

SSAC Proposal for the Name Collision Analysis Project



STATUS OF THE DOCUMENT: FOR PUBLIC COMMENT
28 February 2018

Preface

This project proposal has been prepared by the ICANN Security and Stability Advisory Committee (SSAC) and details its approach for studying name collision in response to the ICANN Board's request in resolutions 2017.11.02.29 - 2017.11.02.31.

The SSAC expects a final project proposal, taking account of public comments, will be ready for Board approval in May 2018.

The SSAC focuses on matters relating to the security and integrity of the Internet's naming and address allocation systems. This includes operational matters (e.g., pertaining to the correct and reliable operation of the root zone publication system), administrative matters (e.g., pertaining to address allocation and Internet number assignment), and registration matters (e.g., pertaining to registry and registrar services). SSAC engages in ongoing threat assessment and risk analysis of the Internet naming and address allocation services to assess where the principal threats to stability and security lie, and advises the ICANN community accordingly. The SSAC has no authority to regulate, enforce, or adjudicate. Those functions belong to other parties, and the advice offered here should be evaluated on its merits.

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1 Introduction

On 2 November 2017, the ICANN Board passed resolutions (2017.11.02.29 - 2017.11.02.31) requesting the ICANN Security and Stability Advisory Committee (SSAC) to conduct studies to present data, analysis, and points of view on .CORP, .HOME, and .MAIL (C/H/M) and other Collision Strings. In the resolution, the Board also requested the SSAC to do the work in a timely and organized fashion, with adequate visibility on costs and schedule, which shall be subject to review and approval by the Board.

Following the Board resolution, the SSAC initiated the project planning in December 2017. In January 2018, the SSAC Name Collision Analysis Project (NCAP) Work Party was formed. It has been meeting weekly to discuss and prepare the project plan.

The current document represents a snapshot of the project planning in progress. With much detail still to be worked out, it provides a high-level view of the planned approach. The document does not represent the consensus of the SSAC, but a straw man proposal to stimulate community discussion and feedback. In particular, there is a section on Risk Management at the end of the document that outlines why any proposed timelines are only estimates at this stage and could substantially change based on knowledge gained throughout the execution of the plan. The SSAC expects a final project proposal, taking account of public comments, be ready for approval in May 2018.

Current view of the project scope includes three major studies, three workshops, and a final report. The estimated duration of the project is about two years at a budget of \$3.6 M. This is a high-level rough order of magnitude estimate at this point provided as a snapshot of the project plan. The SSAC will advise the Board promptly of any significant variation to the timeline or budget of the project.

2 Background

2.1 Terminology

Name Collision refers to the situation where a name that is defined and used in one namespace may also appear in another. Users and applications intending to use a name in one namespace may actually use it in a different one, and unexpected behavior may result where the intended use of the name is not the same in both namespaces. The circumstances that lead to a name collision could be accidental or malicious. In the context of top-level domains (TLDs), the conflicting namespaces are the global Internet Domain Name System (DNS) namespace reflected in the root zone as published by the Root Zone Management Partners and any other namespace, regardless of whether that other namespace is intended for use with the DNS or any other protocol. Definitions of other terms will be added as the project progresses.

2.2 Board's Request

In resolutions (2017.11.02.29 - 2017.11.02.31) the Board requests the SSAC to conduct studies to present data, analysis and points of view, and provide advice to the Board:

1. Regarding the risks posed to users and end systems if .CORP, .HOME, .MAIL strings were to be delegated in the root, as well as possible courses of action that might mitigate the identified risks.
2. On a range of questions that include, but are not limited to, the following:
 - a. a proper definition for name collision and the underlying reasons why strings that manifest name collisions are so heavily used.
 - b. the role that negative answers currently returned from queries to the root for these strings play in the experience of the end user, including in the operation of existing end systems;
 - c. the harm to existing users that may occur if Collision Strings were to be delegated, including harm due to end systems no longer receiving a negative response and additional potential harm if the delegated registry accidentally or purposely exploited subsequent queries from these end systems, and any other types of harm;
 - d. possible courses of action that might mitigate harm;
 - e. factors that affect potential success of the courses of actions to mitigate harm;
 - f. potential residual risks of delegating Collision Strings even after taking actions to mitigate harm;
 - g. suggested criteria for determining whether an undelegated string should be considered a string that manifest name collisions, (i.e.) placed in the category of a Collision String;
 - h. suggested criteria for determining whether a Collision String should not be delegated, and suggested criteria for determining how remove an undelegated string from the list of Collision Strings; and
 - i. measures to protect against intentional or unintentional creation of situations, such as queries for undelegated strings, which might cause such strings to be placed in a Collision String category, and research into risk of possible negative effects, if any, of creation of such a collision string list.

