78 ANNUAL GENERAL MEETING

ICANN 1998–2023

IANA Stewardship Transition 2016–2023

Introduction to IANA

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PTI | An ICANN Affiliate

What is IANA?

- “Internet Assigned Numbers Authority” is responsible for global Internet unique identifier systems.
- The unique identifiers include protocol parameters, Internet numbers and domain names
- One of the oldest Internet institutions, its role dates back to 1970s.

What Are the IANA Functions?

- In 1998, ICANN was established as the steward and operator of the IANA functions
- The IANA Department within ICANN maintains the registries of the Internet's unique identifiers
- These lists are maintained according to policies adopted by Internet names, numbers and protocol standards communities
- Today, "IANA" may refer to either the functions, or the department that runs the IANA functions.

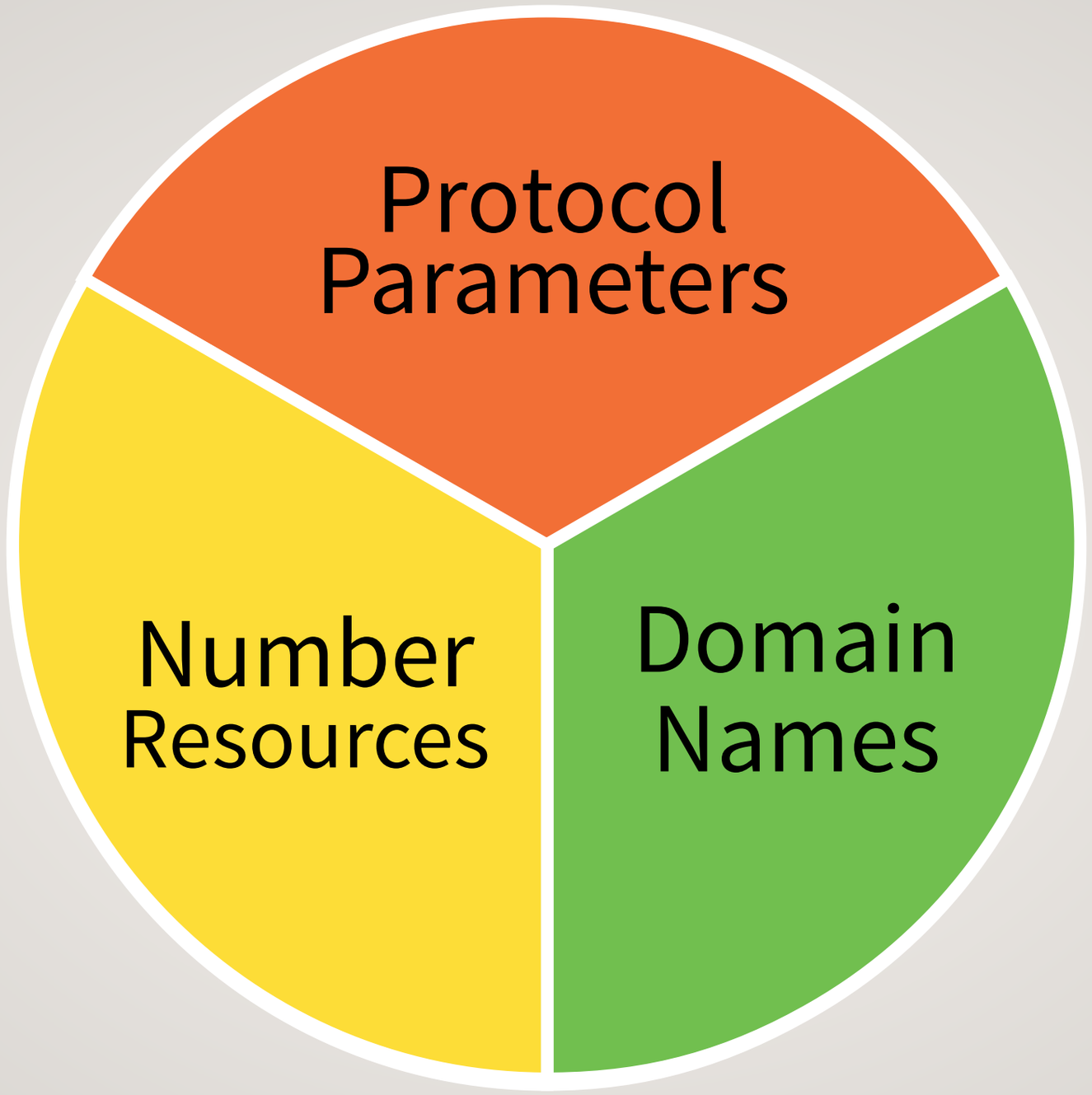
Why Do the IANA Functions Exist?

