Intro and Update on IANA

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John Crain (For Kim Davies)

Internet Corporation for
Assigned Names &
Numbers

ICANN

What is IANA?

‣ "Internet Assigned Numbers Authority" is responsible for global Internet unique identifier systems.

‣ One of the oldest Internet institutions, its role dates
back to 1970s.

What is IANA?

‣ Since 1998, operated by ICANN – a non-profit internationally-organised entity setup by the global community as the steward for the IANA functions.

‣ Today, "IANA" may refer to either the functions, or the department within ICANN that runs the IANA functions.

Why does IANA exist?

‣ There is no central control of the Internet

‣ If computers did not use the same system of identifiers and numbers to talk to one another, the system would not interoperate

‣ IANA coordinates the identifier systems needed to ensure the Internet interoperates globally

‣ ICANN was devised to be the institutional home for the IANA
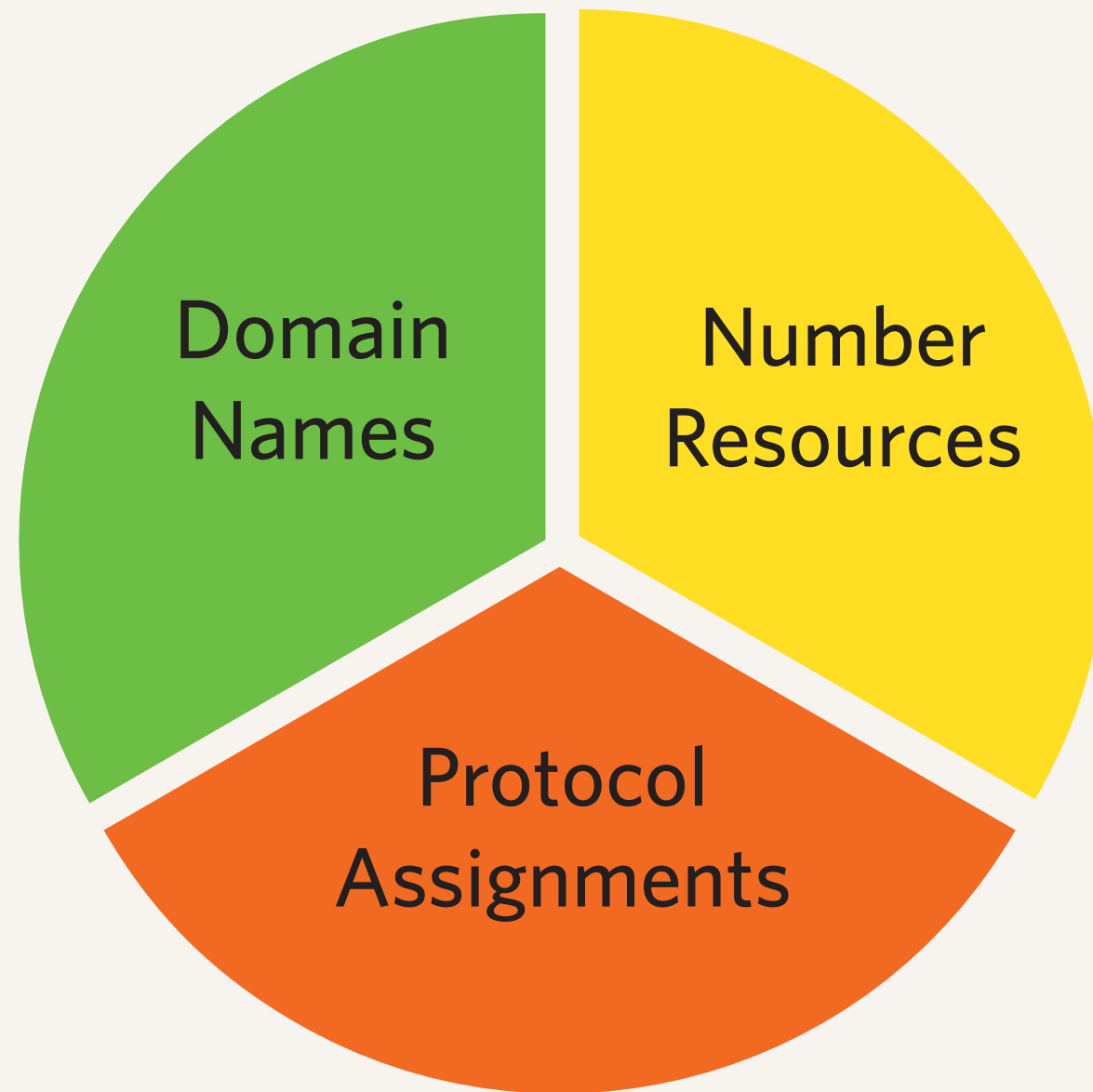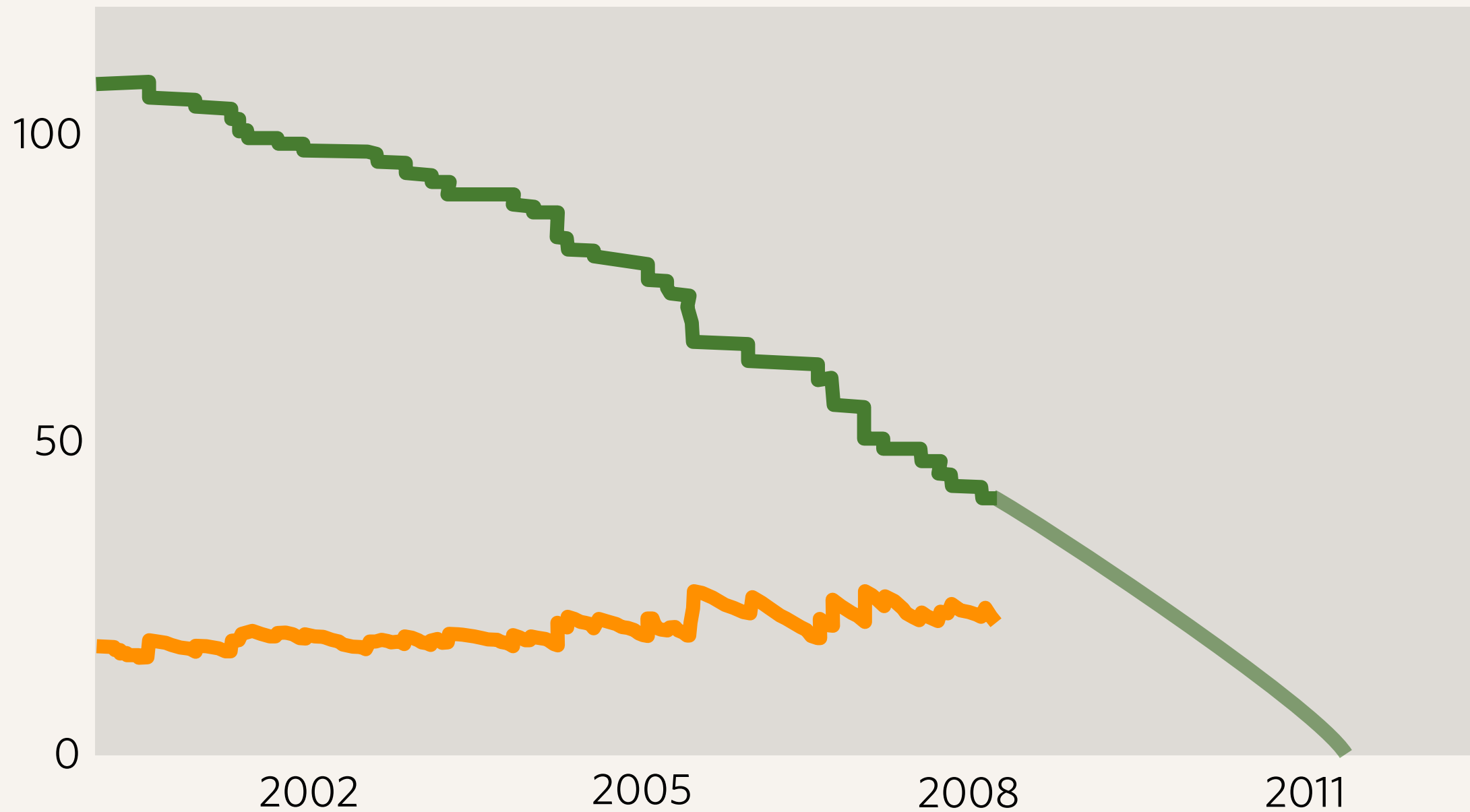
IANA services

