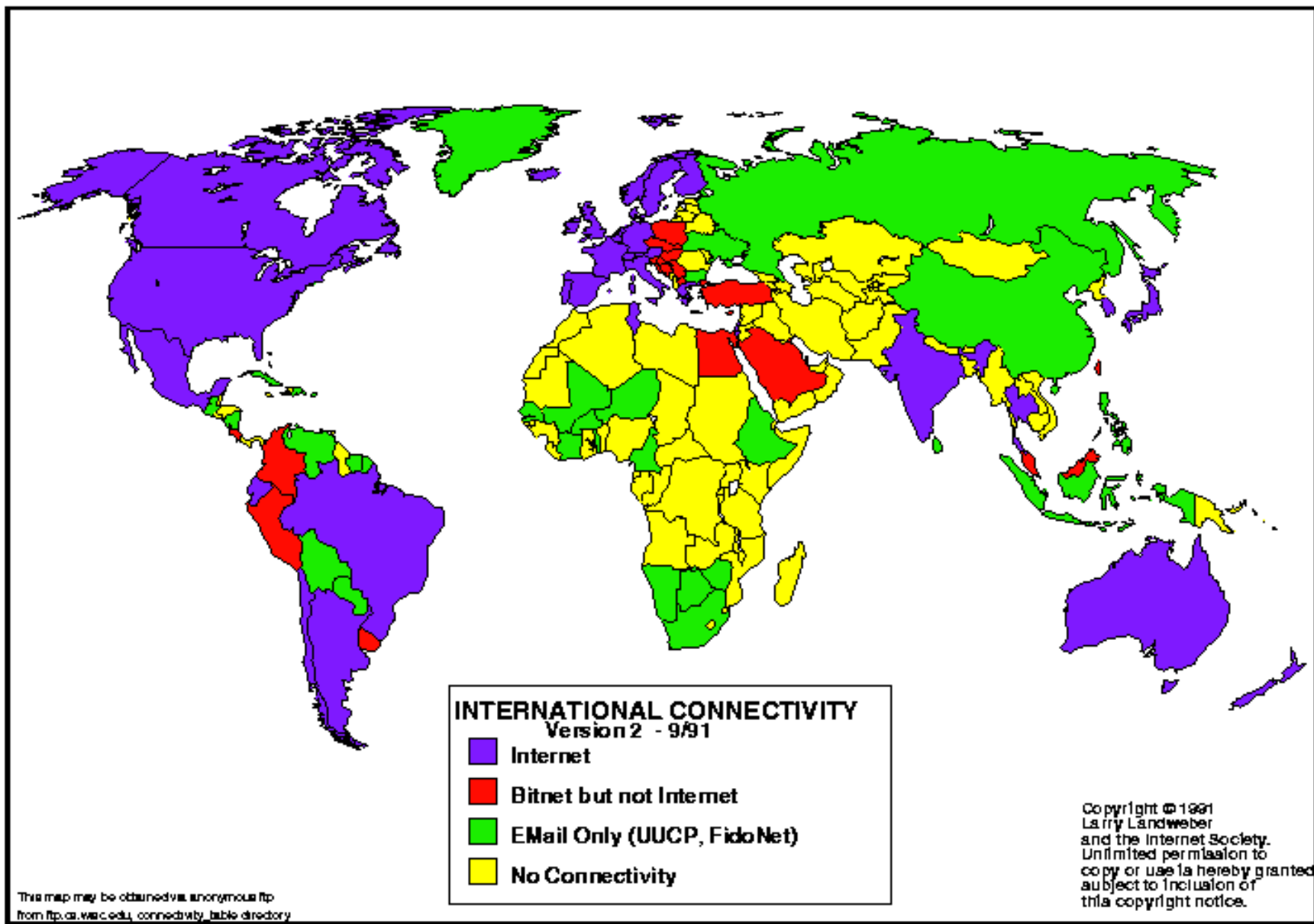
Brief History (II)



