

**ICANN**  
ANNUAL GENERAL

**66**

**MONTREAL**

2-7 November 2019

# IANA: 3 Years since the Transition

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**PTI | An ICANN Affiliate**



# Three years ago

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- From 2000 until 2016, ICANN performed the IANA functions under a contract with the US Government
  - Prior to ICANN, IANA functions were activities under other US Government programs
- The **IANA stewardship transition** ended that contractual oversight role and replaced it with a model where the ICANN community oversees the functions
- The formal model the community designed creates a new non-profit that operates the IANA functions called **Public Technical Identifiers (PTI)**, a backronym for *post-transition IANA*.

12am 1 October 2016  
The IANA contract ends



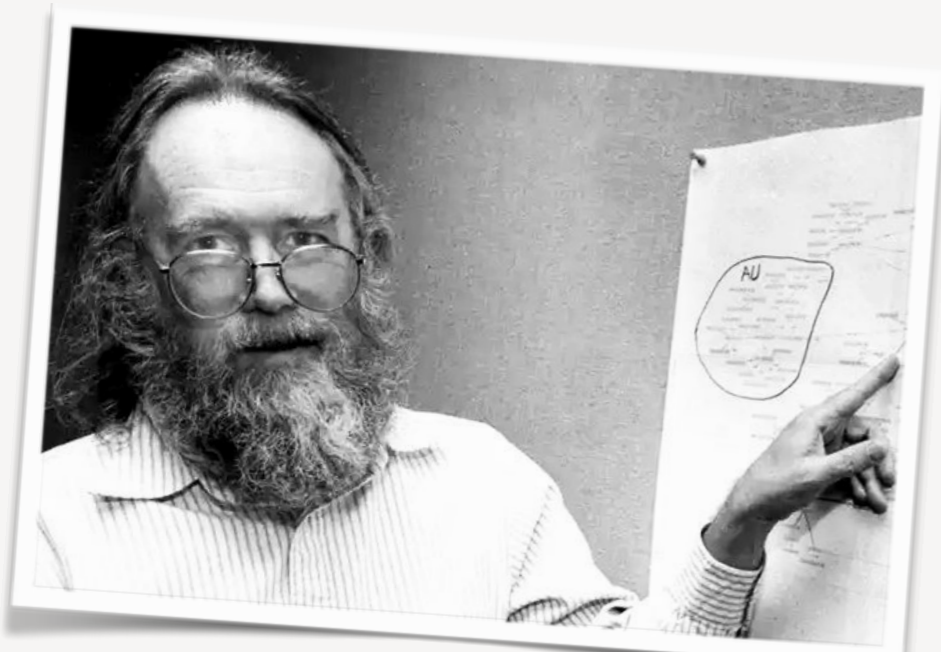
# It is a good time to recap

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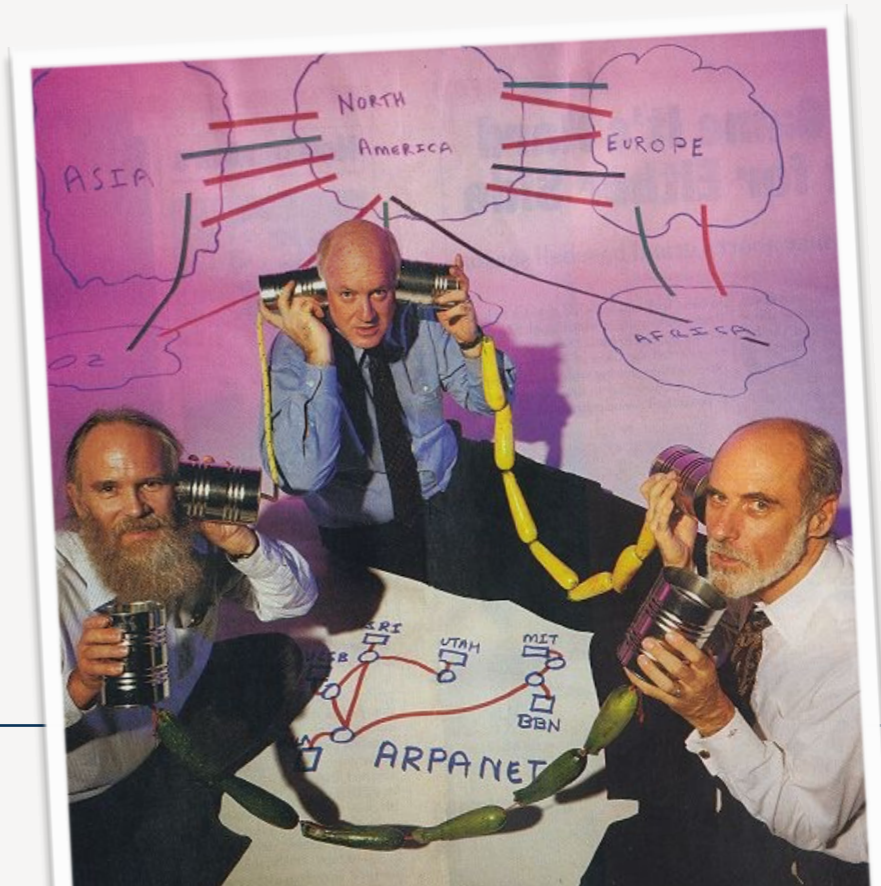
- What has changed?
- What stays the same?
- This is a review of the IANA functions, how they work and the ultimate impact of the transition

# What are the IANA functions?

- 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
- The unique identifiers include protocol parameters, Internet numbers and domain names
- The IANA team maintains these records according to policies adopted by Internet names, numbers and protocol standards communities



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



# Why do the IANA functions exist?

- Coordinating the Internet unique identifier systems is needed to ensure the Internet interoperates globally
- If Internet-connected devices do not use the same system of identifiers and numbers to talk to one another, the system will not interoperate (i.e. speak a common language)
- The authoritative registries are used by vendors, service providers, businesses, application developers and others to innovate and expand the use of the Internet

**BGP Header Structure:**

- 32 bits
- Version (1 byte)
- My Autonomous System (2 bytes)
- Hold Time (2 bytes)
- BGP Identifier (4 bytes)
- Opt Param Len (1 byte)
- Option

**Parts of an SRV record:**

service	proto	name	TTL	class	priority	weight	port	target
_sip	_ts	example.yourdomain.com	600	IN	SRV	0	5 5060	sipserver.yourdomain.com

**Answers:**

- www.google.com: type A, class IN, addr 74.125.131.147
- www.google.com: type A, class IN, addr 74.125.131.103
- www.google.com: type A, class IN, addr 74.125.131.104
- www.google.com: type A, class IN, addr 74.125.131.106
- www.google.com: type A, class IN, addr 74.125.131.99

**OID Tree Example:**

```
graph TD
    Root[Root] --> iso[iso (1)]
    Root --> org[org (3)]
    Root --> dod[dod (6)]
    Root --> Internet[Internet (1)]
    Internet --> directory[directory (1)]
    Internet --> mgmt[mgmt (2)]
    Internet --> experimental[experimental (3)]
    Internet --> private[private (4)]
    directory --> mib2[mib-2 (1)]
    directory --> interfaces[interfaces (2)]
    directory --> ip[ip (4)]
    private --> cisco[cisco (9)]
    private --> microsoft[microsoft (311)]
    private --> juniperMIB[juniperMIB (2636)]
```

**HTTP Status Codes:**

Code	Description
200	OK
201	Created
202	Accepted
204	No Content
300	Multiple Choices
301	Moved Permanently
302	Found
303	See Other
304	Not Modified
305	Use Proxy
307	Temporary Redirect
308	Permanent Redirect
400	Bad Request
401	Unauthorized
402	Payment Required
403	Forbidden
404	Not Found
405	Method Not Allowed
406	Not Acceptable
407	Proxy Authentication Required
408	Request Timeout
409	Conflict
410	Gone
411	Length Required
412	Precondition Failed
413	Payload Too Large
414	Request-URI Too Long
415	Unsupported Media Type
416	Requested Range Not Satisfiable
417	Expectation Failed
418	I'm a teapot
421	Misdirected Request
422	Unprocessable Entity
423	Locked
424	Failed Dependency
426	Upgrade Required
429	Too Many Requests
431	Request Header Fields Too Large
444	Connection Closed Without Response
451	Unavailable For Legal Reasons
499	Client Closed Request
500	Internal Server Error
501	Not Implemented
502	Bad Gateway
503	Service Unavailable
504	Gateway Timeout
505	HTTP Version Not Supported
506	Variant Also Negotiates
507	Insufficient Storage
508	Loop Detected
510	Not Extended
511	Network Authentication Required
599	Network Connection Aborted

**TCP Connection Establishment:**

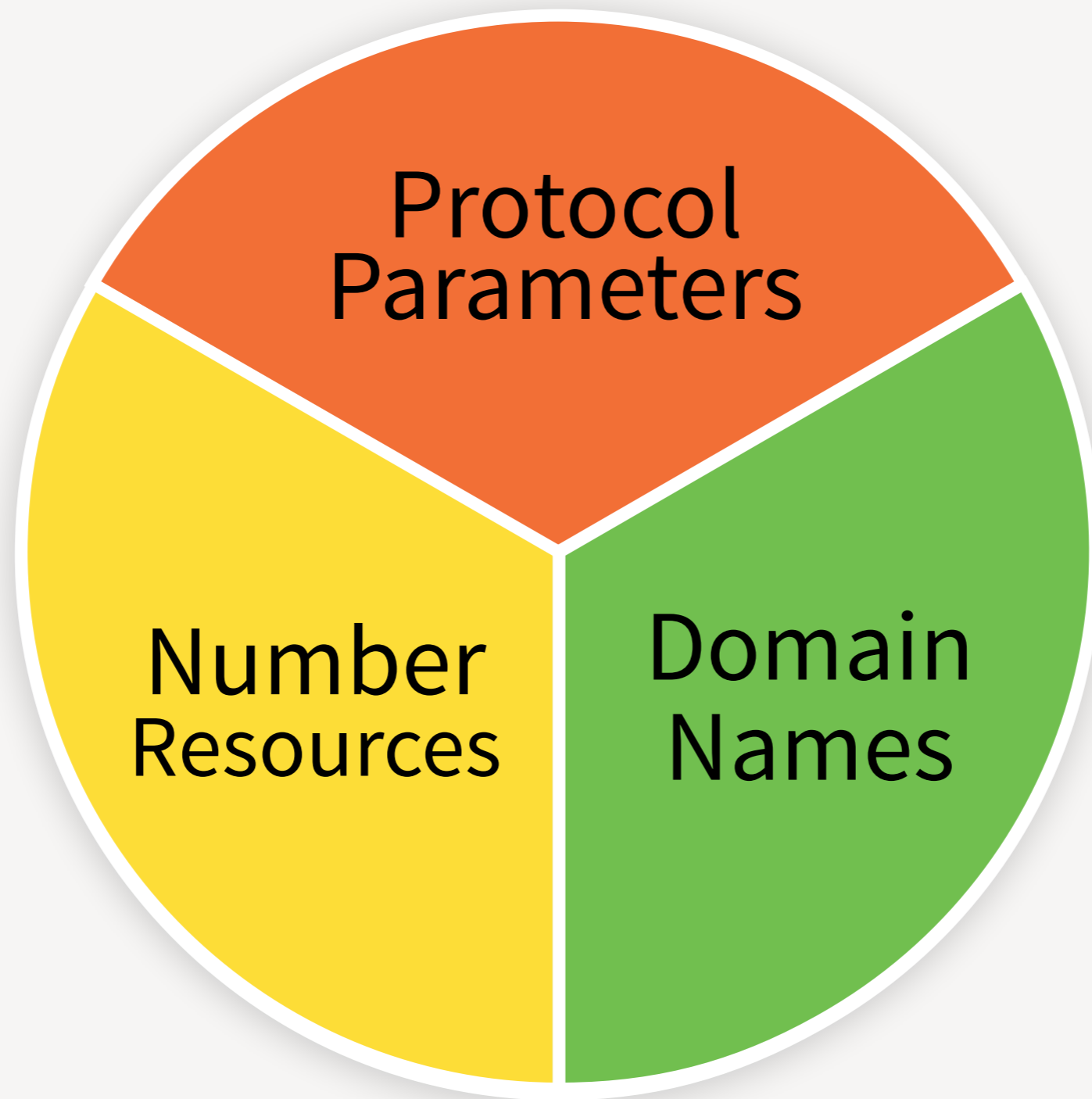
- Send SYN (SEQ=100 CTL=SYN)
- SYN received (SEQ=300 ACK=101 CTL=SYN, ACK)
- Send SYN, ACK (SEQ=101 ACK=301 CTL=ACK)
- SYN, ACK received
- Established (SEQ=101 ACK=301 CTL=ACK)

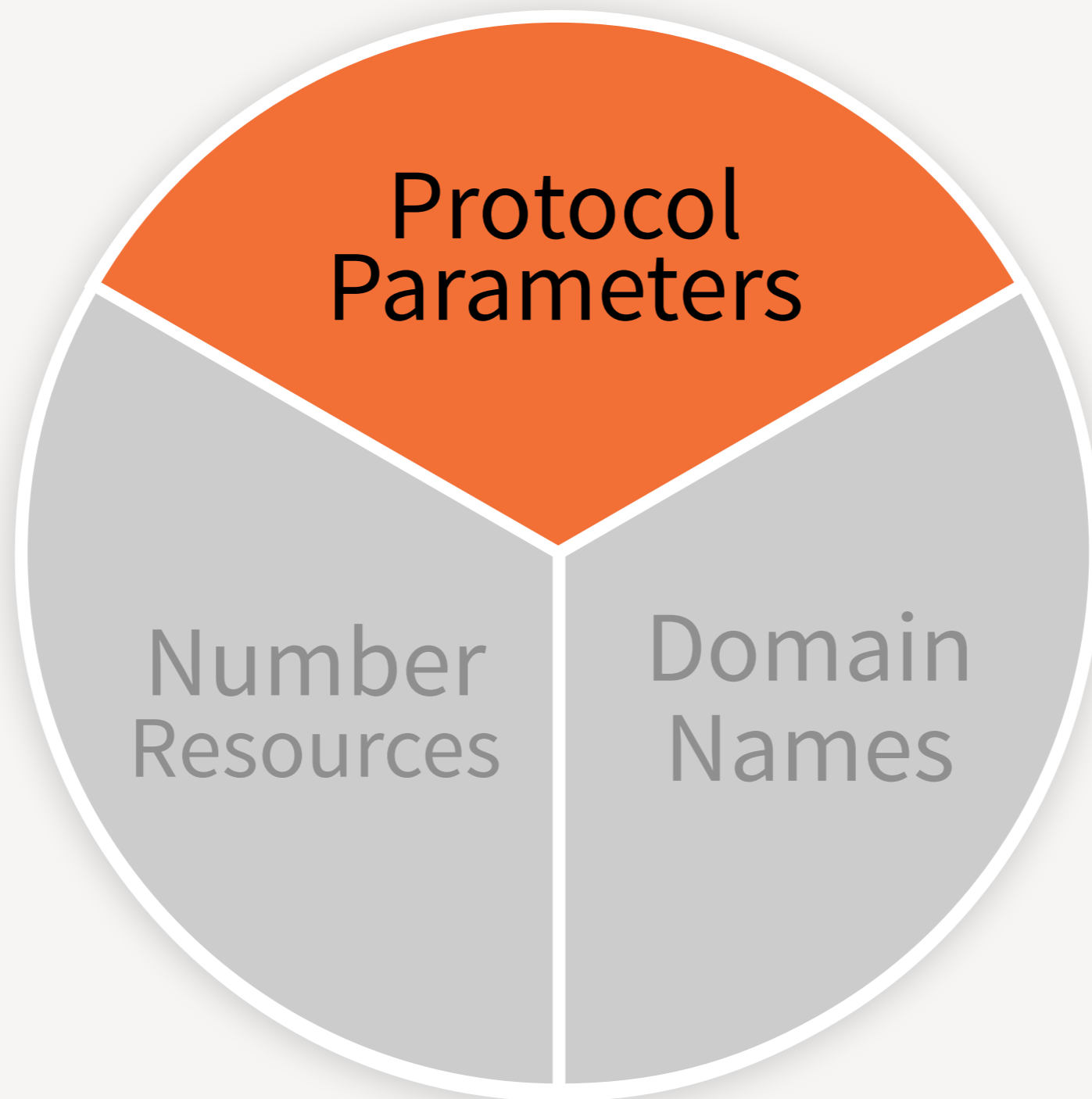
**Transmission Control Protocol (TCP) Header:** 20-60 bytes

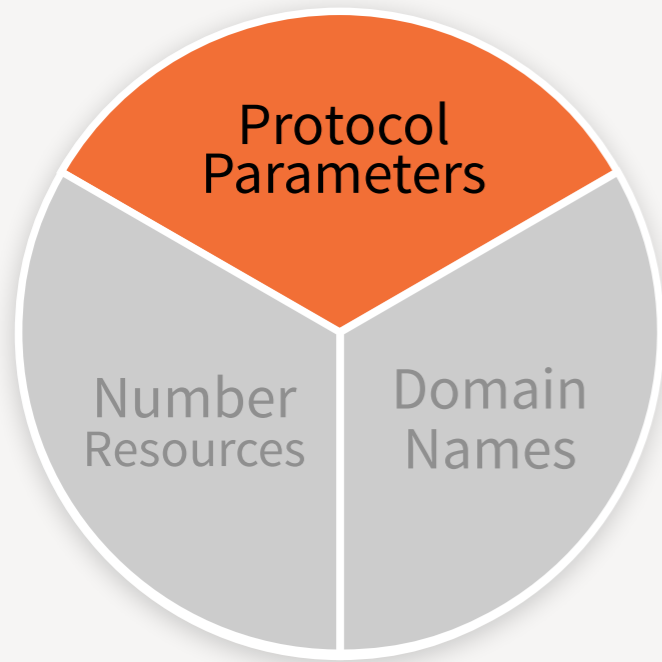
Field	Length
source port number	2 bytes
destination port number	2 bytes
sequence number	4 bytes
acknowledgement number	4 bytes
window size	2 bytes
urgent pointer	2 bytes
checksum	2 bytes
data offset	4 bits
reserved	3 bits
control flags	9 bits
optional data	0-40 bytes