In addition, the Board requests that:

1. the SSAC conduct the study in a thorough and inclusive manner that includes technical experts (such as members of IETF working groups, technical members of the GNSO, and other technologists); and
2. the SSAC conduct the study in a timely and organized fashion, with adequate visibility on costs and schedule, which shall be subject to review and approval by the Board.

3 Project Proposal

In this section, the SSAC provides the following proposal for the Board’s consideration and for the information of the ICANN Community and other interested parties. The proposal has eight subsections: project team, project scope and deliverables, project timeline, project cost, project communications, project procurement, project risk management, and conflict of interest discussion.

3.1 Project Teams

As part of the resolution, the Board requests that the studies be conducted in a thorough and inclusive manner that includes technical experts (such as members of IETF working groups, technical members of the GNSO, and other technologists). To fulfill this requirement, several teams are identified to perform the work of the NCAP.

SSAC NCAP Work Party (“NCAP WP” or “WP”) will be the primary team for conducting the work and responsible for all deliverables from the project.

- **Purpose:** The WP will study the name collision issues requested by the Board resolution. To inform its analysis and deliberation, it may contract independent third parties to assist in the data collection, analysis, and modeling of name collision and mitigation methods.
- **Membership:** Membership of the NCAP WP will start with volunteers from the current members of the SSAC. Membership will be extended to non-SSAC technical experts (SSAC Invited Guests) by invitation from the NCAP WP with a set of criteria determined by the WP. Membership for the NCAP WP will be limited to about 50 experts. Contracting and engagement of independent third parties will be performed by full SSAC Members only and not Invited Guests.
- **Chair:** If required, the SSAC Administrative Committee will appoint one or more interim Chair(s) prior to project kick-off until the Work Party is fully formed (with external experts) and able to appoint its Chair(s).
- **Criteria to Invite Experts:** Details are to be determined by the WP. At a minimum, an invited expert is expected to have made a contribution to related work in the past or to the current work on name collision through the opportunities provided to the public.
- **Working Methods:** The NCAP WP will follow existing well-established processes for SSAC work parties, including but not limited to the ability to handle confidential materials and invite external experts to be members (Invited Guests). According to those processes, the NCAP WP will determine and publish its working methods for its email group list(s) and its meetings. Since there may be confidential materials made available to the WP, it is likely that some of its work will need to be conducted on a closed email group list and in closed meetings. Open meetings where the public may participate and contribute to the work will be scheduled at least at every ICANN meeting.

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NCAP Discussion Group (“NCAP DG” or “DG”) is an open public group dedicated as a discussion forum on name collision issues pertaining to the SSAC study.

- **Purpose:** The DG is provided as one of the methods by which the community may engage with the WP and make contributions for consideration by the WP.
- **Membership:** All members of the WP will be part of the NCAP DG. In addition, anyone can join this group and there is no limit placed on the size of its membership.
- **Working Methods:** Members of the discussion group can share any data, analysis, and viewpoints on the study. The NCAP WP will share its latest work products, solicit feedback on draft work, and announce public NCAP WP meetings.

The SSAC Admin Committee is the project executive sponsor, oversees the project progress and serves as the escalation point for the NCAP WP.

ICANN organization will make resources available for project management, legal, secretariat, technical writing and meeting support. A Project Manager, Technical Writer and Administrative Assistant will be assigned to the project. For the purpose of this proposal, this assumes that the aforementioned project resources will be contracted as additional cost.

