Name Collisions: What They Are and Why They Matter

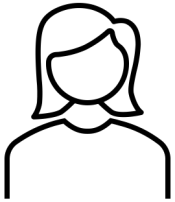
James Galvin, SSAC Liaison to the ICANN Board of Directors

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.

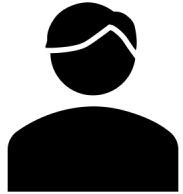
In the DNS, name collisions occur when a domain used in the global DNS namespace is also used in a different namespace (e.g., private enterprise), where users, software, or other functions may misinterpret it.



Home of Danielle EndUser

123 Home Ave
Example, ST USA 12345

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



Home of Steve Networks

123 Home Ave
Example, ST USA 12345

What Is NOT A Name Collision?

Name Collision

- A technical problem causing security & stability issues.
- Caused by delegating the exact same TLD already used in private networks.

  `example.corp` (Private Network Use)
  `example.corp` (Public Domain)

- ***Risk*:** Queries for private names "leak" to the public DNS, causing technical conflicts and security failures.

String Similarity

- A user problem causing confusability issues.
- Caused by different public TLDs that look or sound alike.

  .example (lowercase '`l`')
  .example (uppercase '`I`')

- ***Risk*:** Enables phishing, fraud, and loss of user trust.

Understanding Name Collisions is Important for Internet Security

- **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.

The Evolution of Name Collision Analysis

- 2012 new gTLD round accelerated growth of the root zone, prompting questions about what happens when new strings are added that may already be in use

- 2013: SSAC issued SAC062, highlighting that significant security and stability problems may occur as a result of name collisions
  - The most significant detected string collisions were .home, .corp, and .mail, which the Board suspended indefinitely

- 2017: ICANN Board tasked SSAC to conduct comprehensive studies to enable all future gTLD delegations to be done in a ***secure, stable, and predictable manner***

Name Collision Analysis Project (NCAP)

Suzanne Woolf, Co-Chair of NCAP Discussion Group


142
Open Teleconferences
36
Discussion Group Observers
26
Discussion Group Members
10
ICANN Public Meetings
10
Staff & Contractor Support Team Members
3
Public Comments

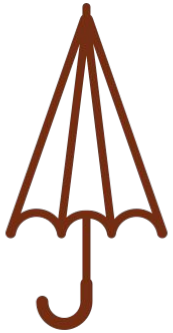
Proposed Name Collision Risk Assessment Framework

NCAP Study 2 proposed 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

Name Collision Risk Assessment Process

- Applicants perform proactive assessment using public data.

- A Technical Review Team (TRT) assesses initial risk.
- "High risk" strings require a mitigation plan review.

- Temporary delegation occurs for live data assessment.

- TRT provides a final risk recommendation to the ICANN Board
- TLD applicant may propose risk mitigation plan for TRT review
- ICANN Board makes the final delegation decision

Benefits of Name Collision Risk Assessment Framework

- ➔ **Proactive Risk Management:** Identifies name collision risks and allows for the development and review of mitigation strategies *before* they cause harm.
- ➔ **Consistent & Effective:** Centralized approach ensures thorough risk assessment and mitigation across all new gTLD applications.
- ➔ **Data-Driven:** Enables informed decisions for secure expansion of the Internet's namespace.
- ➔ **Privacy Concerns Addressed:** While risk is inherent in assessing name collisions, the privacy risk of *not* accurately assessing name collisions is greater than the risk associated with assessment. Early risk detection and informed mitigation are crucial for the security and stability of the DNS.