

# NPOC Webinar Series #2

Patrick Jones

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Online Lecture



# Identifiers 101: Putting the system in context



## **Patrick Jones**

Senior Director, Global Stakeholder Engagement  
ICANN

# What is the DNS?

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- 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**

# What are Internet Identifiers?

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The Internet is a mesh of networks whose operators agree to communicate using predefined protocols (“TCP/IP”)

Networks use identifiers to name or number individual computers (hosts) so that these can communicate

At ICANN, these are names, numbers and protocol parameters.

# Unique Names and Numbers

IP addresses easy for machines but hard for people

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

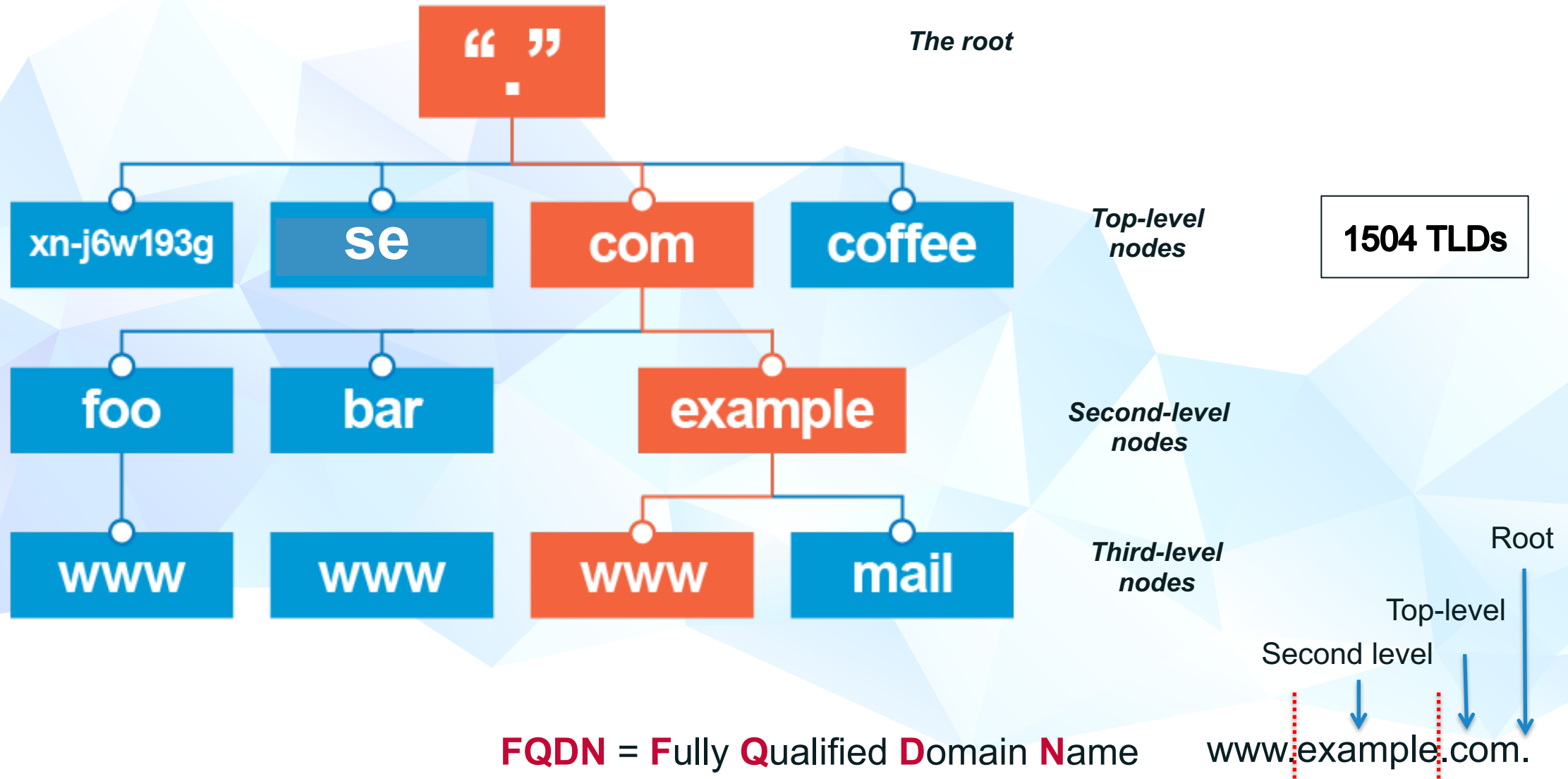


People need to use names.