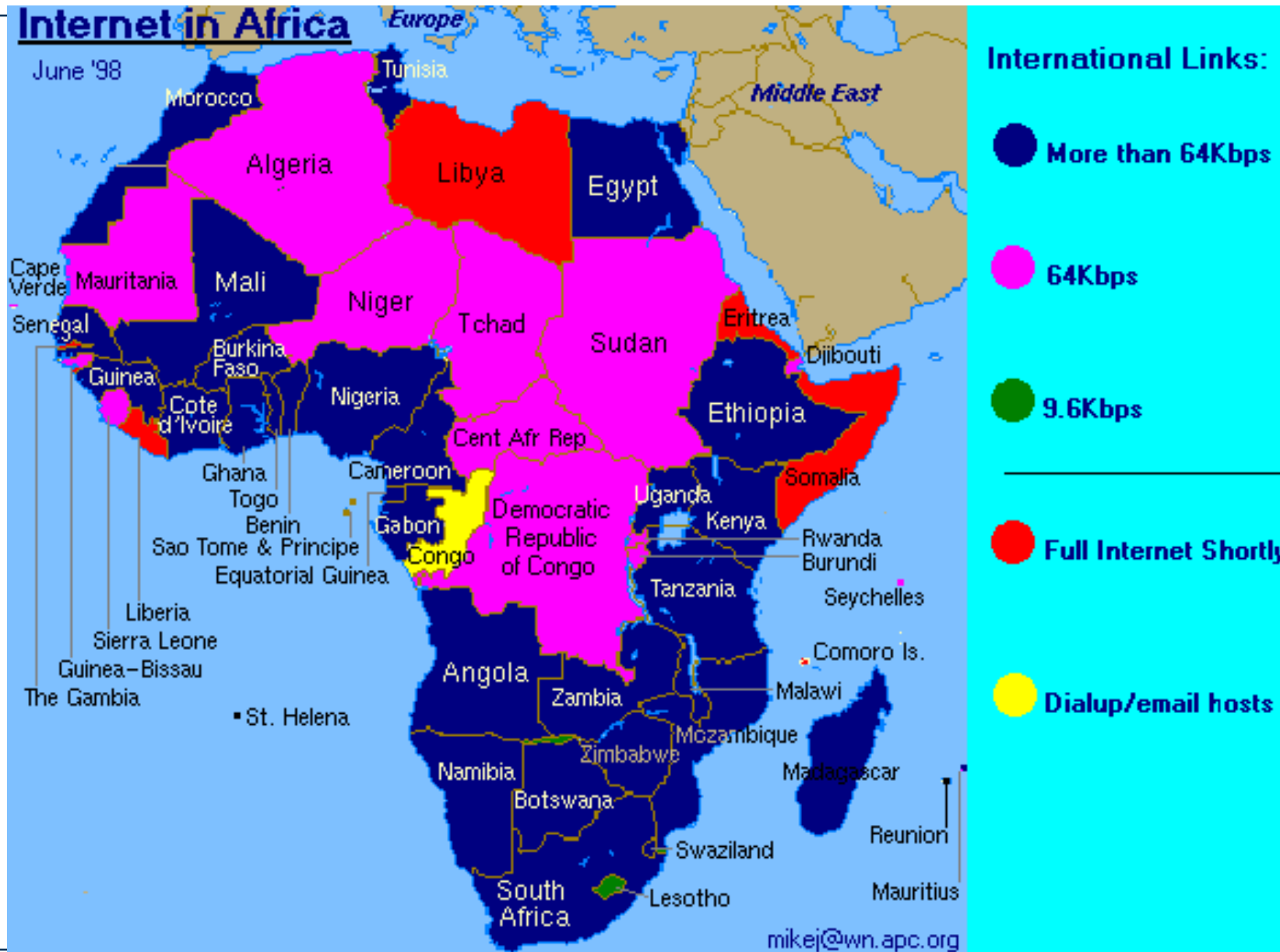
Brief History (III)



State of the Internet connectivity in Africa in 1991



State of the Internet connectivity in Africa in 1998



Internet & what is the DNS

The Internet is a Global Network of Networks



Connected devices, connected everything



Domain Names

ASCII Domain Name Label

www.cafe-123.com



Third Level
Domain

Second Level
Domain

Top Level
Domain (TLD)

②

Forming ASCII Labels

Use LDH

- Letters [a-z]
- Digits [0-9]
- Hyphen [H]

Label length = 63

Other constraints (e.g. on hyphen)

①

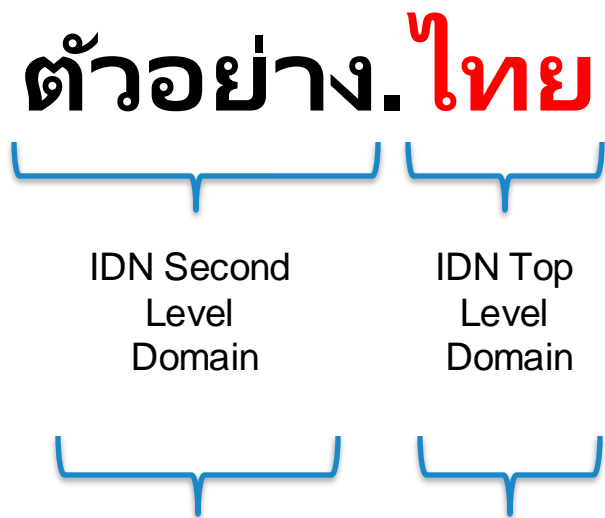
Forming ASCII Labels

Use only Letters

- Letters [a-z]

Label length = 63

Internationalized Domain Name (IDN) Labels



Syntax of IDN Labels

Valid U-Label: Unicode code points as constrained by **the “LDH” scheme** within IDNA 2008

②

Syntax of IDN Labels

Valid U-Label, further constrained by **the “letter” principle** for TLDs

①

What Is Universal Acceptance?

