

Understanding Name Collision Risks:

Insights from NCAP Study Two and SAC124

12 June 2024





Agenda

- Opening and Thanks the NCAP Discussion Group (Ram Mohan, SSAC)
- Problem Statement (Rod Rasmussen, SSAC)
- Proposed Name Collision Risk Assessment Framework (Rod Rasmussen, SSAC)
- NCAP DG Report and GNSO Subsequent Procedures Name Collision Mitigation (Anne Aikman-Scalese, GNSO)
- SAC124: SSAC Advice on Name Collision Analysis (Ram Mohan, SSAC)
- ICANN org Advice Consideration Process (Danielle Rutherford, Francisco Arias, Odeline MacDonald, ICANN)
- Open Discussion

Problem Statement & Proposed Name Collision Risk Assessment Framework

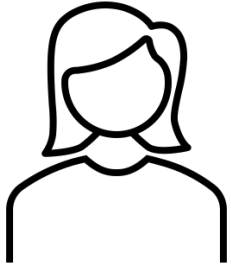
Rod Rasmussen, SSAC

What Is A Name Collision?

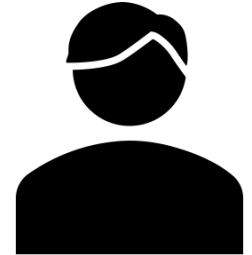
Think of domain names like house addresses.

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

Proposed Name Collision Risk 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

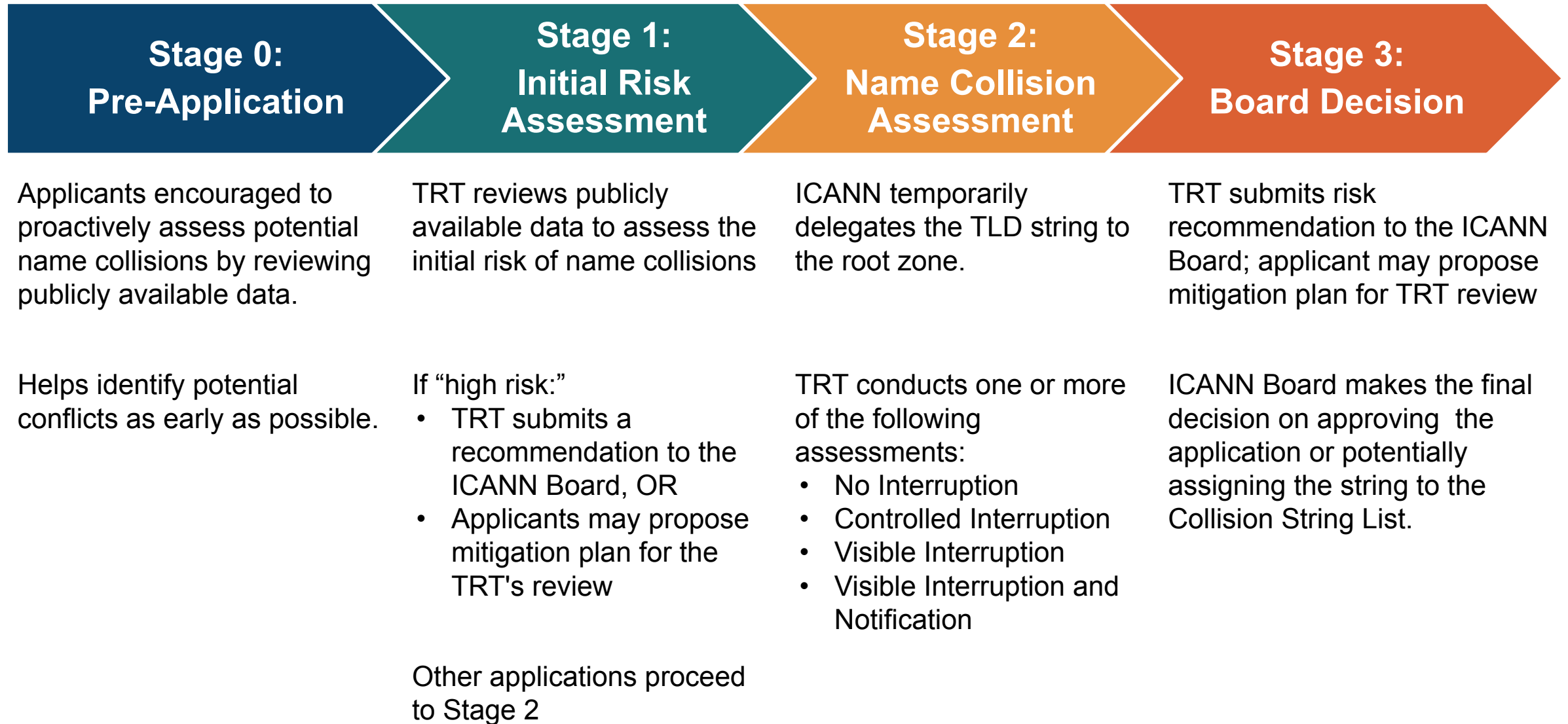
- Root zone delegation is required for empirical analysis of potential name collisions
- Requires ability to define, collect, and analyze relevant measurements (see Study 2 Report)