Number Resources

Number Resources

‣ Internet Protocol (IP) Addresses

   ‣ Unique identifier for each computer connected to the public Internet

   ‣ Version 4 — currently in use

   ‣ Version 6 — under deployment

‣ Autonomous System (AS) Numbers

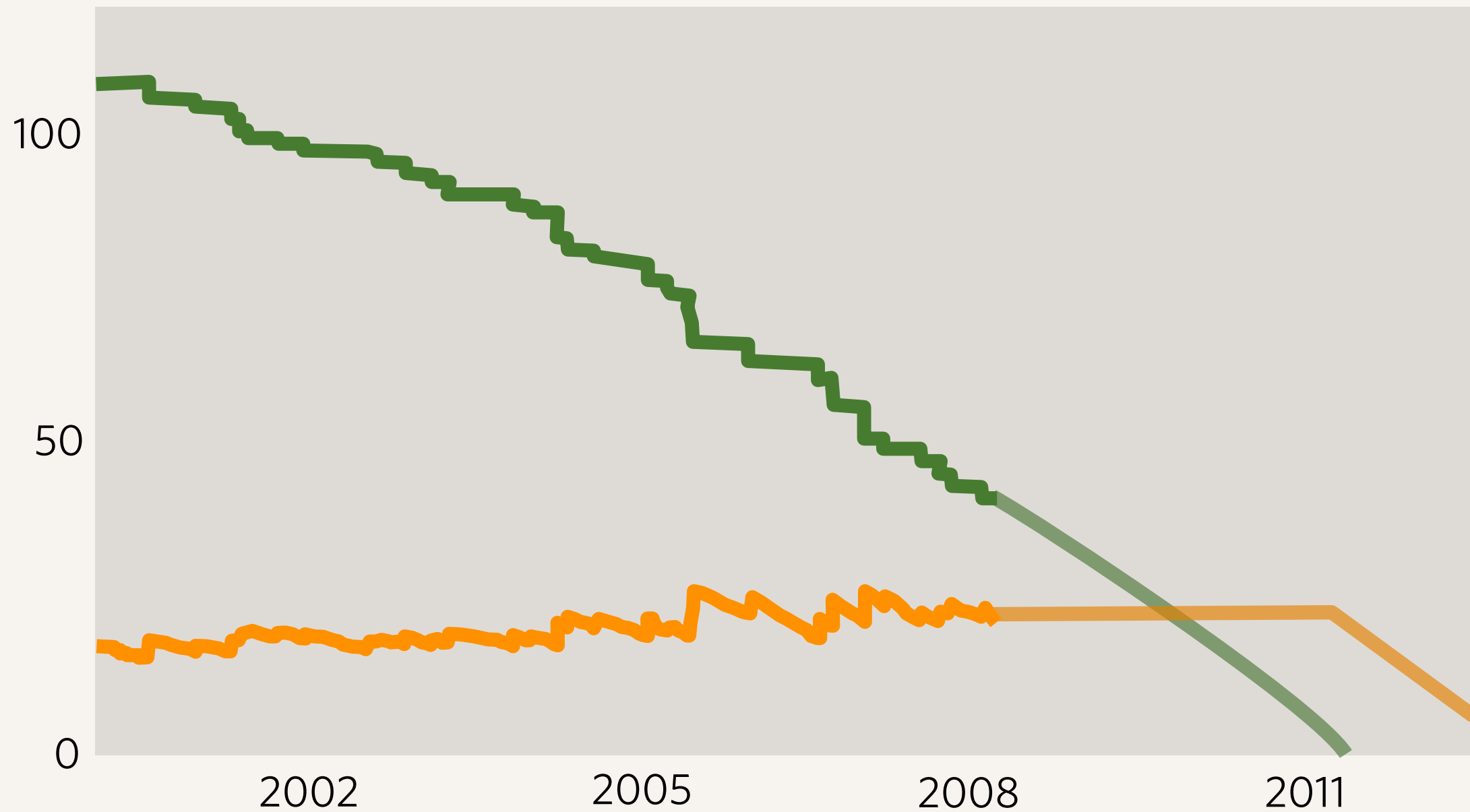   ‣ Unique identifier for each network that cross-connects with other networks
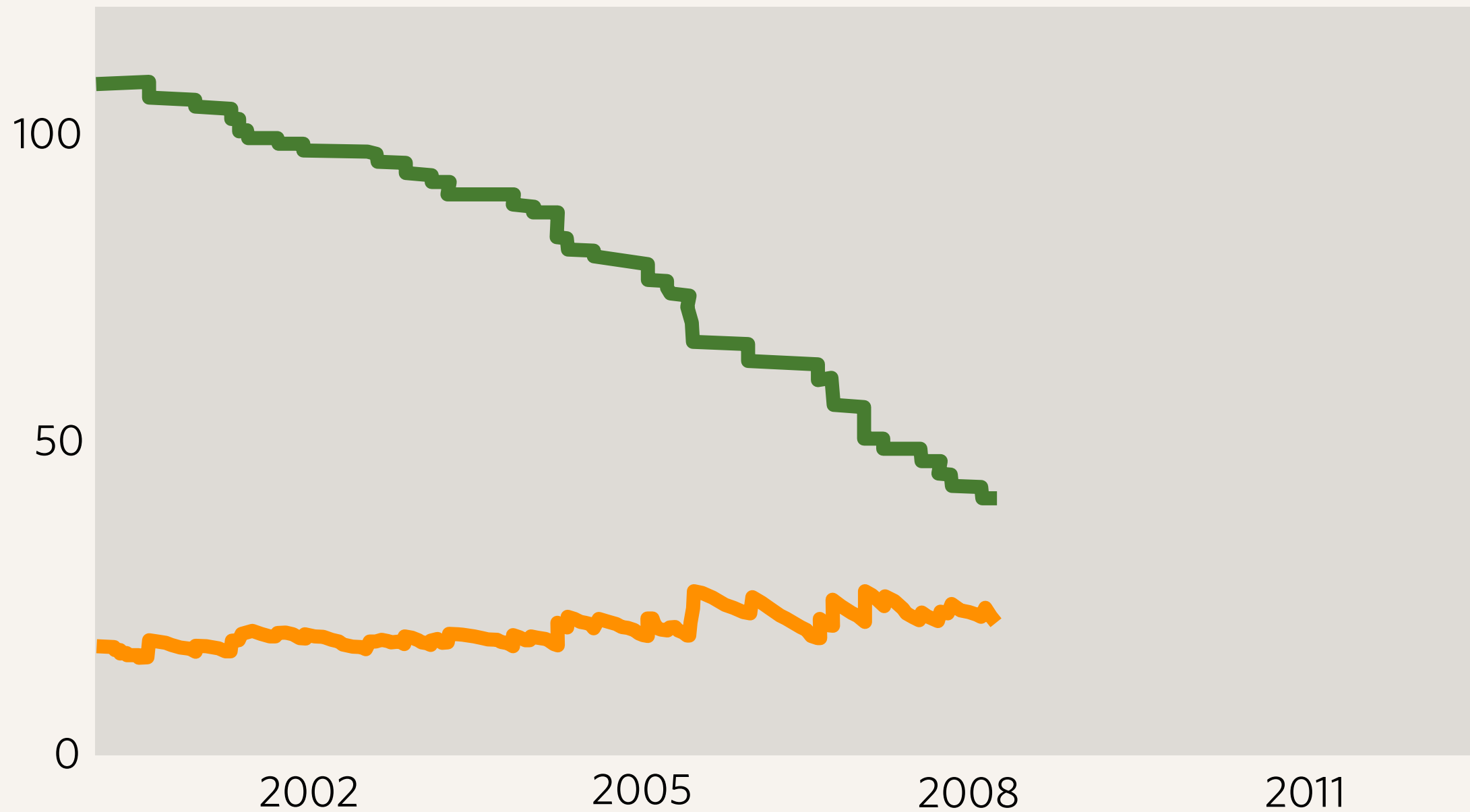
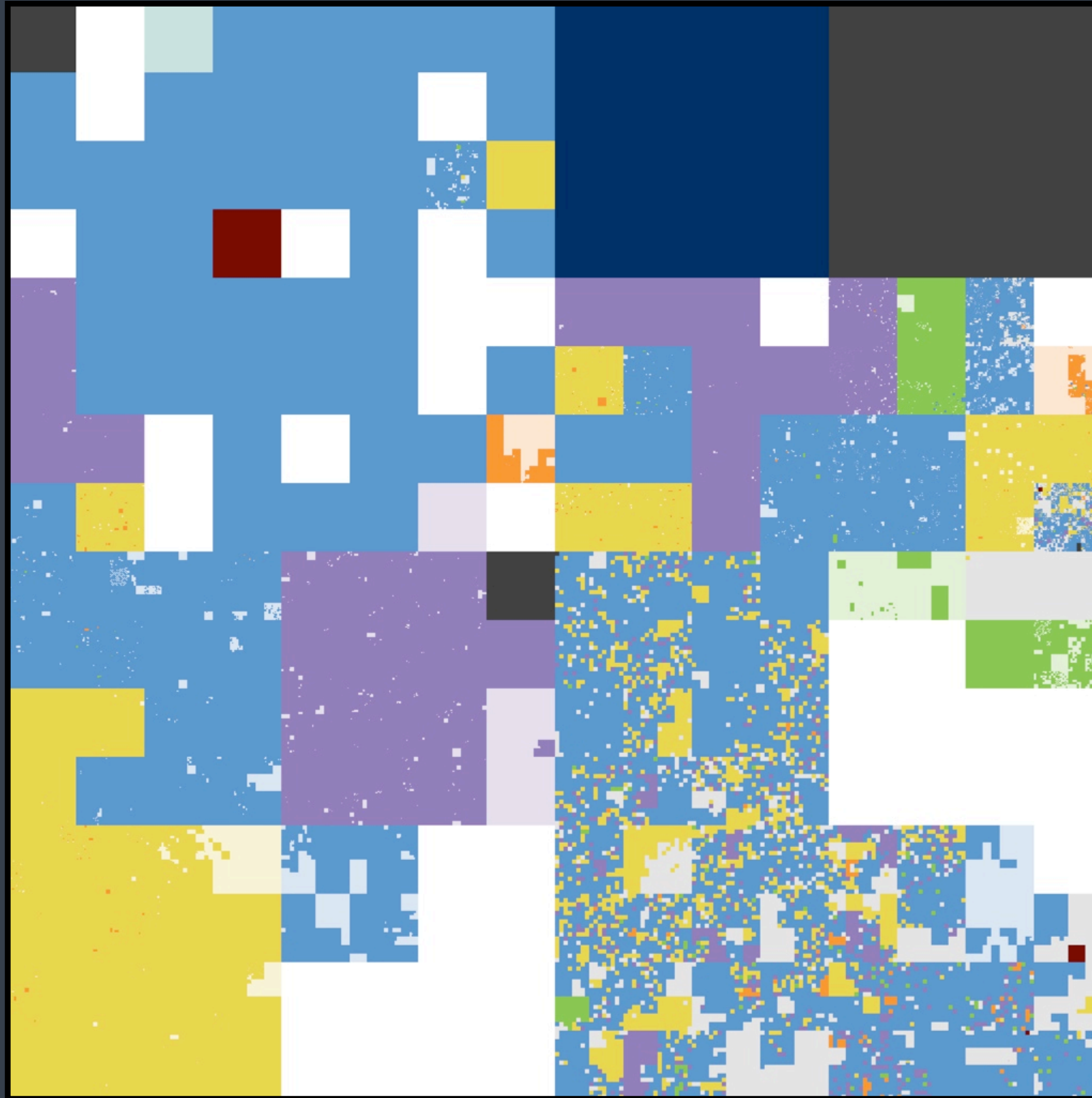# IPv4 Availability

