

Introduction to IANA

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VP, IANA Services & President, PTI

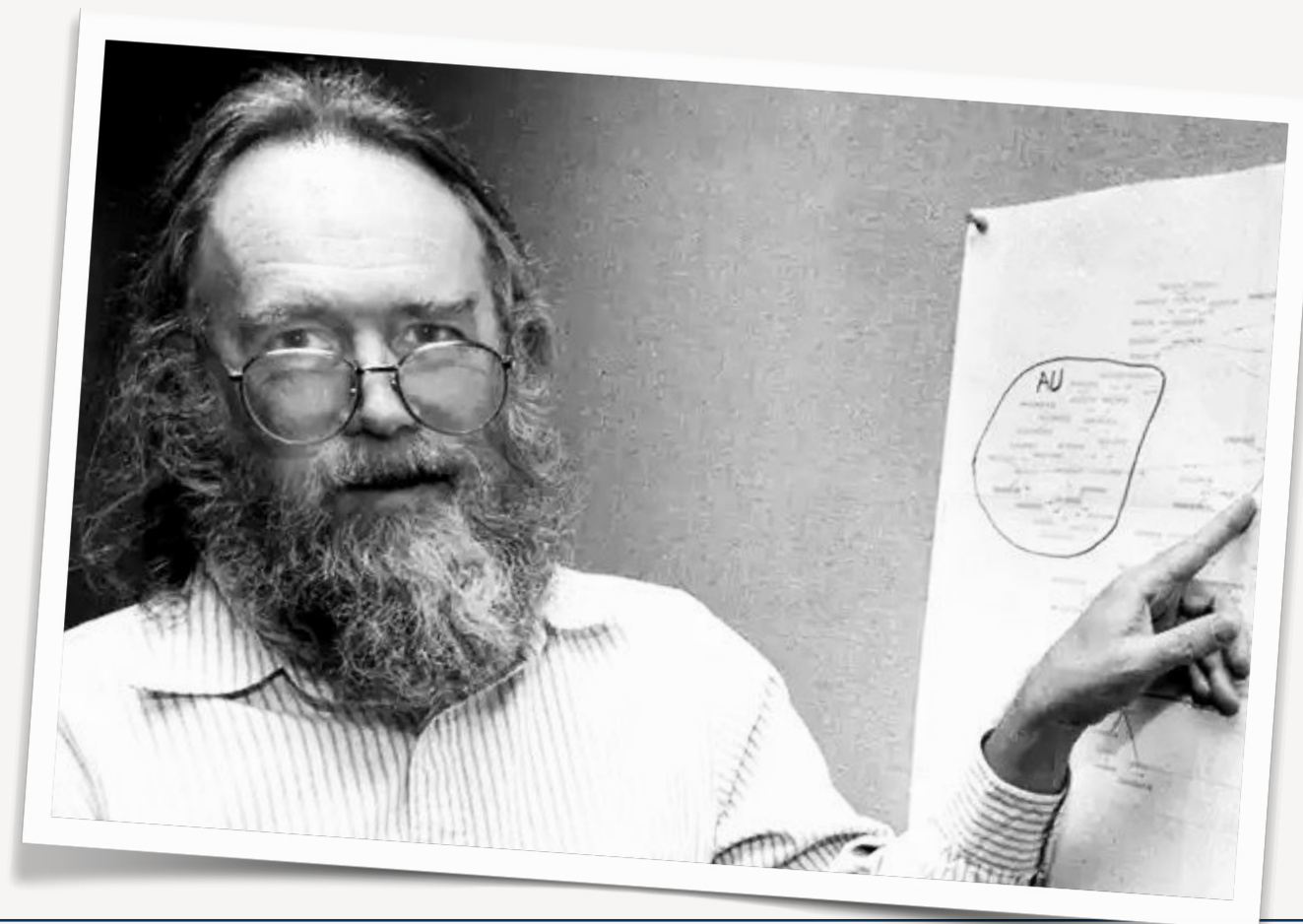
Seattle
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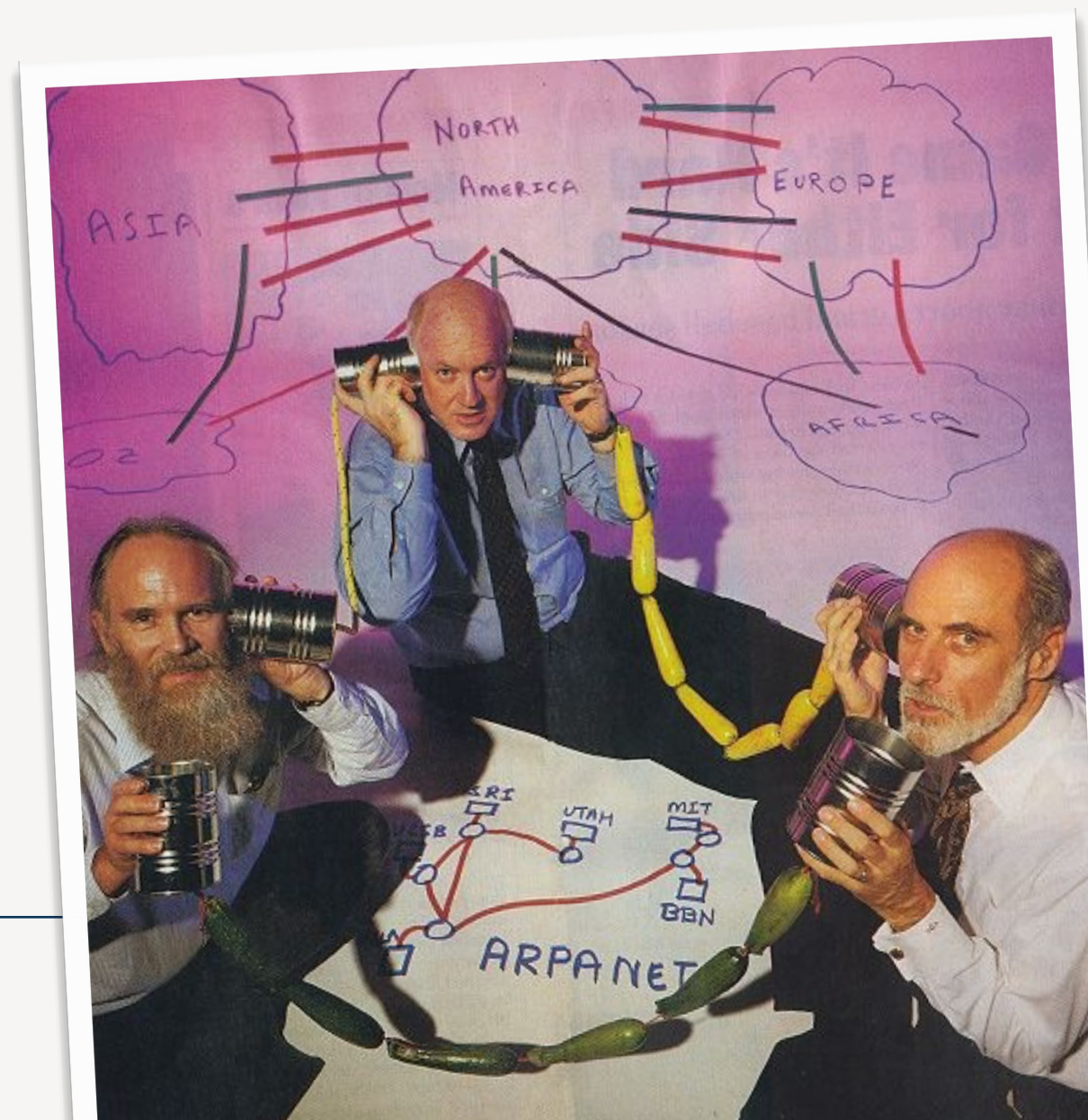


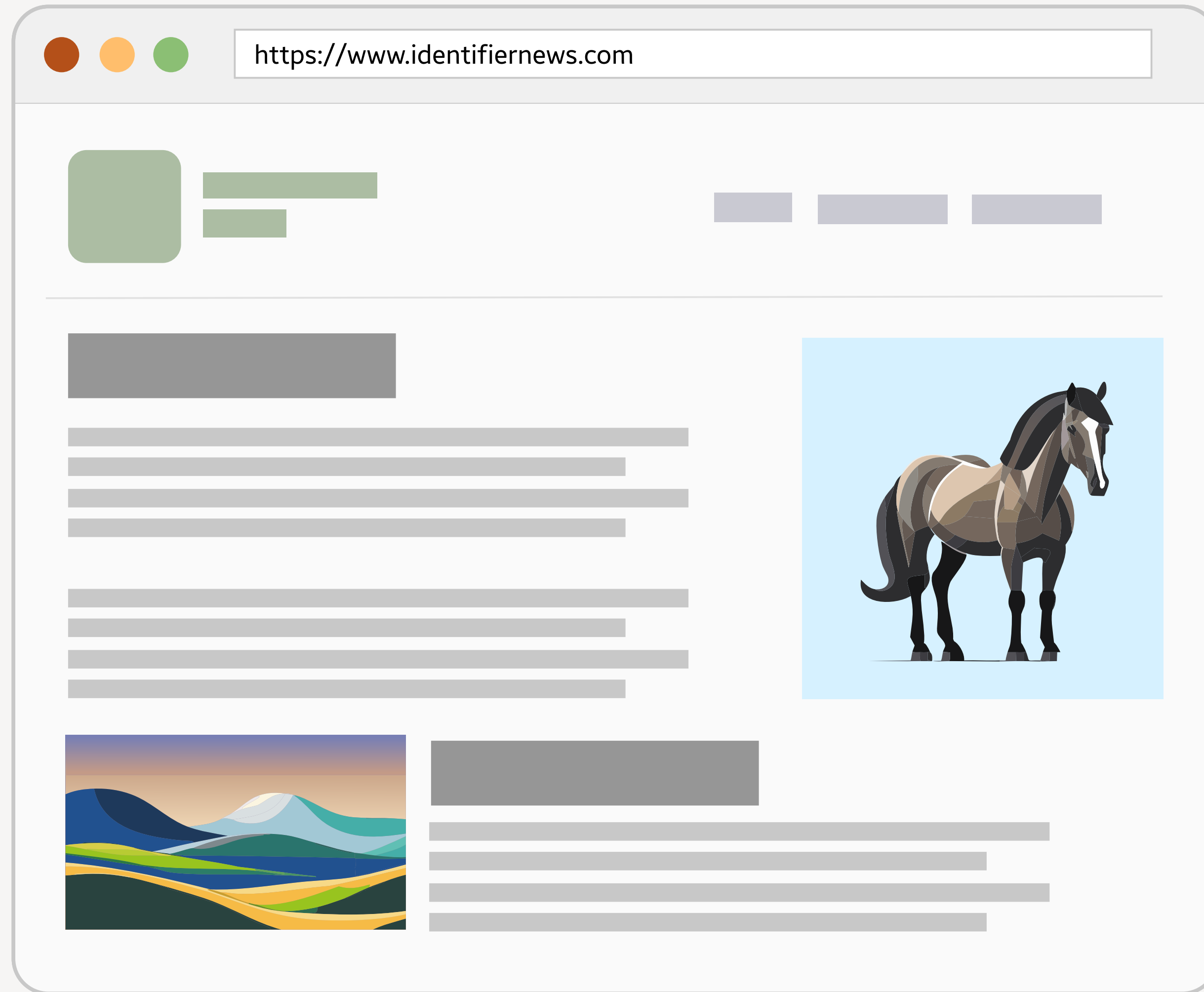
What is IANA?