All domain names should be treated equally.



IP addresses

Unique Names and Numbers on the Internet

IP addresses easy for machines but hard for people

- IPv4: 192.0.2.7
- IPv6: 2001:0db8:ac10:fe01:0000



People need to use names.

Mapping names to IP addresses is **name resolution**.

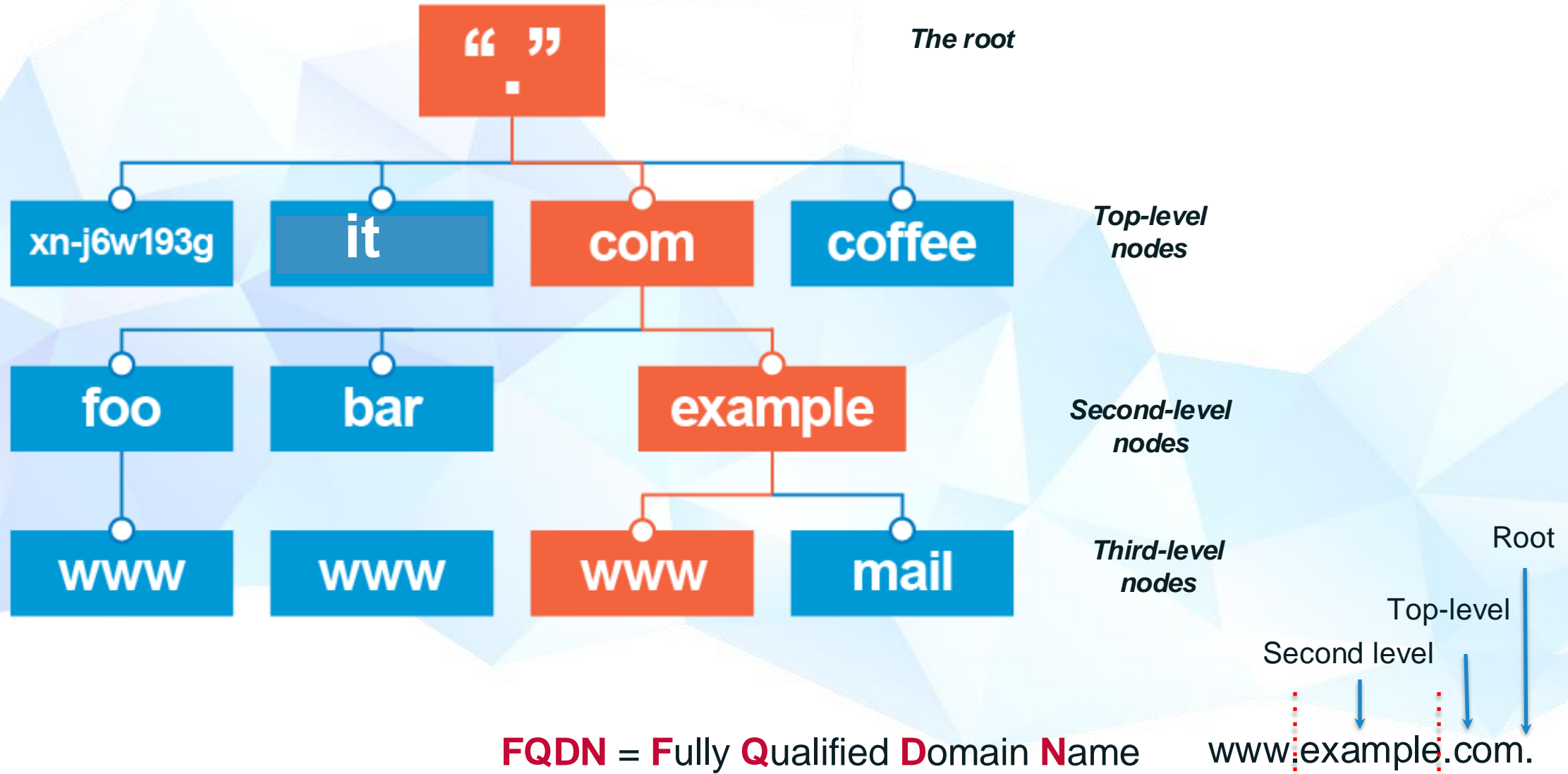


Domain Name System

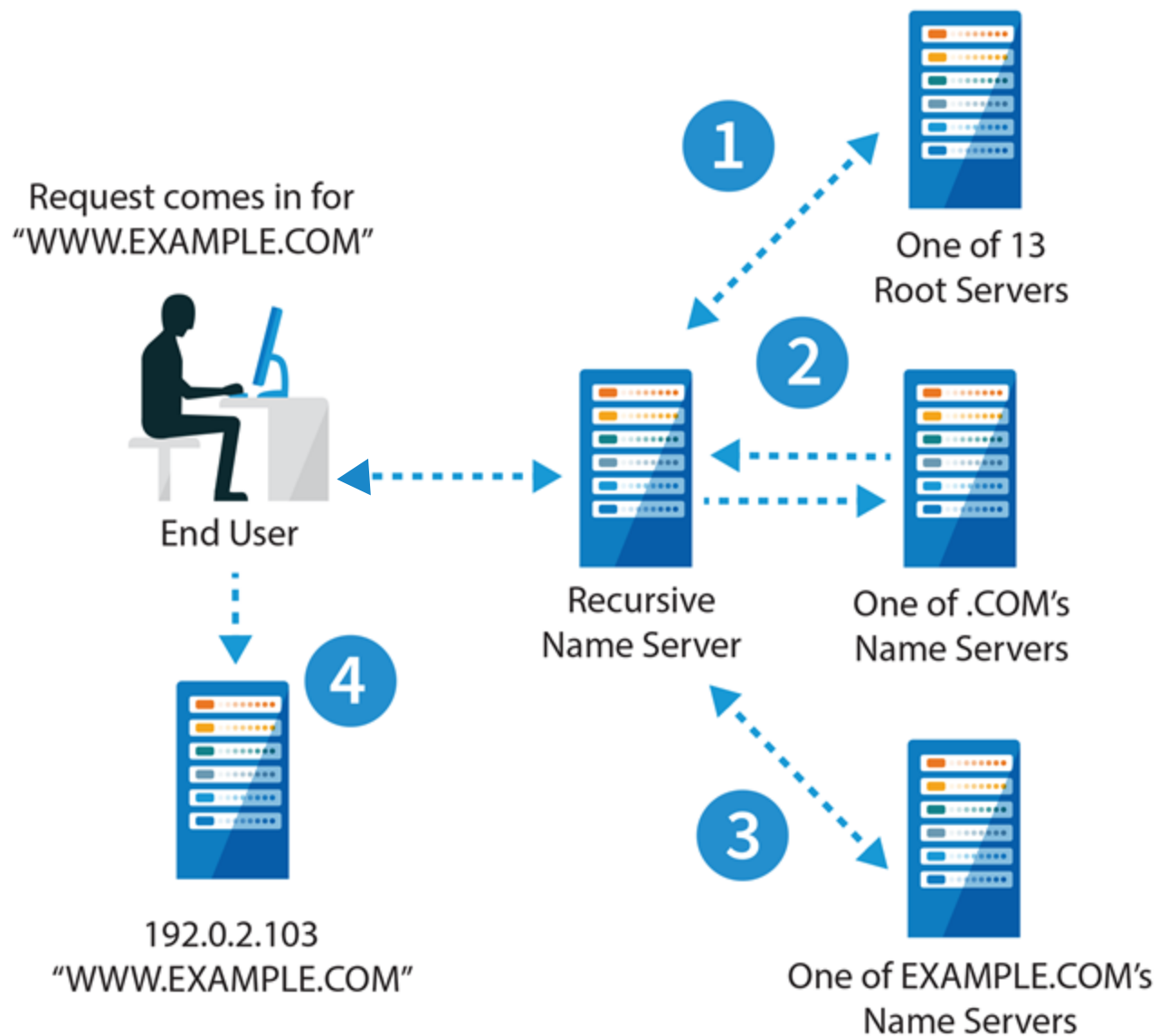
The Domain Name System

- No single consistent definition – considered a combination of:
- A commonly used naming scheme for objects on the Internet
- A distributed database representing the names & certain properties of these objects
- An architecture providing distributed maintenance, resilience & loose coherency for the database
- A simple query and response protocol implementing this architecture

The Domain Name System (DNS)