‣ Dwindling stocks ...

IPv4 Availability

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IPv4 Availability

‣ Dwindling stocks ...

IPv4 Consumption as a map

IPv6 in a nutshell

- 128–bit address space

  - 340,282,366,920,938,463,463,374,607,431,768,211,456 addresses

- IANA still has lots in reserve

All IPv6 Space

⅛th devoted
to Unicast

Divided into
512 /**12** segments

ARIN	1
RIPE NCC	1
AfriNIC	1
LACNIC	1
APNIC	1
Mixed	1
Unallocated	506
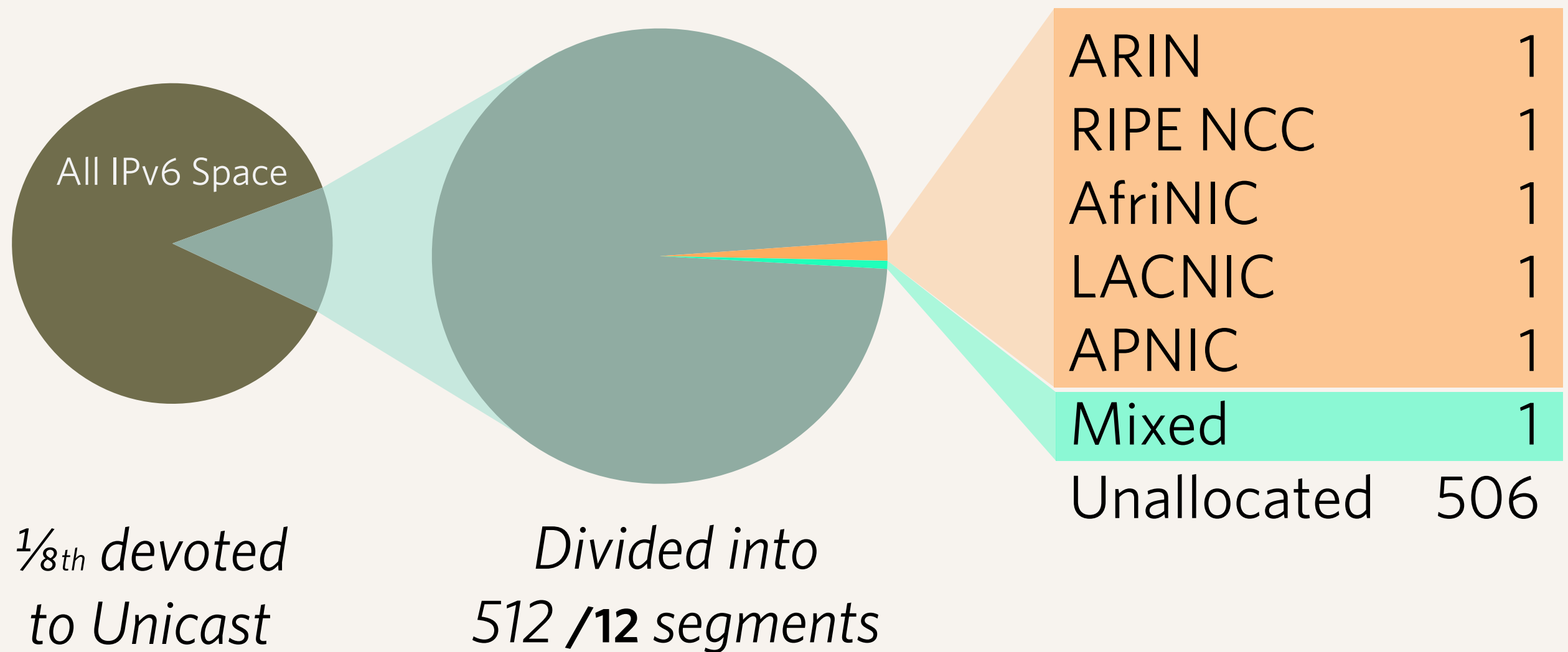
IPv6 Availability

▸ Approximately 1% of Unicast designated space is allocated to RIRs.

Number Allocation Systems

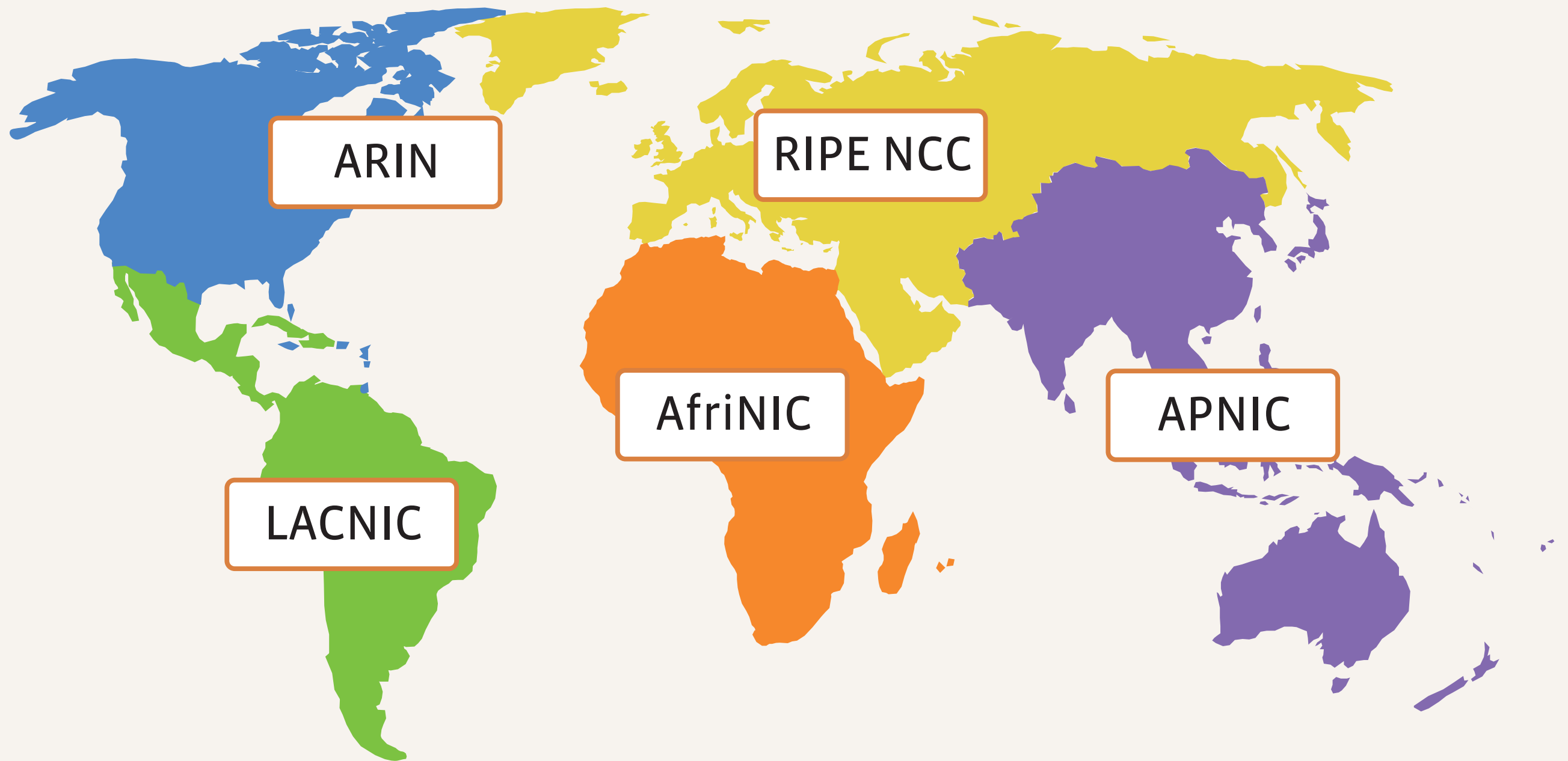‣ Most numbers allocated in large blocks to Regional Internet Registries

‣ Some blocks held by IANA for special purposes (private use blocks, etc.)