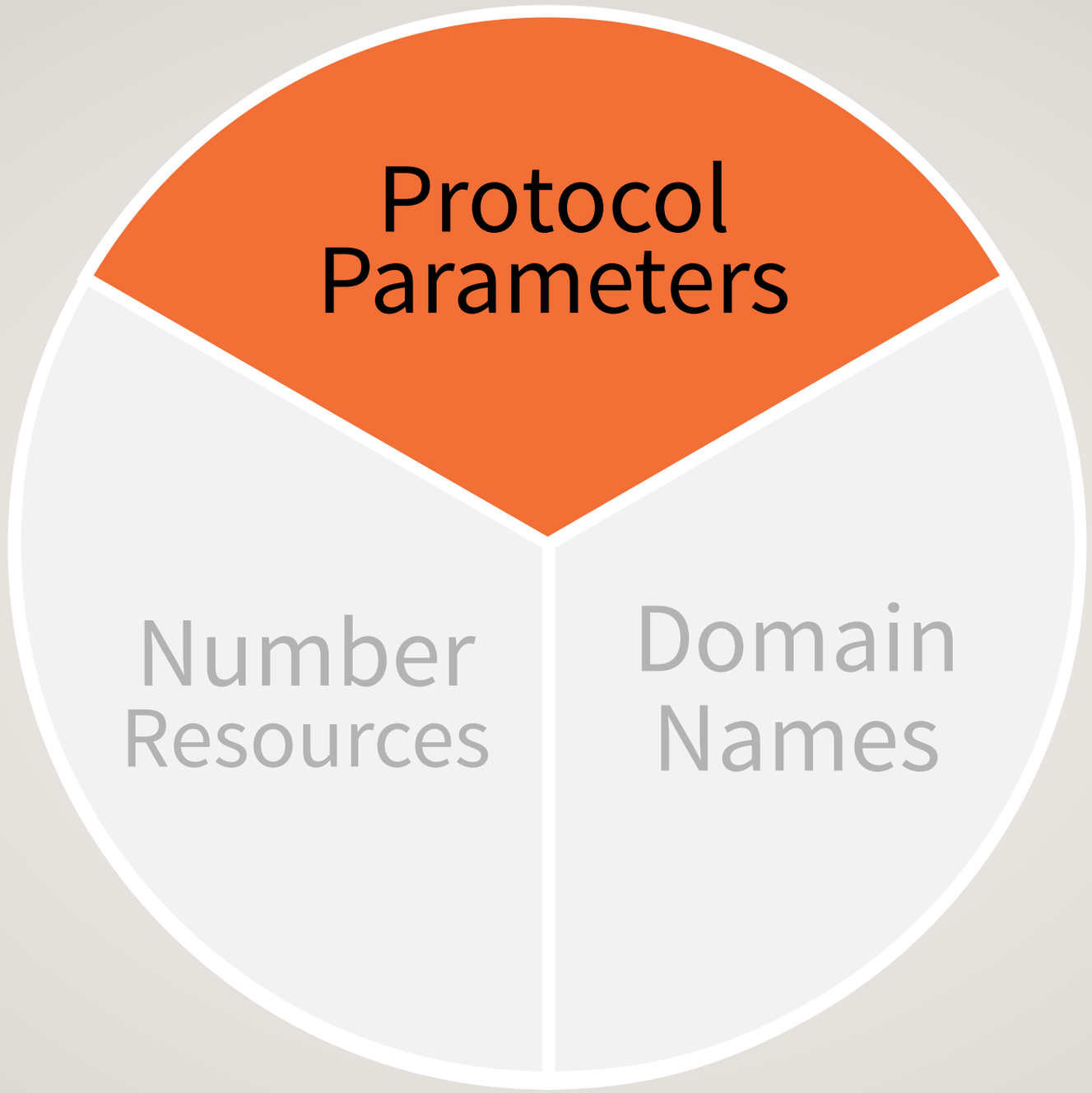
- Coordination of the Internet unique identifier systems is needed to ensure the Internet interoperates globally
- If computers did not use the same system of identifiers and numbers to talk to one another, the system would not interoperate
- The authoritative registries are used by vendors, service providers, businesses, application developers and others to innovate and expand the use of the Internet

IANA Today

- A set of functions performed under a multitude of contracts by the IANA team
  - Performed by Public Techical Identifiers (PTI), an affiliate of ICANN.
  - Functions as a department of ICANN
- Around 16 people delivering service directly, and a number of direct and indirect contributors across the broader ICANN.