To enhance transparency and in accordance with ICANN standard practice, all members of the NCAP WP, the NCAP DG and the SSAC Admin Committee will be requested to submit a Statement of Interests (SOI), based on the ICANN standard SOI with additional specific questions relevant to name collisions.

3.2 Conflicts of Interest

The SSAC as a whole recognizes that the risks around conflicts of interest are potentially higher for this project than many other projects that SSAC undertakes. The SSAC has a detailed and well-established process for managing conflicts of interest in its Operational Procedures that will be used for this project.

- All members of the NCAP WP, the NCAP DG, the SSAC Admin Committee, and potential Invited Guests and contractors are required to fill out a detailed statement of interest declaration.
- This declaration asks specific questions, including about any financial relationships that may exist.
- Any conflicted SSAC members will be expected to recuse themselves and the declarations will be reviewed by the SSAC Admin Committee to ensure this is properly applied.
- The SSAC reserves the right to decline participation by any potential Invited Guest or contractor who has a conflict of interest.

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- All members of the WP, whether SSAC members or Invited Guests, as well as contractors, will be required to sign the same NDAs and possibly other confidentiality agreements that are developed throughout this project covering the project work, access to the data and the findings produced.

SSAC wishes to specifically draw your attention to the following:

- Due to the limited expertise available in what is a complex and niche area, the SSAC Admin Committee does not plan to exclude members of the WP or their affiliated companies from bidding for the work.

3.3 Project Scope and Deliverables

The scope of the project answers the Board's questions in its resolutions 2017.11.02.29 - 2017.11.02.31. Currently, the project is envisioned to be composed of multiple contracted studies, workshops, ICANN meeting sessions, community input tracking and evaluation, and production of reports. These are described in detail below.

3.3.1 Study One: Understanding the Current State of Name Collisions and Data Repository

Name collision is not a new issue and much work has been done on it before. Past work is likely to have utility going forward for this project and so needs to be thoroughly examined and the pertinent issues brought forward. In addition, given the work that has already taken place, some people know much about this issue while others know little and so the output needs to include a means to bring the latter group up to speed quickly.

It is anticipated that collection of data is needed for this study. The work on creating a data repository and supporting rules is not dependent on other study tasks and thus can be undertaken in parallel with the other work. Completing such background administrative work allows the second study to proceed expeditiously.

Thus, the goal of the first study is twofold. The first goal is to examine all prior work on the issue of name collisions and produce a summary report that brings forwards important knowledge from prior work into this study, and which can act as a primer for those new to the subject. The second goal is to create a data repository with all the supporting rules in place as to how the data will be managed and processed.

Study Tasks include the following:

1. Properly define name collision
2. Review and analyze past studies and work on name collision
3. Produce a written report that provides a simple explanation of the issue, lists all the previous work on the subject, any actions taken so far and any important points that should be brought forward for this project
4. Present the report as widely as possible to ensure strong community engagement.
5. Develop rules regarding any datasets collected. This will need to consider:
 - a. Anonymization of data to comply with privacy laws

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- b. Protection of data submitted under confidentiality provisions
 - c. Defining data retention policies
 - d. Determining whether instrumentation for performing the data analysis should be made available for public use
6. Create a data register which logs the source of datasets, the date or period over which the data was collected and key identifying features
 7. Create a common data repository where the data can be stored and processed efficiently and, if necessary, confidentially
 8. Data repository with associated data management procedures and tools

Study Design: The study will be conducted in two parts that will take place simultaneously. Each part will be preceded by a procurement phase for that part.

- Part 1: Analysing previous work and producing a report
- Part 2: Preparing to accept the data needed for study 2

Study Deliverables are data repository and study reports.

Estimated Time duration for the study is 4 months.

3.3.2 Study Two: Name Collision Root Cause and Impact Analysis

The goals of the second study are twofold. First is to understand the root cause of a majority of the name collisions. Second is to understand the impact of any choice made regarding .CORP, .HOME, and .MAIL, including leaving them undelegated.