‣ Some blocks allocated directly by IANA (multicast address space, protocol specific use)

Regional Internet Registries

Protocol Assignments

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

How do protocols eventuate?

‣ IETF is the main venue for Internet standardisation

‣ Technical standards documents are part of a documentation series known as RFCs (Request for Comments)

    ‣ Maintained by the RFC Editor (a former sister of IANA)

‣ RFCs nominate IANA registries, and IANA maintains these registries with guidance from the Internet Engineering Steering Group (IESG), and Internet Architecture Board (IAB)

Open Shortest Path First v3 (OSPFv3)

OSPFv3 LSA Function Codes	RFC 4970	0 Reserved, 1-255: Standards Action, 256-8175: Reserved, 8176-8183: Experimentation, 8184-8191: Vendor Private Use
OSPFv3 Options	RFC 4940	Standards Action
OSPFv3 Prefix Options	RFC 4940	Standards Action
OSPFv3 Router LSA Link Type	RFC 4940	0 Reserved, 1-127: Standards Action, 128-255: Reserved
OSPFv3 Router Properties Registry	Internet Draft draft-ietf-ospf-ospfv3-update-23	Standards Action

Open Systems Interconnection (OSI) Network Service Access Point Addresses (NSAPA) Internet Code Point

OSI NSAPA Internet Code Point	Internet Draft draft-gray-1888bis-03	2-9999 IETF Consensus

Operating System Names

Operating System Names	RFC 952 (?)	(?)
Specific Parameters	RFC 3659	First Come First Serve

OPES Callout Protocol Core

OCP Features	RFC 4037	Designated expert review for standards-track registration

## Optimized Link State Routing Protocol (OLSR)

|		
Optimized Link State Routing Protocol (OLSR)	RFC 3626	5-127: Standards Action (section 22) 128-255: Reserved for Private/Local use. (section 22)

Per Hop Behavior Identification Codes

Protocol Assignments

‣ All protocol assignments are free

‣ Eligibility criteria varies, usually either open-to-all, or requires standard action to implement

‣ Some popular registries have automated or specialised approaches to allocation

   ‣ Private Enterprise Numbers

   ‣ Port Numbers
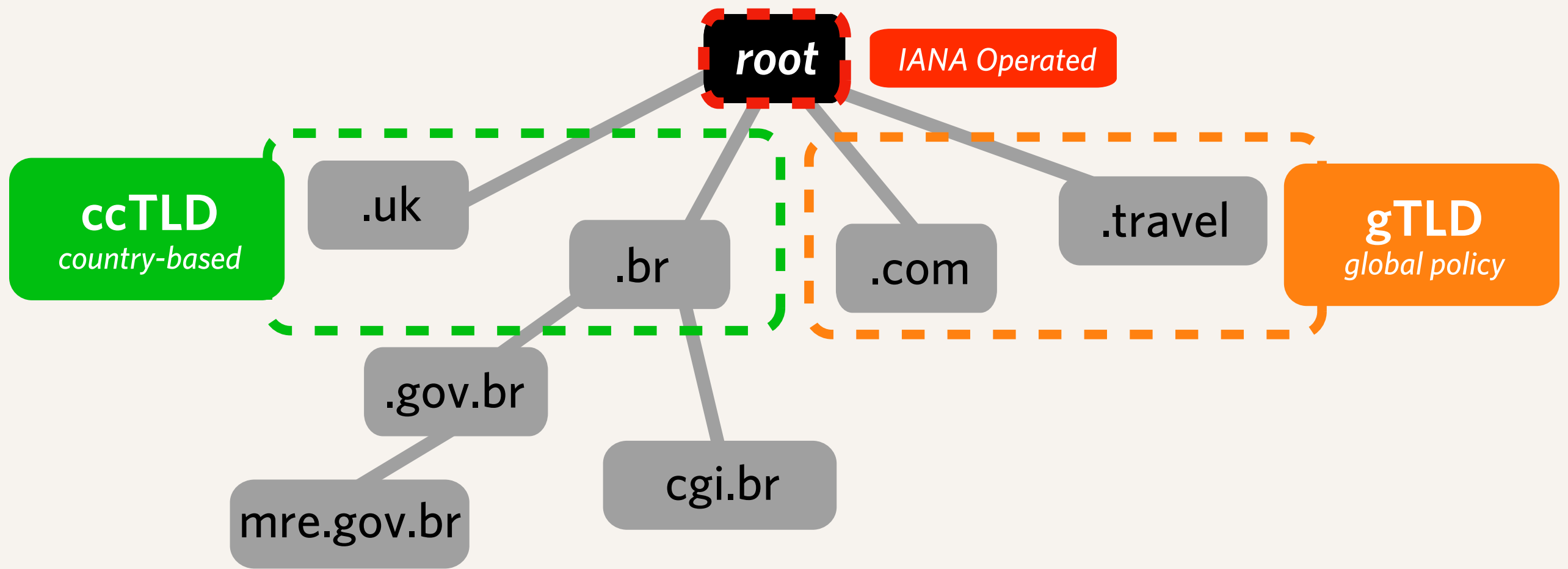
   ‣ etc.

