

I C A N N
POLICY FORUM

77

WASHINGTON, D.C.

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Inside IROS:

Identifier Research, Operations, and Security Function

Who We Are & What We Do



The IROS function
an umbrella that covers two teams:

**Office of the Chief Technology Officer
(OCTO)**

Collecting data, researching and writing papers, providing training and capacity building, and trying to help identify and measure DNS security threats and abuse.

IANA Functions

Delivering the names, numbers, and protocol parameters functions that the community depends upon for the Internet to work.

OCTO functions in a nutshell

- **Operations:** Liaise between OCTO and other ICANN functional teams and facilitate OCTO-specific meetings and activities - ICANN DNS Symposium (IDS), Registry Operators Workshop (ROW), How it Works Workshops (HiW), as well as provide project management support to OCTO and IANA (as requested).
- **Technical Engagement (TE):** Develop framework for organizations to cooperate, coordinate, and collaborate with ICANN on technical matters. Ensure a coherent technical engagement across ICANN by framing and communicating the organization's technical position.
- **Security Stability and Resiliency (SSR):** Facilitates cybersecurity discussions and contributes subject matter expertise or data that, in one form or another, helps to maintain secure and resilient identifier systems.
- **Research:** Provide trusted and verifiable information to the Internet community regarding the system of unique identifiers. Perform studies or analyze data to better understand the health and well-being of the DNS ecosystem.

Technical Engagement

Adiel Akplogan - VP, Technical Engagement

David Huberman - Regional Technical Engagement Manager, NA

Technical Engagement in a nutshell

- Develop and sustain relationships with other technical organizations who share the vision and responsibility for secure, stable, and resilient unique identifier system coordination.
- Responsible for building a proper framework for organizations to cooperate, coordinate, and collaborate with ICANN on technical matters.
- Coordinate ICANN initiative Knowledge-Sharing and Instantiating Norms for DNS and Naming Security (KINDNS).
- Lead and coordinate ICANN's global DNS technical capacity development program.

Two Tracks for Technical Engagement

- Technical capacity building and outreach:
 - Regional training and capacity development
 - Online technical training content
 - Training partnerships

- Engagement with the technical community:
 - Promote ICANN's technical initiatives at key technical events
 - Technical assessment of policies, regulations, and technology trends
 - Support regional communities on technical topics (IDNs, DNS, DNSSEC, security best practices for Internet Identifiers System)
 - Support SSAC, RSSAC, UASG, and other advising constituencies

Technical Engagement



Security, Stability, & Resiliency Research

John Crain (on behalf of Samaneh Tajalizadehkhoob)

SSR Research Goals

Support ICANN's contractual and operational commitment to ensure the security, stability, and resiliency of the topmost levels of the Internet's system of unique identifiers by:

- Understanding the state-of-the-art research
- Educating the community on the topics related to SSR of DNS
- Leading and carrying out research in the areas that is relevant to the SSR of DNS
- Creating tools, visuals and data that helps the community to understand and measure events related to SSR of DNS
- Facilitating cyber security discussions
- Contributing subject matter expertise or data that helps maintain secure and resilient identifier systems

Key SSR Research Activities

- Domain Abuse Activity Reporting (DAAR) project
 - Report metrics on how DNS abuse is distributed over the gTLD and ccTLD spaces
 - Help registries start their own abuse monitoring platforms
- Domain Name Security Threat Information Collection & Reporting (DNSTICR)
 - Tracking and reporting of domain registrars
- IC-DAMME
 - Helps compliance with identification of abusive domains
- RDAP Measurements
- Parked Pages
 - Identify parked pages from their DNS (NS, A, AAAA, CNAME) records
 - A feature to classify domains
- DNS Abuse prediction
 - Flag potentially malicious domain names using AI

Research

Matt Larson, VP, Research

Paul Hoffman, Distinguished Technologist

Research Goals

- Provide trusted and verifiable information to the Internet community regarding the system of unique identifiers
- Engage actively with the DNS technology communities to identify issues that fall within ICANN's remit and will benefit from the focused attention our researchers can bring to bear on the issue
- Facilitate or participate with these same communities in preparedness activities to protect against or mitigate threats to DNS ecosystem
- Perform studies or analyze data to better understand the health and well-being of the DNS ecosystem
- Root server traffic research
- Facilitate the Name Collision Assessment Project (NCAP)
- Represent ICANN org on RSSAC

Research Activities

- Identifier Technology Health Indicators (ITHI)
 - Develop metrics to measure the health of the Internet's unique identifier system
- DNS authoritative servers and resolvers
 - Concentration and distribution
- Resource Public Key Infrastructure (RPKI)
 - Coverage of DNS servers and resolvers by Route Origin Authorizations (ROAs)
- DNSSEC error reporting
 - Develop protocol and facilitate and encourage implementation
- Published DNS top-level data sets
 - DNS Core (mapping the boundary between public and private DNS)
 - TLD apex history (TLD DNS metadata tracked over time)
- ICANN Managed Root Server (IMRS) behavior
 - Tracking round trip times from various locations

OCTO Document Series

- OCTO publishes technical documents written by OCTO authors in the OCTO document series
 - Series started in 2019
 - Published 35 documents and counting
- Recent examples:
 - Observing DNSSEC Key Lifecycles (OCTO-035)
 - Challenges with Alternative Name Systems (OCTO-034)
 - DNSSEC Algorithm Use in 2022 (OCTO-033)
 - DNS Resolvers Used in the EU (OCTO-032)
 - Quantum Computing and the DNS (OCTO-031)
 - IETF Year in Review for 2021 (OCTO-030)
 - DNSSEC Deployment Guidebook for ccTLDs (OCTO-029)
 - Registrations Related to COVID-19: 18 Months of Data (OCTO-028)
 - A Primer in Registration Data Access Protocol (RDAP) Performance (OCTO-024)
- Links to all documents at <https://www.icann.org/octo/publications>

The work of the OCTO team

Where can you find it?

External work of the OCTO team

ICANN Blog

ICANN Publishes DNS Abuse Trends

22 March 2022

By [Samaneh Tajalizadeh](#)

DNS abuse is one of the most common threats to the right place to mean by DNS abuse coordinator of the D program focused on

ICANN's 2021 LAC Engagement Sessions Reached Over 3,000 Stakeholders

22 December 2021

By [Nicolás Antoniello](#) and [Daniel Fink](#)

ICANN Publishes Paper on How Quantum Computing Will Affect the DNS in the Future

17 February 2022

By [Paul Hoffman](#)

The topic of quantum computing has appeared more often in the past few years because more people are concerned about its possible effects on security and privacy. If someone can build a very large quantum computer, it would completely undermine the cryptography that is used in digital signatures (such as those used in DNSSEC) and key exchanges for privacy (such as those used in TLS).

Speaking engagements