- The Internet Assigned Numbers Authority
- The record keeper for the unique names and numbers used by Internet technologies to interoperate.
- The IANA functions pre-date ICANN. In 1998, ICANN was established to be the home of the IANA functions with global oversight.
- The IANA team maintains these records according to policies established in standards organizations and by the multi-stakeholder Internet governance community.

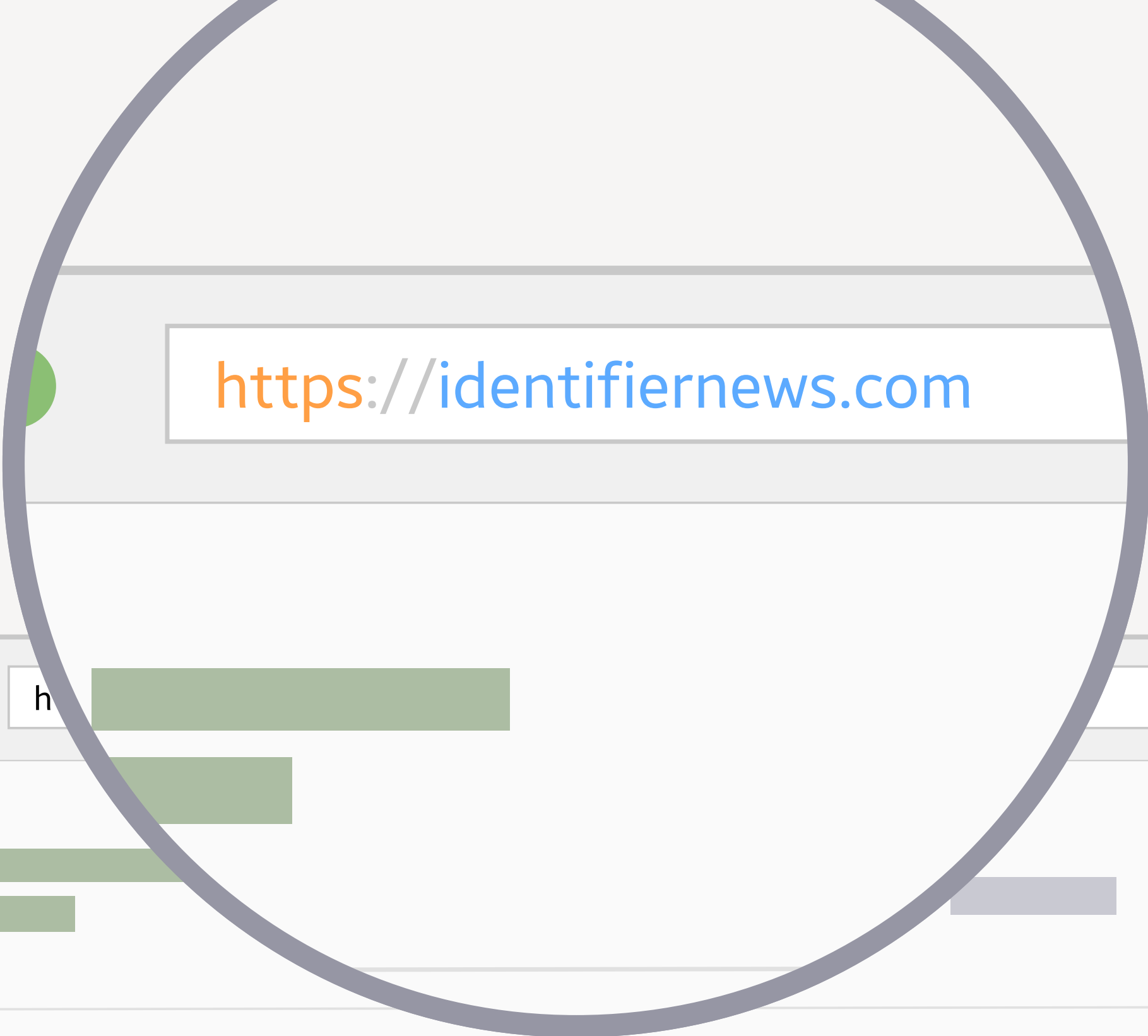


Jon Postel (L) started the IANA; with Steve Crocker and Vint Cerf (R)



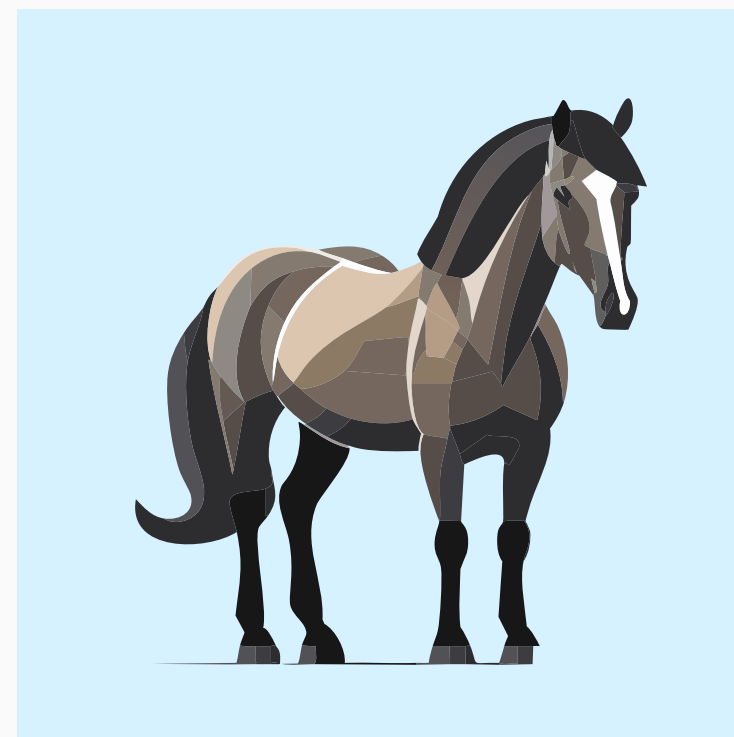


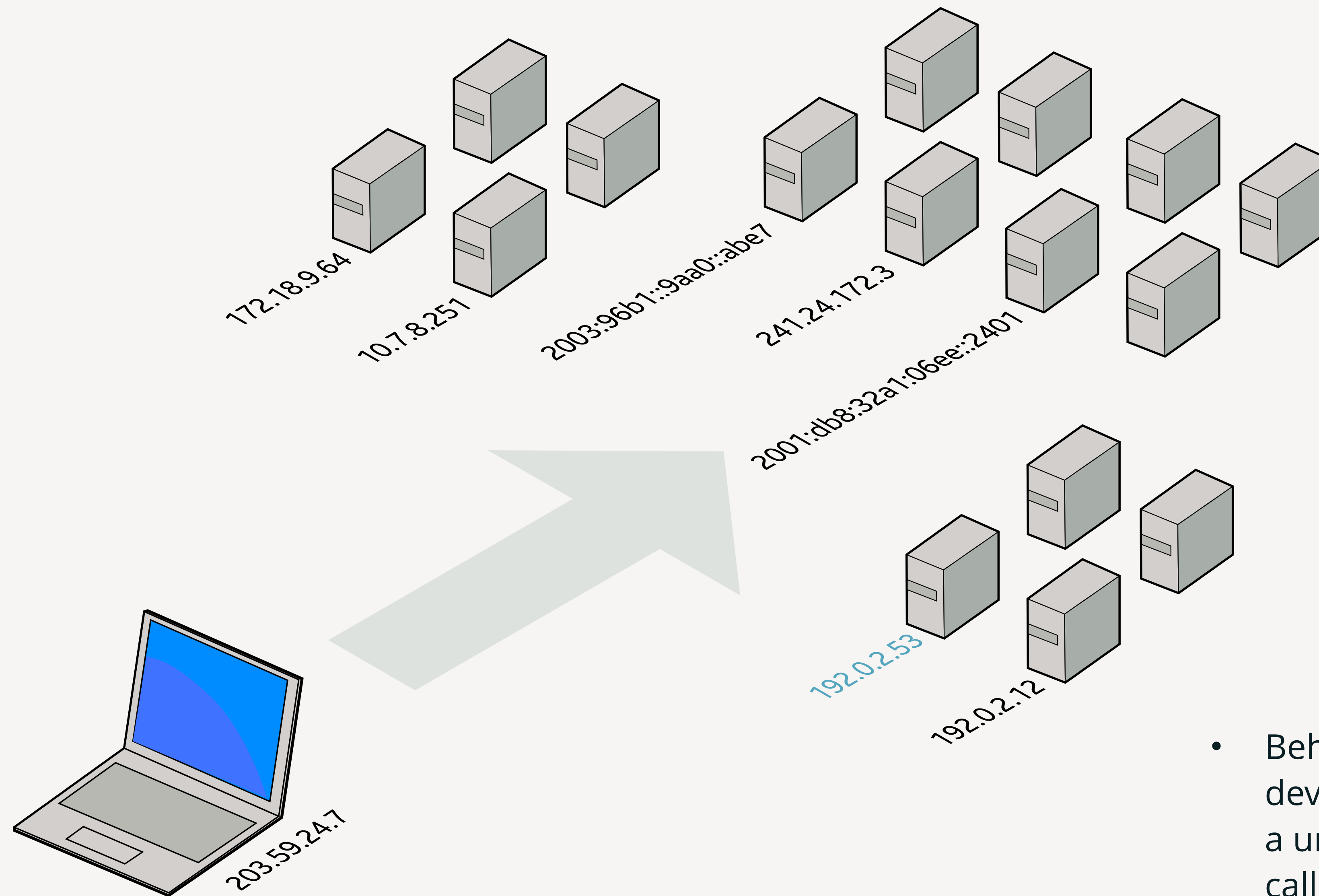
- A simple every-day activity, like requesting a web page, utilizes many unique identifiers
- Some you can see
- Some are hidden beneath the surface