# The core IANA functions areas

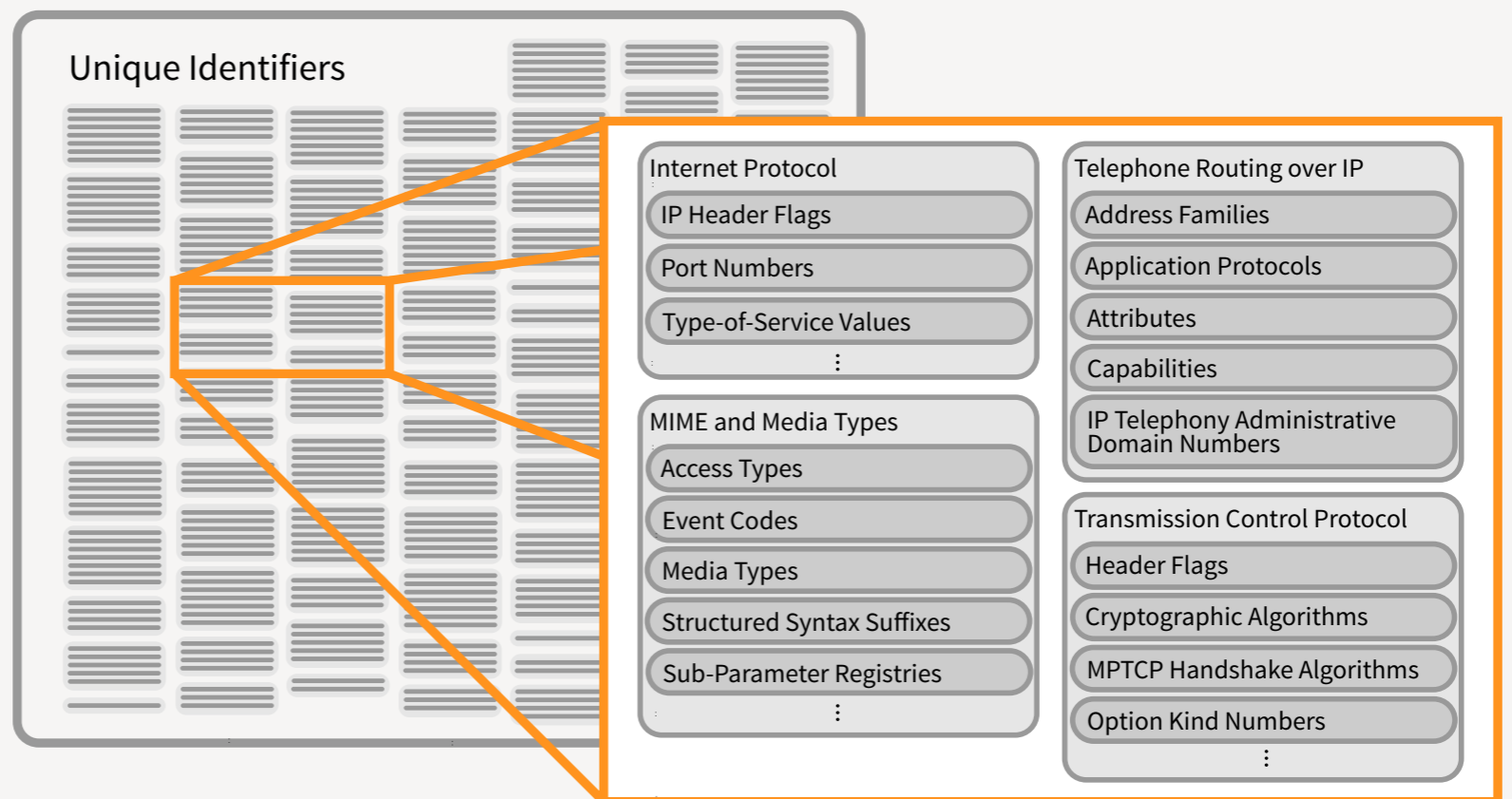
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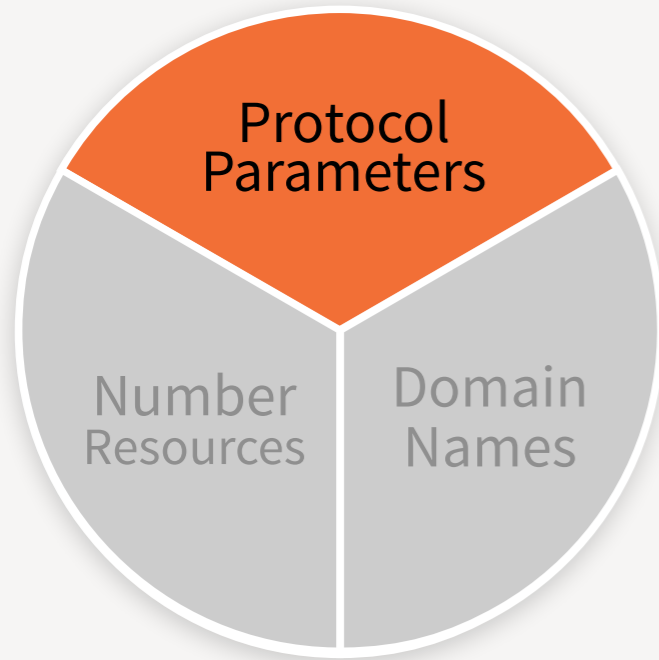




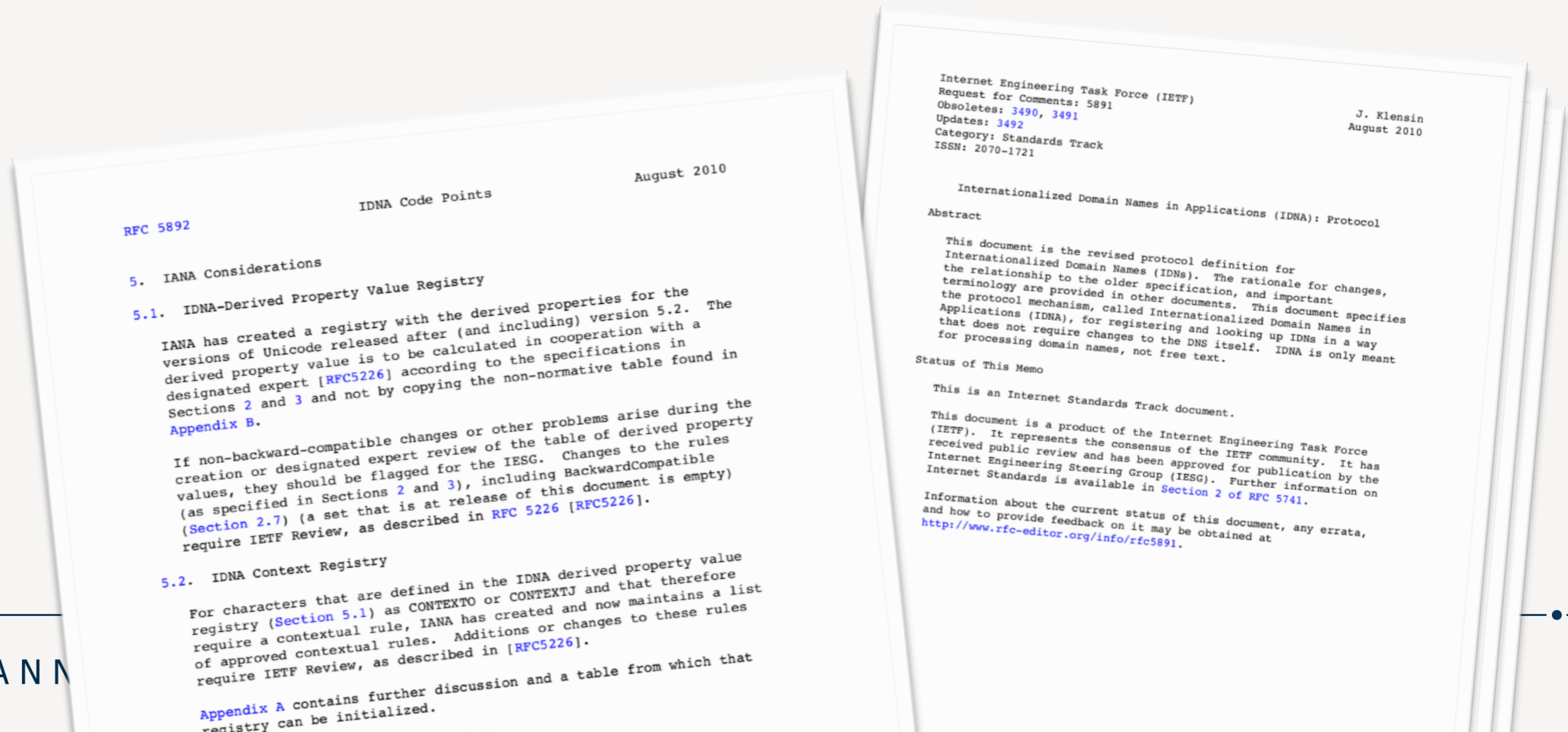
- **Protocol Parameters** are used everywhere and are directly issued by IANA. Rules differ for the qualifying criteria for each type. Applications are evaluated by IANA according to the set criteria.
- Most protocol parameters' visibility is limited to software implementors (i.e. inside software code).

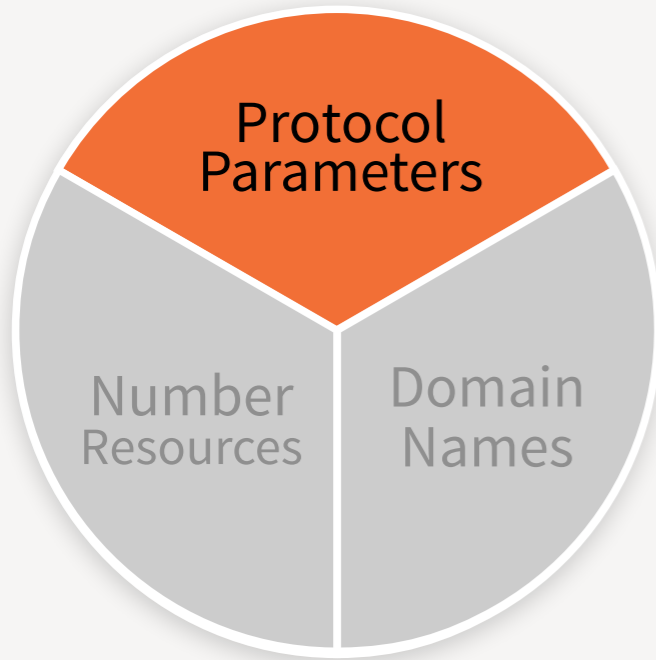






- The **Internet Engineering Task Force (IETF)** develops the Internet standards that define protocol parameter systems. These documents include guidance on unique identifiers that IANA most implement, referred to as “IANA Considerations”:
  - Instructions on the creation of a unique registry for protocol parameters
  - Registration policy
  - Initial registrations and reserved values





- There are thousands of protocol parameter registries spanning many different technologies

**Protocol Registries**

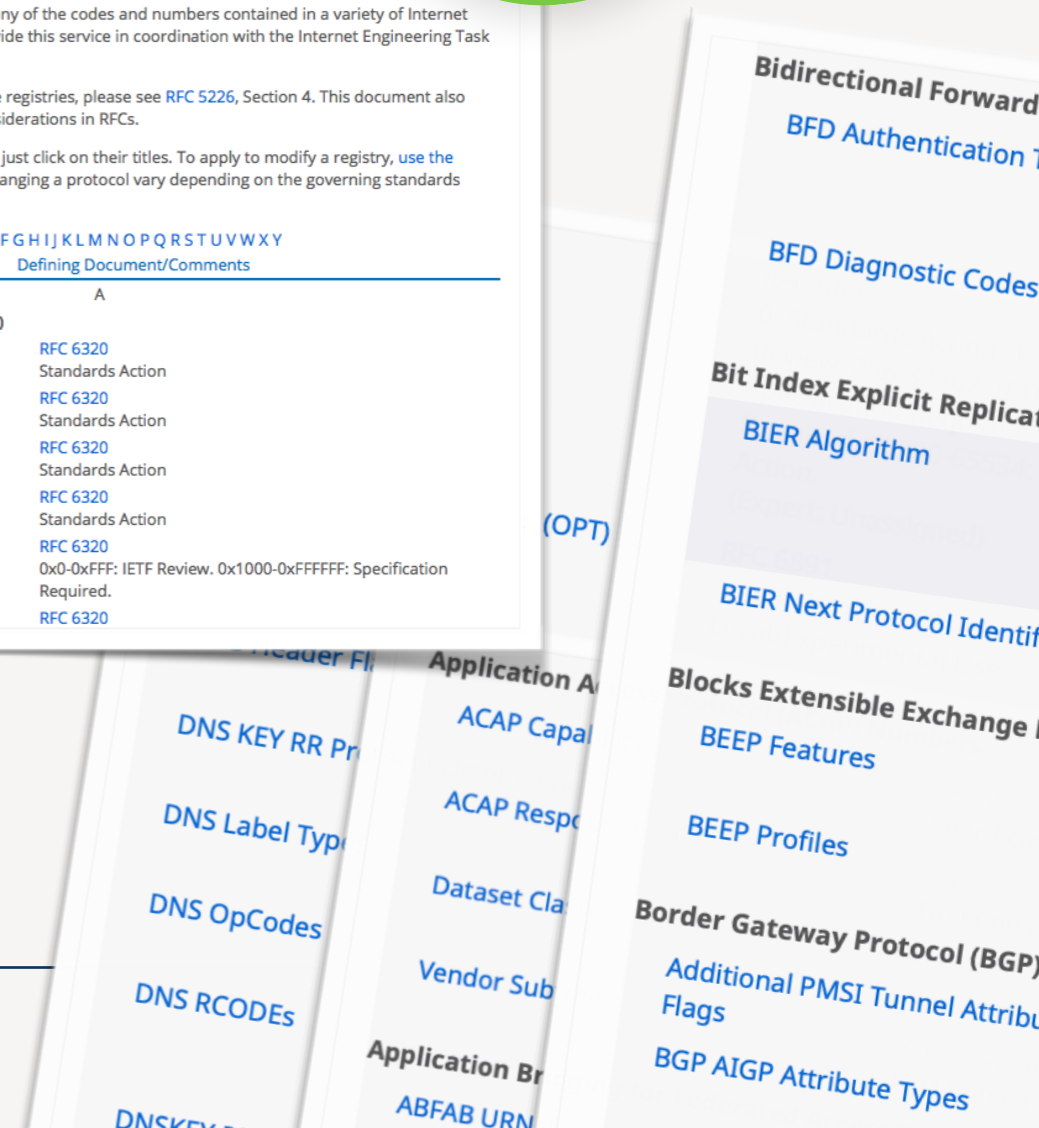
IANA is responsible for maintaining many of the codes and numbers contained in a variety of Internet protocols, enumerated below. We provide this service in coordination with the Internet Engineering Task Force (IETF).

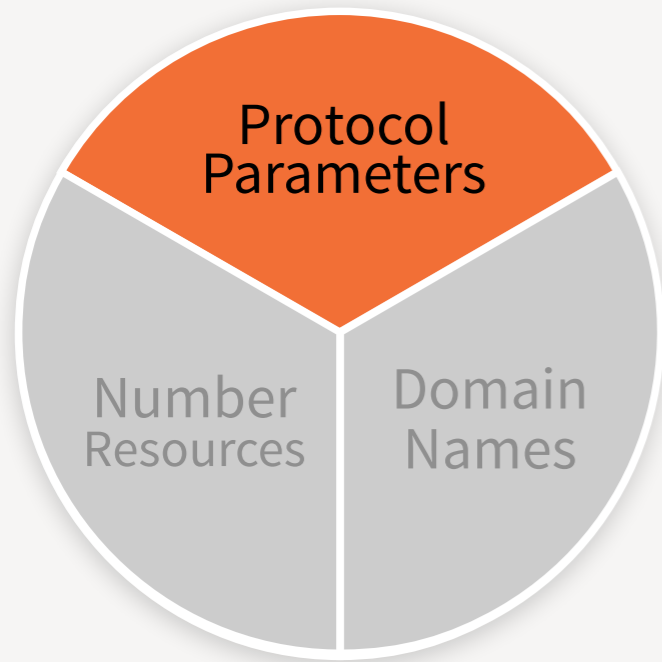
For more information on how to create registries, please see [RFC 5226](#), Section 4. This document also covers the requirements for IANA Considerations in RFCs.

To view the various protocol registries, just click on their titles. To apply to modify a registry, use the [relevant form](#). The qualifications for changing a protocol vary depending on the governing standards documents.

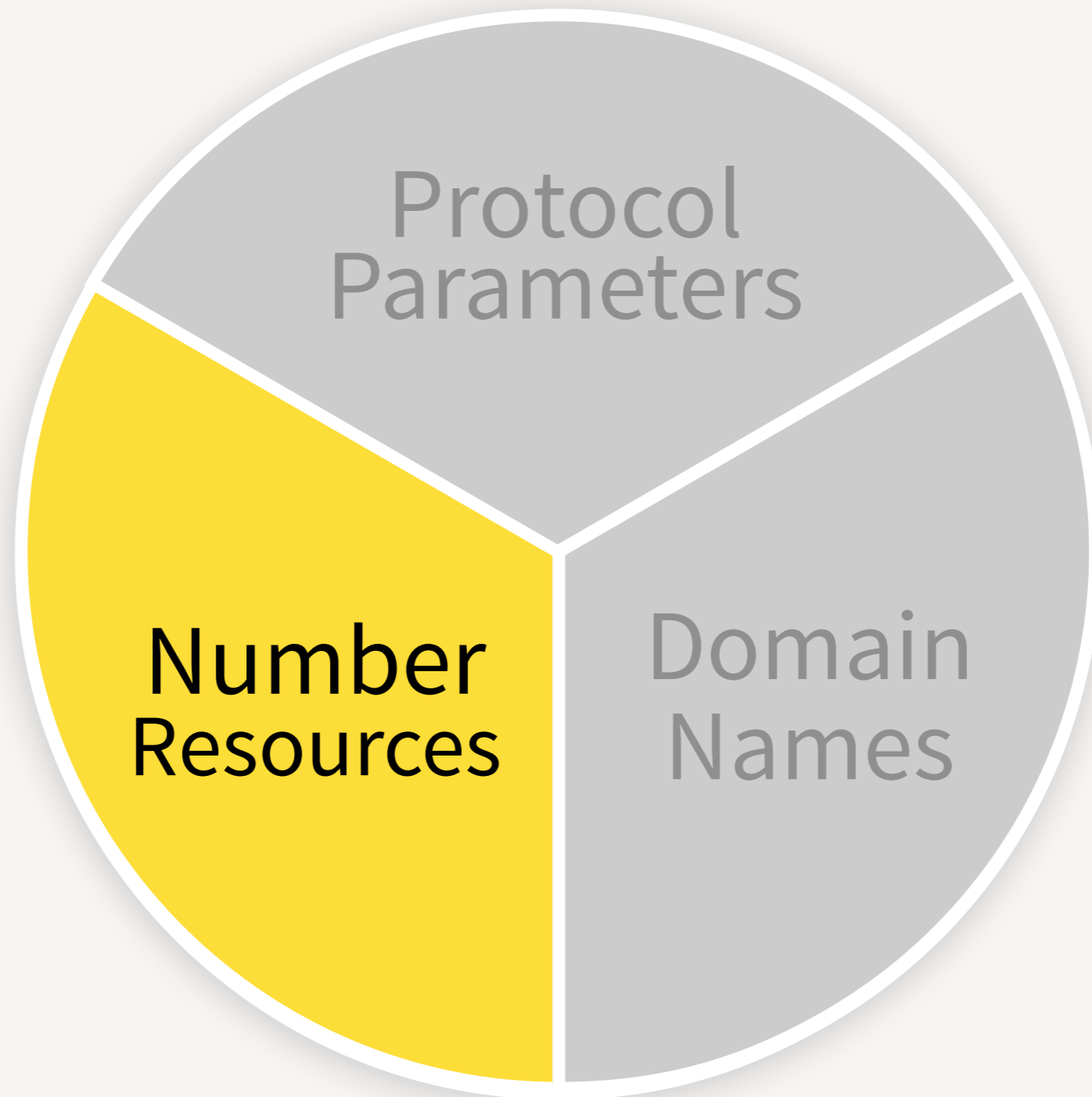
Protocol/Registry	Defining Document/Comments
A	
<b>Access Node Control Protocol (ANCP)</b>	
<a href="#">ANCP Capability Types</a>	RFC 6320 Standards Action
<a href="#">ANCP Command Codes</a>	RFC 6320 Standards Action
<a href="#">ANCP Message Types</a>	RFC 6320 Standards Action
<a href="#">ANCP Port Management Functions</a>	RFC 6320 Standards Action
<a href="#">ANCP Result Codes</a>	RFC 6320 0x0-0xFFF: IETF Review. 0x1000-0xFFFF: Specification Required.
<a href="#">ANCP Technology Types</a>	RFC 6320