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



# The Domain Name System (DNS)





## Domain Names

### Overview

### Root Zone Management

#### Overview

#### Root Database

#### Hint and Zone Files

#### Change Requests

#### Instructions & Guides

#### Root Servers

### .INT Registry

### .ARPA Registry

### IDN Practices Repository

### Root Key Signing Key (DNSSEC)

### Reserved Domains

## Root Files

### Root Hints

Operators who manage a DNS recursive resolver typically need to configure a "*root hints file*". This file contains the names and IP addresses of the authoritative name servers for the root zone, so the software can bootstrap the DNS resolution process. For many pieces of software, this list comes built into the software.

- [Root Hints File](#) (FTP)
- [Root Hints File](#) (HTTP)

### Root Zone File

The complete root zone is available for download at the following locations. Ordinarily there should be no need to download this file on a regular basis, as the contents of the file are served via the DNS system itself.

- [Root Zone File](#) (FTP)
- [Root Zone File](#) (HTTP)



# Sample from the Root Zone

```
eu.                172800 IN      NS      x.dns.eu.
eu.                172800 IN      NS      y.dns.eu.
eu.                172800 IN      NS      cz.dns.eu.
eu.                172800 IN      NS      nl.dns.eu.
eu.                172800 IN      NS      si.dns.eu.
eu.                172800 IN      NS      uk.dns.eu.
EU.                86400  IN      DS      61179 7 1 87E2B3544884B45F36A0DA72DADCB0239C4D73D4
EU.                86400  IN      DS      61179 7 2 3B526BCC354AE085AD9984C9BE73D271411023EFF421EF184BCE41ACE3DE9F8B

EU.                86400  IN      RRSIG   DS 8 1 86400 20150411170000 20150401160000 48613 .
bCTz3iQYxp7pTGQI7hG3jjZiSuQ5pP3mkDbOl1QPRoejWtSnfp9caiovgl9Z49MN1bc8nWpbN6cVjB0HaswkHSOcJ0VMD6ZsXllMNGtHPnWcBujayiGG2EdEaavBbUu
xH39zJcb1R73qZtzocbVAizuYRVlQEvTz6rg7RgXI/nE=

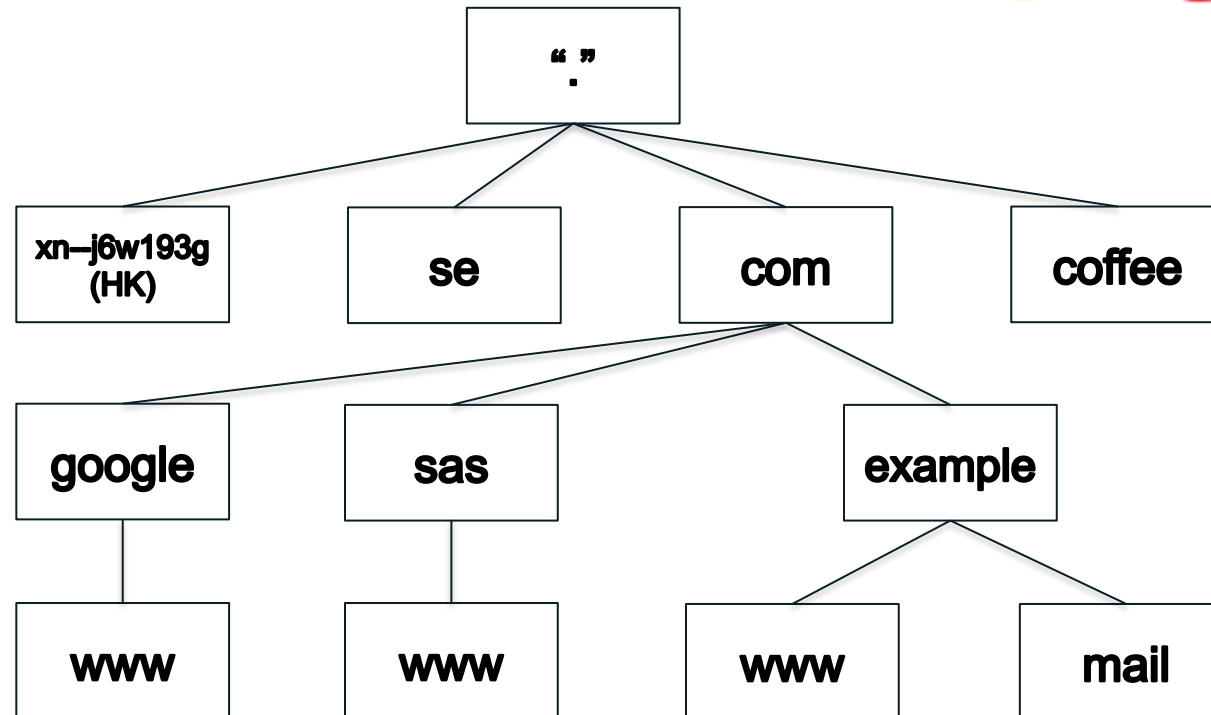