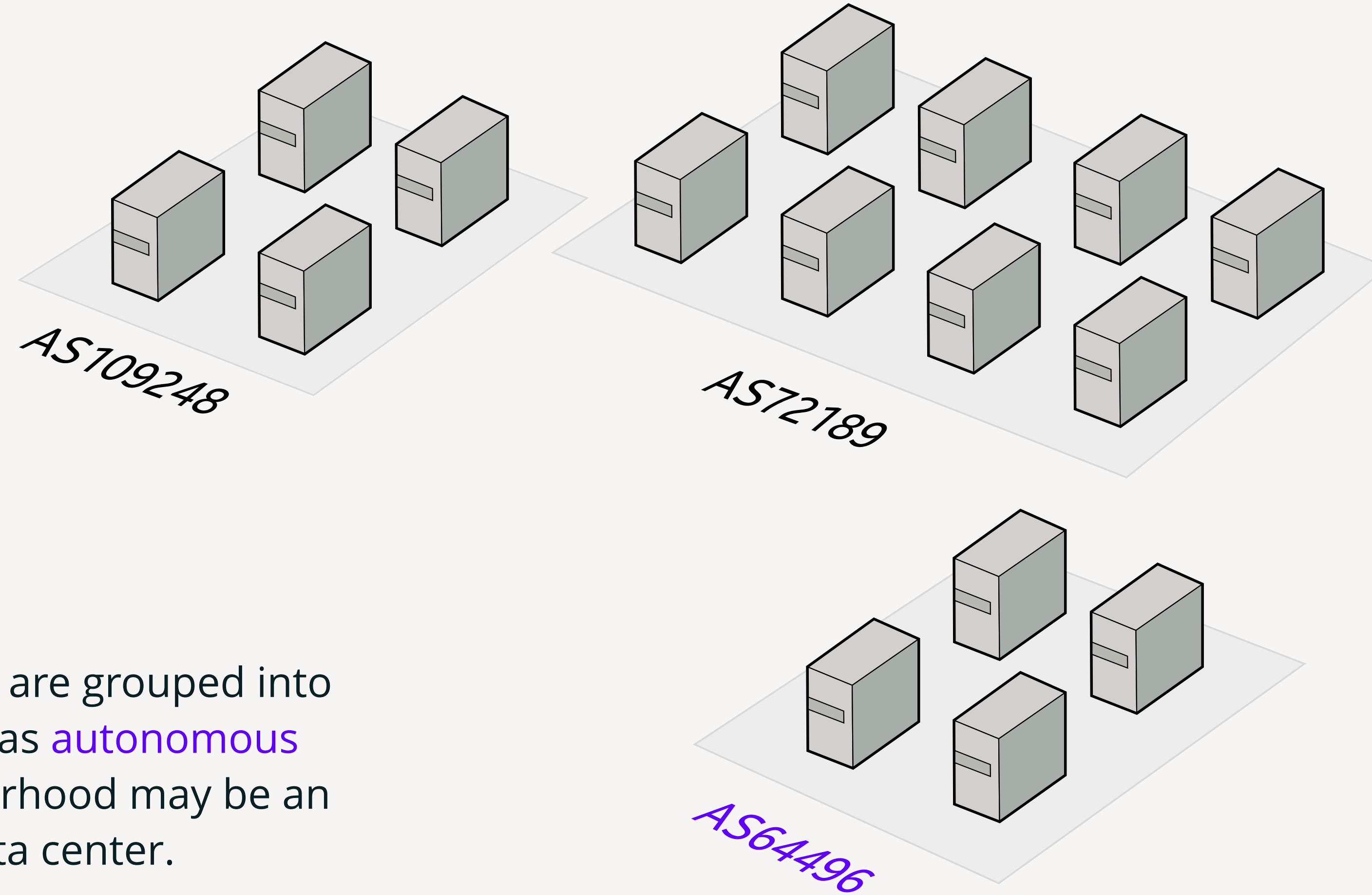
<https://identifiernews.com>

- The web address, known as a URL, contains at least two identifiers:
- `identifiernews.com` is a **domain name**, a human-readable address that provides a memorable means to communicate a location on the Internet.
- `https` is another part of the URL that signals the transmission method used to reach the location, known as a **URI scheme**.