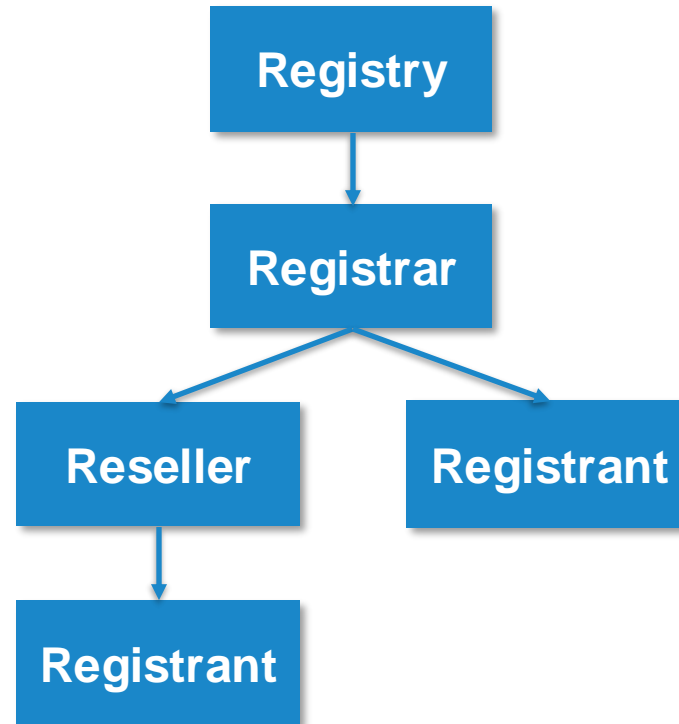


How DNS Works



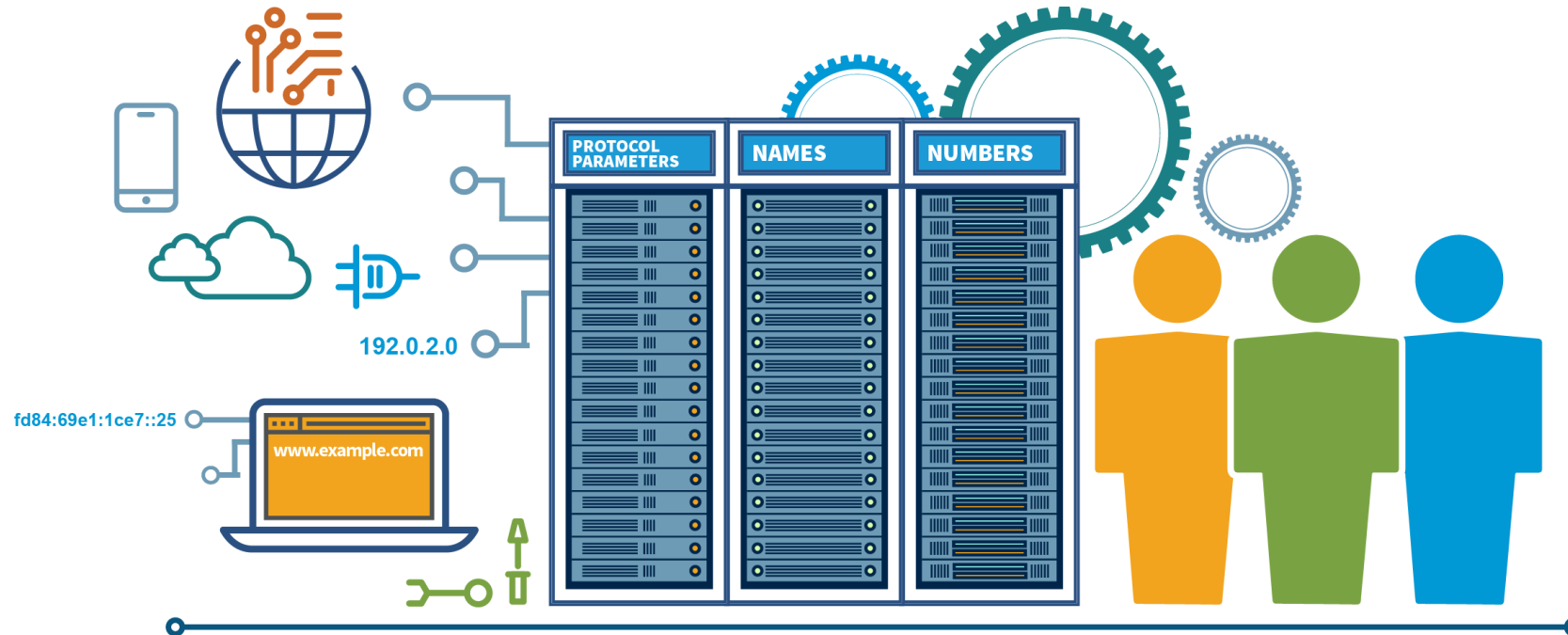
Domain Name Industry Ecosystem Players

- **Registry:** Database of domain names and registrants
- **Registrar:** Primary agent between registrant and registry
- **Registrant:** A holder of a domain name registration



ICANN ECOSYSTEM & IANA

Coordinating with our partners,
we help make the Internet work.