The IANA Functions


Protocol Parameters
Number Resources
Domain Names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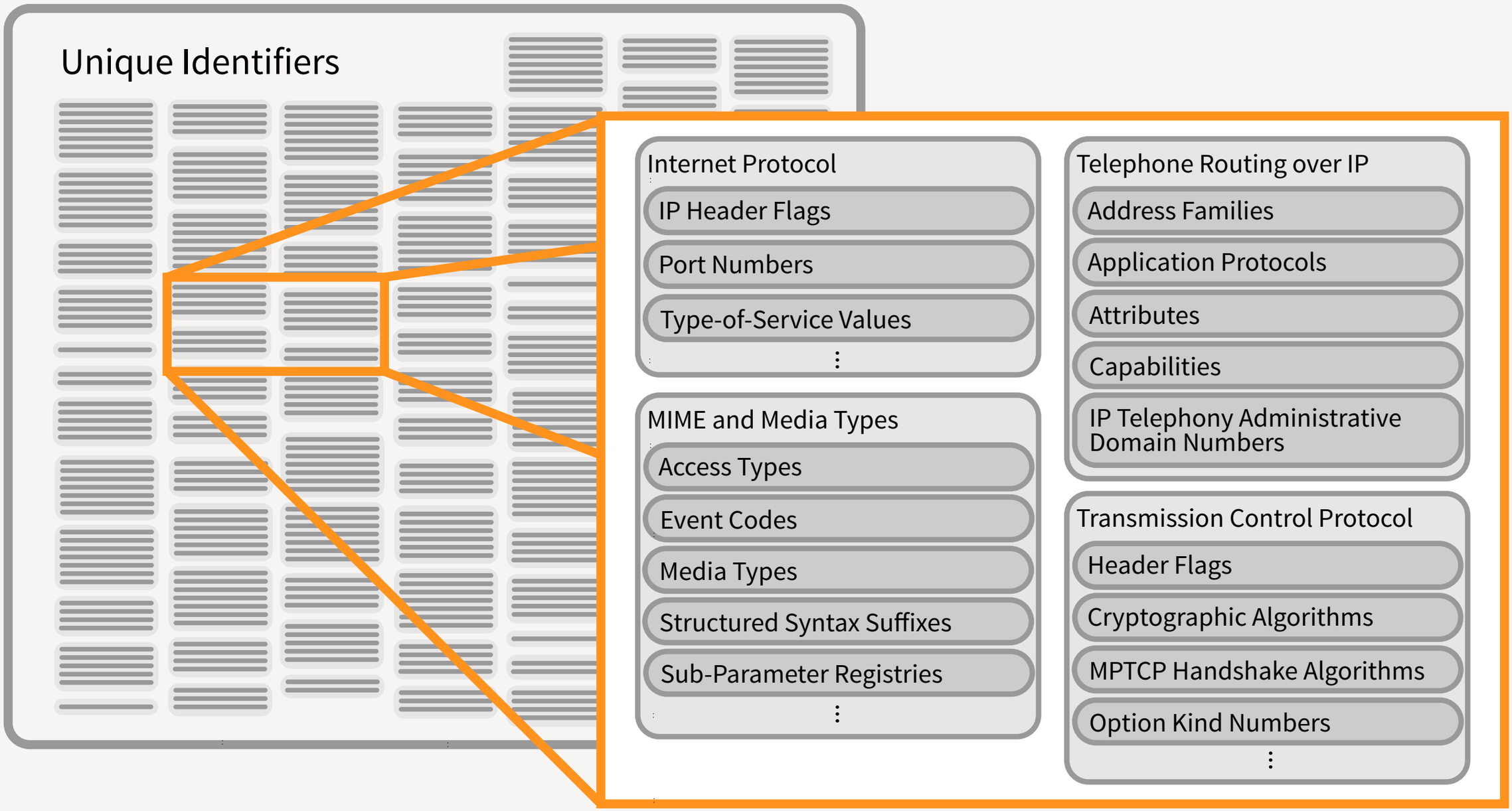