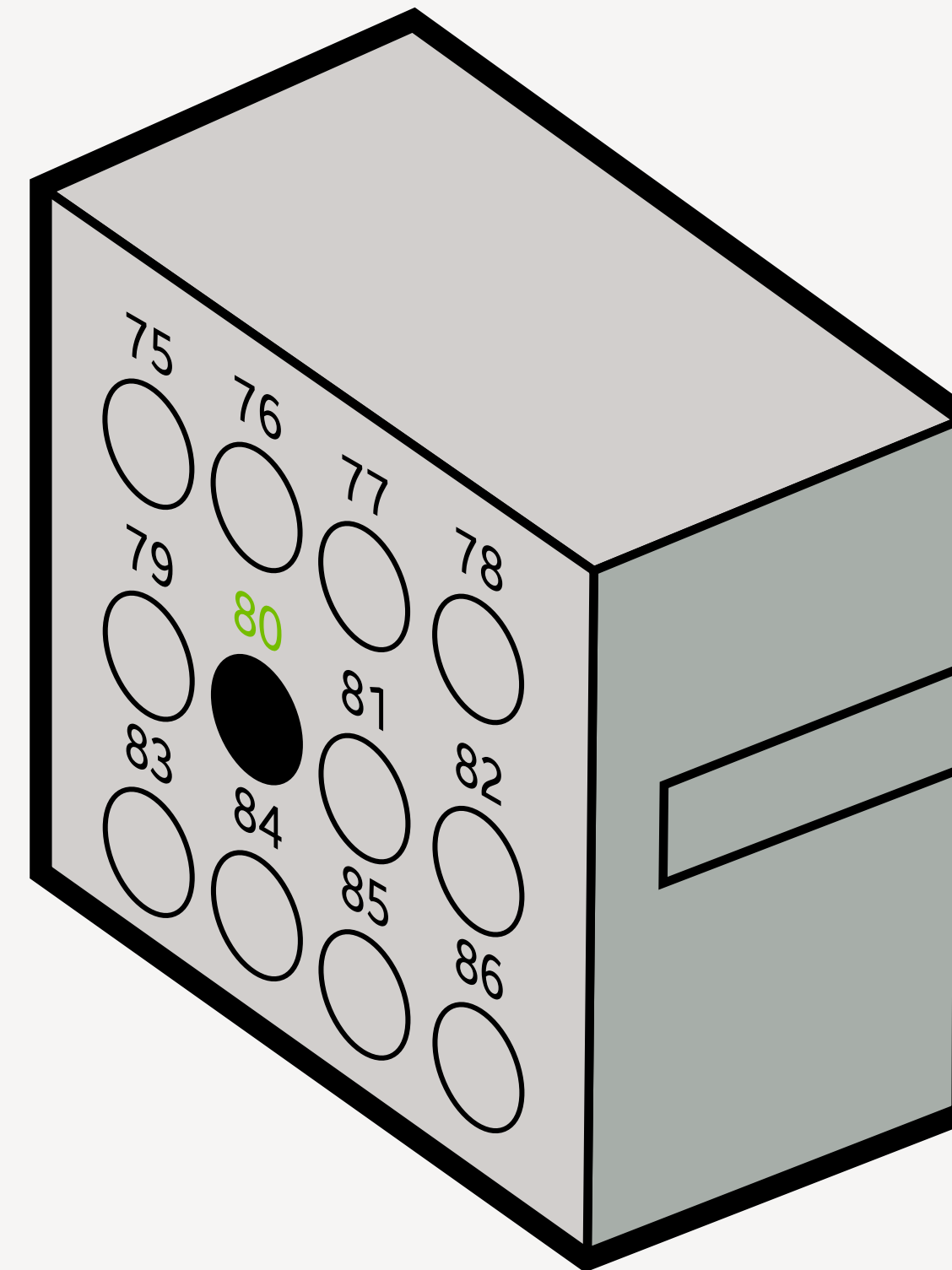


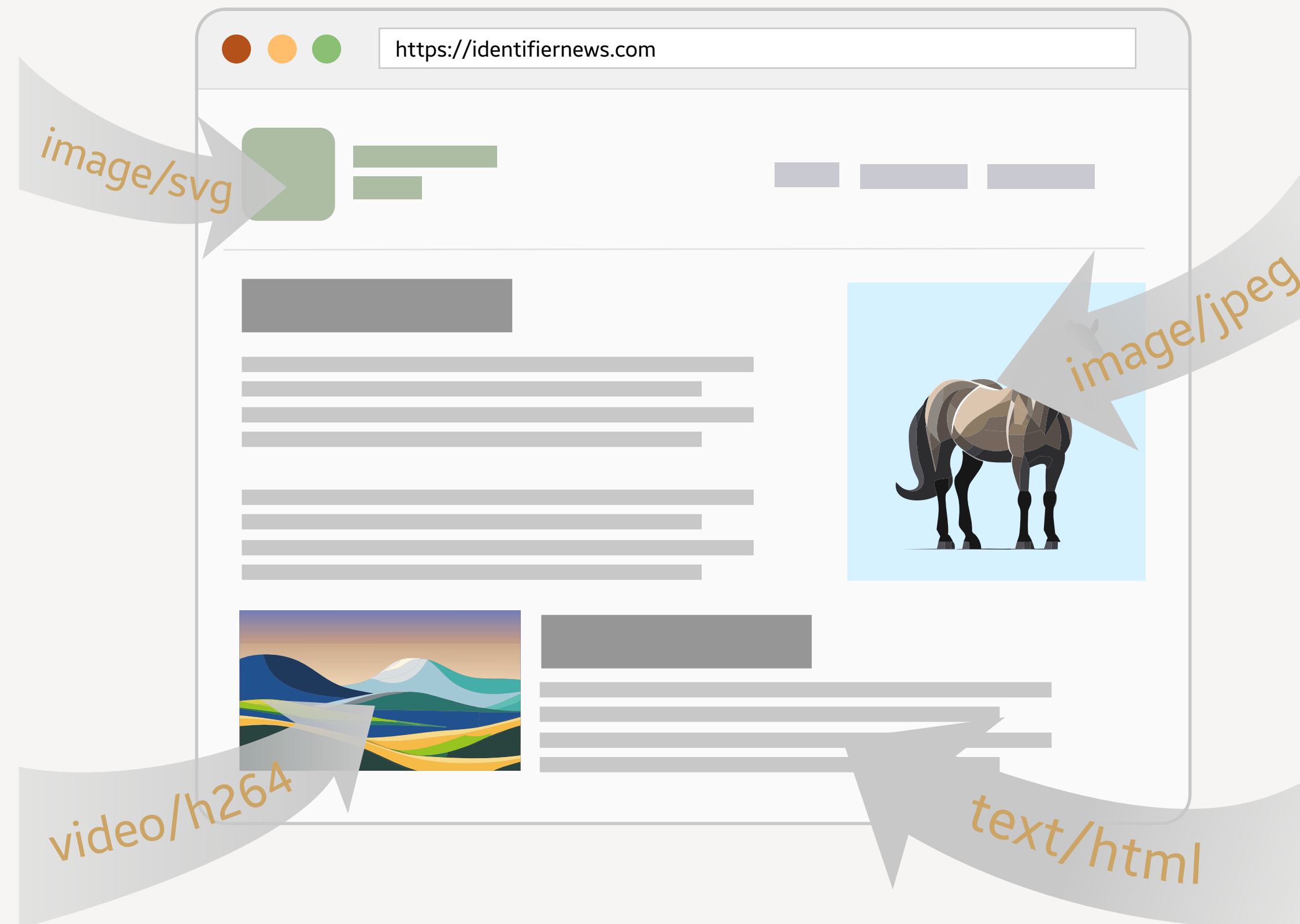
- Behind each domain name is a device on the global network has a unique numerical identifier, called an **IP address**.



- Devices on the internet are grouped into neighborhoods known as **autonomous systems**. Each neighborhood may be an ISP, a company, or a data center.

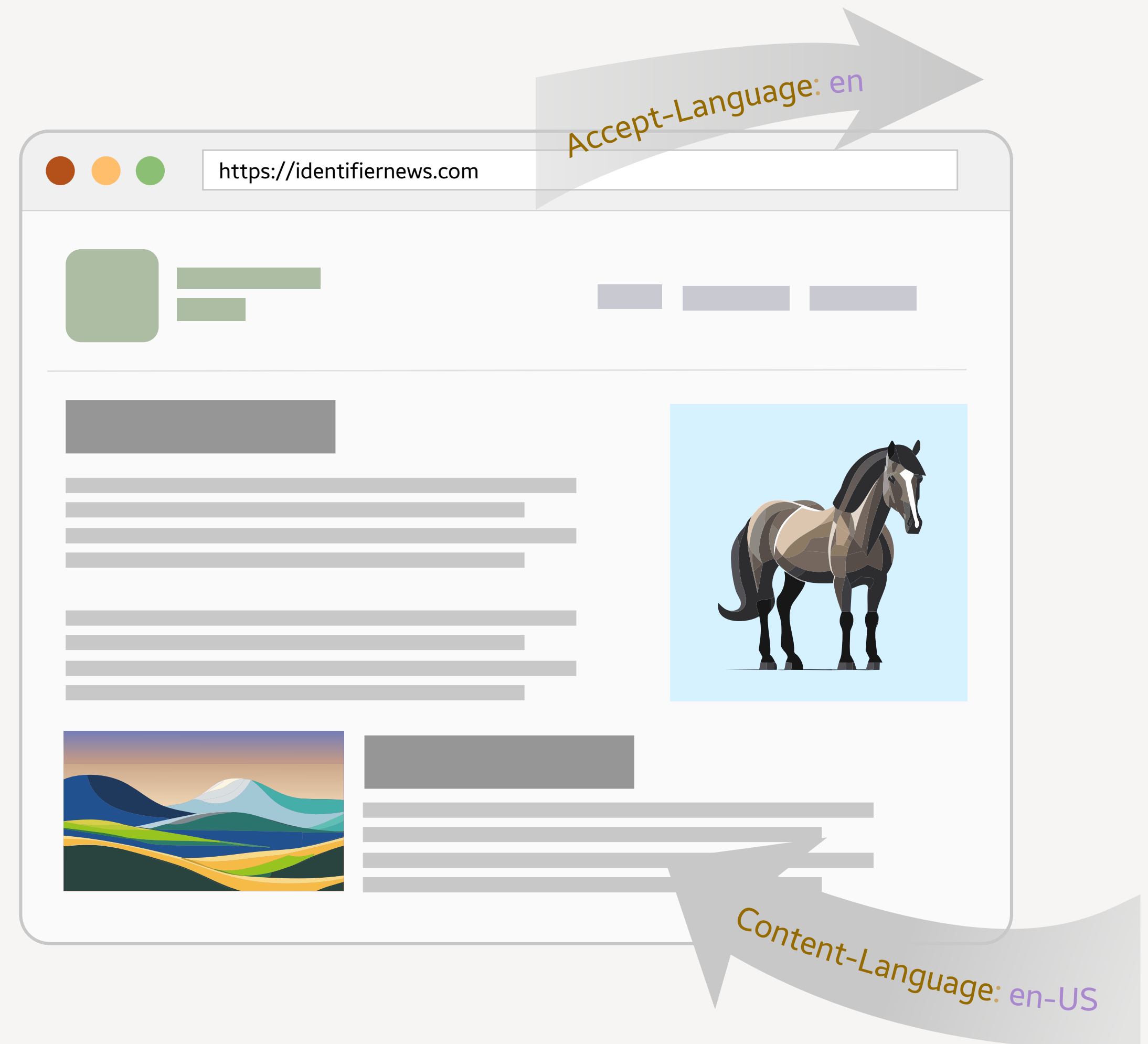
- Which service to connect to on an individual server is denoted through **service names** and **port numbers**.
- A web transmission may go to port 80 whereas an email would go to port 25





- Each piece of the transmission is coded with a **media type** which ties it to the underlying format.

- Parameters to the request are denoted with **header fields**.
- One such field `Accept-Language`, signals language preference using **language tags**.