cz.dns.eu.        172800 IN      A       93.190.128.138
nl.dns.eu.        172800 IN      A       91.200.16.100
si.dns.eu.        172800 IN      A       193.2.221.60
si.dns.eu.        172800 IN      AAAA    2001:1470:8000:100:0:0:0:1
uk.dns.eu.        172800 IN      A       195.66.241.178
x.dns.eu.         172800 IN      A       194.0.1.19
x.dns.eu.         172800 IN      AAAA    2001:678:4:0:0:0:0:13
y.dns.eu.         172800 IN      A       194.146.106.90
y.dns.eu.         172800 IN      AAAA    2001:67c:1010:23:0:0:0:53
ns6.nominum.eu.  172800 IN      A       81.200.69.35

eu.                86400  IN      NSEC    eurovision. NS DS RRSIG NSEC

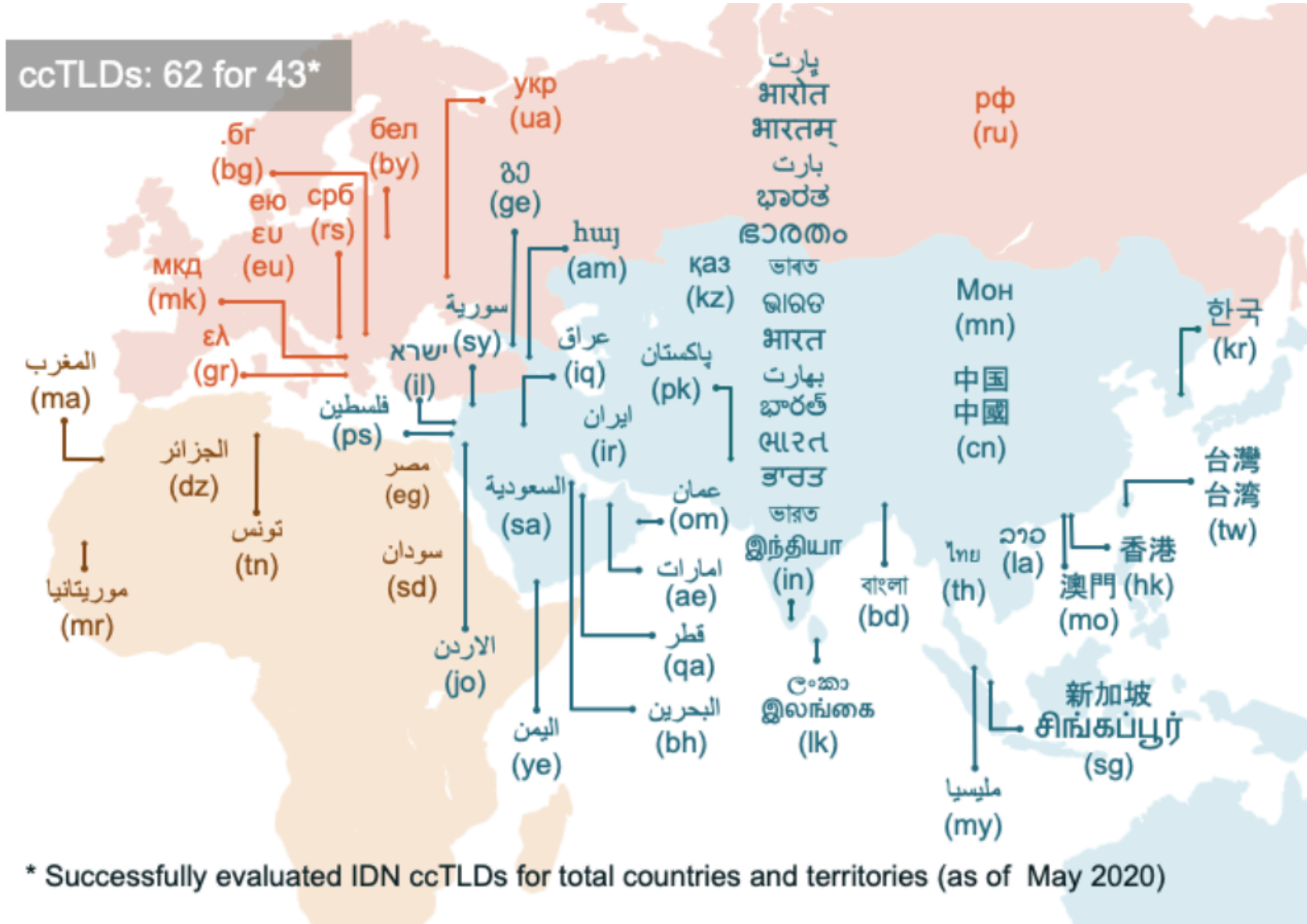
eu.                86400  IN      RRSIG   NSEC 8 1 86400 20150411170000 20150401160000 48613 .
Y2+jPipksunT5NSn9BGs6XUpONfCFX8wlywZug1+Hh4xrh3f+YzoHAMtm3maHqN/A2QwB+tWKxbQhLx9blR4vFaJ2H8fEGOFS+P6e3X2lRRxYOcEkubx+v9QweLpSq
5yp5uA6OVpOUQ/phShZLDVvfCTbL0XbBacFeXTQFSLZjQ=
```