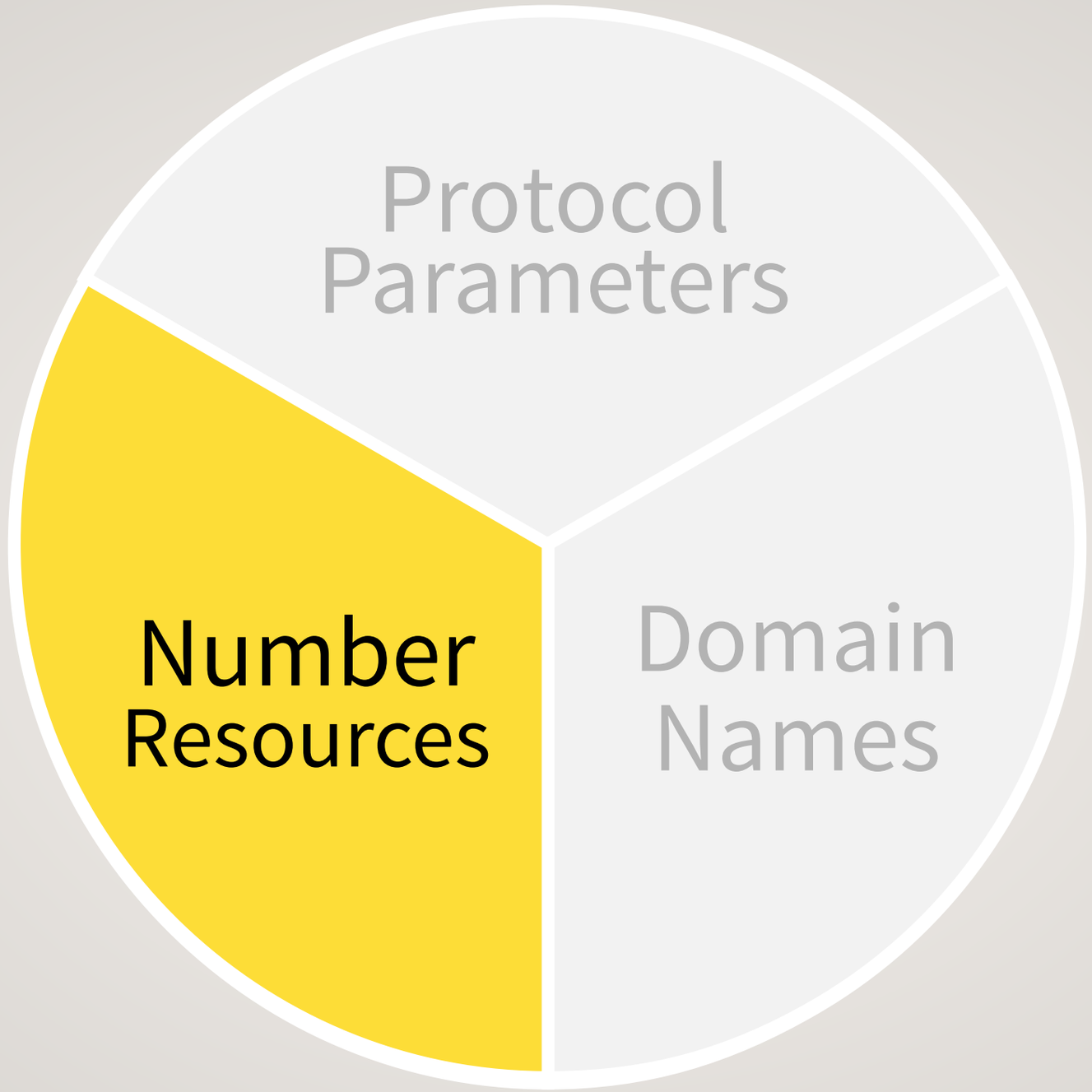
Comprehensive index of protocol parameter registries at **iana.org/protocols**

Protocol Assignments

- Most unique identifiers are allocated directly by IANA to protocol developers and/or end users, with no politics or middle-men
- Number Resources and Domain Names are just specialised cases of protocol assignments
  - They are hierarchically allocated
  - Disproportionately policy-laden and/or political

Where do protocol parameter registries come from?