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



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.

Technical Review Team is Critical

Properly evaluating name collision is a highly skilled activity

- There are no generalized solutions for name collision
- The TRT needs to be able to adapt to changing internet infrastructure

To ensure TRT's success

- Building a team with the right skills to perform the assessment is critical
- The TRT needs ready access to historical as well as longitudinal data in order to perform its assessment
- TRT needs to be given the full ability to determine assessment methods and the data needs of that assessment.

NCAP DG Report and GNSO Subsequent Procedures Name Collision Mitigation

Anne Aikman-Scalese, GNSO

Subsequent Procedures Name Collision Mitigation

Recommendation 29.1: ICANN must have ready prior to the opening of the Application Submission Period a mechanism to evaluate the risk of name collisions in the New gTLD evaluation process as well as during the transition to delegation phase.

Rationale for Recommendation 29.1: The Working Group agreed that the recommendation that ICANN must include a mechanism to evaluate the risk of name collisions in the TLD evaluation process as well during the transition to delegation phase is still relevant, with the addition of the requirement for such a mechanism to be ready prior to the next application period. The Working Group agreed that the requirement for a mechanism would promote predictability for applicants and other parties. In response to concerns raised in comments, the Working Group agreed that it did not have to recommend what the mechanism is.

Affirmation 29.2: The Working Group affirms continued use of the New gTLD Collision Occurrence Management framework unless and until the ICANN Board adopts a new mitigation framework. This includes not changing the controlled interruption duration and the required readiness for human-life threatening conditions for currently delegated gTLDs and future new gTLDs.

Implementation Guidance for Name Collisions

29.3: To the extent possible, ICANN should seek to identify high-risk strings in advance of opening the Application Submission Period, which should constitute a “Do Not Apply” list. ICANN should also seek to identify aggravated risk strings in advance of the next application window opening and whether it would require a specific name collision mitigation framework. Implementation

29.4: To the extent possible, all applied-for strings should be subject to a DNS Stability evaluation to determine whether they represent a name collision risk.

29.5: The ICANN community should develop name collision risk criteria and a test to provide information to an applicant for any given string after the application window closes so that the applicant can determine if they should move forward with evaluation.

29.6: If controlled interruption (CI) for a specific label (usually a 2nd-level domain) is found to cause disruption, ICANN may decide to allow CI to be disabled for that label while the disruption is fixed, provided that the minimum CI period is still applied to that label.

SAC124: SSAC Advice on Name Collision Analysis

Ram Mohan, SSAC

Overview of SAC124 Findings

The SSAC **fully endorses and strongly recommends** the ICANN Board adopt the Proposed Name Collision Risk Assessment Framework.

Why?

- **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.

SAC124: SSAC Advice on Name Collision Analysis

- **Multiple privacy risks when considering name collision analysis**
 - **Delegation Risk:** High risk of exposing personal data in collisions go unnoticed during normal operation
 - **Assessment Risk:** Privacy risks associated with the execution of data collection needed to assess collisions
- **Trade-Offs:**
 - Avoiding Assessment Risk is a mistake—it leaves Delegation Risk unaddressed, compromising security and stability of the DNS
 - Focus on the bigger threat and prioritize mitigating Delegation Risk
 - Implement safeguards to protect collected data during assessment (data minimization, clear data handling policies)
- **SSAC Recommendations:**
 - Adopt the Proposed Framework with safeguards to address privacy concerns.
 - Prioritize mitigating Delegation Risk for a secure and stable next-gen gTLD rollout.