Study Tasks include the following:

1. Gathering data:
 - a. Gather available data from past studies.
 - b. Identify gaps in current data and determine additional datasets or data providers that are needed. The additional datasets may include more recent/up-to-date data on queries to the DNS root servers and recursive resolvers. It may also include new datasets. Examples may include DNS query data inside corporate networks, information on name collision instances, and non-DNS data such as internal certificates.
 - c. Gather new data from a variety of sources for analysis (size of final data set is expected to be on the order of 10 - 100 terabytes).
2. Conduct a root cause analysis, which aims to identify each of:
 - a. *Use Cases* - how each of .CORP/.HOME/.MAIL is used in a private context currently
 - b. *Leakage Scenarios* - what leakage of DNS queries using .CORP/.HOME/.MAIL is seen and the mechanisms by which such leakage occurs.

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- c. *Delegation Forms* - the different forms of delegation that might occur including “not delegated”.
3. Build a test system, which can be used in the impact analysis to fill in gaps in the data and comprehensively test every name collision. This same test system will be used in Study 3 to test possible mitigations.
4. Conduct an impact analysis, which aims to identify each of:
 - a. Name collisions - what happens for each use case under each leakage scenario and for each delegation form.
 - b. Name collision impacts - what the system making the query that is affected by a name collision may or may not do as a result of a name collision.
 - c. Impact sizing - Estimate the scale and severity of each name collision impact.

Study Design: This study will be conducted in four parts:

- Part 1: Collecting the data needed for the root cause analysis and the impact analysis
- Part 2: Conducting the root cause analysis and is expected to be primarily data analysis focused.
- Part 3: Building the test system for the impact analysis to supplement the data analysis
- Part 4: Performing the impact analysis.

Study Deliverables include filling the data repository with data, preliminary and final report for the root cause analysis, test system for the impact analysis and preliminary and final report for the impact analysis.

Estimated Time duration for this study is 6 months.

3.3.3 Study Three: Analysis of Mitigation Options

Having produced a thorough report in Study 2 of what actually does happen we now need to examine all possible ideas for mitigation and what mitigation they might provide. With an understanding of those mitigations we can provide advice on delegation. Study 2 will also have created the test system used in this study to test the potential mitigations, if they can be tested.

The goals of this third study are twofold; First is to identify all the possible mitigation options, particularly those proposed by applicants or other interested parties, and examine each in depth to assess the potential mitigation each can offer. Second is to produce guidance on the delegation of C/H/M and other strings where name collisions will occur.

Study Tasks includes the following:

1. Identify all possible courses of action that might mitigate harm for C/H/M

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2. Explore possible courses of action that might mitigate harm for other Collision Strings
3. Test or otherwise attempt to predict the outcome of proposed mitigation options.
4. Examine factors that affect potential success of the courses of actions to mitigate harm
5. Examine potential residual risks of delegating Collision Strings even after taking actions to mitigate harm
6. Suggest criteria for determining whether an undelegated string should be considered a string that manifest name collisions, (i.e.) placed in the category of a Collision String
7. Suggest criteria for determining whether a Collision String should not be delegated, and suggested criteria for determining whether to remove an undelegated string from the list of Collision Strings
8. Suggest measures to protect against intentional or unintentional creation of situations, such as queries for undelegated strings, which might cause such strings to be placed in a Collision String category
9. Research into risk of possible negative effects, if any, of creation of such a collision string list

Study 3 Design: The study will be conducted in two parts. Preceding the studies, study preparation work that includes identification of the required data and contracting will be performed by the NCAP WP.

- Part 1: Identification and assessment of mitigation options.
- Part 2: Production of recommendations regarding delegation.

Study Deliverables include preliminary and final reports for the study.

Estimated Time duration for this study is 4 months.

3.3.4 Workshops & ICANN Sessions

The SSAC WP envisions holding three workshops. The purpose of the workshops is to engage the community and solicit input for the statement of work for each of the envisioned studies; brainstorm, discuss, and review the data, methodology and results of each of the studies; and consult the community on the risk analysis and mitigation options.

The workshops are envisioned to be four days each, with 1-2 days for public engagement and 2-3 days of private interactions. The first two workshops are expected to be held adjunct to an ICANN meeting.