Domain Names
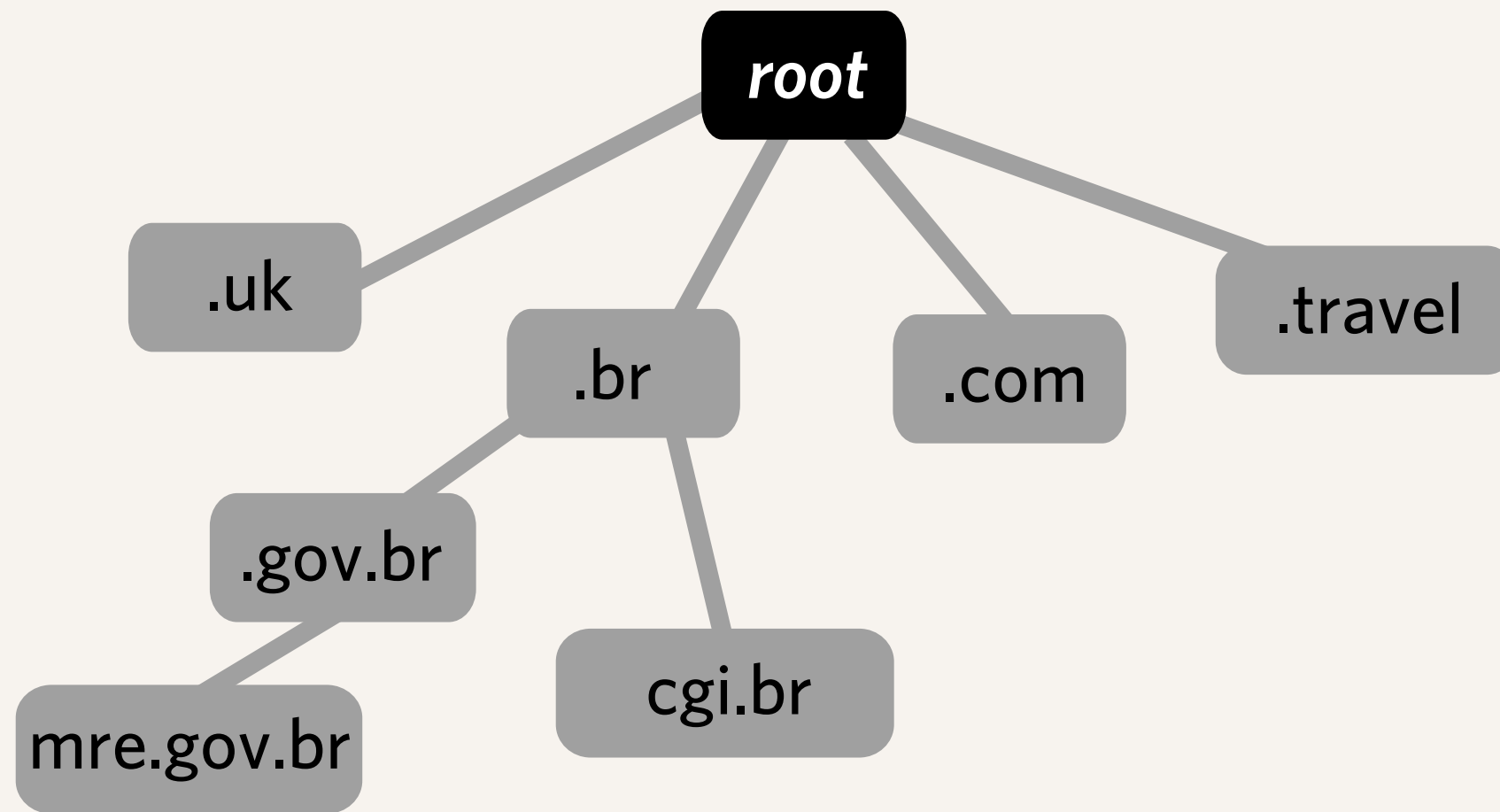
Domain structure
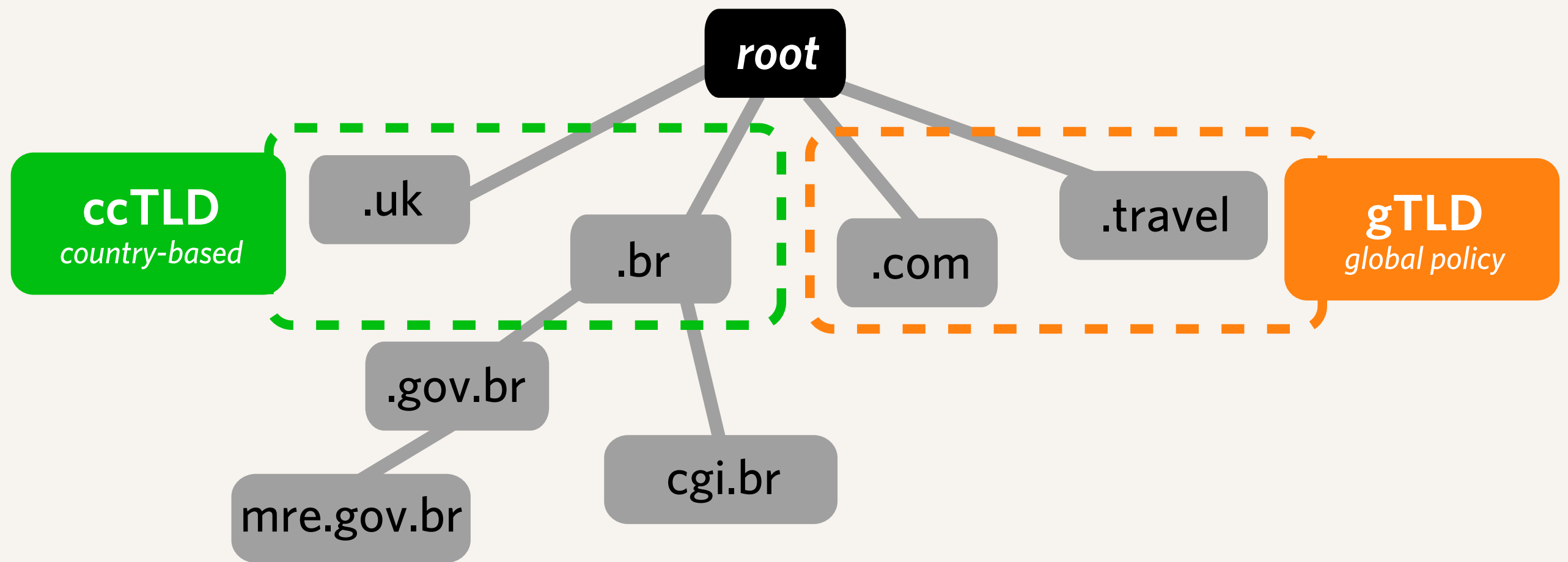
Domain structure