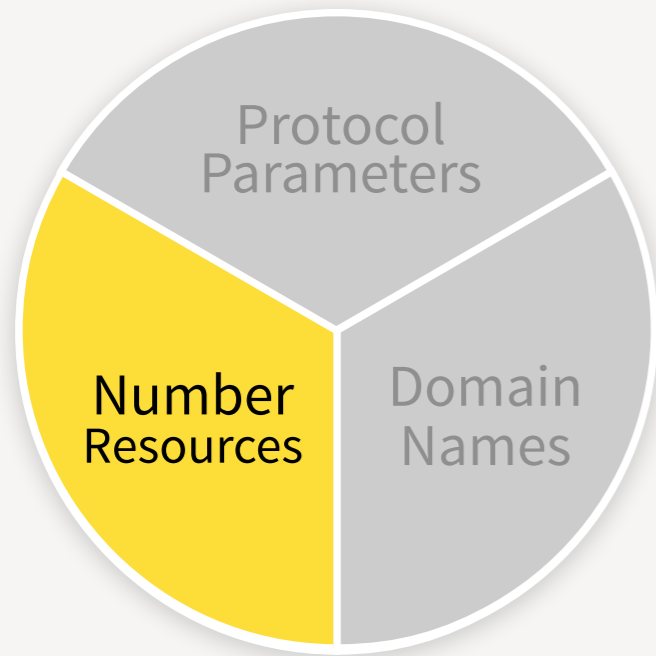
around  
**3,000**  
protocol  
parameter  
registries





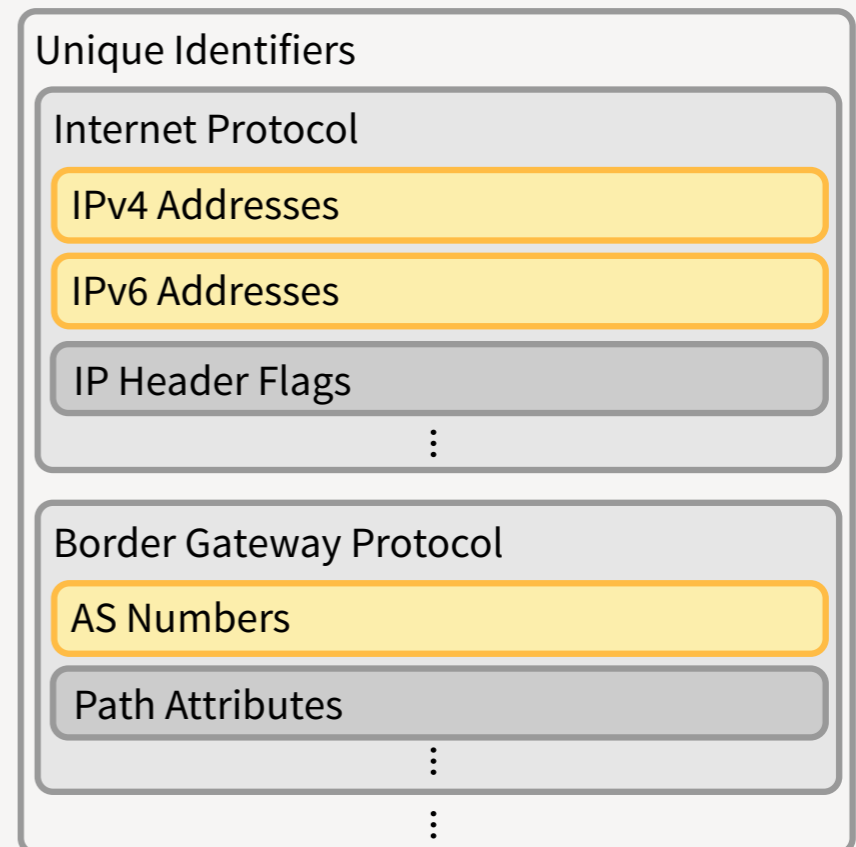
- IANA role includes:
  - Maintaining and publishing registry data
  - Receiving and evaluating requests to create new registries and to add new values to registries
  - Providing advice on upcoming standards efforts on how it would be implemented as part of the IANA functions

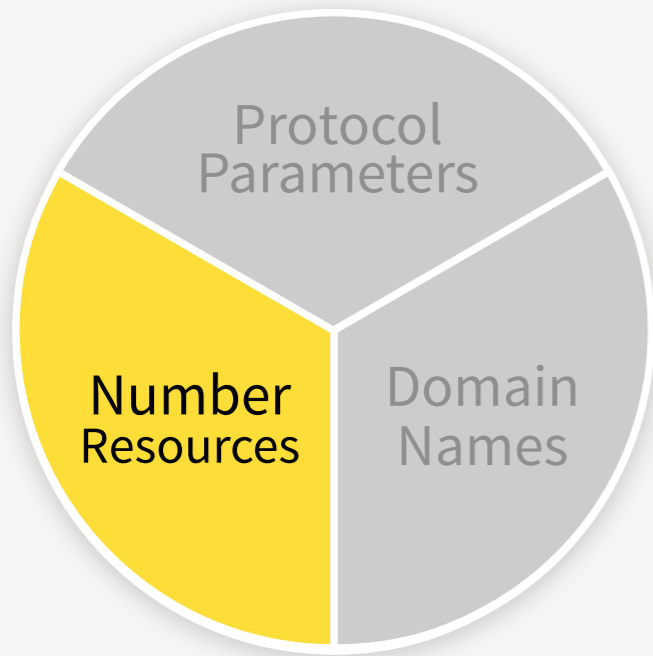




**Number Resources** are specialized forms of protocol parameters:

- IP Addresses: unique identifiers for devices on the Internet
- Autonomous System (AS) numbers: unique identifiers that group networks on the Internet





- Number Resources are predominantly hierarchically delegated through five Regional Internet Registries
- RIRs in turn delegate them to ISPs and network operators in their region
- Some specialized allocations are made directly by IANA (e.g. multicast)
- Deterministic decision making is used. Recently we launched an RIR Dashboard to show calculations against eligibility requirements

**IANA**  
Internet Assigned Numbers Authority

DOMAINS NUMBERS PROTOCOLS ABOUT US

**Number Resources**

Overview

**RIR Allocation Data**

**Overview**

- IPv6 (AFRINIC)
- IPv6 (APNIC)
- IPv6 (ARIN)
- IPv6 (LACNIC)
- IPv6 (RIPE NCC)
- ASN (AFRINIC)
- ASN (APNIC)
- ASN (ARIN)
- ASN (LACNIC)
- ASN (RIPE NCC)

**Abuse Issues**

- Overview
- Questions and Answers

**Number Resource Allocation Data**

Our primary role in managing [Internet number resources](#) is to provide pool and AS numbers to Regional Internet Registries (RIRs) according to their [Global Addressing Policies](#).

These policies contain allocation algorithms that are based on the level of allocations. We track allocation rates here and provide analysis of eligibility.

**IP Address Allocations**

The chart below summarizes allocations of IPv6 addresses RIRs have made not represented as IANA's supply has been exhausted and our allocation space does not factor in utilization.

Detailed information is available for each RIR by clicking the chart.

RIR	Percentage Available
AFRINIC	~10%
APNIC	~25%

**Autonomous System Number Allocations**

The chart below summarizes allocations of AS numbers that RIRs have made to net. Detailed information is available for each RIR by clicking the chart.

RIR	Percentage Available
AFRINIC	~10%
APNIC	~45%
ARIN	~85%
LACNIC	~40%
RIPENCC	~95%

**RIPE NCC ASN Allocations**

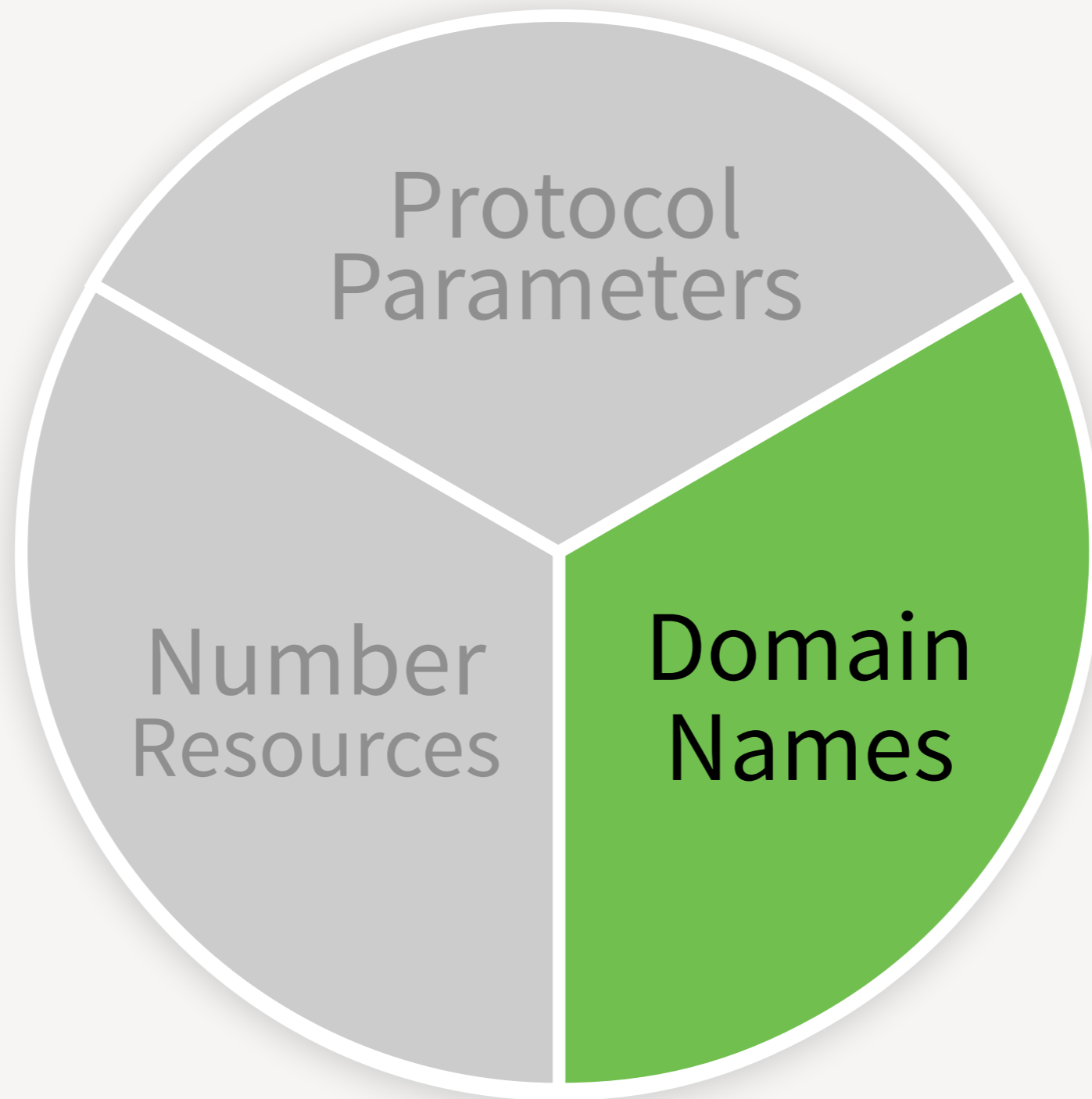
Allocations of autonomous system numbers are made to regional Internet registries according to their needs, based on allocation rates they publish. Specifically, RIRs are eligible for further allocations if their available address space is 80% allocated, or the available pool does not satisfy two months of need based on the previous six months' average allocation rate.

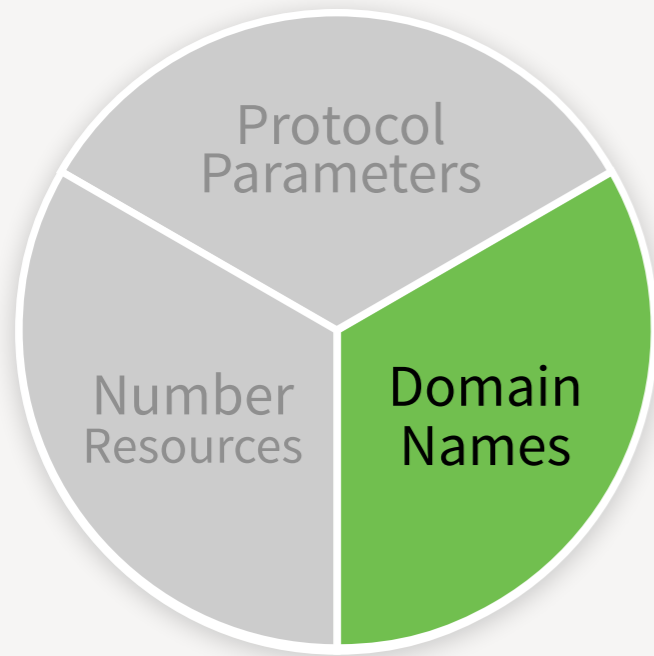
**Current Pool and Eligibility**

Category	Value
Eligibility	756
Available	454
Two Month Need	227
Monthly Average	227
Last Allocation by IANA	3,072 ASNs (2018-08-20)

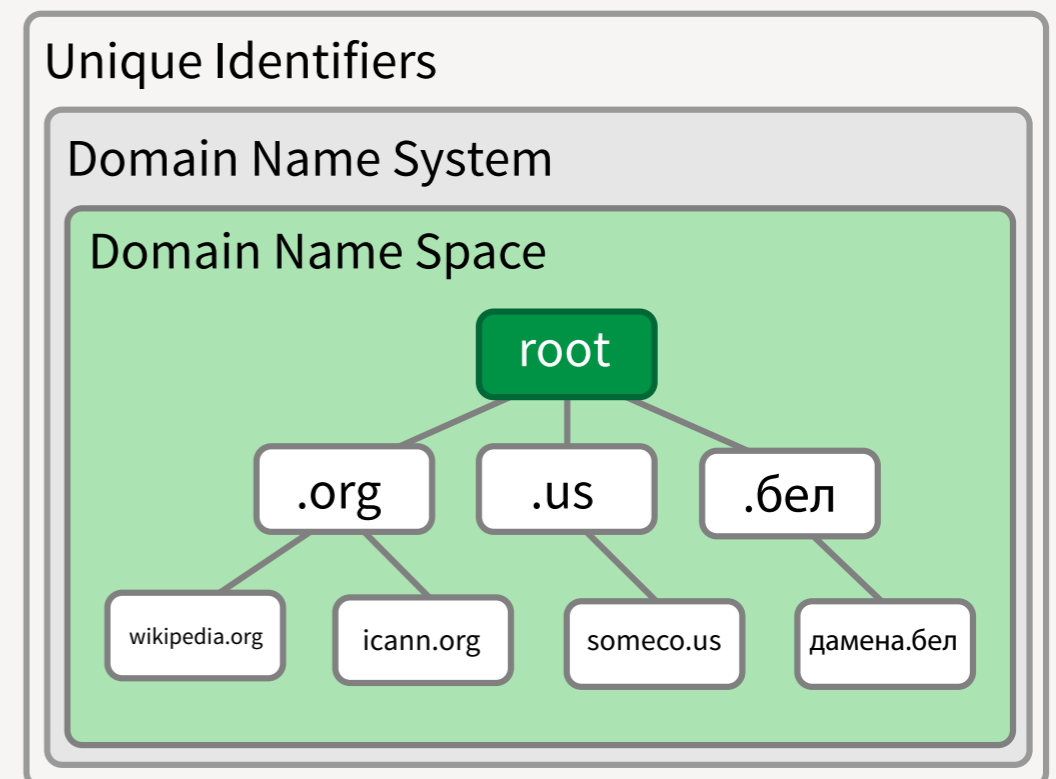
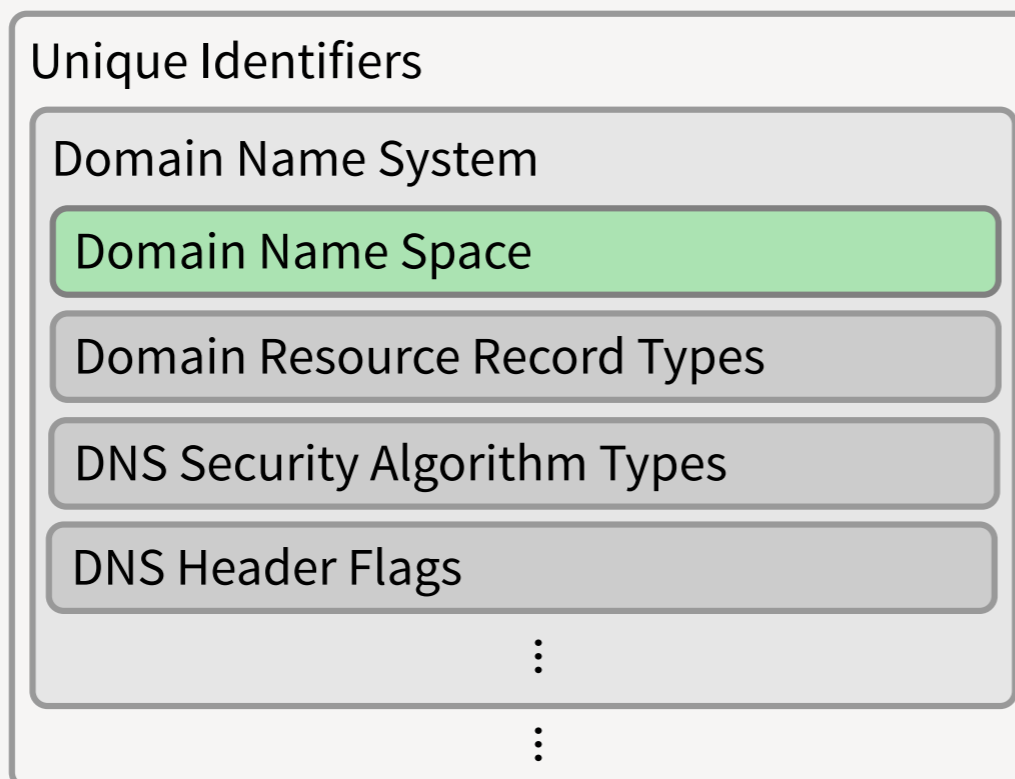
**12 Month Forecast**

The graph below uses RIPE NCC's current average allocation rate to forecast their available ASN space over the next 12 months. This can be used to estimate if RIPE NCC will become eligible to apply for additional AS Numbers in the near future.