In addition to the workshops, the NCAP WP plans to meet in person at each ICANN meeting. These meetings will have time set aside for public engagement.

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Estimated Budget for the workshops and ICANN meetings will be based on travel cost for twenty NCAP members for the workshops and ten project funded travelers for ICANN meetings.

3.3.5 Project Deliverables

- Project estimate information to the Board (Board info paper)
- Draft project plan for community input (Public Comment)
- Updated project plan published on NCAP wiki.
- Workshop Reports
- Study Reports
- Preliminary NCAP report for public comment
- NCAP Report (Formal SSAC Advice to the ICANN Board)

3.4 Project Timeline

The Board has requested SSAC to conduct these studies in a timely and organized fashion. While noting the duration of each task in full, opportunities for early starts and overlaps have been considered to optimize the total duration of the project. The critical path of the project is primarily defined by the sequential tasks of the studies that have dependencies on earlier studies. The project duration from project kick-off is about two years.

The project kick-off is assumed to be in June 2018. The project start is dependent on the Board approval and allocation of resources by ICANN organization. Prior to this date, the project is considered to be in initiation phase that includes the Board review of the plan, formulation of the WP, and presentation of the project plan to the community for comments.

The timeline summary view of the project is provided in the figure below.

Timeline - Summary View													
2018					2019							2020	
Jun	- Aug	Sep	-	Dec	Jan	-	Jun	Jul	-	Oct	Nov	Dec	Jan-Jun
Study Prep		Study 1 (4mo)			Study 2 (6mo)			Study 3 (4mo)			Final Report (7mo)		
WS1						WS2					WS3		
Kickoff													

3.5 Project Cost

The project cost is estimated at this time to be \$3,600,000 over 3 fiscal years. Costs are in three major parts: contracted studies, travel cost for workshops and ICANN meetings, and project support cost.

Project Support cost includes secretariat support, technical writer and project management.

Travel Cost includes funding for three workshops, funding for the work party at ICANN meetings, and to other venues as requested by the project.

3.6 Project Communications

The project will be conducted in a thorough and inclusive manner, with adequate visibility. At a high level, the SSAC intends to meet these requirements in the following ways:

- Public consultation and feedback will be sought on the Project Plan, study methodology, study findings, analysis, and recommendations, throughout the project.
- A community wiki page will be used to communicate project background, plans, status, calls for inputs, and FAQs. This will be the project home workspace facing the public. An NCAP Data Submission Proforma will be available on this page for formal inputs. The project wiki page will be located under the “Projects” tab and titled “NCAP.” <https://community.icann.org/category/prj>
- The WP welcomes both formal and informal inputs throughout the project from anyone, at any time, in person or remotely. All formal inputs will be tracked and responded to by the WP.
- The Discussion Emailing List (ncap-discuss@icann.org) will be created to facilitate sharing of data, suggestions, coordination, and discussion. This email list will be open to any interested person to join upon submission of an NCAP SOI in accordance with standard ICANN procedure.
- The WP will produce summaries of activities to be reported out by the SSAC as part of its ordinary reporting and newsletters for the ICANN community.
- Public sessions will be held at every ICANN meeting to update the community on project progress. The work party meetings will also be open to the public at ICANN meetings.
- Public announcements will be made on ICANN.org for key project milestones.
- Three dedicated workshops where participants can present data and viewpoints will be held.

3.7 Project Procurement

- The NCAP plans to procure study services for all three studies. The procurement may consist of RFPs and direct contracting based on the scope of work.
- Due to the limited expertise available, NCAP plans not to exclude members of the WP or their affiliated companies from bidding for the work.
- Evaluation criteria for qualification for the work will be publically made available at the time of the RFP.
- Selection of the supplier will be conducted by the ICANN Organization based on the criteria defined by the NCAP WP following the ICANN procurement process.

3.8 Project Risk Management

The NCAP WP has identified the following set of risks. At this stage, they are recorded with a simplified methodology that will be expanded as needed. In particular, no mitigations are presented at this stage and the risk is rated atomically rather than using a more detailed combination of likelihood and impact. The NCAP WP notes that some of these are sufficiently highly rated that they render problematic any estimates of timelines or budgets to complete this research.

