ICANN 79 COMMUNITY FORUM

Joint Session
SSAC & ICANN Board

Board Topic

The Board would like to understand from SSAC's point of view the essential elements of the NCAP proposal, including the key risk factors, key recommendations, and an update on the availability of the final report.

Name Collision Analysis Project

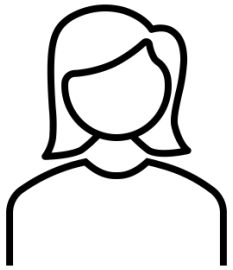
Matt Thomas and Suzanne Woolf

What Is A Name Collision?

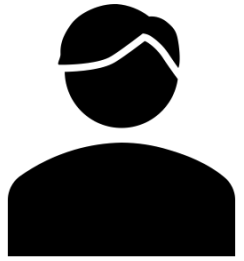
Think of domain names like house addresses.

If two houses share the same address, it becomes hard to know which one mail or deliveries should go to. There are also security issues if the mail gets delivered to the wrong address.

In the DNS, name collisions occur when a domain used in the global DNS namespace is also used in a different namespace (e.g., private enterprise), where users, software, or other functions may misinterpret it.



Home of
Danielle EndUser



Home of
Steve Networks

123 Home Ave
Example, ST USA 12345

123 Home Ave
Example, ST USA 12345

The impact of name collisions is much greater than this metaphor might suggest.

Why is Name Collision Assessment Relevant?

- **Risk of unintended consequences**. Businesses have used labels as internal TLDs in private namespaces that may leak to the global internet.
- **Introduction of new gTLDs increases probability of name collisions.** A larger pool of potential names increases the possibility that a gTLD string might unintentionally overlap with names already used in private networks or internal naming systems.
- **Measuring name collisions is difficult due to evolution of technology and network infrastructure**. Privacy enhancements in the DNS and alternative naming systems have made the DNS landscape more complex and measurements more difficult.

Why is the SSAC involved in Name Collision Studies?

- ➔ The ICANN Board wanted to ensure that gTLD delegations be done in a ***secure, stable*** and ***predictable*** manner.
- ➔ Name collisions are a factor in new gTLD delegations
- ➔ The Board tasked SSAC to conduct studies to present data, analysis and points of view, and provide
  - ◆ Specific advice regarding .home/.corp/.mail
  - ◆ General advice regarding name collisions going forward
  - ◆ Studies to be conducted in a thorough and inclusive manner

Key Takeaways from Commissioned Studies

- **Case Study of Collision Strings**
  - Potential for negative impact from name collisions has increased
  - Critical Diagnostic Measurements help predict the *impact* of name collisions
  - Leaking collision strings differ from delegated TLD queries
  - DNS service discovery protocols and search lists are a major problem

- **A Perspective Study of DNS Queries for Nonexistent Top-Level Domains**
  - Root server data itself is not enough
  - To the extent that root server data is beneficial—any root server data is sufficient
  - Similarities and differences of root server data and public recursive resolvers

- **Root Cause Analysis - New gTLD Collisions**
  - Private use of DNS suffixes (search list) is widespread
  - Name collision reports are supported strongly by measured data
  - The impact of TLD delegation ranged from *no* impact to *severe* impact

From a risk management perspective, name collisions continue to pose a persistent threat to DNS security and stability

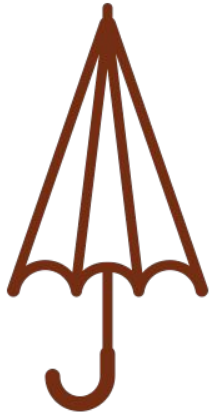
Name Collision Assessment Framework

NCAP Study 2 proposes a new **Name Collision Risk Assessment Framework** to address the documented limitations of the previous management framework.

Key Features:

- **Integrated Risk Assessment:** Embeds name collision assessment into the broader review process for new gTLD string applications.
- **Technical Review Team (TRT):** Introduces a dedicated team to evaluate proposed new gTLD strings based on empirical analysis.
- **Enhanced Data Collection:** Encourages the collection of additional quantitative and qualitative data from publicly available datasets for a more comprehensive risk assessment.
- **Multiple Assessment Methods:** Offers four methods for collecting and analyzing data to assess risk.