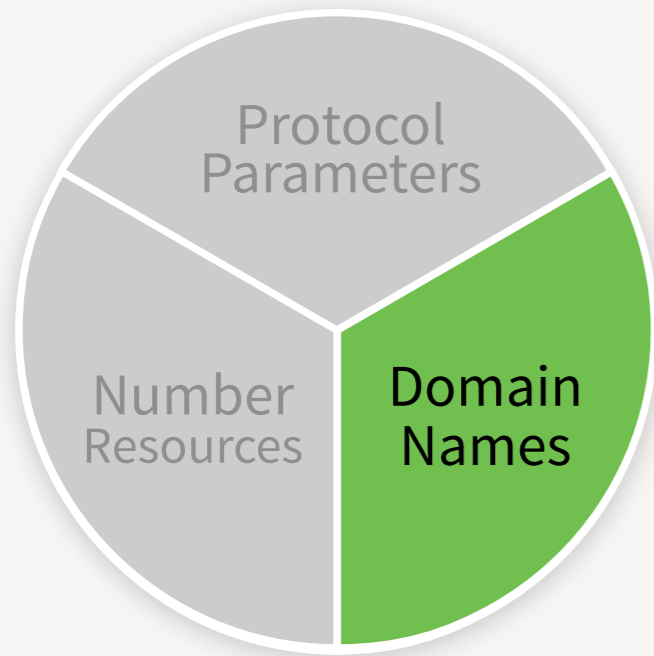




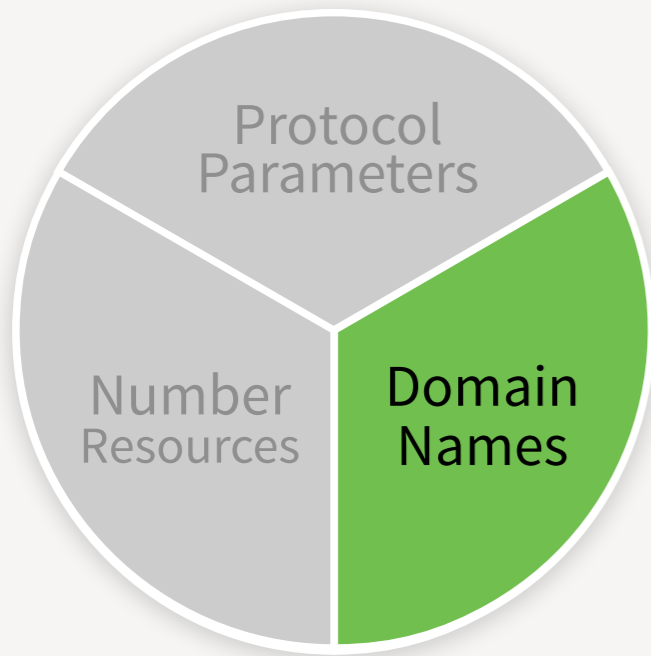
- Most notable IANA function is managing the DNS root zone, which defines top-level domains
- Like number resources, the domain name space is hierarchically delegated, with IANA responsible for the upper-most level of allocations



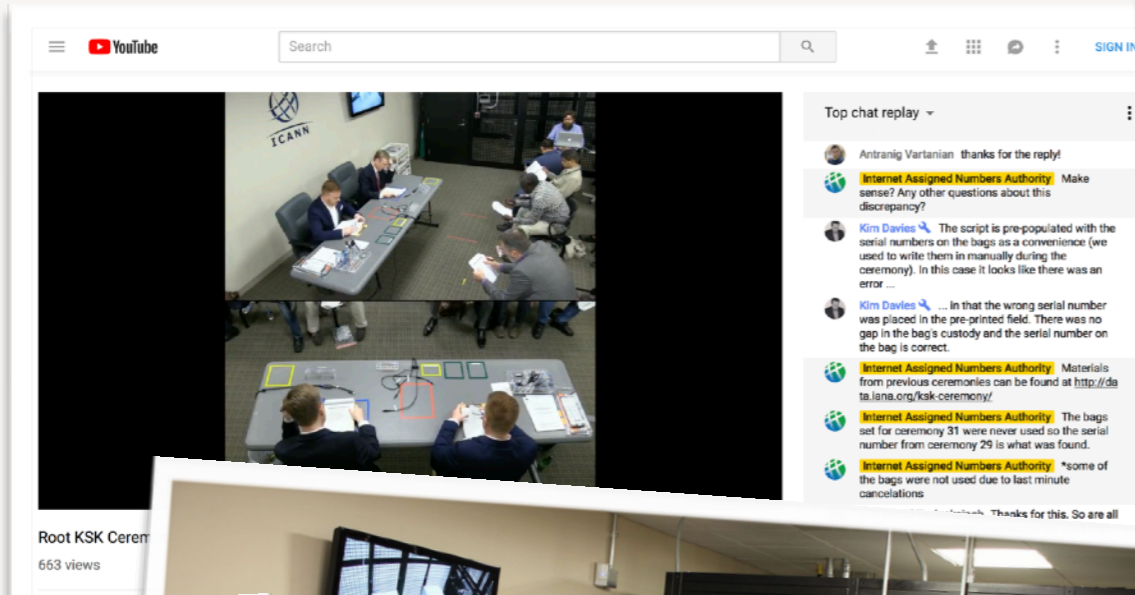




- The IANA tasks include:
  - Receiving and evaluating root zone changes requests against policies and operational requirements:
    - Assignment and transfer of TLDs
    - Routine maintenance of name servers and other technical elements
    - Points of Contact
  - Transmitting vetted changes for implementation in the root zone and root servers
  - Operating the .INT domain for intergovernmental treaty organizations
  - IDN table/LGR repository maintenance



- Managing the trust anchor for the DNS (the “Root Zone Key Signing Key”)
  - Using the key happens in public “key signing ceremonies”, involving trusted community representatives and other oversight.
  - Includes managing the lifecycle of the key, including when it is replaced (a “rollover”)



## Root KSK Ceremony 34

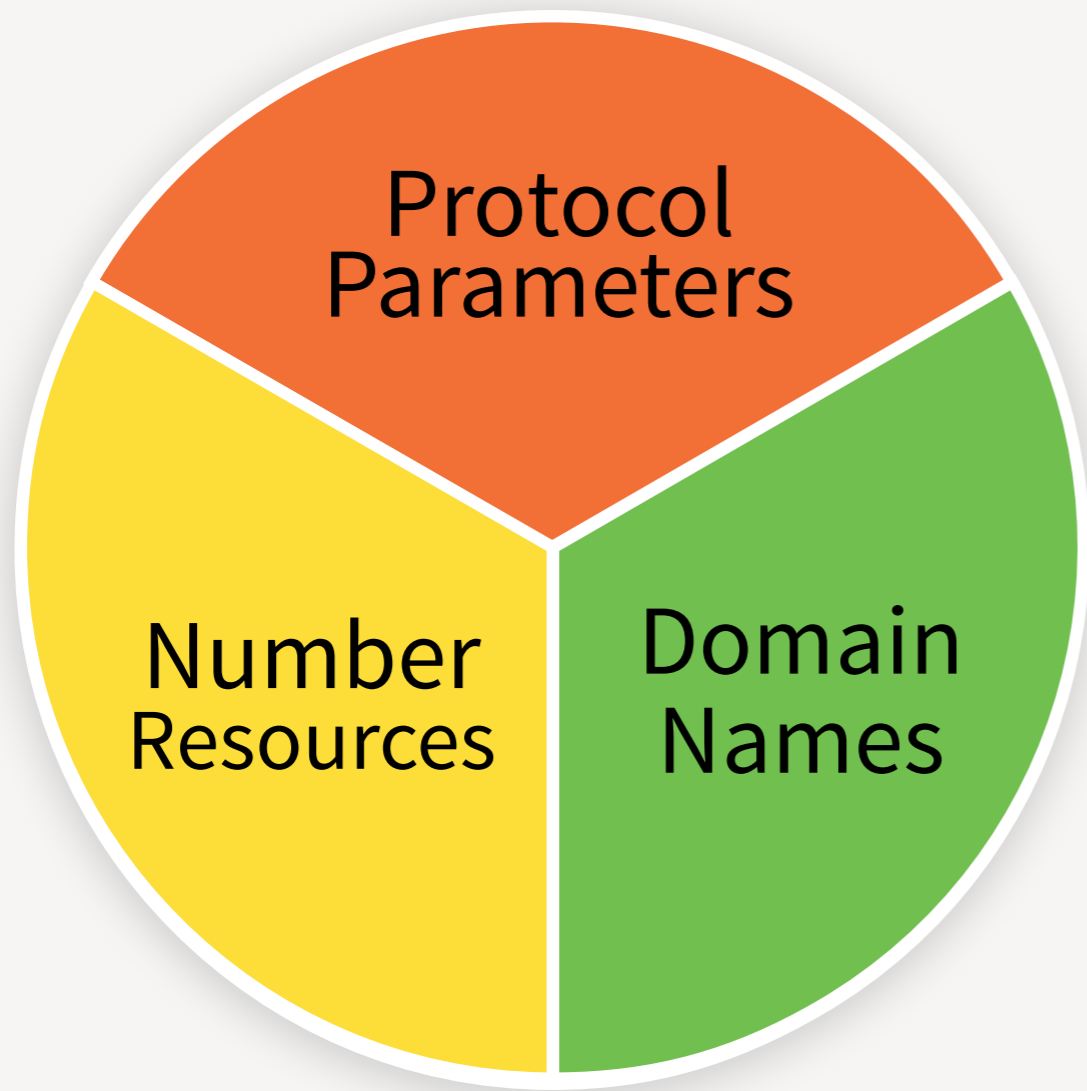
This DNSSEC key signing ceremony is planned for  
15 August 2018, 2000 UTC

Location	Root Zone Key Management Facility West El Segundo, California, USA
Ceremony Start	2018-08-15 20:00:00 UTC Wednesday 15 August 2018, 1 p.m. (local time at facility)
Objectives	Sign the ZSK for 2018Q4

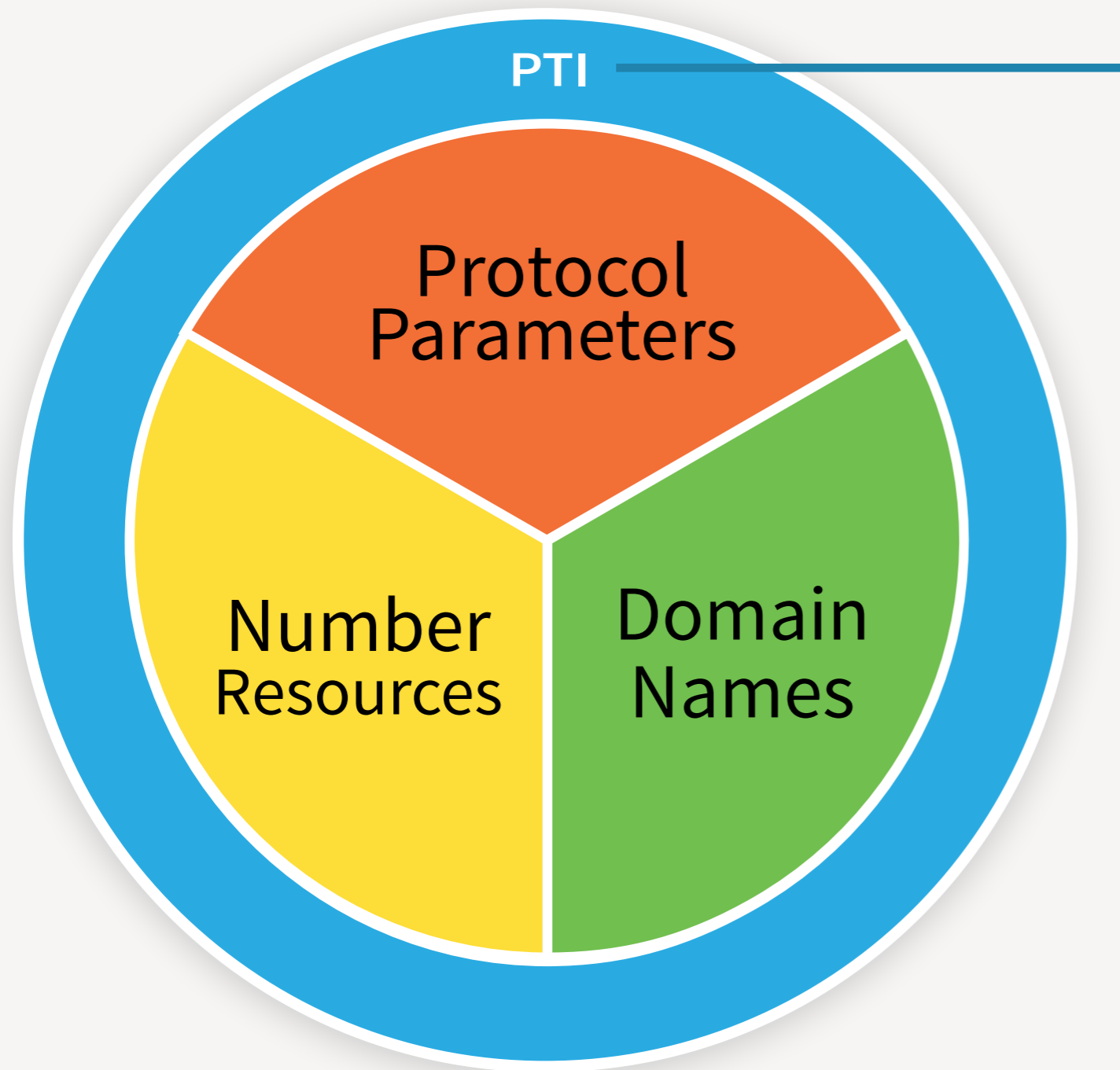
### Observing the ceremony

The key signing ceremony is a public event, and you are welcome to observe. Due to space only a small number of persons are able to participate as observers at a ceremony in person. We broadcast ceremonies as they happen, and will provide recordings after the ceremony is complete. Prior to observing a ceremony, we recommend you review the ceremony materials (i.e. the ceremony materials) in advance.



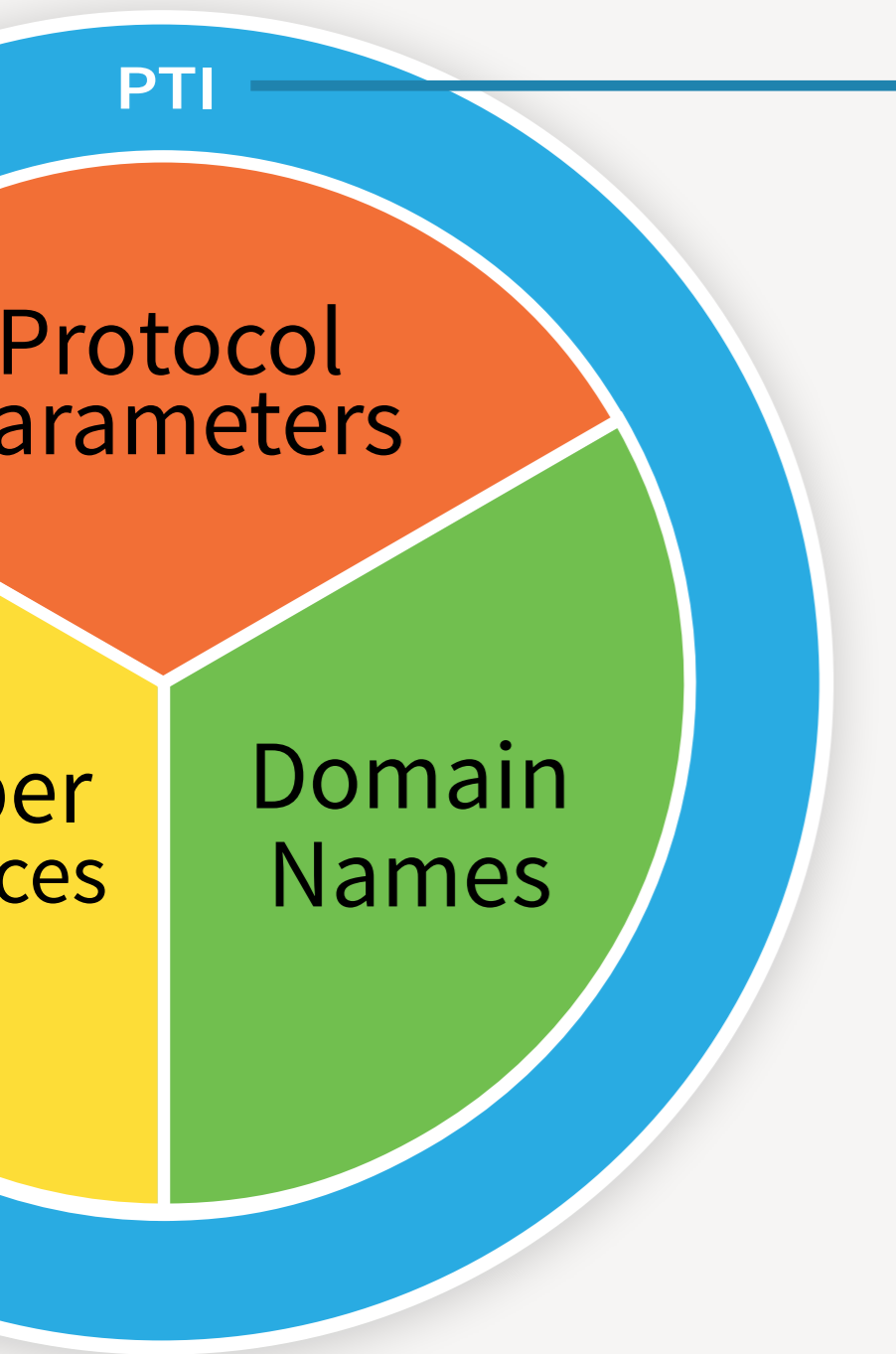


- Together, protocol parameters, number resources and domain names comprise the IANA functions
- These divisions also represent the three different accountability mechanisms for these functions



## Public Technical Identifiers

- Performs the IANA functions
- Hires the IANA staff
- Is a non-profit organization created in 2016
- ICANN is its sole member (i.e. affiliate of ICANN)



## IANA Staff



**Alan Akahoshi**  
PRODUCT MGMT



**Shaunte Anderson**  
AUDIT



**Amanda Baber**  
REQUEST SPECIALIST



**Michelle Cotton**  
IETF RELATIONS



**Kim Davies**  
PRESIDENT



**Aaron Foley**  
CRYPTOGRAPHY



**Selina Harrington**  
REQUEST SPECIALIST



**Marilia Hirano**  
EXCELLENCE & AUDIT



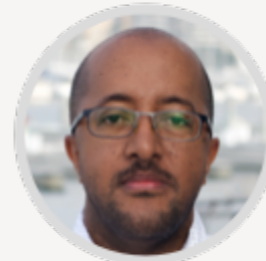
**Jennifer Johnson**  
EXECUTIVE ASSISTANT