- The Internet Engineering Task Force (IETF) community writes Internet Drafts (I-Ds)
- When approved by the leadership of the IETF, these I-Ds become official Requests for Comments (RFCs)
- Many RFCs contain guidance to the IANA Department:
  - Instructions on the creation of a unique registry for protocol parameters
  - Registration policy
  - Initial registrations and reserved values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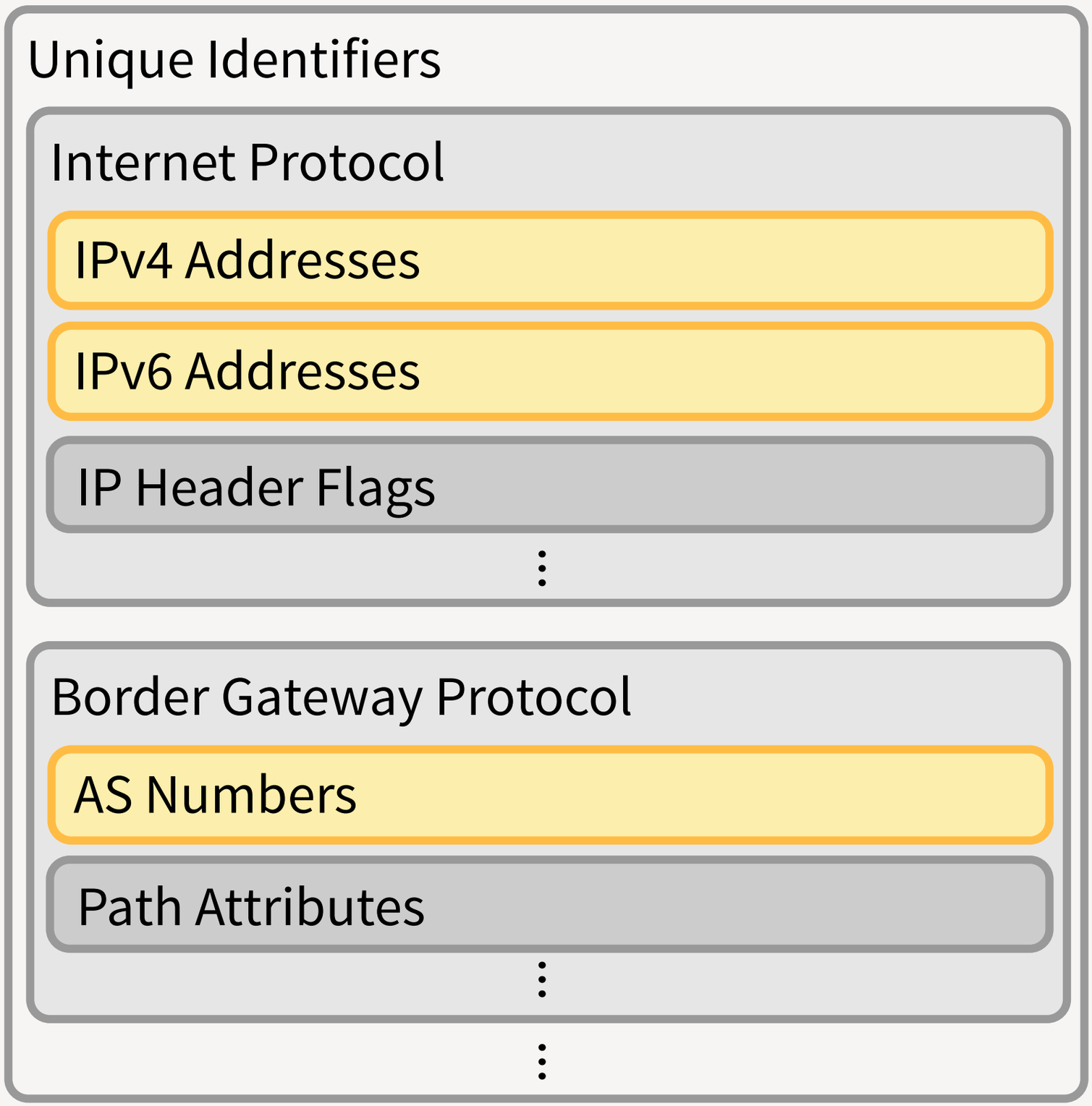
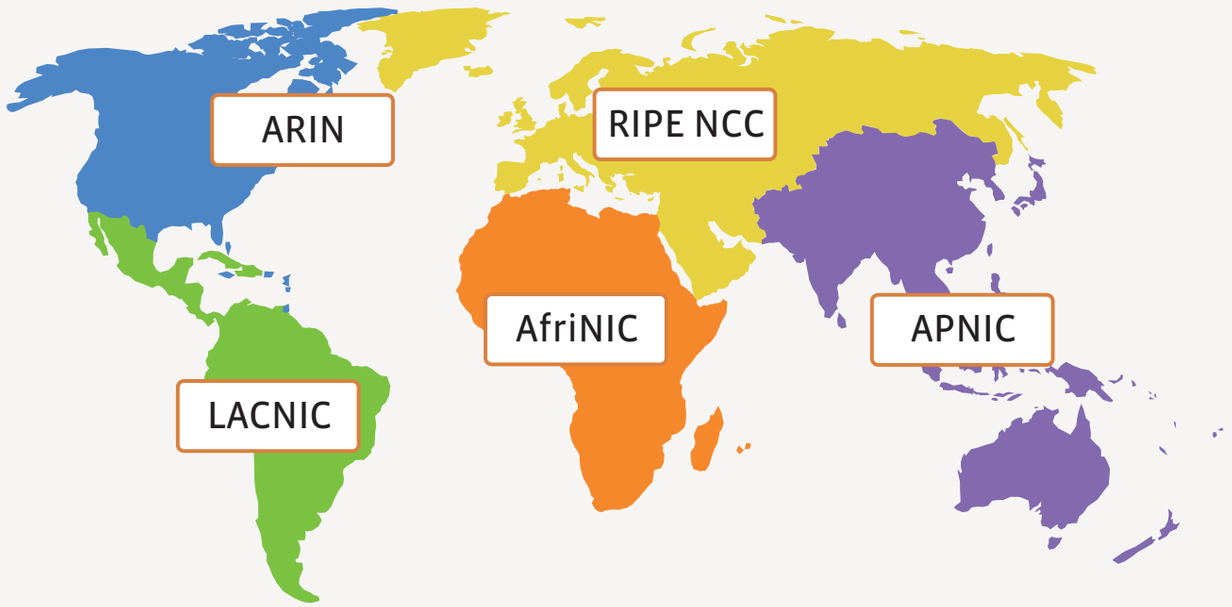