Addressing Privacy Concerns

- SSAC acknowledges ICANN org's privacy concerns and emphasizes:
 - Name collisions pose inherent privacy risks, and ignoring them doesn't eliminate these risks, it merely transfers them to others, potentially leading to greater harm
 - ICANN's role in ensuring the stable and secure operation of the Internet's unique identifier systems requires data collection to make informed decisions and proactively mitigate security and stability risks
- Proposed Framework's proactive approach is essential for protecting user privacy by minimizing the potential for harmful name collisions
- Proposed Framework itself does not explicitly detail how to balance privacy and SSR risks
 - The Board has the opportunity to ensure this balance is achieved by design through oversight of the Proposed Framework's implementation
- SSAC welcomes the engagement from ICANN org and is committed to offer its expertise throughout the implementation process

ICANN org Advice Consideration Process

Danielle Rutherford, Francisco Arias, Odeline MacDonald

Advice Consideration Process

ACKNOWLEDGE

Formally record the receipt of the Advice document and notify the Advice Provider

UNDERSTAND

Ensure a complete understanding of the Advice and any recommended actions

EVALUATE & CONSIDER

Assess the feasibility and impact of the Advice, and prepare for Board review

IMPLEMENT

Execute approved actions from the Board and keep the Advice Provider informed of progress

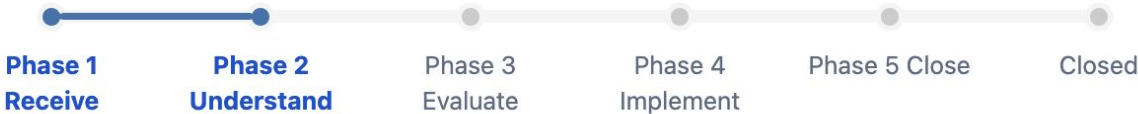
CLOSE OUT

Obtain formal confirmation of completion

Advice is Tracked Publicly on the [Community Wiki](#)

SSAC Advice on Name Collision Analysis (R1)

Date Issued	Document	Reference ID	Current Phase
 01 May 2024	SSAC Advice on Name Collision Analysis (R1)	SAC124	Phase 2 Understand



Description:

The SSAC recommends that the ICANN Board adopt and implement all the recommendations in NCAP Study Two.

STATUS UPDATES

Date	Phase	Type	Status Updates
 08 May 2024	Phase 2	Phase Update	ICANN received SAC124, acknowledged, and is currently reviewing
 08 May 2024	Phase 2	Phase Change	Now Phase 2: Understand
 08 May 2024	Phase 1	Phase Update	ICANN acknowledged receipt of Advice
 06 May 2024	Phase 1	Phase Change	Now in Phase 1: Acknowledge
 01 May 2024	Phase 1	Phase Update	SSAC published SAC124: SSAC Advice on Name Collision Analysis Link: https://itp.cdn.icann.org/en/files/security-and-stability-advisory-committee-ssac-reports/sac-124-01-05-2024-en.pdf

Evaluating SAC124 and NCAP2

Technical Feasibility

- Existing capabilities vs. required changes
- Timelines for implementation
- Potential risks or unintended consequences

Legal Feasibility

- Data protection impact assessment

Operational Impact

- Estimate resource requirements
- Develop draft implementation plans, including timeline identifying potential impacts on the next round timeline

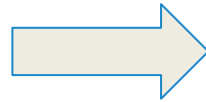
Financial Analysis

- Prepare budget estimates for implementing Name Collision Analysis Framework
- Estimate additional cost to applicants as the next round is operated on a cost recovery basis

High-Level Data Protection Assessment based on Study 2

Identified data protection risks

- Possible lack of legal basis
- Lack of transparency
- Lack of data minimization



Mitigation Steps from the Assessment

- Identify suitable legal basis for data processing
- Apply data minimization measures
- Ensure transparency with clear notices
- Implement security measures
- Conduct data protection impact assessments as required by laws like GDPR

Challenges

- These findings are only based on a high-level assessment
- There are still a lot of unknowns
- The nature of data collection is unpredictable
- There may be high residual risks if the mitigation steps are not or cannot be implemented
- A thorough assessment is needed throughout the different phases, from design to implementation
- Compliance with data protection laws is difficult!

Discussion

Moderator: Ram Mohan, SSAC

Open Discussion

- What are your initial thoughts on the Proposed Framework and its potential impact on mitigating name collision risks?
- What specific concerns or questions do you have regarding the balance between privacy protection and the need for effective risk assessment?
- What additional factors or considerations should be taken into account for the consideration of NCAP Study Two?