Goals of Proposed Name Collision Risk Assessment Framework



Goal 1: Ensure that name collisions can be assessed

- Root zone delegation is required for empirical analysis of potential name collisions
- Requires ability to define, collect, and analyze relevant measurements (see Study 2 Report)

Goal 2: Provide a process for ICANN to evaluate mitigation and remediation plans for identified name collisions

- While known causes may inform mitigation and remediation plans, further investigation may be required for specific labels
- Ensures that a mitigation or remediation plan (or both) can be developed and assessed

Proposed Process

Stage 0: Pre-Application	Stage 1: Initial Risk Assessment	Stage 2: Name Collision Assessment	Stage 3: Board Decision
Applicants encouraged to proactively assess potential name collisions by reviewing publicly available data.	TRT reviews publicly available data to assess the initial risk of name collisions	ICANN temporarily delegates the TLD string to the root zone.	TRT submits risk recommendation to the ICANN Board; applicant may propose mitigation plan for TRT review
Helps identify potential conflicts as early as possible.	If "high risk:" • TRT submits a recommendation to the ICANN Board, OR • Applicants may propose mitigation plan for the TRT's review Other applications proceed to Stage 2	TRT conducts one or more of the following assessments: • No Interruption • Controlled Interruption • Visible Interruption • Visible Interruption and Notification	ICANN Board makes the final decision on approving the application or potentially assigning the string to the Collision String List.

Technical Review Team

- We recommend establishing a highly skilled Technical Review Team to oversee the evaluation of name collision assessment.

- **TRT Member Qualifications**
  - Deep experience in *DNS management*
  - Strong understanding of *Internet infrastructure*
  - Proficient in handling historical and real-time data for *trend analysis and predictive modeling*
  - Proficient in *risk management*

- **TRT Functional Role**
  - Assess the visibility of name collisions;
  - Document data, findings, and recommendation(s);
  - Assess mitigation and remediation plan;
  - Advise on emergency response

Data Collection

You can't simply re-use the Collision detection methods you used in 2012.

- Controlled Interruption as implemented in the last round does not work for IPv6
- Root servers & Resolver operators have much less data now than in 2012
  - ➜ Due to technology and regulatory changes

To seriously analyze name collisions, you must collect data from a variety of sources.

- Impossible to build a generalized case for root causes
- Impact assessment may require large amounts of data over significant periods of time
- ICANN org has expressed concerns about risks to privacy and confidentiality with some of the proposed data collection methods
  - ➜ These concerns need to be thoroughly understood and addressed as the DG recommendations move towards implementation.

Additional SSAC Input On Name Collisions

Ram Mohan

The SSAC Work Party has so far found strong agreement with the recommendations and observations of the NCAP Discussion Group.

High Level Input (advice in progress)

- **Name collisions continue to pose a persistent threat to DNS security and stability**
- **Data collection is crucial—the question is *when* and *where* in the evaluation process**
  - 2012 ICANN framework tagged name collision assessment and mitigation *at the end* and transferred the responsibilities (and risks) to *TLD registries*
  - Since 2012, DNS technology changes make less information available at root servers and recursive resolvers for name collision analysis; controlled interruption as implemented in 2012 does not work for IPv6 only clients
  - NCAP/SSAC proposes making name collision visible, collect data *in the beginning*, give it to the technical review team to review, and use the information to inform the granting of the TLD
- **Granting the TLD to the applicant does not resolve privacy risks related to name collision; rather, it transfers these costs and risks onto the successful applicant. The applicant may also lack the capacity or incentive to properly mitigate name collision.**

High Level Input (advice in progress)

- When choosing mitigation and notification methods, **ICANN's primary focus should remain on ensuring a secure and stable DNS infrastructure**, which aligns with its mission and the global internet community's interests
- Unless there are compelling privacy concerns that cannot be mitigated, the SSAC urges ICANN to prioritize finding solutions to address privacy concerns without compromising on critical security and stability aspects

Timeline

- **Estimate: 7 Apr 2024** - NCAP Discussion Group sends SSAC the Final Study 2 Report
- **Estimate: 1 May 2024** - SSAC transmits NCAP Study 2 Report and any Advice it has on name collision to ICANN Board