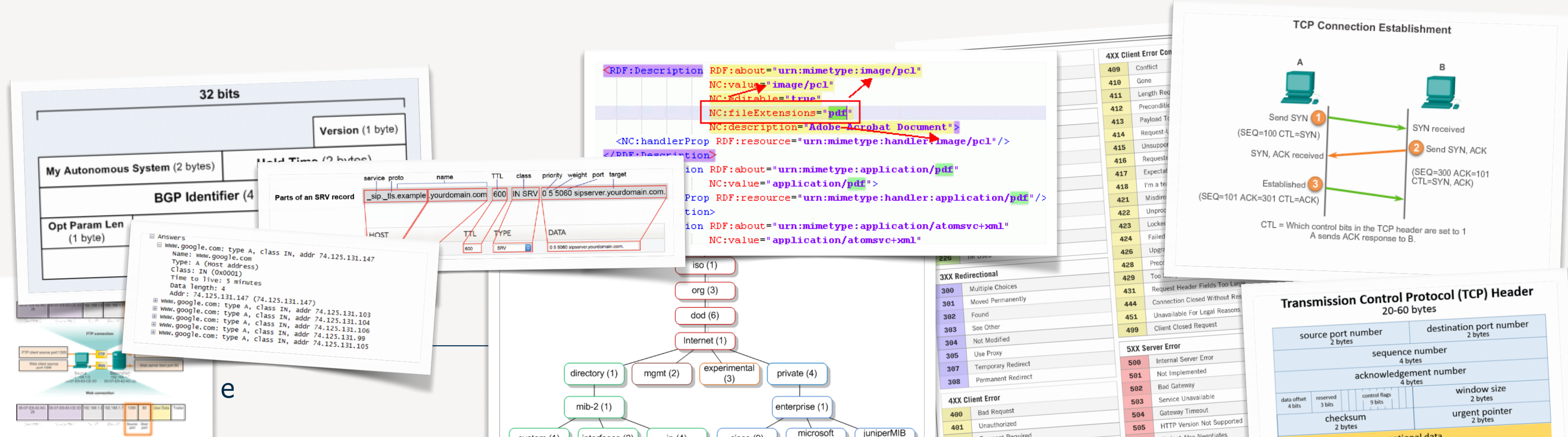


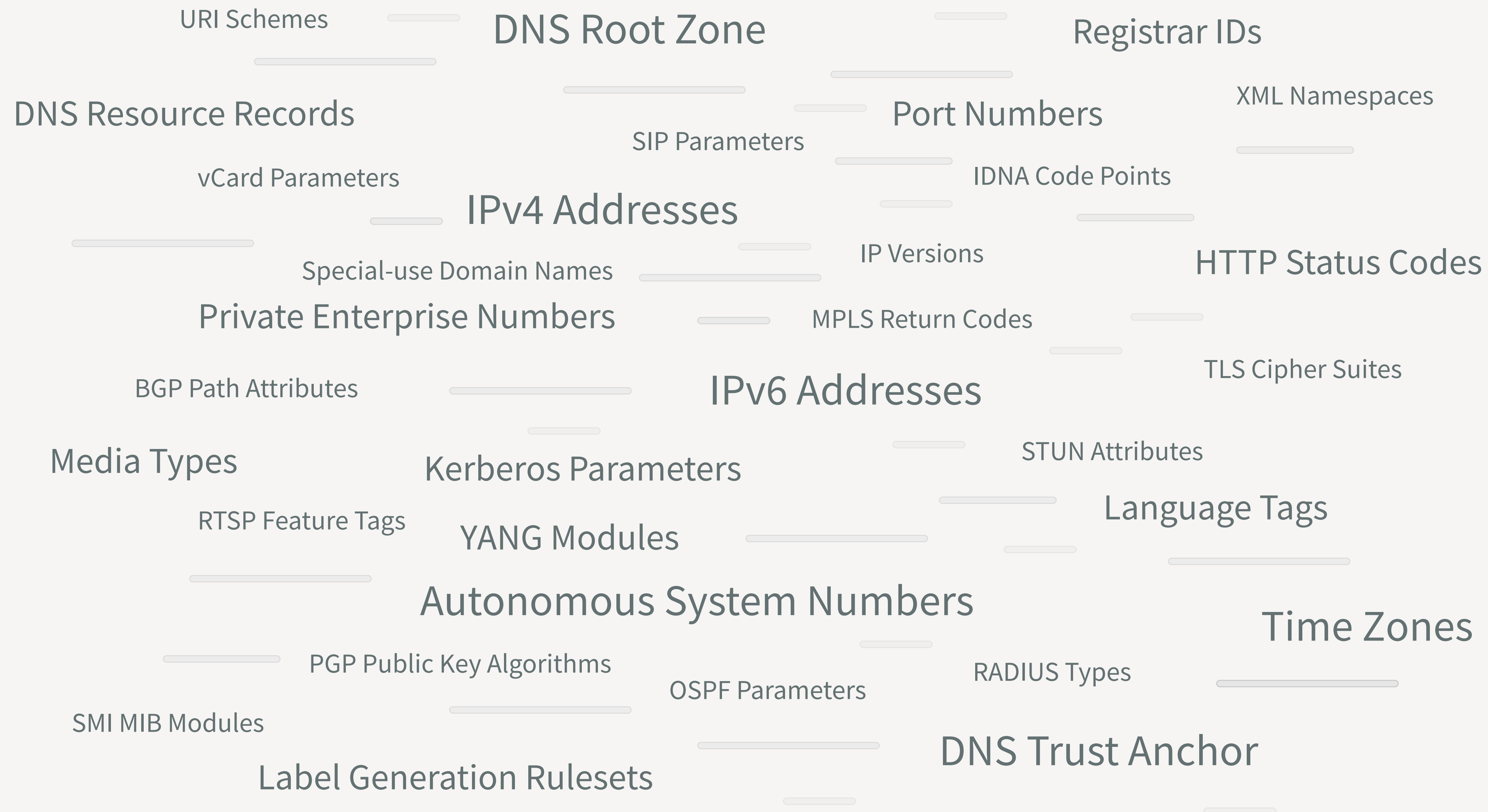
Unique identifiers are everywhere

- In retrieving a single web page, and think about some of unique identifiers that were involved:
 - The **domain name** - the human-friendly address of the website;
 - The **URI scheme** - that tells your computer the language (protocol) it needs to speak to request the website;
 - The **IP address** - the machine-readable identifier of the server the web site is located at;
 - The **AS number** - the neighborhood the server is located in where your ISP needs to send your request to;
 - The **service name** and **port number** - that connects to the correct service on the destination IP address;
 - The **media type** - which helps your computer decode the data it gets back into pieces it can understand and represent on your screen;
 - The **header field** specifies extra data for requests and responses; and
 - A **language tag** signals the language desired, available and sent.
 - And many more...

What do these all have in common?

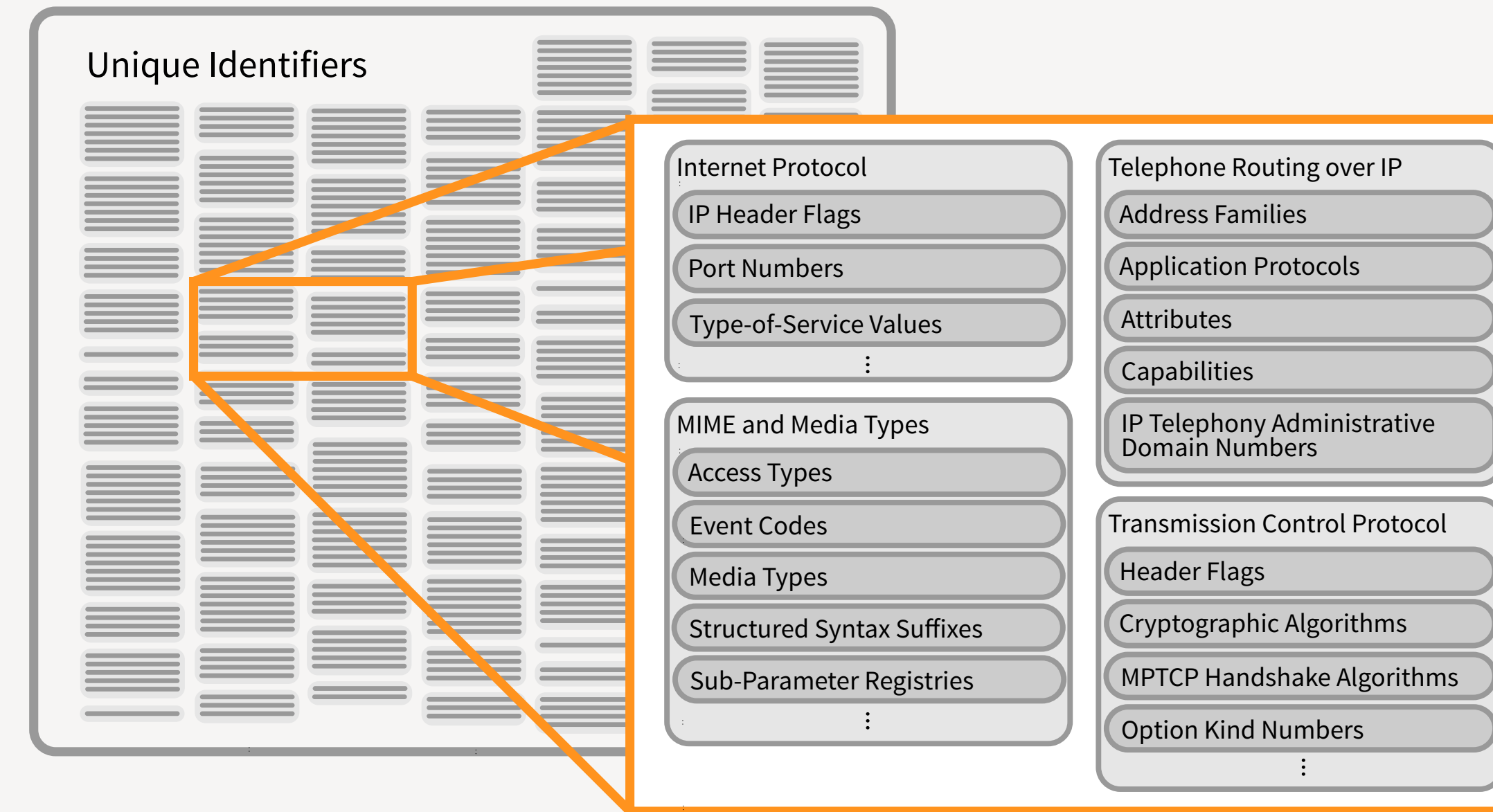
- All of these unique identifiers are just a fraction of those necessary to transmit a single webpage across the Internet.
- Coordinating the Internet unique identifier systems is needed to ensure the Internet interoperates globally.
- If any one of those identifier types didn't have a common standardized meaning around the world, the web page would have failed to transmit across the Internet.
- **The IANA functions' responsibility is to manage all those identifiers globally.**