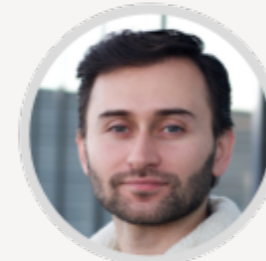
**Ali Mohammadi**  
SOFTWARE



**Andres Pavez**  
CRYPTOGRAPHY



**Seman Said**  
SOFTWARE



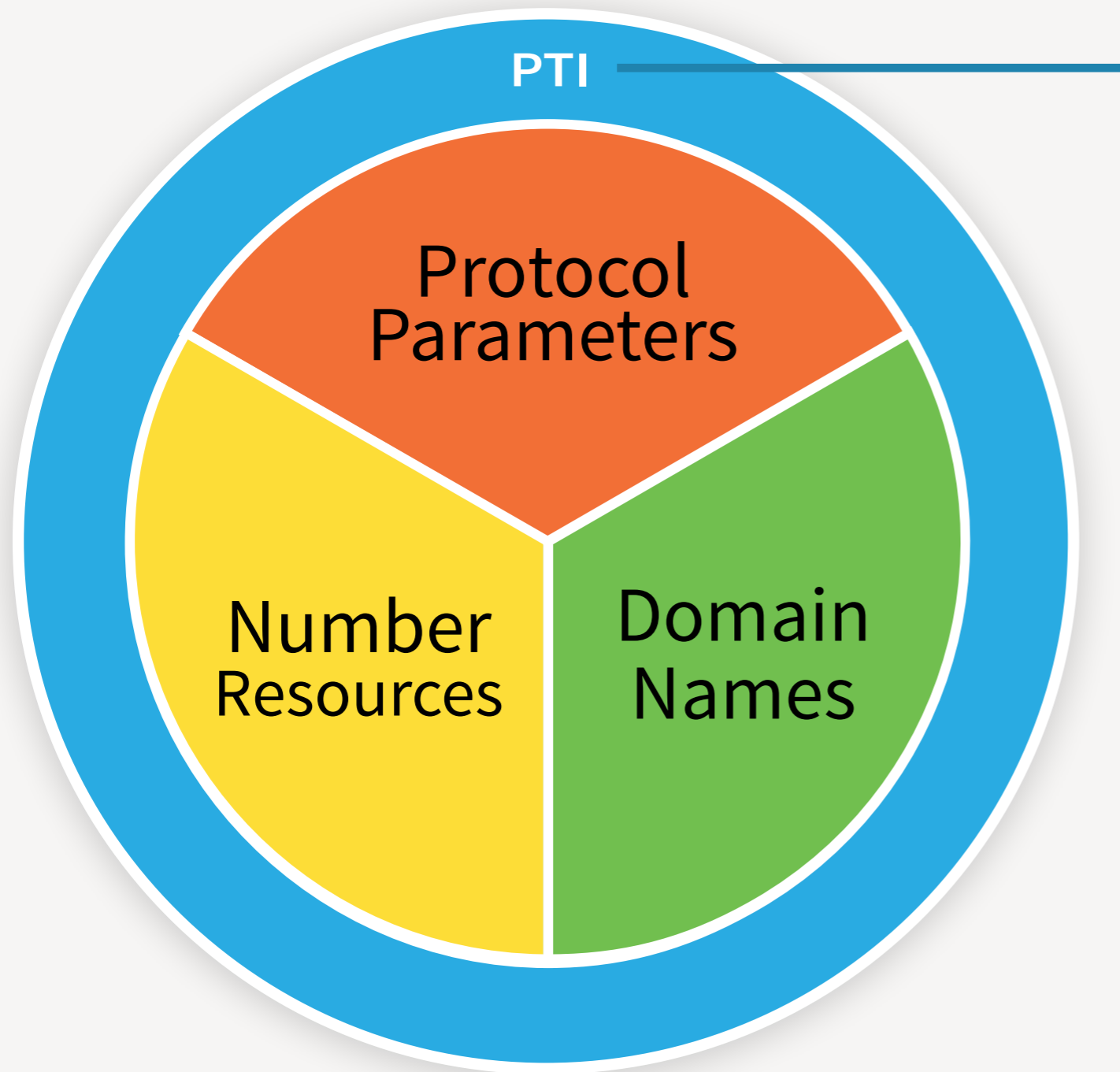
**George Sarkisyan**  
REQUEST SPECIALIST



**Naela Sarras**  
SERVICE DELIVERY

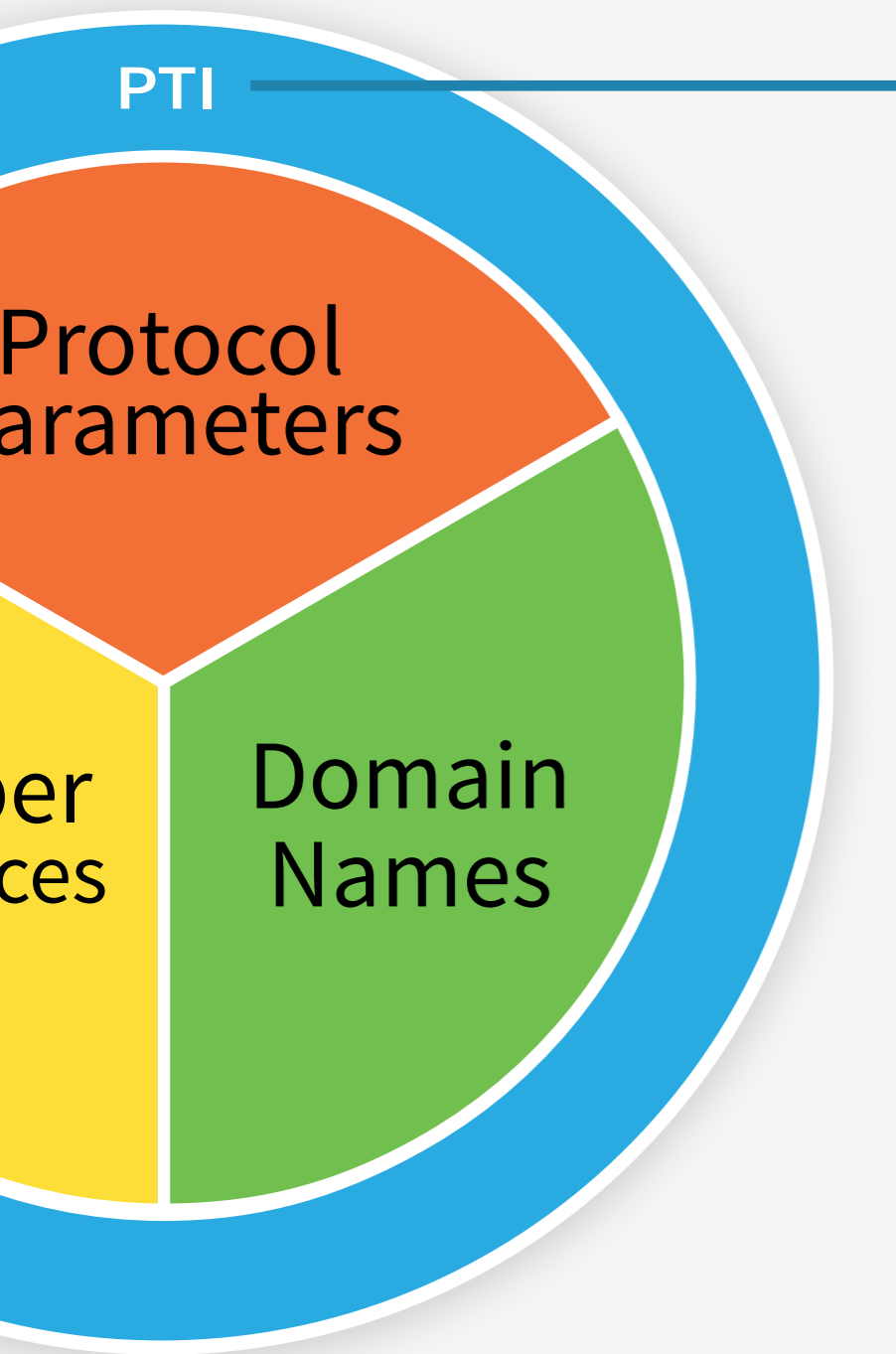


**Sabrina Tanamal**  
REQUEST SPECIALIST



## Public Technical Identifiers

- Five-member board of directors including 2 Nomcom appointees



## PTI Board



**Lise Fuhr**  
CHAIR  
NOMCOM APPTTEE



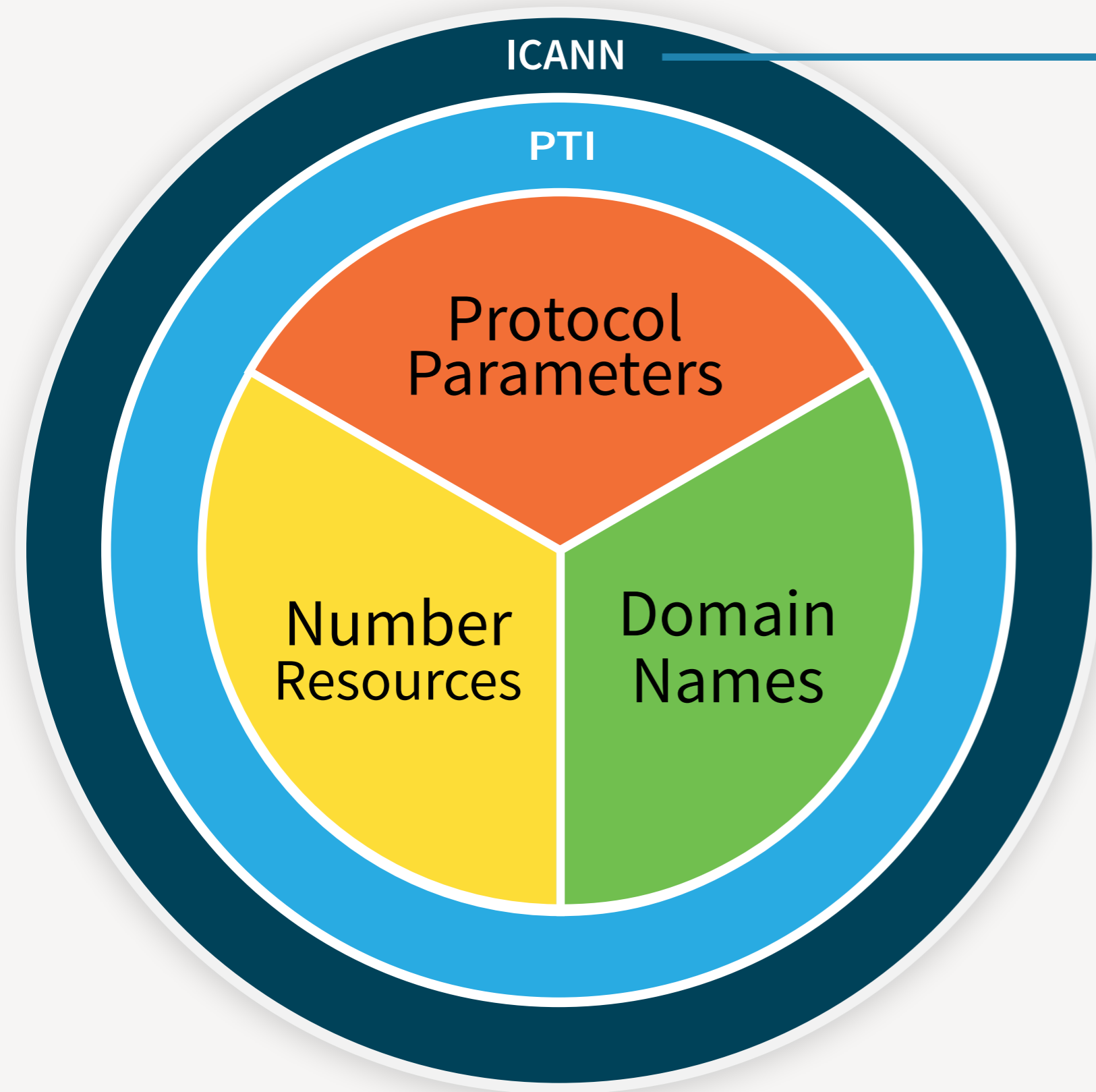
**Wei Wang**  
NOMCOM APPTTEE



**Kim Davies**  
PTI PRESIDENT



**David Conrad**  
ICANN CTO



## 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

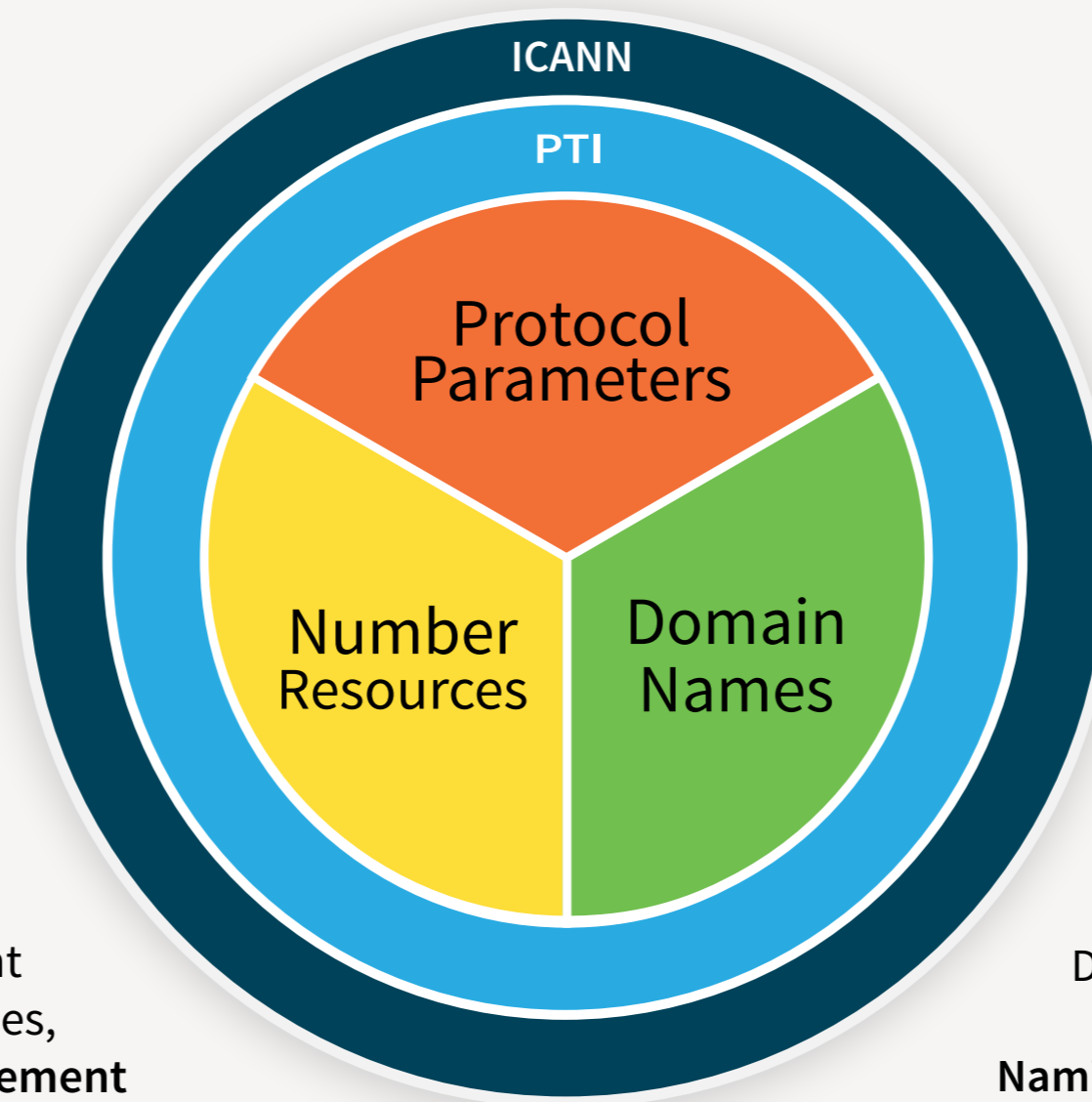


# Accountability and Performance

Naela Sarras

# Accountability

Protocol Parameter oversight  
through **Memorandum of Understanding**  
between **IETF** and **ICANN**,  
subcontracted from **ICANN** to **PTI**



Number resource oversight  
by Regional Internet Registries,  
governed by **Service Level Agreement**  
between **ICANN** and **RIRs**,  
subcontracted from **ICANN** to **PTI**

Domain Name oversight by **ICANN**;  
governed by  
**Naming Contract** between **ICANN** and **PTI**;  
performance oversight by  
**ICANN Customer Standing Committee**

# Performance Reporting

- Monthly reporting for each of the three areas

IANA Protocol Parameter Service  
Monthly Report  
October 15, 2019

For the Reporting Period of  
September 1, 2019 – September 30, 2019

Prepared by: Amanda Baber  
amanda.baber@iana.org

Executive Summary  
Statistics  
IESG approved documents (a)  
Reference Updates (b)  
Last Calls (c)  
Evaluations (d)  
Media (MIME) type requests (e, f)  
New Port number requests (g)  
Modification to and/or deletions of Port number requests (h)  
New Private Enterprise Number (PEN) requests (i)  
Modifications to and/or deletions of PEN requests (j)  
New TRIP/ITAD Numbers (k)  
Requests relating to other IETF-created registries for which the request rate is more than five per month (l)  
Deliverables  
Provide publicly accessible, clear and accurate periodic statistics  
Track and publicly report on a monthly basis (monthly report)  
Conclusions

**Executive Summary**  
This monthly report provides statistical information of the IANA Services operations as they relate to the IETF. Also included are the deliverables for this reporting period in accordance with the Supplemental Agreement (SLA) between ICANN and the IAOC with the effective date 31 July 2019.  
For this reporting period, we completed 90 of 90 requests within the IANA Services processing goal times (100%).

**Protocol Parameters**

### Number Resource Performance June 2019

#### Performance Summary

These performance targets are derived from section 4.3 of the Service Level Agreement for the IANA Numbering Services for the allocation of unicast IP addresses and AS numbers to the five Regional Internet Registries.