ICANN was formed in 1998 as a not-for-profit public benefit corporation with a community of participants from all over the world

The IANA Functions



The global coordination of the DNS Root, IP addressing, and other Internet protocol resources is performed as the Internet Assigned Numbers Authority (IANA) functions.

[Learn more.](#)

Domain Names

Management of the DNS Root Zone (assignments of ccTLDs and gTLDs) along with other functions such as the .int and .arpa zones.

- Root Zone Management
- Database of Top Level Domains
- .int Registry
- .arpa Registry
- IDN Practices Repository

Number Resources

Coordination of the global IP and AS number spaces, such as allocations made to Regional Internet Registries.

- IP Addresses & AS Numbers
- Network abuse information

Protocol Assignments

The central repository for protocol name and number registries used in many Internet protocols.

- Protocol Registries
- Apply for an assignment
- Time Zone Database

CCTLD delegation information example. (1/2)

```
|et
```

```
% IANA WHOIS server  
% for more information on IANA, visit http://www.iana.org  
% This query returned 1 object
```

```
domain:          ET
```

```
organisation:    Ethio telecom  
address:         P.O. Box 1047  
address:         W. Churchill Rd.  
address:         Addis Ababa Region 14  
address:         Ethiopia
```

```
contact:         administrative  
name:            Chief Information Officer (CIO)  
organisation:    Ethio Telecom  
address:         P.O. Box 1047  
address:         W. Churchill Rd.  
address:         Addis Ababa Region 14  
address:         Ethiopia  
phone:           +251 911 208321  
fax-no:          +251 115 53 15 69  
e-mail:          endale.asrat@ethiotelecom.et
```

CCTLD delegation information example (2/2)

```
contact:      technical
name:         Value Added Services Operations Manager
organisation: Ethio Telecom
address:      P.O. Box 1047
address:      W. Churchill Rd.
address:      Addis Ababa Region 14
address:      Ethiopia
phone:        +251 911 107398
fax-no:       +251 115 515777
e-mail:       senait.mezgebu@ethiotelecom.et

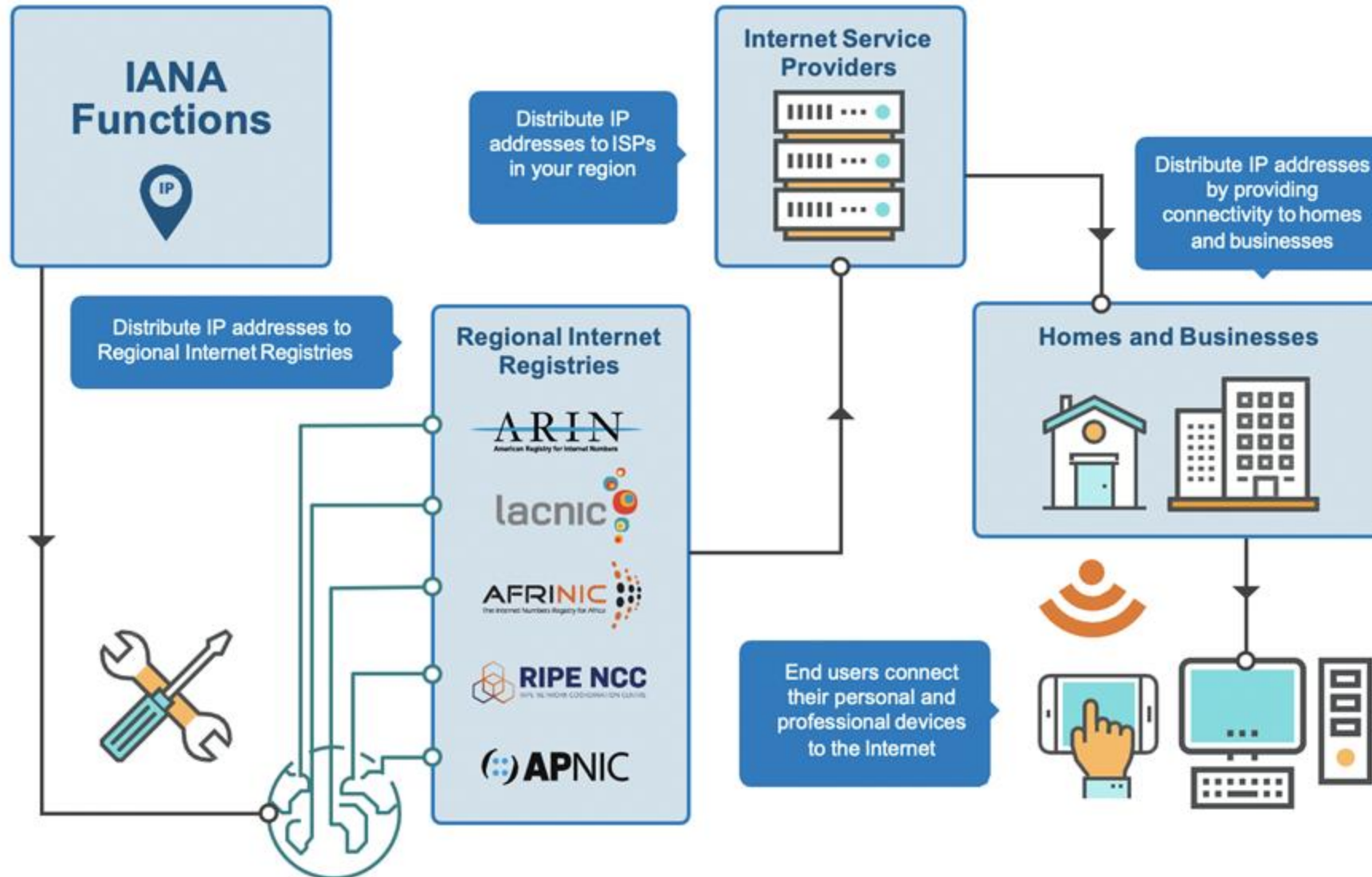
nserver:     A.NIC.ET 197.156.74.192
nserver:     B.NIC.ET 197.156.74.193

whois:

status:      ACTIVE
remarks:     Registration information: http://www.ethiotelecom.et

created:     1995-10-15
changed:     2022-06-02
source:      IANA
```