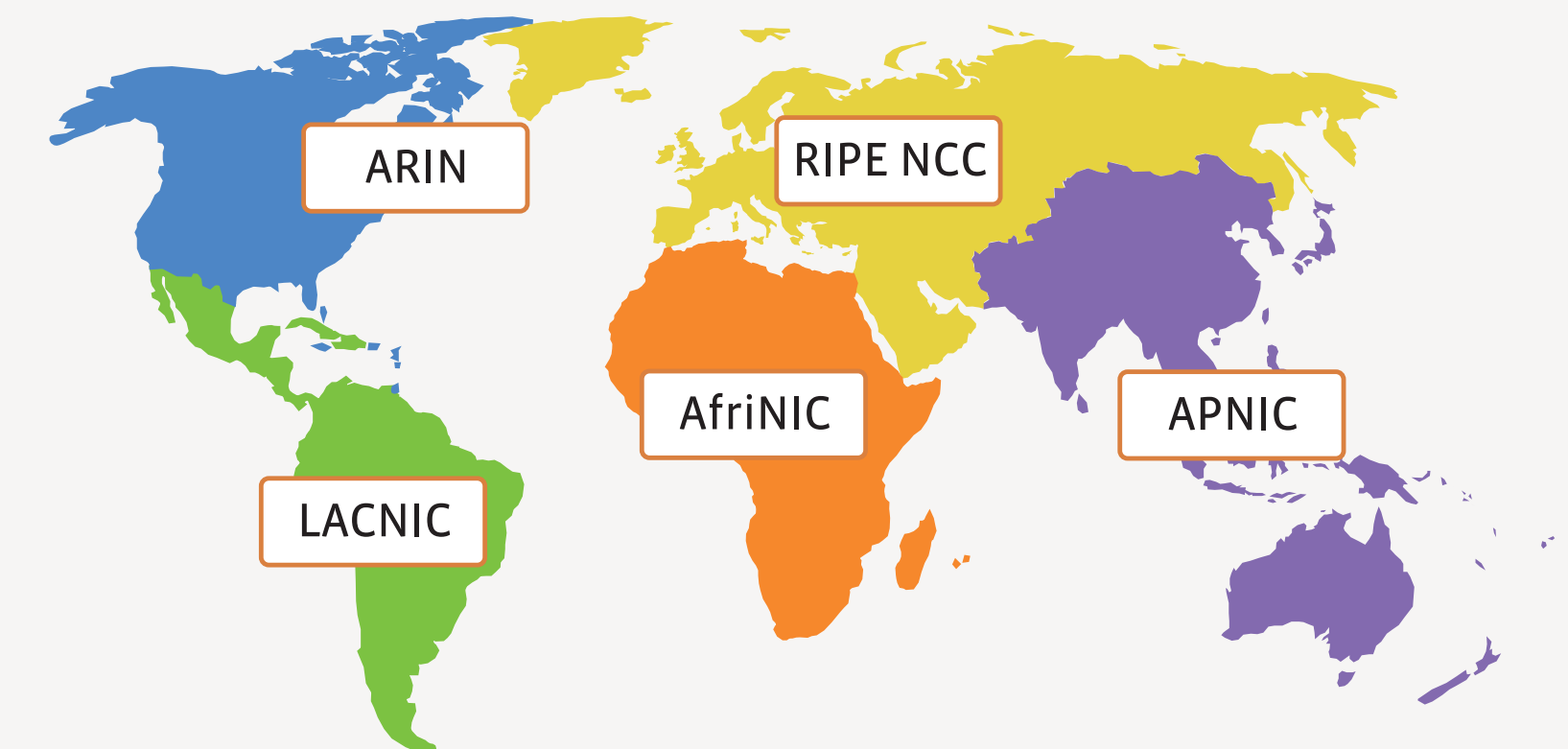
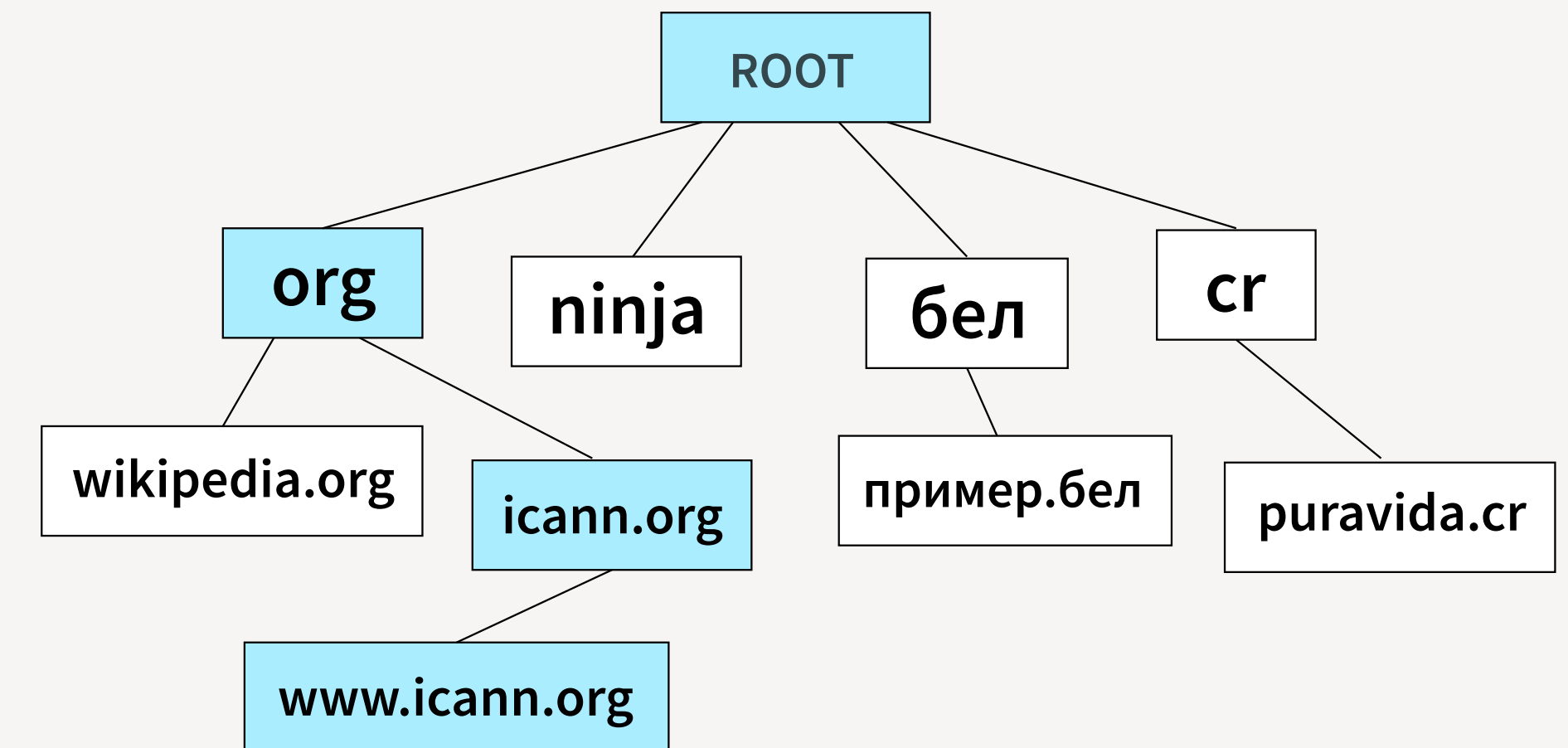
Identifier registries

- Most IANA registries provide for direct allocation by IANA to the user. Rules differ for the qualifying criteria for each type. Applications are evaluated by IANA according to the set criteria.
- The visibility of most of these identifiers is limited to software implementors (e.g. inside software code).
- The **Internet Engineering Task Force** (IETF) develops the Internet standards that define protocol parameter systems. These documents include guidance on unique identifiers that IANA most implement, referred to as “IANA Considerations”:
 - Instructions on the creation of a unique registry for protocol parameters;
 - Registration policy;
 - Initial registrations and reserved values.



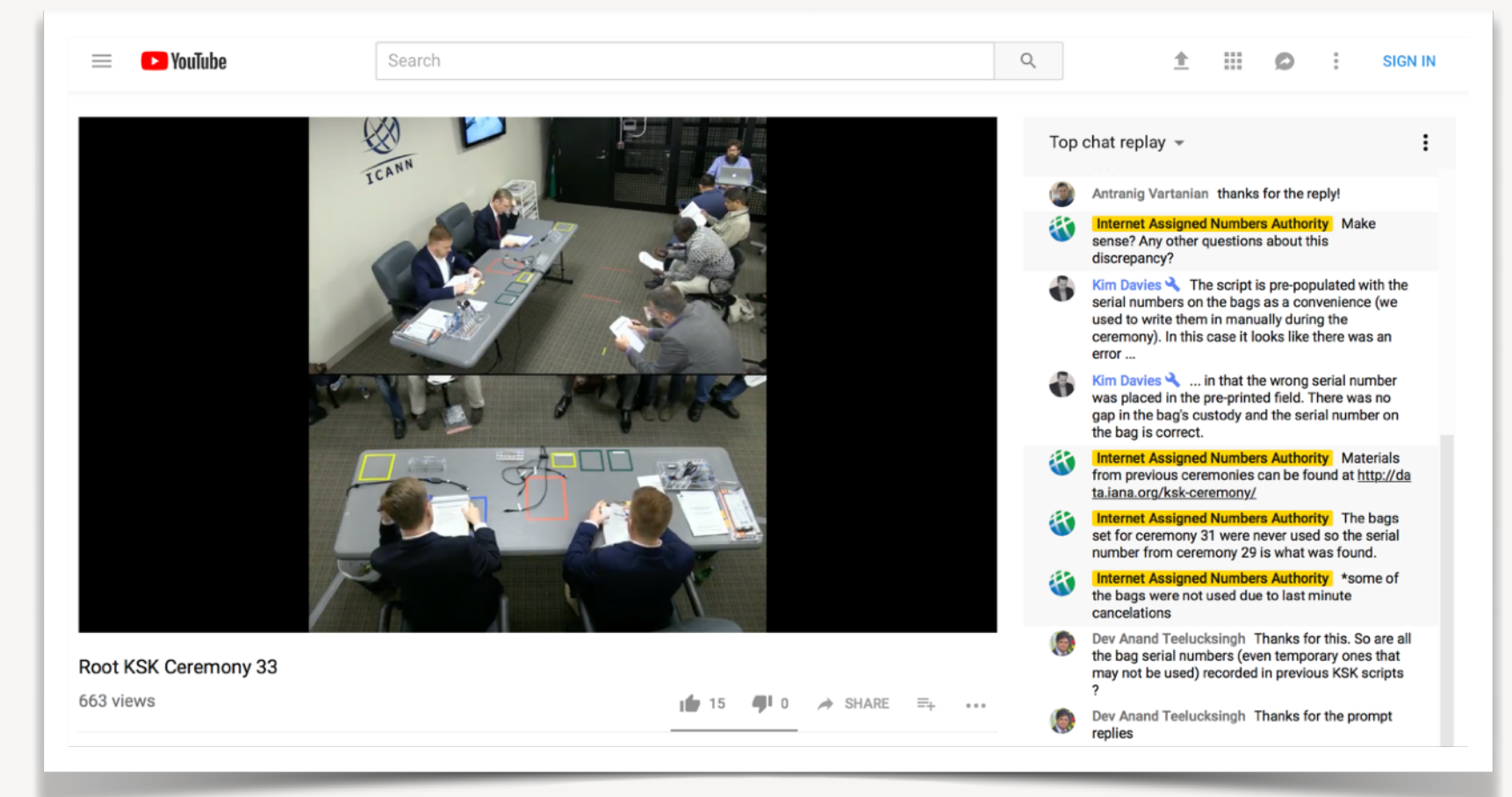
Hierarchically delegated registries

- Some particular important identifiers with global scope have a hierarchical delegation model, where IANA is responsible for the overall global namespace at the upper-most level, but delegates significant responsibilities to other organizations.
- Examples of these are:
 - Domain Names
 - IP addresses
 - Autonomous System Numbers
- ICANN and its constituent stakeholder bodies develop the policies that govern how these hierarchical delegations are made.



Operationally complex registries

- Many registries are simple, IANA is the official record keeper and maintains a database of allocations made. Relevant technical standards refer to the IANA registry as the source of truth for implementations.
- Some registries have a day-to-day operational dimension that the Internet operation relies upon
- The DNS root zone, and the ecosystem around the DNS root, plays an essential role in operation of the Internet
- Managing the cryptographic keys that secure the DNS involve logistically challenging equipment and facility maintenance, and are operated through high-profile public key ceremonies.
- Many registries rely on complex operational and provisioning systems, often requiring deploying of leading edge technology to implement.