The NCAP WP and the SSAC Admin Committee will monitor the activities and progress of the NCAP WP to identify additional risks and consider mitigation steps throughout the project.

Risk	Triggers	Rating
<p>The WP may not be able to produce any useful and/or authoritative output</p> <p>(Note - this is the top-level risk under which all other risks are listed as triggers)</p>	<ol style="list-style-type: none"> 1. Insufficient data is made available for the studies. 2. The degree of active testing required is not possible. 3. The output of the WP has low credibility within the ICANN Community. 4. The scope of the project has been seriously underestimated. 5. A serious problem develops with the management of the project. 	High
<p>Insufficient data is made available for the studies</p>	<ol style="list-style-type: none"> 1. ICANN, as host for the data, may identify legal issues, such as those that derive from the GDPR, which leads it to be unable to host the full datasets required. 2. Complex confidentiality rules will be required for WP members and contracted third parties. These rules may take significant time to determine and the 	High

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	<p>process of doing so may uncover difficult or even intractable issues.</p> <ol style="list-style-type: none"> 3. The third parties who have datasets needed for this study may not make them available due to concerns about confidentiality within the data (i.e. what it contains) or confidentiality of the data (i.e. who it is shared with) or other yet to be determined concerns. 4. Some data may be hard to find. 5. The data management requirements are significant and if an error is made this may lead to third parties withdrawing existing data and refusing to provide new data. 	
<p>The degree of active testing required may not be possible</p>	<ol style="list-style-type: none"> 1. Legal concerns that certain forms of active testing are unacceptable due to perceived risk of negative impact may exclude those from the studies. 2. A precedent for an unwillingness to sanction certain forms of active testing may have been set by ICANN Org with the introduction of Controlled Interruption rather than other forms of active testing recommended by the ICANN Community. 	<p>High</p>
<p>The output of the WP has low credibility within the ICANN Community</p>	<ol style="list-style-type: none"> 1. If SSAC members are chosen as the contractors then this may lead to perception that the scale of the studies and the methodology behind them was chosen to create and/or inflate the value of contracts commissioned for the benefit of SSAC members. 2. If SSAC members that are linked to those bidding for C/H/M or likely to be contracted to successful bidders for C/H/M, are perceived as being given favorable treatment compared to people in a similar position who are not SSAC members. 3. If SSAC members that are linked to those bidding for C/H/M or likely to be contracted to successful bidders for C/H/M, are perceived as having been in a 	<p>Medium</p>

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	<p>position where they could influence the outcome of the WP in favor of their employers or their own financial benefit.</p> <p>4. The output of the WP is perceived by the ICANN Community as an “inside job” - SSAC being a tool to minimize liability to ICANN Org at the cost of many community dollars and time.</p>	
<p>The scope of the project has been seriously underestimated</p>	<p>1. The production of an upfront plan when so much of the project is not yet understood leads to a significant degree of estimation, which may contain several errors.</p> <p>2. The nature of this series of studies is largely dependent upon what is found in earlier steps. Results of examination of data from known sources and those volunteered by new ones are likely to present new areas for exploration. That makes estimating subsequent work a best estimate based on experience working on complex projects. Thus the estimates for project scope, timelines, and costs may diverge significantly in later stages.</p>	<p>High</p>
<p>A serious problem develops with the management of the project</p>	<p>1. SSAC has never managed or overseen a process and project of this scale, and complexity, and dimensions outside our areas of expertise, such as the legal issues around data sharing.</p> <p>2. Even with good management and highly skilled contractors, many factors are simply outside of our control.</p> <p>3. The ongoing availability of WP members to devote effort and enthusiasm as volunteers to this project is not guaranteed and there may be changes in the WP membership and leadership throughout its duration, impacting on project continuity.</p>	<p>High</p>

4 Comparing the Proposal Against the Board's Requirements

4.1 Fulfillment of Board's Overall Requirement

In resolutions 2017.11.02.29 - 2017.11.02.31, the Board requested that the SSAC conduct the study in a thorough and inclusive manner that includes technical experts (such as members of IETF working groups, technical members of the GNSO, and other technologists). In addition, the SSAC should conduct the study in a timely and organized fashion, with adequate visibility on costs and schedule, which shall be subject to review and approval by the Board.