# Label Syntax

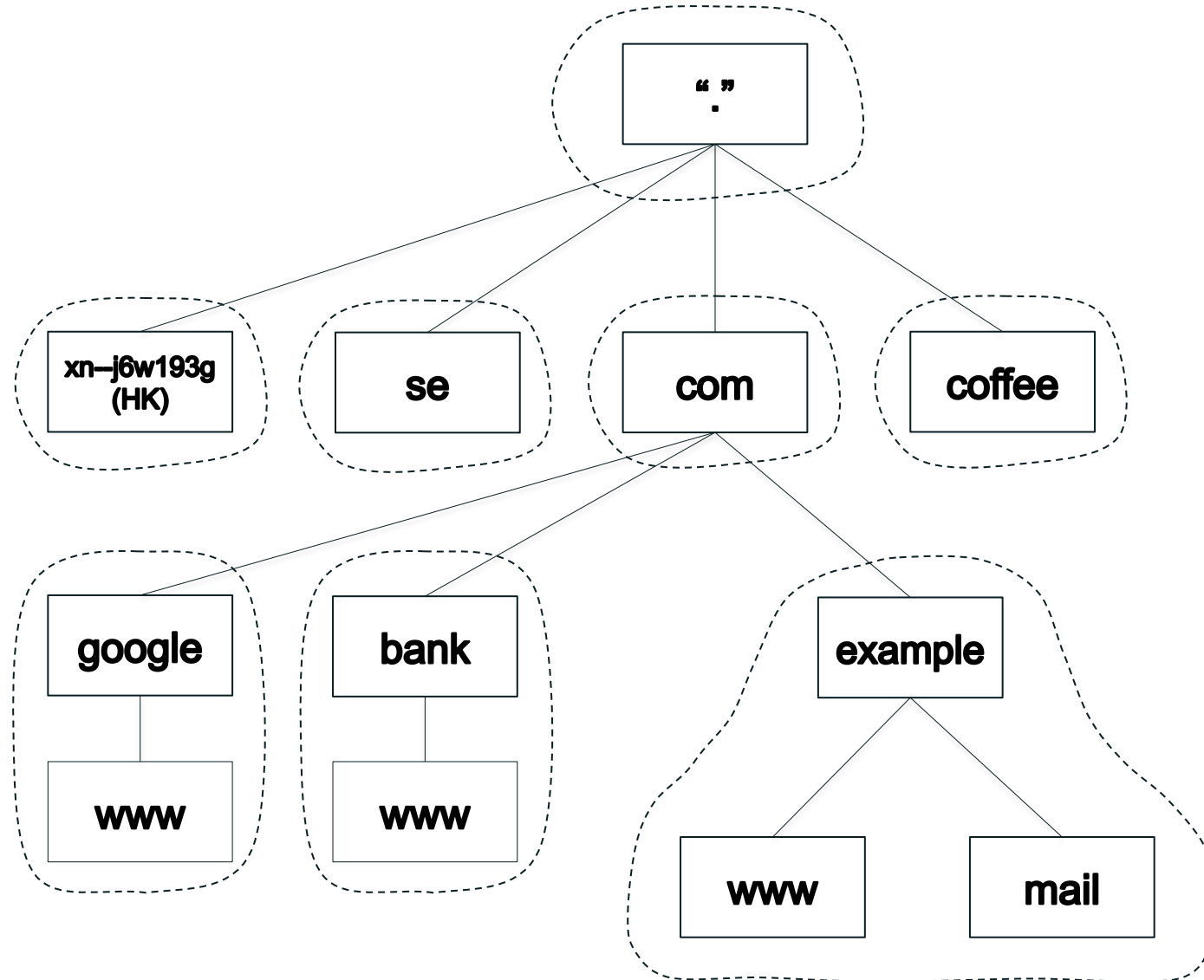
- Legal characters for labels are “LDH” (letters, digits, hyphen)
- Maximum length 63 characters
- Emojis not allowed as top-level labels