Unique Identifiers
Internet Protocol
IPv4 Addresses
IPv6 Addresses
IP Header Flags
Border Gateway Protocol
AS Numbers
Path Attributes

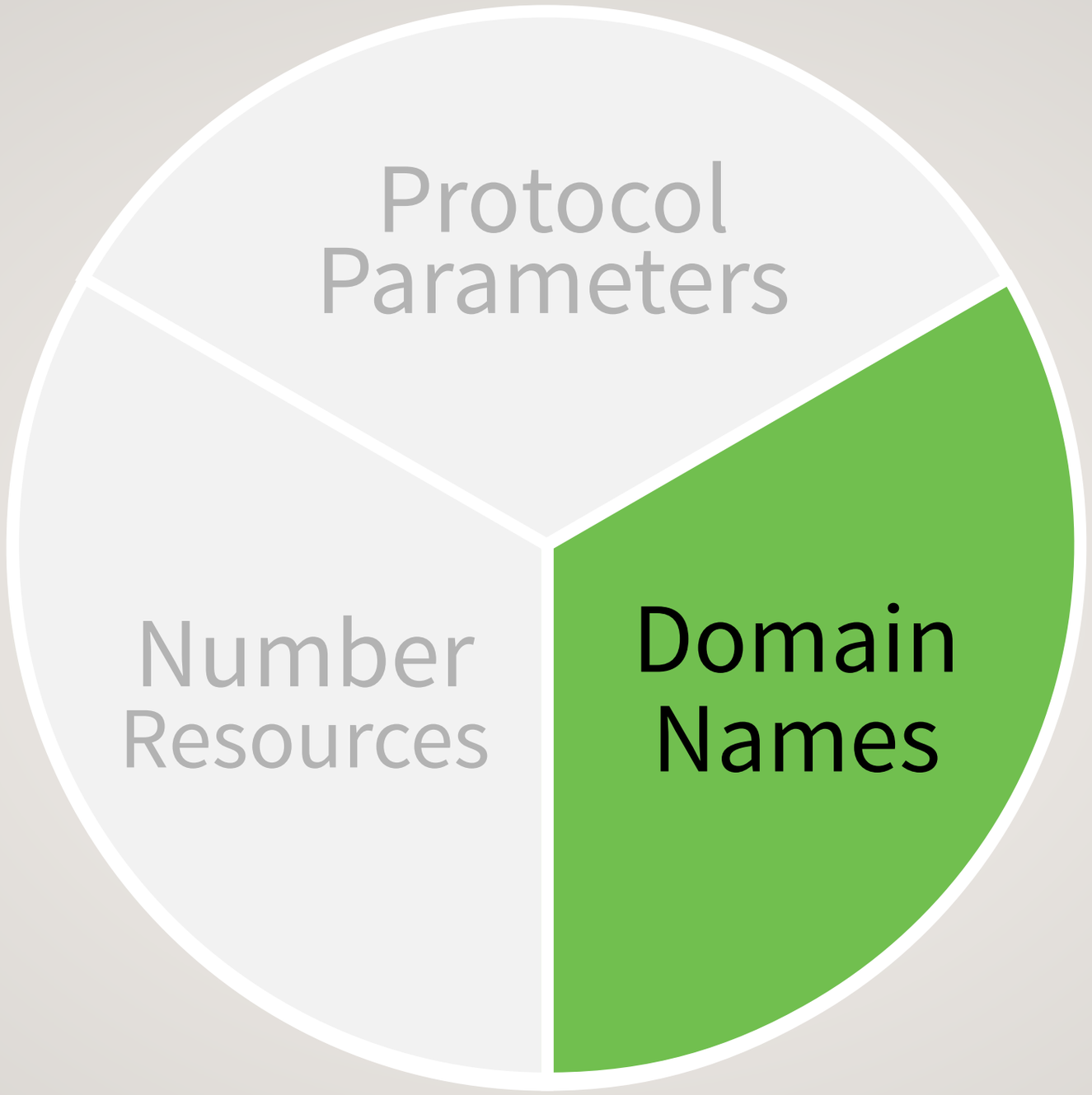
Number Resources

- Internet Protocol (IP) Addresses
  - Unique identifier for each computer connected to the public Internet
  - Version 4 — universal deployment
  - Version 6 — rapidly growing
- Autonomous System (AS) Numbers
  - Unique identifier for each network that cross-connects with other networks
  - Similar to a zip/postal code for demarcating parts of a network

Number Allocation

- Most numbers allocated in large blocks to **Regional Internet Registries**
- Some blocks held by IANA for special purposes (private use blocks, etc.)
- Some blocks allocated directly by IANA (multicast address space, protocol specific use)