- Requests acknowledged on time (100%)
- Responded on time (100%)
- Implemented on time (100%)
- Implemented accurately (100%)

#### Individual Requests to Regional Internet Registries

Date	Request Type	Request Processing Details
2019-05-13	IPv6 Unicast	<ul style="list-style-type: none"><li>Responded on time (0.3 days)</li><li>Implemented on time (0.2 days)</li><li>Clarification asked on time (2.1 days)</li><li>Accurately implemented</li></ul>
2019-06-11	AS Number	<p>2019-06-11 01:42:36 Request received from APNIC</p> <p>0.6 business days</p> <p>2019-06-11 15:12:36 Request acknowledged</p> <p>Acknowledged on time (within 2 business days)</p> <p>0.6 business days</p> <p>2019-06-12 18:03:29 Implemented using resource(s)</p> <p>Implemented on time (within 4 business days)</p> <p>Implemented accurately</p>

**Number Resources**

### Summary of Performance

Metric	Category	Expected	Actual	Detail
Submission				
Acceptance Recognition	Routine (Technical)	≤60s (95.0%)	✓ 1.62s	p5
Acceptance Recognition	Routine (Non-Technical)	≤60s (95.0%)	✓ 1.38s	p5
Acceptance Recognition	gTLD Creation/Transfer	≤60s (95.0%)	✓ 1.06s	p6
Acceptance Recognition	ccTLD Creation/Transfer	≤60s (95.0%)	✓ 0.85s	p6
Acceptance Recognition	Other Changes	≤60s (95.0%)	✓ 0.66s	p6
Manual Lodgment Time	Routine (Technical)	≤3d (95.0%)	✓ 0.18d	p7
Manual Lodgment Time	Routine (Non-Technical)	≤3d (95.0%)	✓ 0.55d	p7
Manual Lodgment Time	gTLD Creation/Transfer	≤3d (95.0%)	✓ 0.47d	p7
Manual Lodgment Time	ccTLD Creation/Transfer	≤3d (95.0%)	✓ 0.47d	p8
Manual Lodgment Time	Other Changes	≤3d (95.0%)	✓ 0.03d	p8
Technical Checks				
Technical Check (First)	Routine (Technical)	≤50m (95.0%)	✓ 0.47m	p9
Technical Check (First)	gTLD Creation/Transfer	≤50m (95.0%)	✓ 0.15m	p9
Technical Check (First)	ccTLD Creation/Transfer	≤50m (95.0%)	✓ 0.2m	p9
Technical Check (First)	Other Changes	≤50m (95.0%)	✓ 5.16m	p10
Technical Check (Retest)	Routine (Technical)	≤10m (95.0%)	✓ 1.47m	p10
Technical Check (Retest)	gTLD Creation/Transfer	≤10m (95.0%)	✓ 0.17m	p11
Technical Check (Retest)	ccTLD Creation/Transfer	≤10m (95.0%)	✓ 0.17m	p11
Technical Check (Retest)	Other Changes	≤10m (95.0%)	✓ 0.44m	p11
Technical Check (Supplemental)	Routine (Technical)	≤10m (95.0%)	✓ 0.47m	p12
Technical Check (Supplemental)	gTLD Creation/Transfer	≤10m (95.0%)	✓ 0.16m	p12
Technical Check (Supplemental)	ccTLD Creation/Transfer	≤10m (95.0%)	✓ 0.3m	p12
Technical Check (Supplemental)	Other Changes	≤10m (95.0%)	✓ 0.3m	p13
Contact Confirmations				
Email Dispatch	Routine (Technical)	≤60000ms (95.0%)	✓ 1ms	p13
Email Dispatch	Routine (Non-Technical)	≤60000ms (95.0%)	✓ 3ms	p14
Email Dispatch	gTLD Creation/Transfer	≤60000ms (95.0%)	✓ 1ms	p14
Email Dispatch	ccTLD Creation/Transfer	≤60000ms (95.0%)	✓ 1ms	p14
Email Dispatch	Other Changes	≤60000ms (95.0%)	✓ 1ms	p14
Recognition of Confirmation	Routine (Technical)	≤60000ms (95.0%)	✓ 0.8ms	p15
Recognition of Confirmation	Routine (Non-Technical)	≤60000ms (95.0%)	✓ 1ms	p15
Recognition of Confirmation	gTLD Creation/Transfer	≤60000ms (95.0%)	✓ 0ms	p16
Recognition of Confirmation	ccTLD Creation/Transfer	≤60000ms (95.0%)	✓ 0ms	p16
Recognition of Confirmation	Other Changes	≤60000ms (95.0%)	✓ 0ms	p16
Staff Processing				
Validation and Reviews	Routine (Technical)	≤60000ms (95.0%)	✓ 0.85d	p17
Validation and Reviews	Routine (Non-Technical)	≤60000ms (95.0%)	✓ 1.02d	p17
Validation and Reviews	gTLD Creation/Transfer	≤60000ms (95.0%)	✓ 0.72d	p17
Validation and Reviews	ccTLD Creation/Transfer	≤60000ms (95.0%)	✓ 29.35d	p18
Validation and Reviews	Other Changes	≤60000ms (95.0%)	✓ 3.78d	p18
Third Party Approval			✓ 18.8d	p19
Implementation				
Root Zone Publication			✓ 28.47h	p20
Root Zone Publication			✓ 15.81h	p20
Root Zone Publication			✓ 3.06h	p20
Root Zone Publication			✓ 15.55h	p21
Notification of Completion			✓ 0.27h	p21

**Domain Names**

# Performance Reporting

PTI produces monthly reports on its performance for its three functional areas.

[iana.org/performance](http://iana.org/performance)

Dashboard providing real-time reporting of performance metrics defined by the naming community for root zone management performance.

[sle-dashboard.iana.org](http://sle-dashboard.iana.org)

### Monthly Performance Report from Public Technical Identifier Customer Standing Committee

February 2017

Summary of Performance  
 Exceptions and Narrative  
 Detailed Performance  
 Definitions

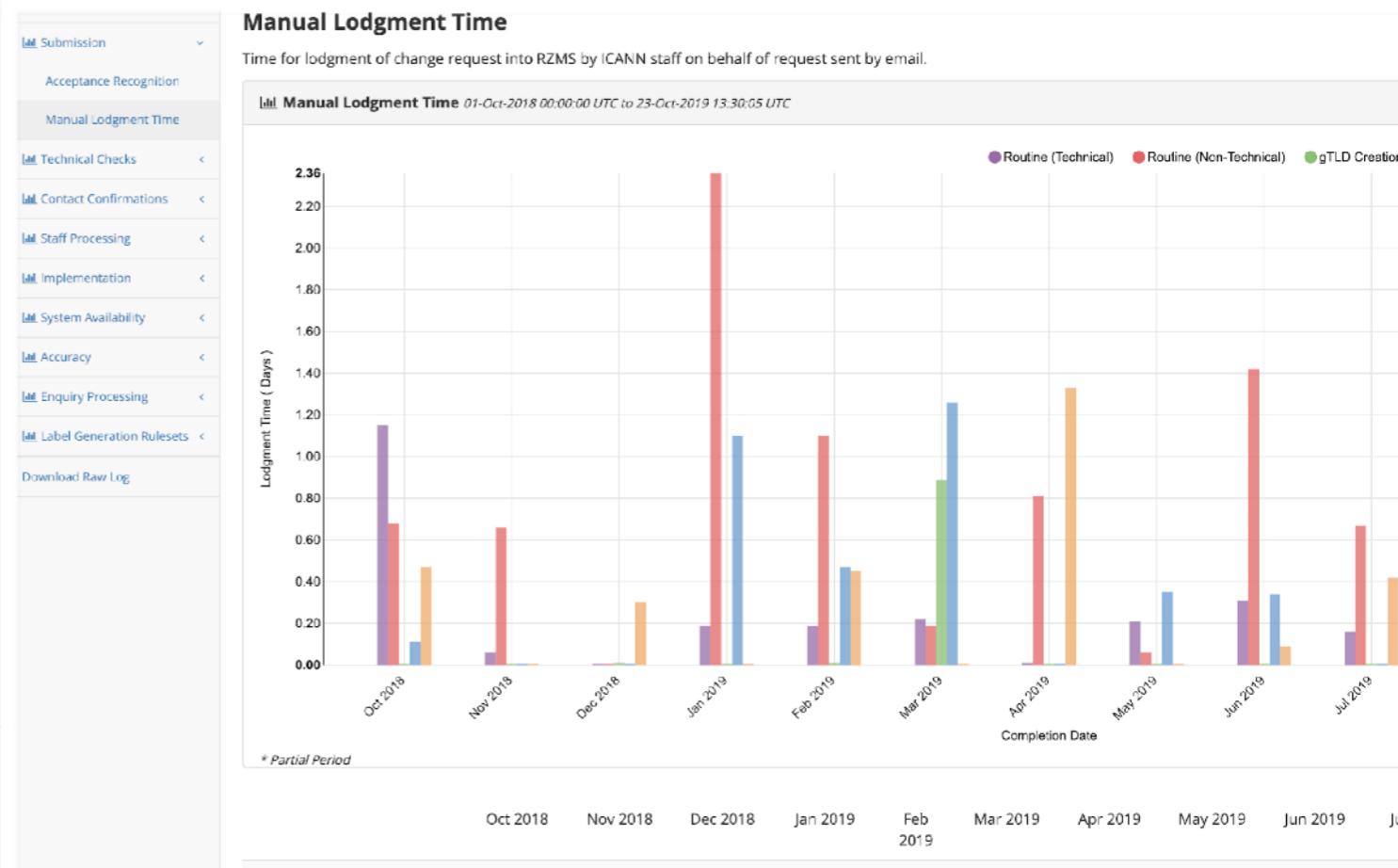
### Exceptions and Narrative for Reporting Period

Metric	Category	Expected	Actual
Manual Lodgment Time	Routine (Non-Technical)	3d	4,07d

Primary cause: Clarification needed from requestor  
 Analysis/Comments: Request started with an inquiry on how to make changes in the IANA root zone but no change request was included in the initial submission. Staff explained the procedure to lodge a change request. The requestor was clarified that the change request was not included in the initial submission. The requestor was clarified that the change request was not included in the initial submission. This request is on the list of items to address in the next reporting period.

### Summary of Performance

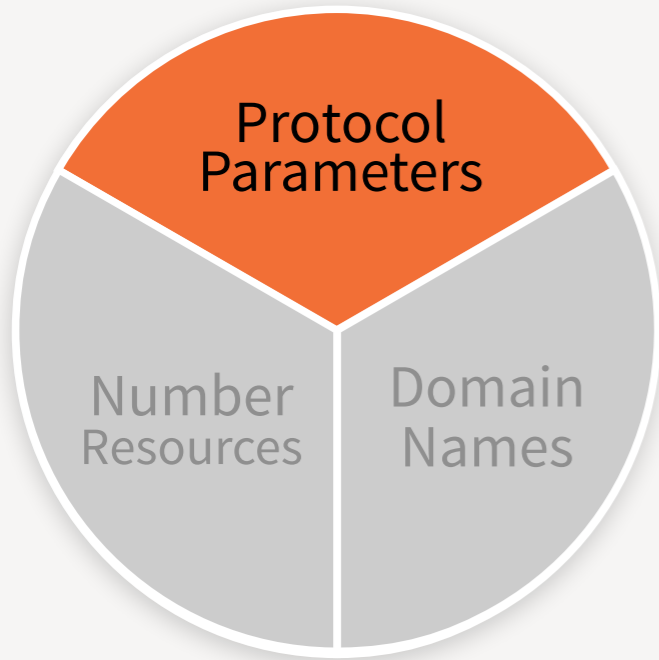
Metric	Category	Expected	Actual	Detail
Submission				
Acceptance Recognition	Routine (Technical)	s50s (95.0%)	✓ 1,72s	p5
Acceptance Recognition	Routine (Non-Technical)	s50s (95.0%)	✓ 2,34s	p5
Acceptance Recognition	gTLD Creation/Transfer	s50s (95.0%)	✓ 1,44s	p6
Acceptance Recognition	ccTLD Creation/Transfer	s50s (95.0%)	✓ 0,72s	p6
Acceptance Recognition	Other Charges	s50s (95.0%)	✓ 1,55s	p6
Manual Lodgment Time	Routine (Technical)	s3d (95.0%)	✓ 0,92d	p7
Manual Lodgment Time	Routine (Non-Technical)	s3d (95.0%)	✗ 4,07d	p7
Manual Lodgment Time	gTLD Creation/Transfer	s3d (95.0%)	✓ —	p8
Manual Lodgment Time	ccTLD Creation/Transfer	s3d (95.0%)	✗ 3,38d	p8
Manual Lodgment Time	Other Charges	s3d (95.0%)	✓ —	p8
Technical Checks				
Technical Check (First)	Routine (Technical)	s50m (95.0%)	✓ 6,85m	p9
Technical Check (First)	gTLD Creation/Transfer	s50m (95.0%)	✓ 4,1m	p9
Technical Check (First)	ccTLD Creation/Transfer	s50m (95.0%)	✓ 2,6m	p10
Technical Check (First)	Other Charges	s50m (95.0%)	✓ —	p10
Technical Check (Rebest)	Routine (Technical)	s3m (95.0%)	✓ 2,1m	p11
Technical Check (Rebest)	gTLD Creation/Transfer	s3m (95.0%)	✓ —	p11
Technical Check (Rebest)	ccTLD Creation/Transfer	s3m (95.0%)	✓ —	p12
Technical Check (Rebest)	Other Charges	s3m (95.0%)	✓ —	p12
Technical Check (Supplemental)	Routine (Technical)	s1m (95.0%)	✓ 0,61m	p13
Technical Check (Supplemental)	gTLD Creation/Transfer	s1m (95.0%)	✓ 0,28m	p13
Technical Check (Supplemental)	ccTLD Creation/Transfer	s1m (95.0%)	✓ 0,25m	p13
Technical Check (Supplemental)	Other Charges	s1m (95.0%)	✓ —	p13
Contact Confirmations				
Email Dispatch	Routine (Technical)	s50000ms (95.0%)	✓ 1ms	p14
Email Dispatch	Routine (Non-Technical)	s50000ms (95.0%)	✓ 1ms	p14
Email Dispatch	gTLD Creation/Transfer	s50000ms (95.0%)	✓ 1ms	p15
Email Dispatch	ccTLD Creation/Transfer	s50000ms (95.0%)	✓ 0ms	p15
Email Dispatch	Other Charges	s50000ms (95.0%)	✓ 1ms	p15
Recognition of Confirmation	Routine (Technical)	s50000ms (95.0%)	✓ 0ms	p16
Recognition of Confirmation	Routine (Non-Technical)	s50000ms (95.0%)	✓ 0,4ms	p16
Recognition of Confirmation	gTLD Creation/Transfer	s50000ms (95.0%)	✓ 0ms	p17
Recognition of Confirmation	ccTLD Creation/Transfer	s50000ms (95.0%)	✓ 0ms	p17
Recognition of Confirmation	Other Charges	s50000ms (95.0%)	✓ 1ms	p17
Staff Processing				
Validation and Reviews	Routine (Technical)	s5d (90.0%)	✓ 3,43d	p18
Validation and Reviews	Routine (Non-Technical)	s5d (90.0%)	✓ 4,02d	p18
Validation and Reviews	gTLD Creation/Transfer	s10d (90.0%)	✓ 1,03d	p19
Validation and Reviews	ccTLD Creation/Transfer	s5d (100.0%)	✗ 93,32d	p19
Validation and Reviews	Other Charges	s5d	✓ 6,8d	p19
Third Party Approval	ccTLD Creation/Transfer	s5d	✓ 14,25d	p20
Implementation				
Root Zone Publication	Routine (Technical)	s72h (95.0%)	✓ 33,08h	p21
Root Zone Publication	gTLD Creation/Transfer	s72h (95.0%)	✓ 18,31h	p21
Root Zone Publication	ccTLD Creation/Transfer	s72h (95.0%)	✓ 17,07h	p22
Root Zone Publication	Other Charges	s72h (95.0%)	✓ —	p22
Notification of Completion	Routine (Technical)	s6s (95.0%)	✓ 0,36s	p23



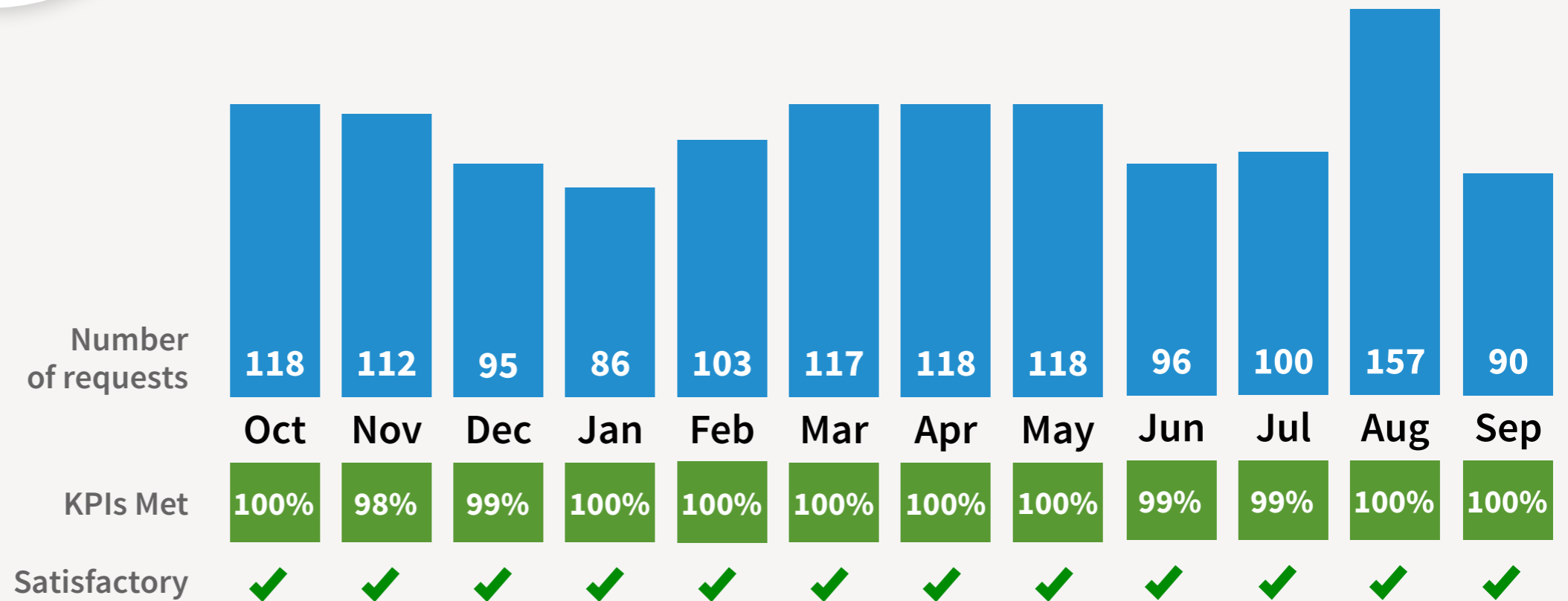
# Service Level Agreements

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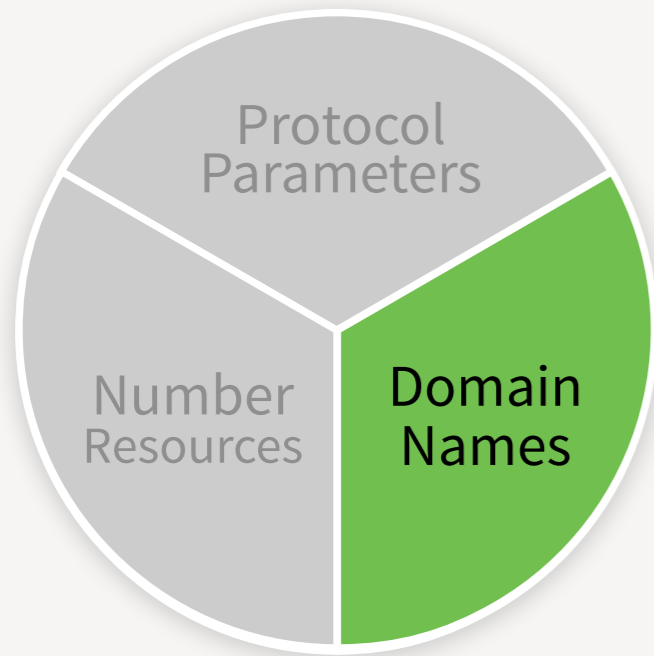
- Each three functions has service level expectations defined and reported against
  - Reports against KPIs to the IETF for protocol parameters
  - Around 70 measurement categories to the Customer Standing Committee for naming functions
  - Performance reporting to the numbering community for IP address and AS number allocations
- These figures are reviewed through various processes
  - Monthly Customer Standing Committee meetings, plus IANA Naming Function Reviews
  - Regular meetings and dialogue with IETF leadership
  - Reports to RIRs and an annual IANA Review Committee process