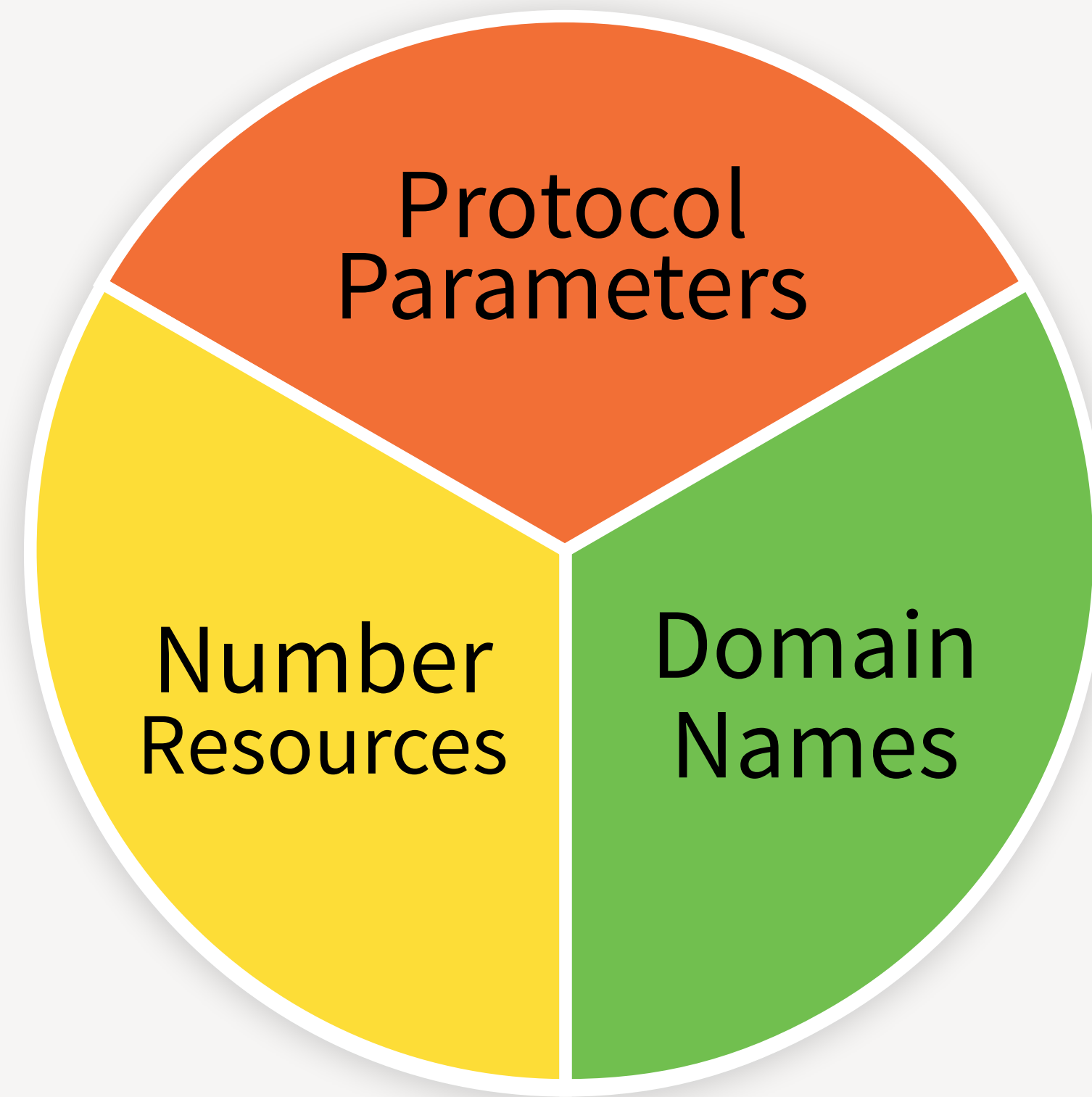


Accountability

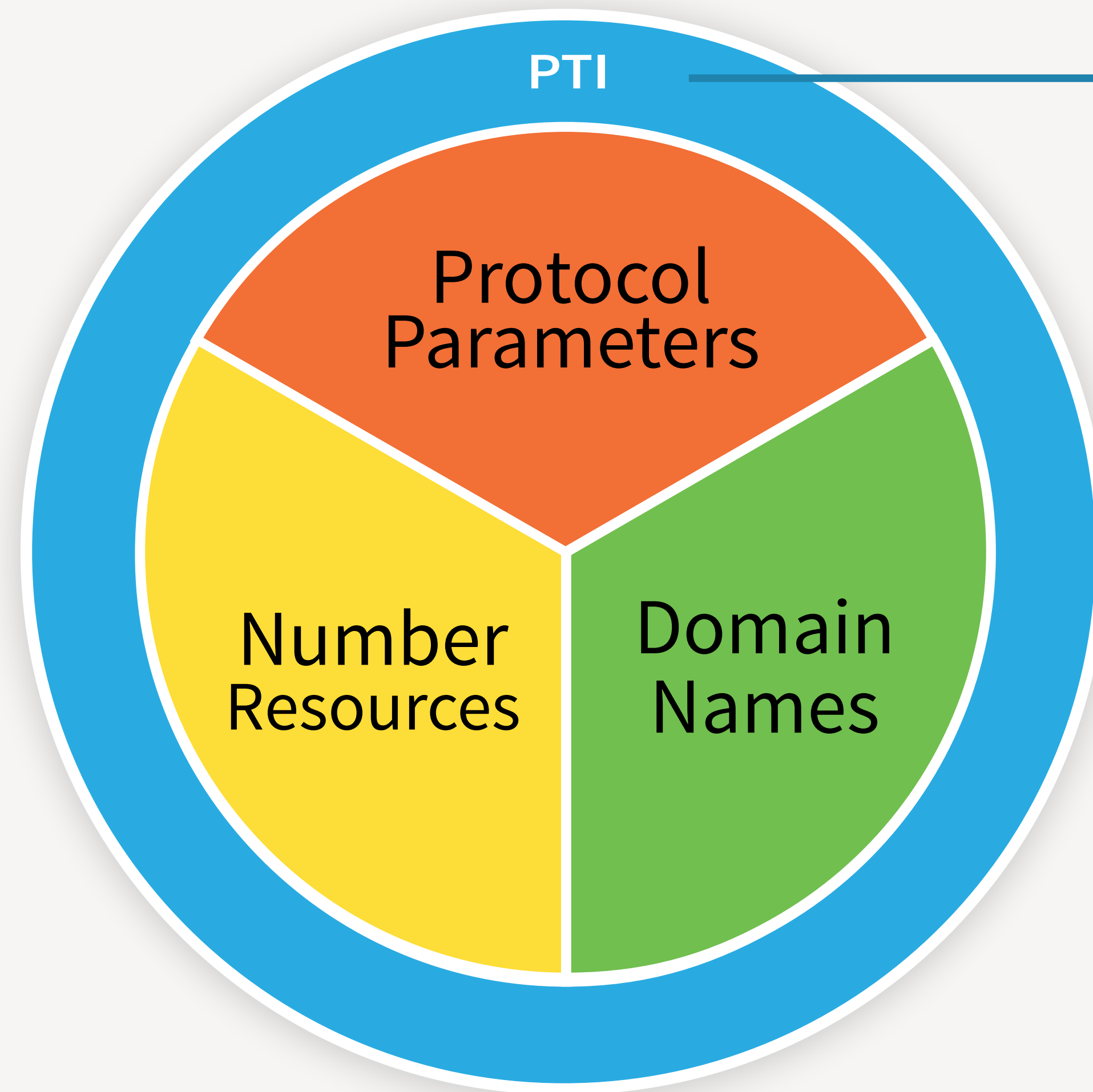
- IANA operates under a comprehensive framework of accountability measures, including:
 - Service level agreements with the community with regular reporting
 - Periodical community oversight through established committees and processes
 - Remediation and escalation procedures in the event of problems
 - Mandatory third-party audits with reporting to key stakeholders and the community at large
 - Customer surveys, both after interactions and annually
 - Publication of detailed data to allow community analysis and correlation



Three key accountability groups



- We often organize the scope of the IANA functions by the three main groups of accountability:
 - Protocol Parameters
 - Numbers Resources
 - Domain Names
- For each of these groups there are different oversight and accountability models.

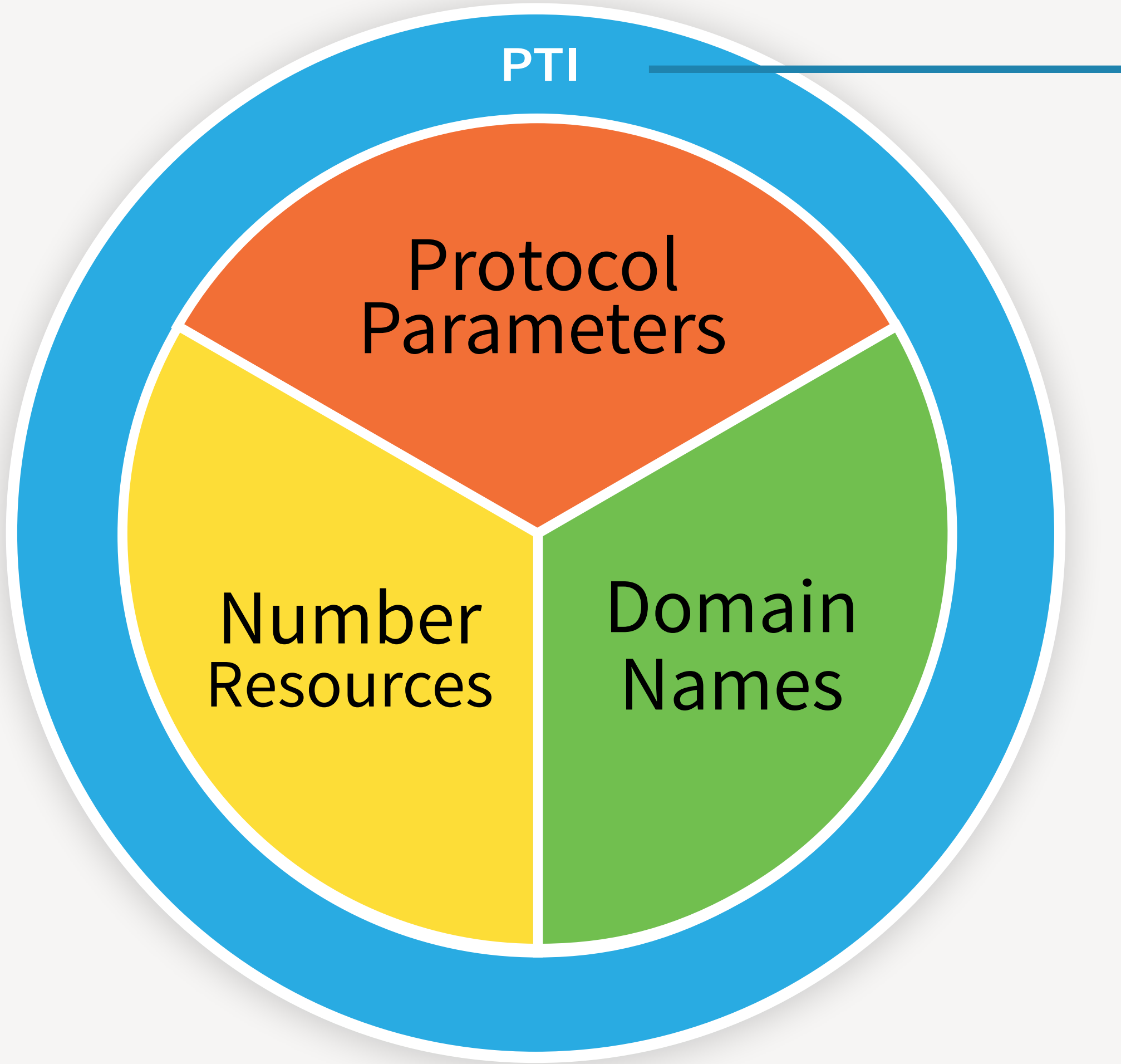


Public Technical Identifiers

- The IANA functions are performed by a not-for-profit organizations called Public Technical Identifiers (PTI)
- Established in 2016, PTI is an affiliate of ICANN