How Internet Protocol Addresses are Distributed



ICANN Ecosystem



The ICANN Multistakeholder Community

MAKING POLICY:

Three Supporting Organizations (SOs) are responsible for developing policy recommendations in the areas they represent: IP addresses, generic top-level domains (gTLDs), and country code top-level domains (ccTLDs).



PROVIDING ADVICE:

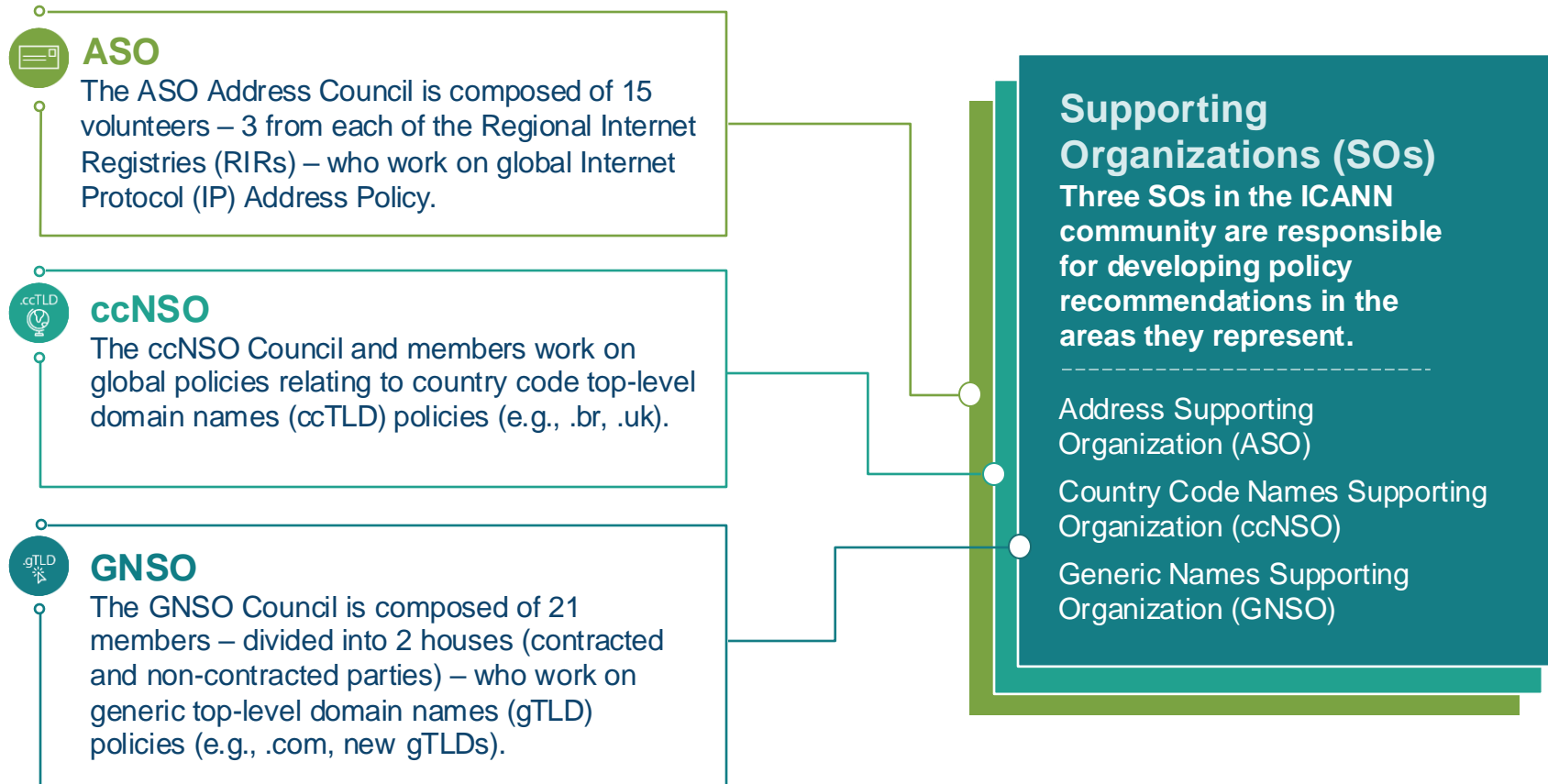
Four Advisory Committees (ACs) give advice and make recommendations on ICANN topics. The ACs are made up of representatives from: governments and international treaty organizations, root server operators, Internet security experts, and Internet end users.