Protocol Parameters
Number Resources
Domain Names

Unique Identifiers

Domain Name System

Domain Name Space

Domain Resource Record Types

DNS Security Algorithm Types

DNS Header Flags

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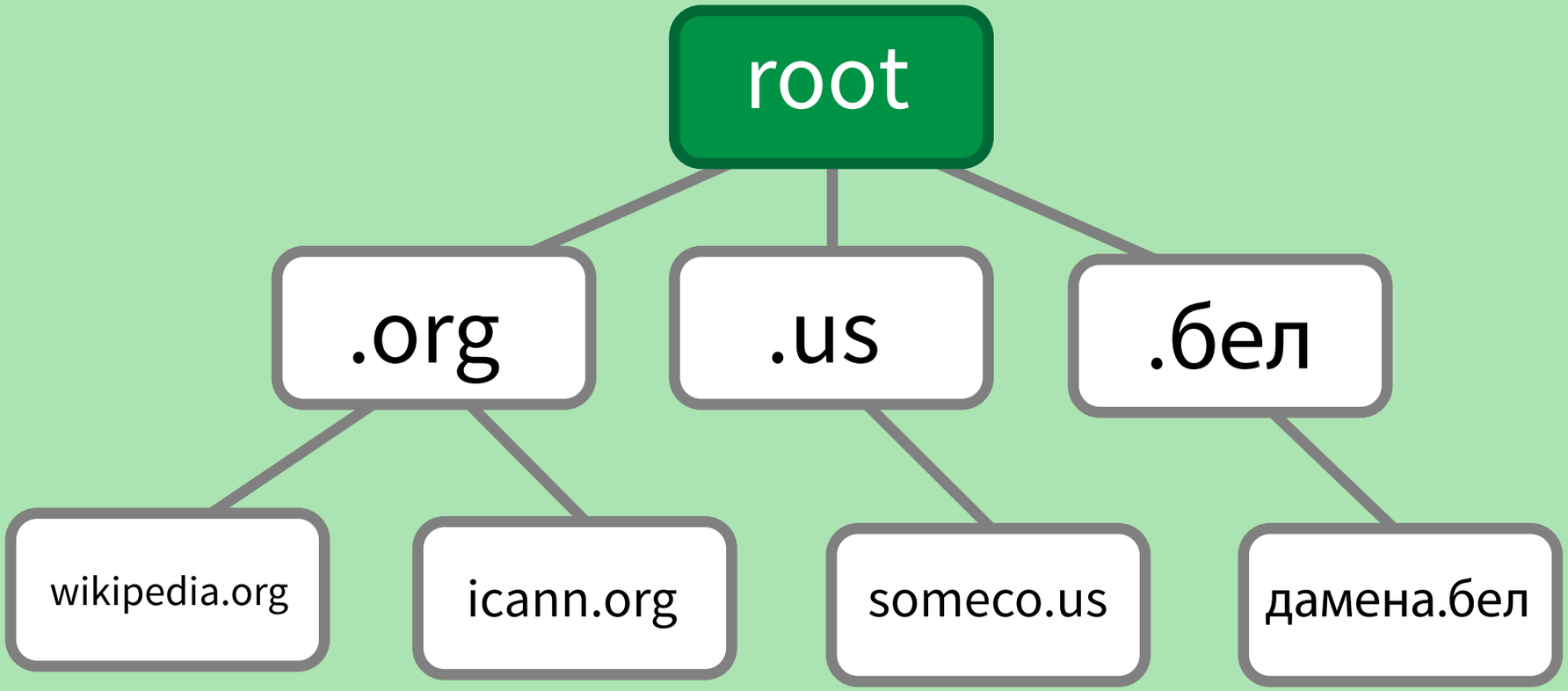
Unique Identifiers