# Internationalized Domains

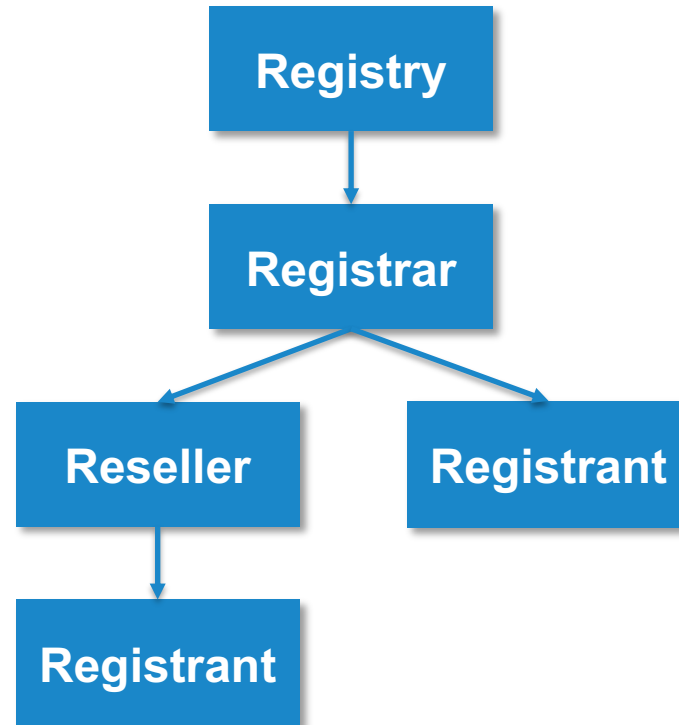


# Zones are Administrative Boundaries

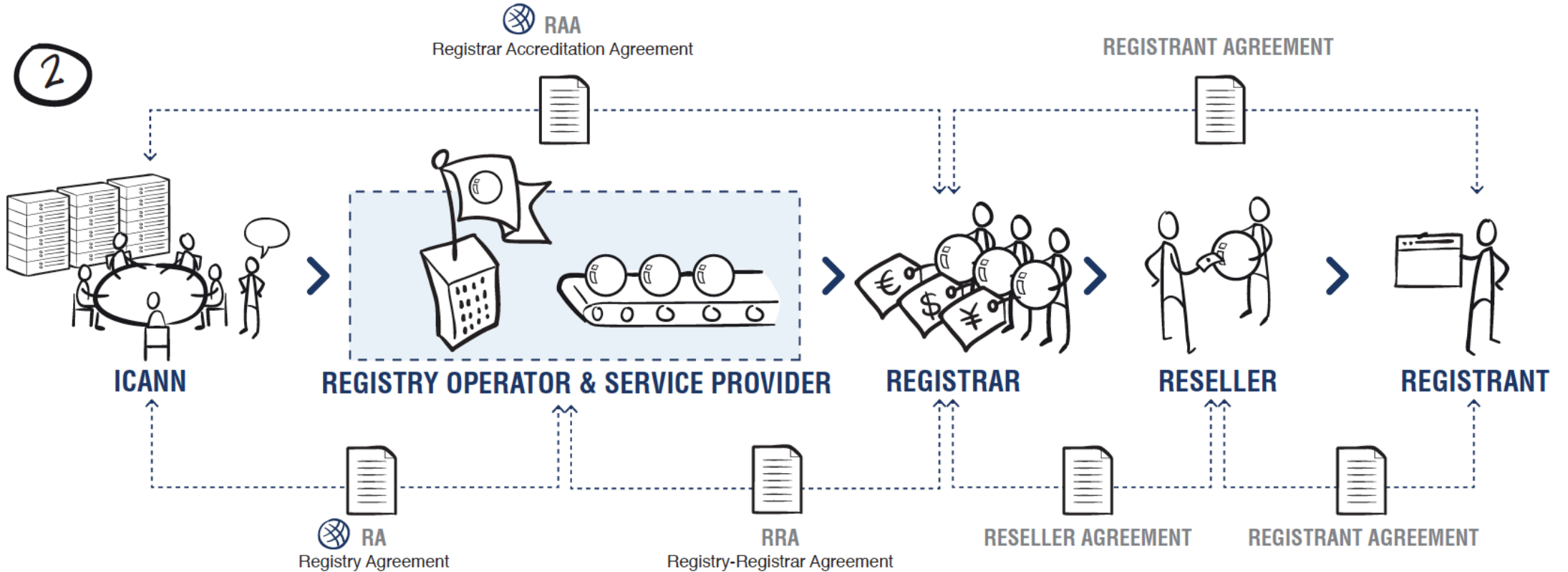


# Domain Name Industry Ecosystem Players

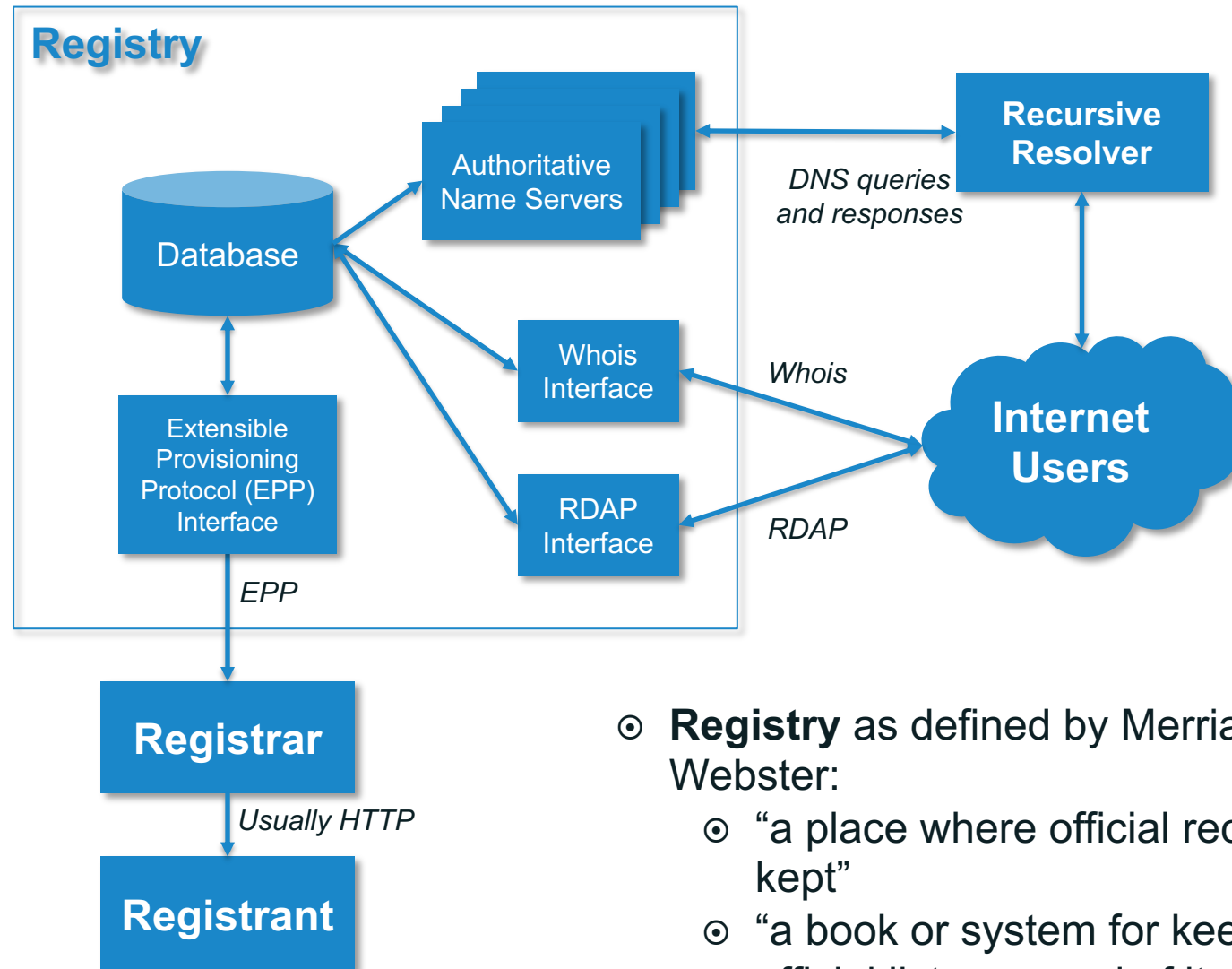
- ⦿ **Registry:** Database of domain names and registrants
- ⦿ **Registrar:** Primary agent between registrant and registry
- ⦿ **Registrant:** A holder of a domain name registration



# Relationships based on contracts



# Domain Name Registries



- ⊙ **Registry** as defined by Merriam-Webster:
  - ⊙ “a place where official records are kept”
  - ⊙ “a book or system for keeping an official list or record of items”

# Engage with ICANN – Thank You and Questions



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