Exploring ICANN's Multistakeholder Community



Supporting Organizations (SOs)



Advisory Committees (ACs)

Advisory Committees (ACs)

Four ACs give advice and make recommendations on ICANN topics.

At-Large Advisory Committee (ALAC)

Governmental Advisory Committee (GAC)

Root Server System Advisory Committee (RSSAC)

Security and Stability Advisory Committee (SSAC)



ALAC

The ALAC voices the interests of the individual Internet user and is composed of 15 members – 2 from each of the 5 Regional At-Large Organizations (RALOs) and 5 appointed by the ICANN Nominating Committee. It is supported by over 200 At-Large Structures (ALSes) and volunteers.



GAC

The GAC provides advice on public policy issues, particularly on interactions with policies and national laws or international agreements.



RSSAC

The RSSAC advises the ICANN community and Board on the operation, administration, security, and integrity of the Internet's Root Server System.



SSAC

The SSAC advises on matters related to the security and integrity of the Internet's naming and address allocation systems.

GET INVOLVED

Get Involved and Informed



Attend an ICANN Public Meeting. Three times a year, ICANN holds free and open public meetings in different regions around the world. Visit meetings.icann.org to learn more.



Visit go.icann.org/journey to learn how you can attend an ICANN Public Meeting as part of the NextGen@ICANN or ICANN Fellowship programs.



Take a free online course at learn.icann.org.



Attend events in your region.



Find and participate in an ICANN community group by visiting icann.org/community.



Sign up for ICANN news alerts and regional newsletters.

Subscribe to the AFRICANNmailing list: <https://lists.afrinic.net/mailman/listinfo.cgi/africann>

ICANN FELLOWSHIP PROGRAM

ICANN Meeting	ICANN Region	Meeting Dates	Opening of application round	Closing of application round	Announcement of selected Fellows
ICANN82 Community Forum in Seattle, USA	North America	8-13 March 2025	Closed	Closed	31 October 2024 at 23:59 UTC
ICANN83 Policy Forum in Prague, Czech Republic *	Europe	9-12 June 2025	24 October 2024 at 23:59 UTC	24 November 2024 at 23:59 UTC	4 February 2025 at 23:59 UTC
ICANN84 Annual General Meeting in Muscat, Oman	Asia Pacific	25-30 October 2025	25 February 2025 at 23:59 UTC	25 March 2025 at 23:59 UTC	23 June 2025 at 23:59 UTC

Engage with ICANN – Thank You and Questions



One World, One Internet

Visit us at icann.org



@icann



facebook.com/icannorg



youtube.com/icannnews



flickr.com/icann



linkedin/company/icann



slideshare/icannpresentations



soundcloud/icann

Contact us: gseafrika@icann.org