Domain Name System

Domain Name Space



Domain Name Space

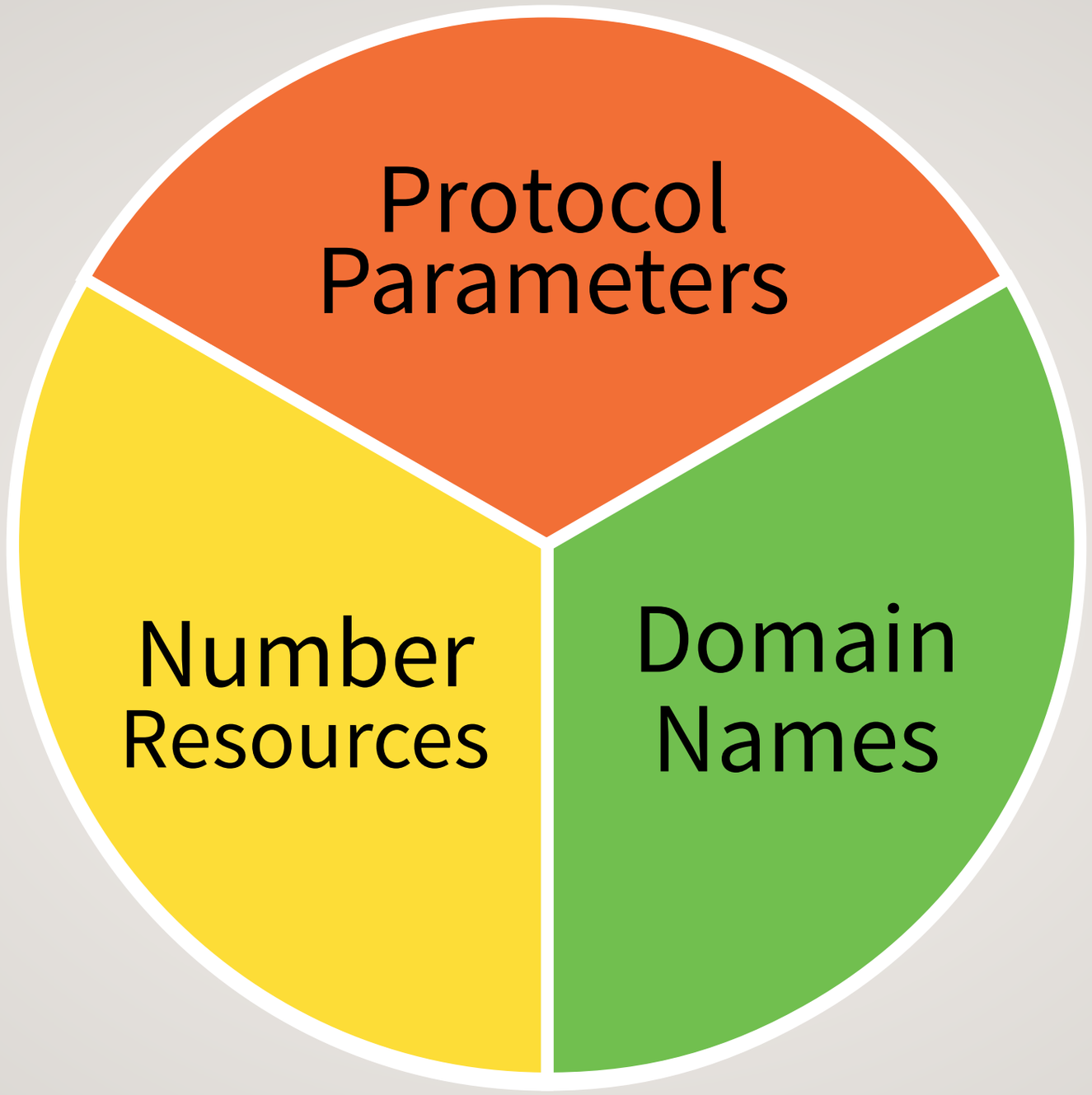
- Our primary responsibility is administration of the DNS root zone
  - Authoritative record of which top-level domains exist, and associated technical and operational data.
- Receive requests to add and modify TLDs
  - Maintain direct interactions with TLD managers
    - Ensure requests comply with relevant policies
      - Contractual relationships for gTLDs
      - Due diligence processes for ccTLDs
- Send updates for propagation through the root servers

The Root Key Signing Key

- As part of its root zone related functions, the IANA manages the **key signing key**, the trust anchor used to secure the DNS with the DNSSEC protocol.
- An auditable process of performing **key signing ceremonies** to use this key is conducted using members of the community as key participants.
- Approximately four times a year, the TCRs and others meet to use the HSMs to sign keys to be used for the root zone.
- The process is streamed and recorded, with external witnesses watching every step. All materials (videos, code, scripts, etc.) are posted online at **iana.org/dnssec**
- The purpose is to ensure **trust in the process**. DNSSEC only provides security if the community is confident the HSMs have not been compromised.

Domain Names — Other functions

- .INT domains — Intergovernmental treaty organisations
- .ARPA domains — technical plumbing
- Label Generation Rulesets (LGRs, IDN tables) — registries share IDN language practices


Protocol Parameters
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Security at IANA

- Security at IANA is more than just DNSSEC
- Dedicated workflow systems for IANA functions, independent of broader ICANN systems
- Access limited to IANA roles
- Separation of user-facing and staff-facing systems
- Strong audit culture — regular third-party audits, including independent SOC2 audit of key IANA systems

Other aspects of IANA

- Impartiality and neutrality
- Performance
- Continuous improvement
- Audits
- Accountability

Summary

- IANA maintains the registries of unique numbering systems, that keep the Internet interoperating
- Most IANA registries are straightforward, and are not generally visible to the end-user
- High-profile, hierarchically-delegated, registries are used for the Domain Name System and Number Resources. IANA maintains the global “root” for these.

We need your feedback!

- Each year we conduct a broad survey with community stakeholders.
- Help the IANA team identify areas of focus for the upcoming year by filling out a brief survey.
- A couple minutes of your time will greatly help us!

Thank you!

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