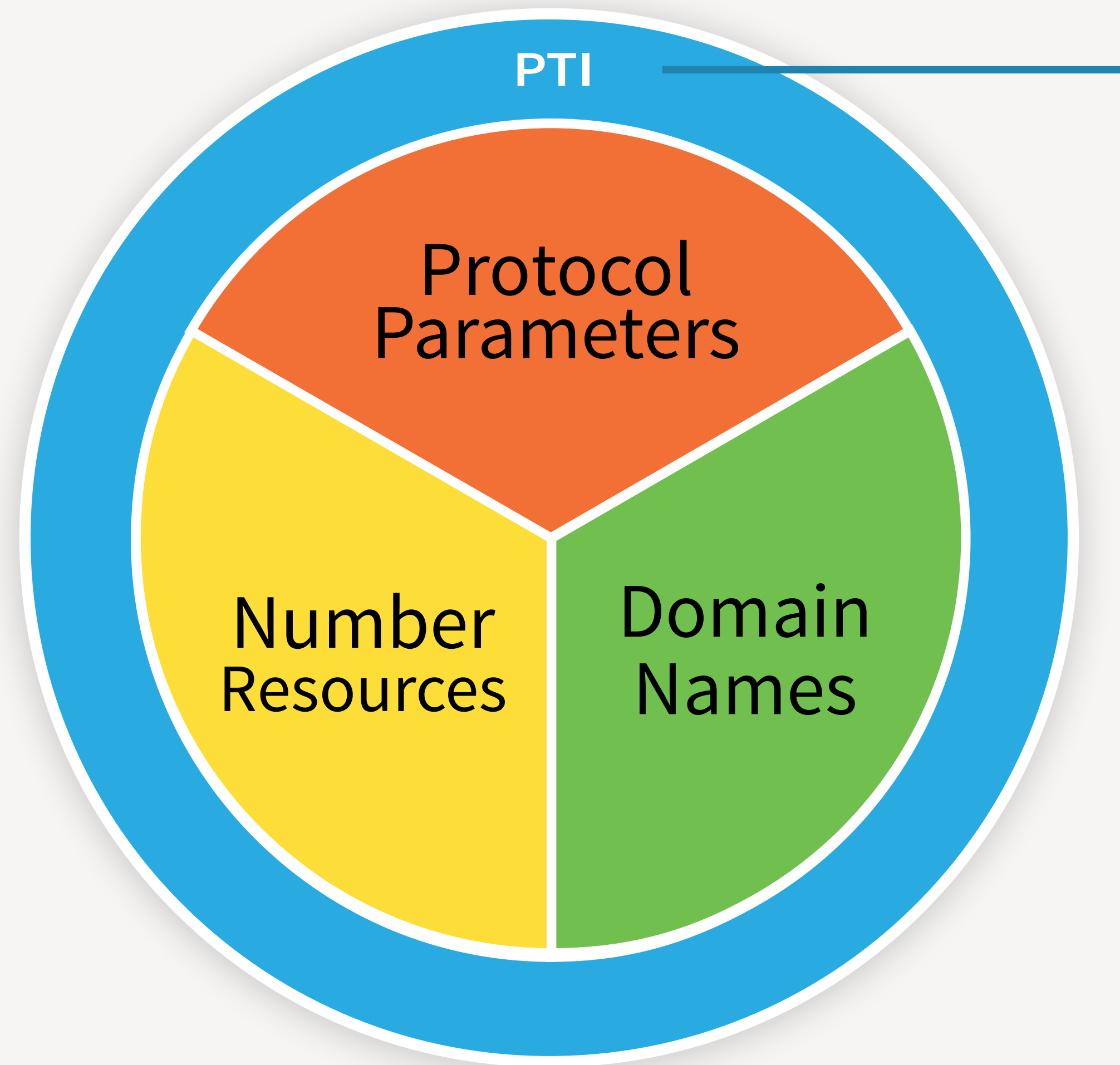
IANA Staff

- 20 staff, headquartered in Los Angeles



 Shaunte Anderson	 Amanda Baber	 Kyla Bundy	 Tyler Carroll	 Amy Creamer
 Kim Davies	 David Dong	 Aaron Foley	 Selina Harrington	 Lawrence He
 Marilia Hirano	 Tania Hopkins	 James Mitchell	 Ali Mohammadi	 Candice Montoya
 Andres Pavez	 Racquel Ross	 Seman Said	 Sabrina Tanamal	 Michelle Thangtamsatid

● Operations ● Strategic Programs ● Technical Services

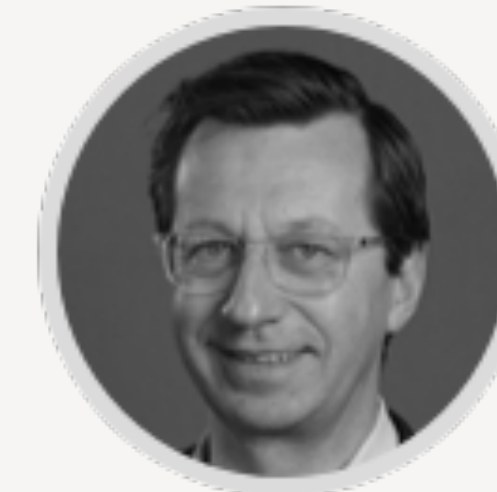


PTI Board

- Five member board, including 2 appointees by the ICANN Nominating Committee



Anupam Agrawal
NOMCOM APPTTEE



Xavier Calvez
ICANN CFO



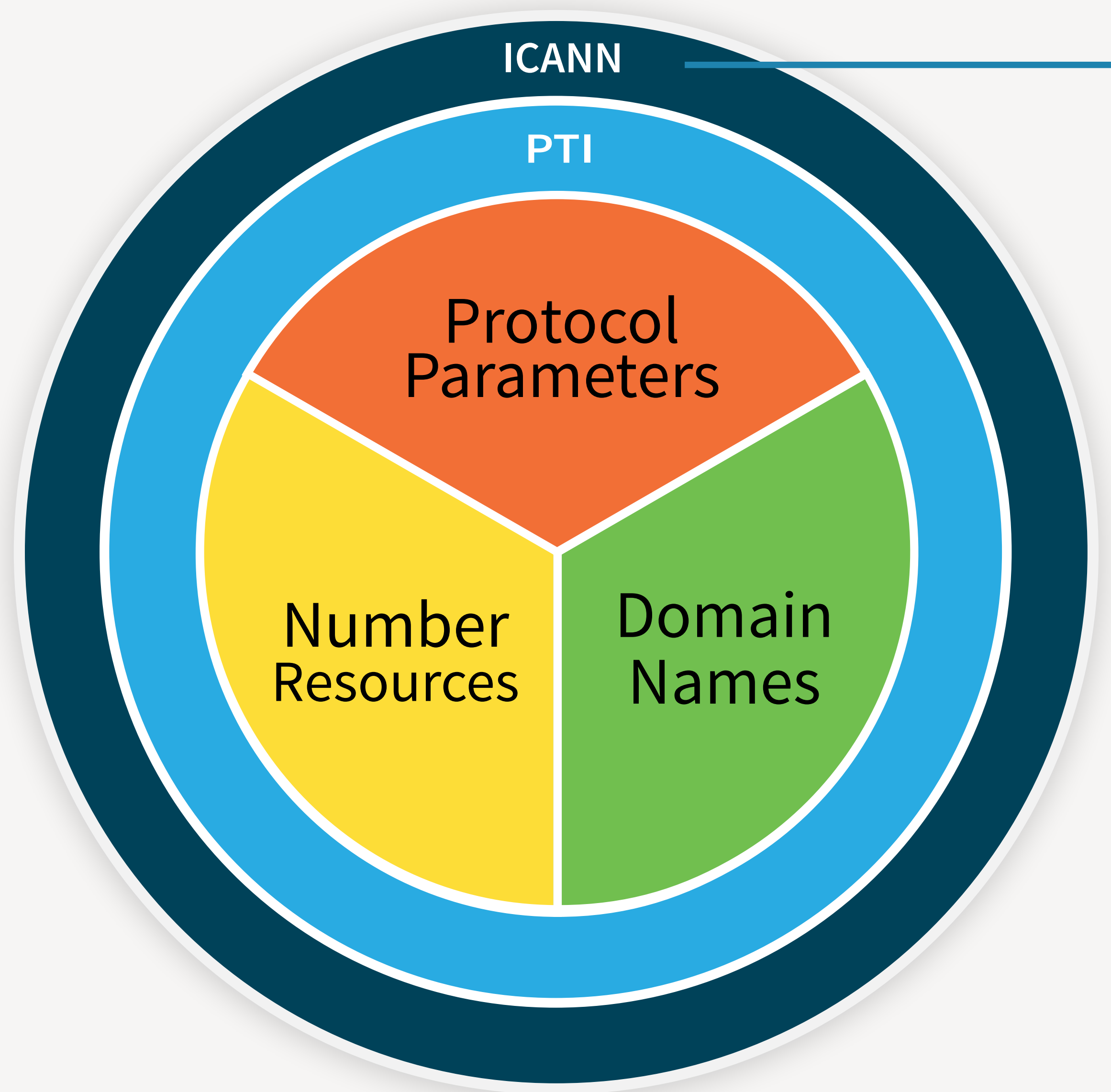
Kim Davies
PTI PRESIDENT



John Crain
ICANN CTO



Tobias Sattler
CHAIR
NOMCOM APPTTEE



ICANN

- Responsible for the IANA functions
- Contracts PTI to perform the IANA functions
- Oversees PTI's performance
- Provides shared and dedicated resources (Legal, IT, HR, Finance and many others)
- Provides all funding to PTI
- Operates additional accountability mechanisms such as Customer Standing Committee, IANA Naming Function Reviews

Wrapping up

- The IANA functions perform essential record keeping functions to keep the Internet interoperating
- IANA is a part of ICANN org, operated by an affiliate organization called PTI
- IANA team members will be here this week and we look forward to talking with you