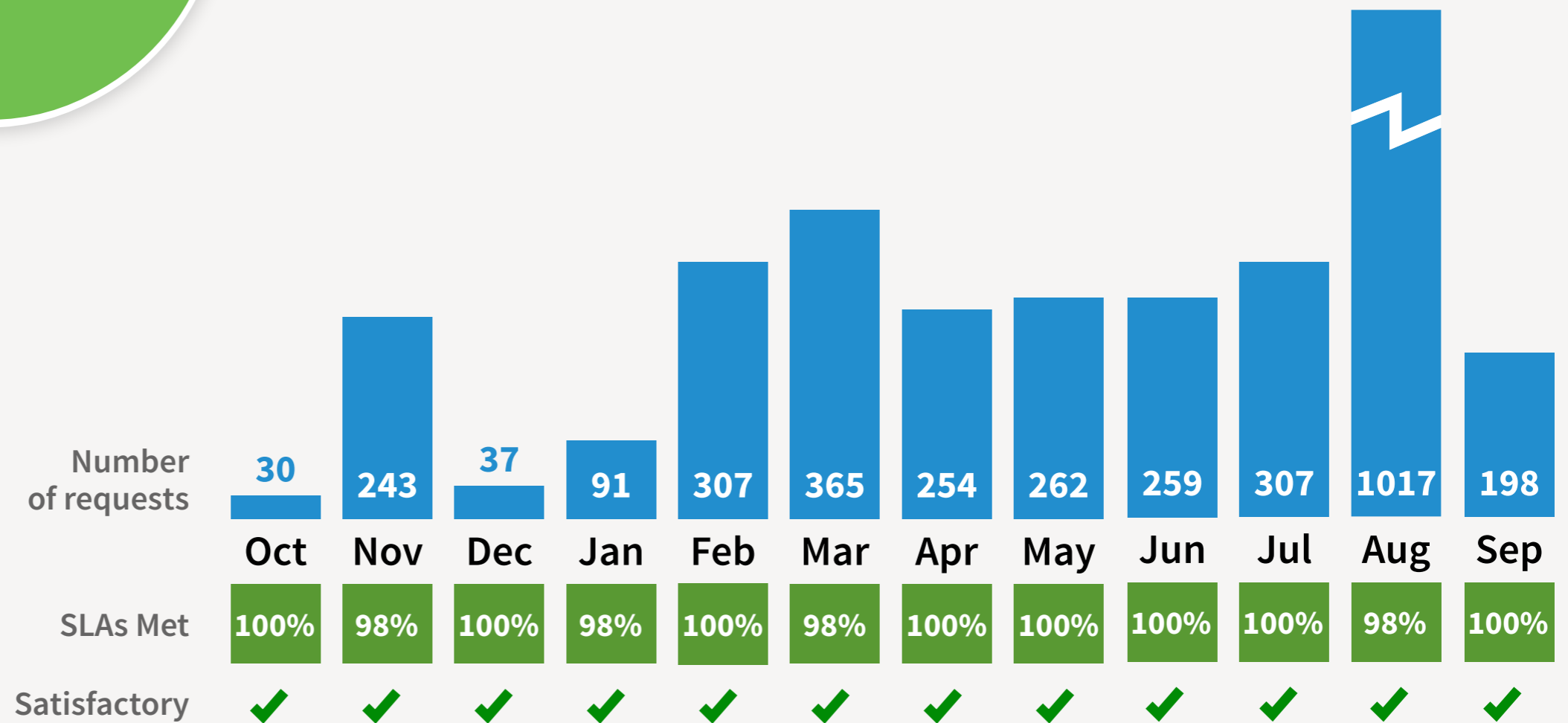
- SLAs are defined through an annual amendment to an MOU between ICANN and the IETF



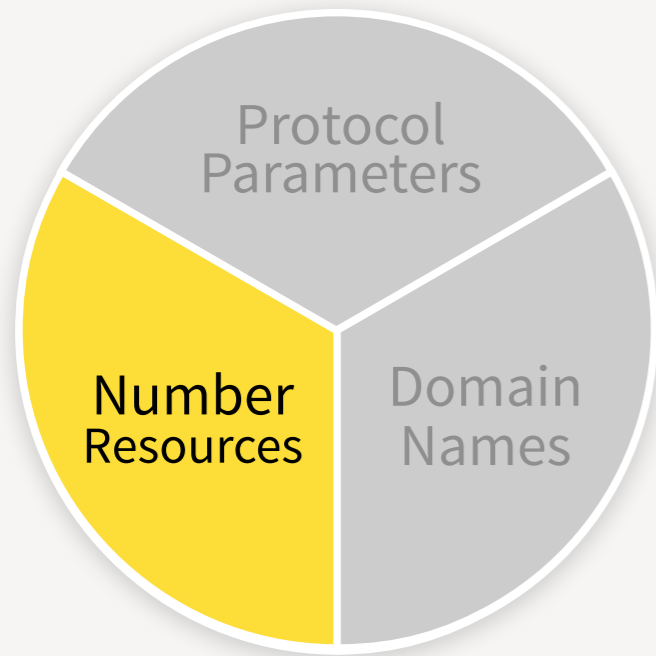
KPIs Met refers to the percentage of KPIs that met their performance target for the period.  
Satisfactory means the KPIs were met to the level required by the IETF MOU



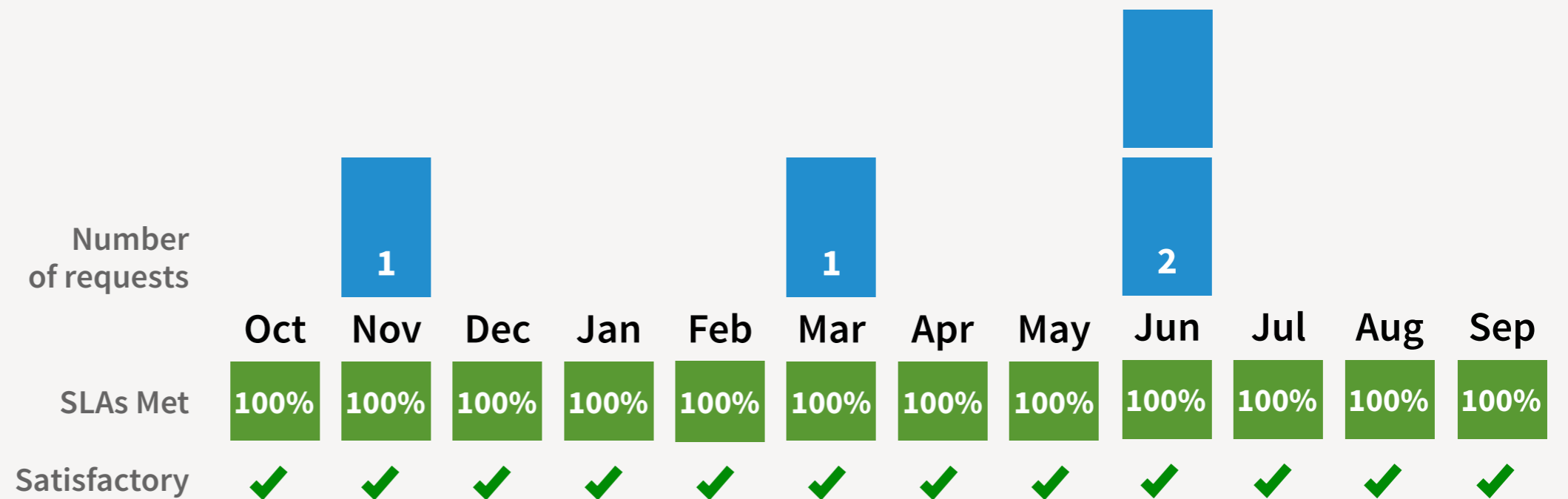
- SLAs are amended and overseen by the Customer Standing Committee



SLAs Met refers to the percentage of SLA categories that met their performance target for the period.  
Satisfactory means the CSC rated performance Satisfactory or higher for the period.



- SLAs are defined by the contract between ICANN and the five RIRs



SLAs Met refers to the percentage of SLA categories that met their performance target for the period.



# Continuous Improvement

Marilia Hirano

# Beyond service level reporting

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- Audit processes
- Monitoring customer satisfaction
- Business Excellence
- Strategic and Operational planning

# Information Security Audit Programs

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- The system controls used for delivering the IANA functions are independently audited, with controls a big part of the team's culture.
- These audits help us constantly monitor and improve our systems.



## Root Zone KSK

Since 2010, issued without exception annually. Audits the security controls that govern the Root Zone Key Signing Key.



## Registry assignment & maintenance systems

Since 2013. Covers the systems we use to process change requests, covering all three areas. Provides detailed assessment provided to our community partners.

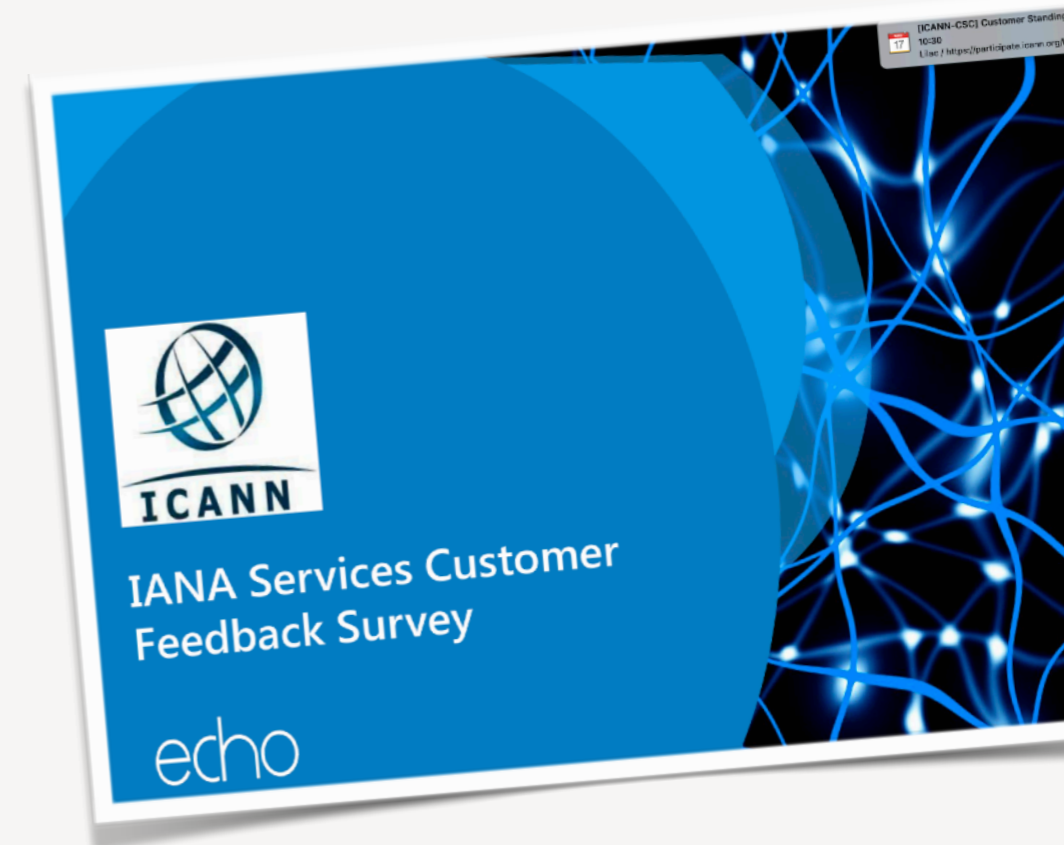
<https://iana.org/audits>

# Measuring customer satisfaction

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## Annual Survey

- Administered by a third party vendor since 2013
- Refined approach in 2019 to focus on engagement
  - Response Rate: 3%
  - Overall Satisfaction: 3.6 (1-5 scale)
- Detailed report to be published in December



# Measuring customer satisfaction

## “How did we do?”

- Launched this year
- Survey sent to customer after request is resolved
- Feedback addressed or escalated within days
- Average monthly satisfaction rate: 86%
- Average monthly response rate: 36%
- Improvements:
  - Distinguish dissatisfaction with policy versus service
  - Tools still being enhanced

The image shows a screenshot of an email survey and a feedback form. The email is from IANA Services, dated Monday, October 15, 2018, at 3:39 PM. The subject is "How was your recent IANA service experience regarding .fk?". The email body asks for feedback on the recent request handling and provides two buttons: "I had a good experience" (green) and "I had problems" (red). Below the email is a feedback form with a "Thank you!" message, a text area for additional comments, and a "Submit" button. A checkbox is checked, indicating the user wants to be contacted for further discussion.

How was your recent IANA service experience regarding .fk?

**IS** IANA Services <noreply-45900088aa66416ba9fa085fb6874313@iana.org>  
Seman Said;  
Monday, October 15, 2018 at 3:39 PM  
[Show Details](#)

Dear Colleague,

We'd like to hear about how your recent request was handled by the IANA team. Please take a single question survey to provide us your valuable feedback.

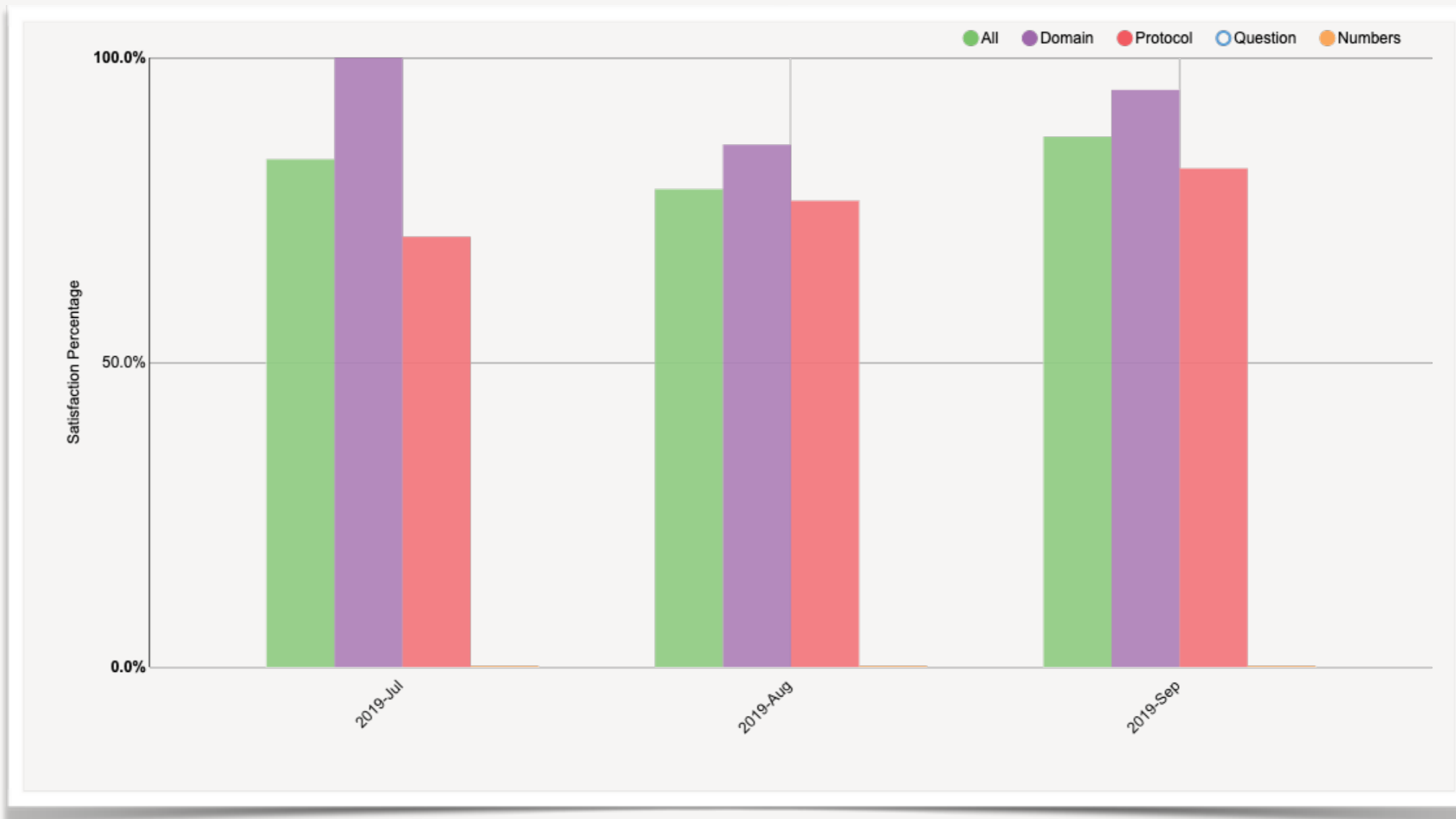
On 5 October 2018, you submitted a change request for the .fk top-level domain. How do you rate your experience?

**Thank you!**  
Your quick feedback will help us identify areas for improvement. If you have any additional comments, please provide them in the box below. If you comment and ask us to contact you, we'll be in touch soon to learn more about your issue and try to make things right.