- Nominally split between ccTLDs and gTLDs

Domain structure

‣ IANA runs the DNS root

Domain Names — The Root Zone

‣ Delegates top-level domains

‣ Root Zone Database is like a regular domain registry, albeit with different policy

‣ Top-Level Domain Operators maintain their registration records with IANA

‣ gTLD Delegations governed by ICANN contracts

‣ ccTLD Delegations governed by Local Internet Community principles

How we manage the root zone

‣ Maintain data for the DNS root

   ‣ Technical data (NS records, "glue")

   ‣ Social data (admin and tech contacts, sponsoring organisations, WHOIS, Registration URLs)

‣ Two types of changes

   ‣ Routine (easy)

      ‣ Confirm authenticity, check for technical problems, implement

   ‣ Redelegations (hard)

      ‣ Perform evaluation, submit to ICANN board, implement

What we **don't** do

‣ Don't set policy

    ‣ We follow precedent where possible, encourage review of our operations by the community.

‣ Don't decide what the two letter codes should be

    ‣ ISO 3166–1 standard provides these

‣ Don't decide who runs a ccTLD

    ‣ The local Internet community decides this.

    ‣ IANA performs due diligence to ensure requests accord with Local Internet Community view

Assignment of ccTLD Operators

▸ "selecting a designated manager for a domain that was able to do an equitable, just, honest and competent job"

▸ "These designated authorities are trustees for the delegated domain, and have a duty to serve the community. The designated manager is the trustee of the top-level domain for both the nation and the global Internet community"

Assignment of ccTLD Operators

‣ IANA performs due diligence on
  ‣ Operator's technical and operational competency
  ‣ Legal structure of organisation
  ‣ Government views
  ‣ Local Internet community views
  ‣ Transfer plans and other stability issues
  ‣ Compliance with various principles (GAC principles, RFC 1591)
‣ IANA's report is presented to the ICANN Board for final approval of a request

Domain Names — Other functions

‣ .INT domains — Intergovernmental treaty organisations

‣ .ARPA domains — technical plumbing

‣ IDN tables — registries share IDN language practices

What should TLD managers do?

Keep IANA records up to date

‣ IANA keeps official records on who runs each TLD

‣ If it is out of date, we don't know who is responsible any more

  ‣ Causes problems if changes need to be made later

  ‣ Also causes problems if someone needs to contact you for operational reasons

‣ TLD operators should check their IANA records and update if necessary!

Checking TLD data

‣ Visit our website:

http://www.iana.org/go/.si

Replace with
your TLD

How to make changes

- Download change template
    - http://www.iana.org/cctld/cctld-template.txt
- Fill in your updated details
    - For sections that don't require a change, just write "No change"
- Make sure the admin and tech contact are aware of the change you are going to submit
    - They must approve of changes
- Email it to root-mgmt@iana.org

Our work in progress

Improved processing efficiency

‣ Working on automation solutions for the root zone management workflow

   ‣ Allow lodgment and status tracking via new web interface

   ‣ Improved interface between IANA, USDOC and VeriSign

‣ Working with USDOC on compliance testing for production deployment

‣ Started final testing programme in June 2009, aim to finish deployment early next year

Signing the DNS root zone

‣ DNSSEC has been deployed in increasing numbers of top–level domains

‣ The DNS root zone will be signed

‣ Aim is to have it signed by the end of the year, involving a testing programme

‣ In the interim, IANA launched the "Interim Trust Anchor Repository" at the start of the year

  ‣ https://itar.iana.org/

New internationalised ccTLDs

‣ Work on internationalised ccTLDs

　　‣ "Fast track" process under development for areas of high demand (e.g. Cyrillic-script countries)

‣ Process will closely match existing IANA redelegation process

　　‣ Additional IDN-specific requirements

　　‣ No "ISO 3166-1" equivalent, so another label selection criteria will be implemented

‣ Public process has not yet begun. Once applications are permitted details on applying for delegation will be announced.

Improved procedures

‣ New clarified technical requirements for top-level domain operators have been published

‣ Other new root zone procedures to be published in time for the internationalised ccTLD launch

New security work

‣ DNSSEC test–bed

‣ Outreach on DNS vulnerability issue (Kaminsky)

Summary

Summary

‣ ccTLDs are operated in the public interest, within countries, involving local Internet community and local government.

‣ IANA manages the root zone, and therefore the delegations that allow TLDs to do their work.

‣ IANA's procedures to verify changes are thorough, to ensure the stability of the DNS root.

‣ It is important that ccTLD operator details are kept up to date with IANA to ensure Internet stability. If

Thanks!