Provide any additional comment (optional)

Please contact me to discuss my experience further

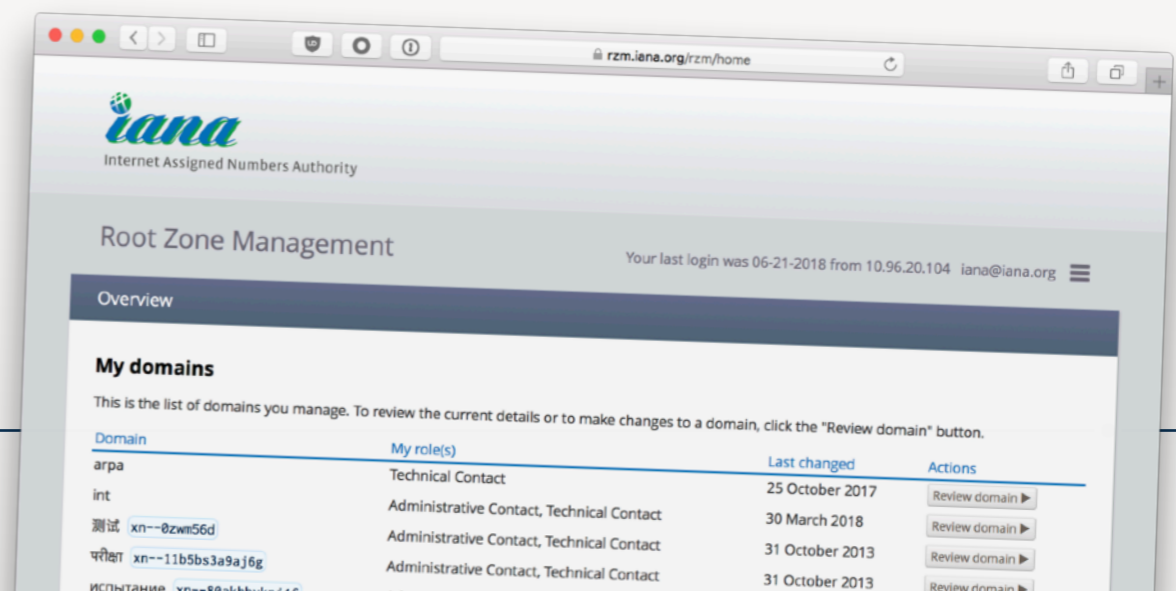
# Customer Satisfaction in recent months



	2019-Jul	2019-Aug	2019-Sep
<b>+ Satisfaction Rate (all)</b>	83.3%	78.4%	87.0%
<b>+ Satisfaction Rate (domain)</b>	100.0%	85.7%	94.7%
<b>+ Satisfaction Rate (protocol)</b>	70.6%	76.5%	81.8%
<b>+ Satisfaction Rate (number)</b>	0%	0%	0%

# Constant Improvement

- We are constantly working on ways to improve our service
- We have had SLAs with the community since 2007.
- We've been implementing business excellence and quality management since 2009, achieving certification in 2013 in the EFQM model.  
<https://www.iana.org/about/excellence>
- We've conducted annual customer surveys since 2012
- We develop systems and tools to support our work:
  - ticketing systems
  - Root Zone Management System
  - automation
  - a new Protocol Parameter Management System



# Prioritization and Planning

Kim Davies



# Strategic Plan

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- PTI's Bylaws call for PTI to have its own strategic plan
- For its first three years, the transition proposal has served as the interim strategy
- The PTI Board is now leading an effort to develop a PTI strategy
- Key objective areas identified
  - Continued focus on customer needs
  - Maintaining culture of operational excellence
  - Maintain trust and demonstrate value and usability
  - Ongoing focus on meeting evolving security requirements
  - Take steps to align with ICANN processes and annual budget

# Strategic Plan

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- Also identified need for a clarified vision statement
- Key milestones
  - Publish draft for public comment: March 2020
  - Aiming to be effective July 2020

# Budget Development

- A PTI Budget and IANA Budget are developed prior to the ICANN Budget each year
  - PTI budget represents the costs of delivering the IANA functions
  - IANA budget is those costs, plus the costs of enabling the IANA functions (such as oversight, contract management, community reviews, etc.)
  - Draft is due 9 months prior to the start of the fiscal year
- The PTI and IANA budgets are currently in public comment
  - Based on priorities discussion held with stakeholder groups in the middle of the year
- This year we are proposing a budget that is roughly consistent with the previous year
- PTI Board will be asked to approve budget at end of the year, and it will be rolled up into ICANN budget process

- 1 PTI Funding/ICANN Funding**  
FY21 Funding of PTI is \$10.0M provided solely from ICANN and is driven by the FY21 Expenses
- 2 PTI baseline cash expenses**  
FY21 Expenses of \$10.0M (including \$0.5M contingency) increased versus FY20 Forecast driven by inflationary Personnel increases of \$0.3M, partially offset by decreases in administrative activities of \$0.2M
- 3 PTI contingency**  
Contingency of \$0.5M remains flat in FY21 compared to FY20 Forecast. Contingency is about 10% of the Direct Dedicated costs and represents an amount of budgeted expense unallocated to specific activities or departments
- 4 Capital Budget**  
Capital for FY21 is for a Hardware Security Module (HSM) Replacements and Key Management Facility (KMF) improvements

TOTAL PTI in Millions, USD	PTI Services FY21 Budget	PTI Services FY20 Forecast	Under/(Over)		PTI Services FY19 Actuals	Under/(Over) Total
			Total	%		
Operating Expenses	(a) \$9.9	\$9.8	(\$0.1)	-1.2%	\$7.6	(\$2.3)
Capital	\$0.1	\$0.1	\$0.0	0.0%	\$0.3	\$0.2
<b>TOTAL</b>	<b>\$10.0</b>	<b>\$9.9</b>	<b>(\$0.1)</b>	<b>-1.2%</b>	<b>\$7.9</b>	<b>(\$2.1)</b>

(a) Included budgeted contingency of \$0.5M.

# Development Projects

# Development activity

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- Technical projects
  - Tools and System Enhancements by internal DevOps team
  - Shared projects with ICANN E&IT
  - Continuous improvement of key management facilities and key ceremonies by Cryptographic Business Operations
- Operational projects
  - Review and refinement of core business processes such as request processing
  - Implementing outcomes of audits and other reviews
- Strategic projects

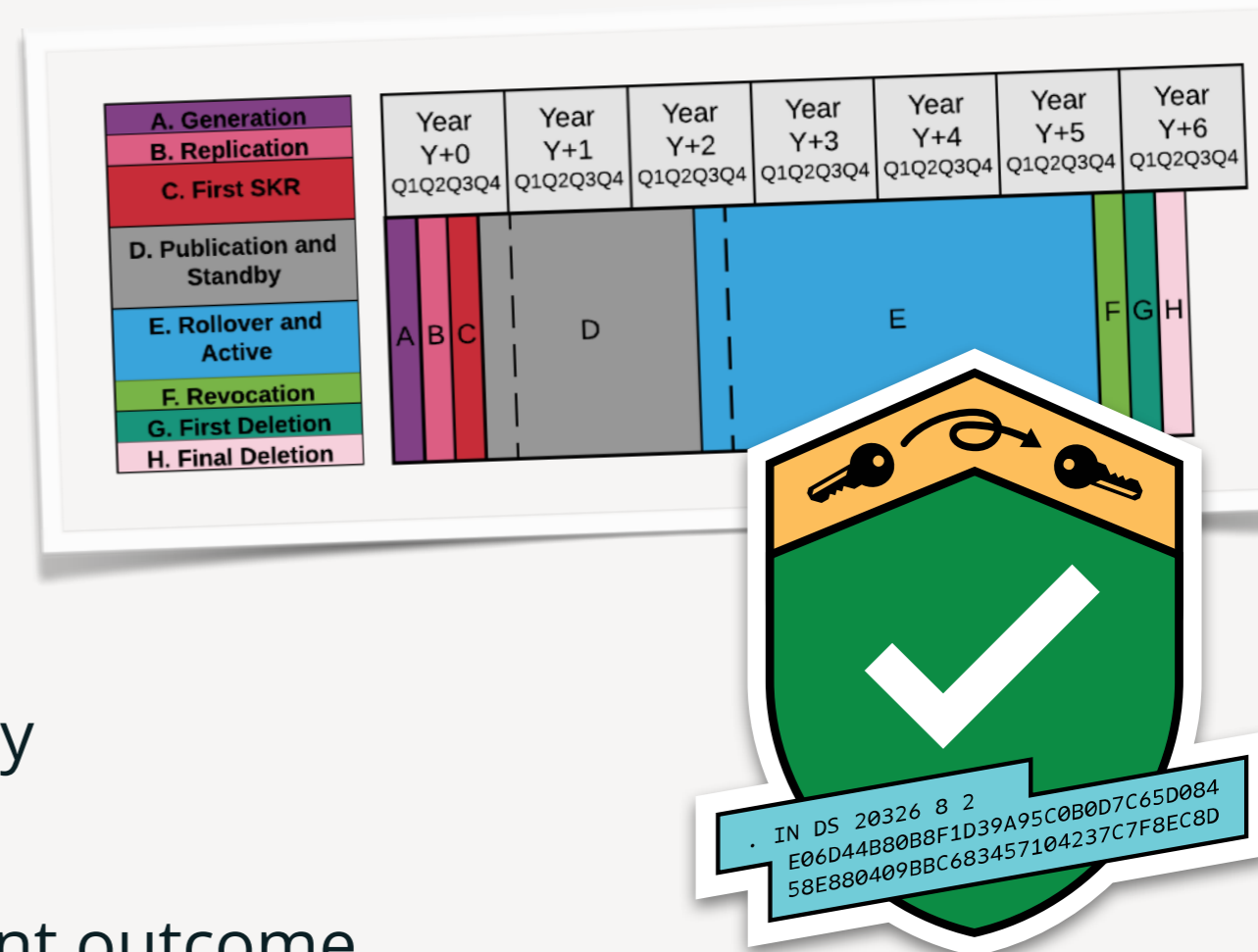
# A taste of current Projects

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- INR Dashboard (recently launched)
- **Future KSK Rollover planning**
- KMF smart card and safe improvements
- **Next-gen Root Zone Management System**
- New KSK key management tools
- **Design a new authorization model for root zone changes**
- RDAP Server for IANA resources
- Improve initial release of HDWD
- **TCR Replacements**
- .INT Zone Inventory
- Platform upgrades for Reverse DNS
- **Registry Workflow System**
- Staff tools improvements
- Replan CA configuration
- Website evolution
- KMF monitoring/dashboard
- Improve ccTLD transfer process
- Strategic Plan Development
- Next-gen protocol parameter reporting
- Enhance internal QA review process
- Root Zone download service
- Improve Root Server Operator request process

# Future KSK Rollovers

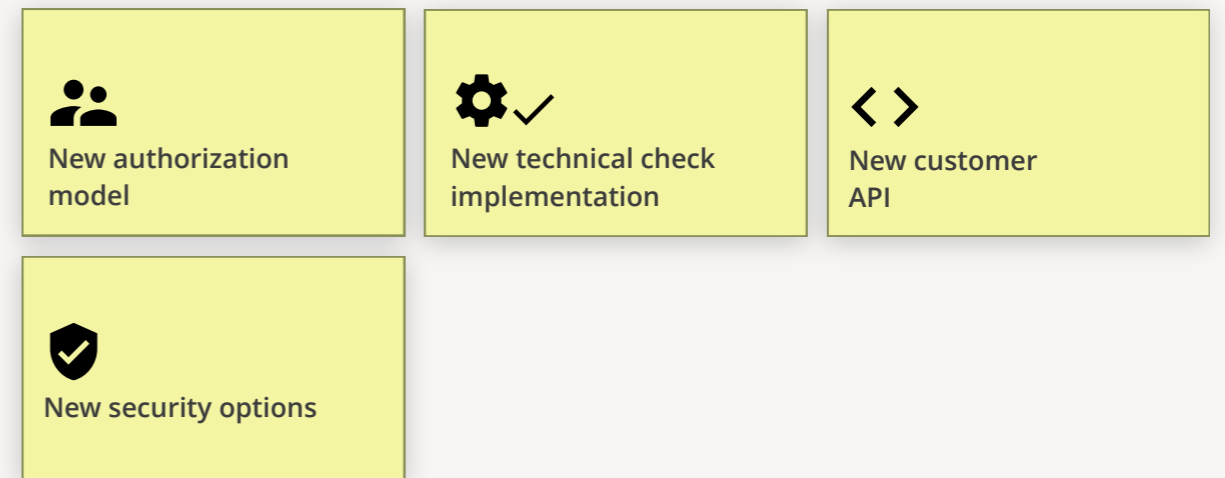
- The first KSK rollover project concluded in August 2019 with the final destruction of the original KSK
  - The cut-over to the new KSK happened 11 October 2018
- Widely considered successful
- We are now proposing a future normalized method of doing these rollovers
  - Regular cadence
  - Increased use as a standby key
  - Tweaks to the process but generally the same approach
- Put for public comment, will implement outcome starting next year



# Root Zone Management System

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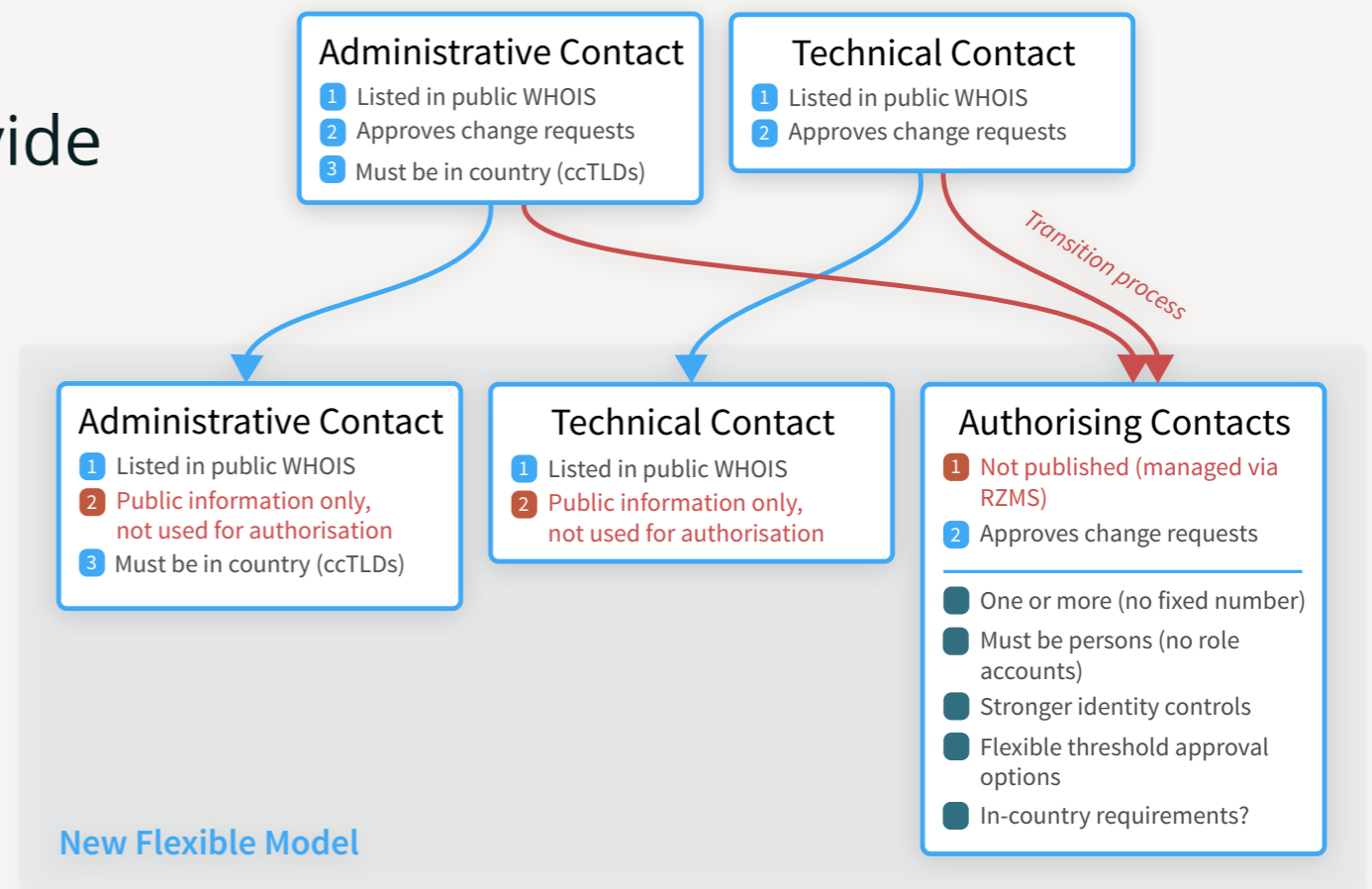
- We continue to make minor updates to our current platform
  - Latest release: RDAP service improvements in July 2019
- Fundamental rewrite of the system ongoing
- Key new features
  - New user model, including 2FA and other improvements
  - Separate the technical check component
  - Better support for bulk updates through API functionality
  - Refreshed UI with better mobile support





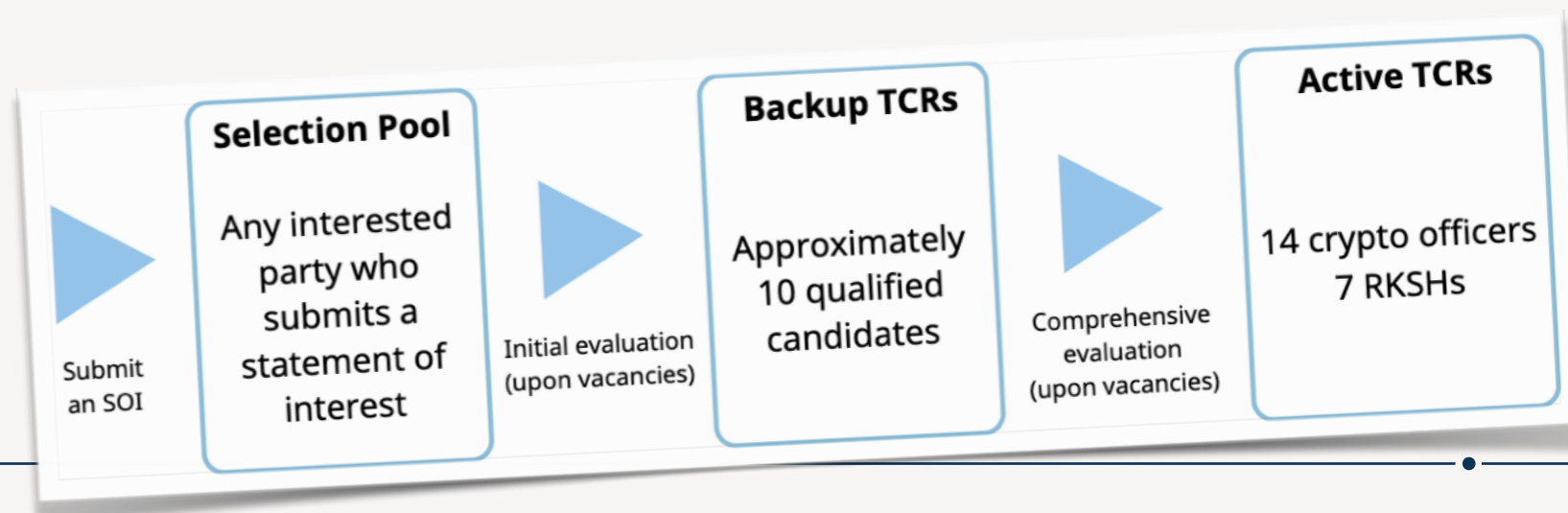
# Authorization Model

- Design a modern, flexible mechanism for approving root zone changes
- Allow for custom configurations that meets most needs expressed by current customers
- Change consent mechanism for “shared glue”
  - No longer require each impacted party to explicitly consent
  - Require normal consent, provide a brief opt-out period before proceeding



# TCR Replacement

- Trusted Community Representatives are an essential part of the Key Signing Ceremonies
  - Sometimes popularized as the “seven key-holders”
- Most TCRs have served since 2010 and anticipated increasing need to replace existing volunteers
- New evergreen process was launched
  - Over a 100 community members submitted an SOI
- Selection criteria seeks diversity in geography, culture, skills, experience, along with reputation and standing in the community
- First selections under new process recently made



# Registry Workflow System

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- Developing a comprehensive system that can support our ~3,000 protocol parameter registries
  - Take learnings from the IETF Datatracker and RZMS
- Early work has focussed on normalization
  - No common standards for registries until now
  - Massive data harmonization effort and inventory
- Now all registry data is normalized, building the UI and workflow components
- Aim: To launch Private Enterprise Numbers as the premier registry on this platform next year
  - Highest volume registry
  - Low complexity
  - Can retire an ancient system

## Post-Transition

*What has changed?*

*What stays the same?*

# The changes

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- More direct accountability to the community
- Streamlined processing of root zone change requests, that no longer require additional authorization steps to be implemented
- SLAs across all three areas of operation, mutually agreed with those communities
- A separate legal entity, with separately defined budget, Board, and other governance mechanisms
- More public accounting for performance with transparent monthly, and in some times real-time, reporting
- IANA staff now employed by PTI rather than ICANN

# The same

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- The same staff team in the same office is still providing the same functions to the same customers
- Continue to work closely with colleagues in other ICANN departments (e.g. GSE)
- No adverse changes to core request processing and customer experience
- The scope of the IANA functions remains unchanged

# In practice

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- The IANA functions continue to be provided dependably to the community.
- The transition process has tailored many aspects of governance and accountability to be a greater fit for the community
- IANA rates high levels of satisfaction and high levels of adherence to the SLAs defined by the community

# Thank you!

**Website**

[iana.org](https://iana.org)

**Service level reporting**

[iana.org/performance](https://iana.org/performance)

**Functional areas**

[iana.org/protocols](https://iana.org/protocols)

[iana.org/numbers](https://iana.org/numbers)

[iana.org/domains](https://iana.org/domains)

**More background**

[iana.org/about](https://iana.org/about)

**PTI website**

[pti.icann.org](https://pti.icann.org)