The SSAC interprets the five overall requirements of the Board are for the Project to be: thorough, inclusive, timely, organized, and transparent. In this section, we describe our understanding of these requirements, and how SSAC plans to meet them.

4.1.1 Thorough

The SSAC understands the thoroughness requirement to mean that the work be done with great care and attention to detail.

The SSAC's proposed work meets the thoroughness criterion in the following way:

- The three studies ensure that the name collision issues are considered in a thorough and methodical manner.
- Additional inputs taken through public workshops and individual contribution submissions ensure that additional and relevant input is considered in the deliberation.

In addition, the collection of facts, perspectives and analyses are to be presented clearly. Both findings and recommendations will be based on clear lines of reasoning. Opinions and subjective judgments, if included, will be identified carefully.

4.1.2 Inclusive

The SSAC understands that "inclusive" means that all points of view are welcome. In particular, proponents from the GNSO, ALAC, IETF, OCTO and the Board's Technical Committee are welcome, encouraged to contribute and will be given adequate time to present viewpoints and data.

The SSAC's proposal meets the inclusiveness criterion in the following way:

- The NCAP WP is inclusive in the sense that experts that have made a contribution to related work in the past on name collision or to the current work through the opportunities provided to the public may be invited to join.
- The NCAP discussion group is inclusive in the sense that anyone with an interest in name collision may participate.

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- The NCAP WP will hold public meetings at every ICANN meeting so that anyone with an interest may participate.
- The project will have two dedicated workshops, taking additional input from the community and beyond.

4.1.3 Timely

The SSAC's proposal meets the timeliness criterion in the following way:

- The SSAC has identified opportunities to overlap tasks as much as possible while not allowing the quality of the work and research to suffer. All the non-critical path tasks will be run in parallel.

4.1.4 Organized

The SSAC's proposed work is to be done with a methodical approach using widely accepted project management practices, involving subject matter experts at clearly planned and identified points in the schedule, seeking regular input and feedback from the community, and is supported by qualified project support staff. The procurement follows standard ICANN procedures.

4.1.5 Transparency

The SSAC's proposal meets the transparency criterion in the following way:

- Members interests (SOIs)
- Public Wiki
- Sessions at each ICANN Meeting
- Public Consultations
- Data submitted visible on (Data Submission Proforma) noting there may be some need to make provision for confidentiality
- Tracking of all formally submitted data
- Public Comment Period for Final Report
- Newsletters

4.2 Fulfilment of Board's Specific Tasks

In resolutions 2017.11.02.29 - 2017.11.02.31, the Board lists a set of specific tasks and questions to be answered. In this section we lists in tabular format how each of the Board's questions are answered through the studies, the deliberations of the NCAP WP, and the deliberations at the workshop.

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		D-WP: Deliberation by NCAP WP					
		S1: Results though Study 1					
		S2: Results though Study 2					
		S3: Results though Study 3					
		D-WS: Deliberation at Workshops					
		Comm: Consultation through Communication Plan					
	Board's requirements	D-WP	S1	S2	S3	D-WS	Comm
1	Regarding the risks posed to users and end systems if .CORP, .HOME, .MAIL strings were to be delegated in the root, as well as possible courses of action that might mitigate the identified risks.	x		x	x	x	x
2	a proper definition for name collision and the underlying reasons why strings that manifest name collisions are so heavily used.	x	x	x		x	x
3	the role that negative answers currently returned from queries to the root for these strings play in the experience of the end user, including in the operation of existing end systems;	x		x		x	x
4	the harm to existing users that may occur if Collision Strings were to be delegated, including harm due to end systems no longer receiving a negative response and additional potential harm if the delegated registry accidentally or purposely exploited subsequent queries from these end systems, and any other types of harm;	x			x	x	x
5	possible courses of action that might mitigate harm;	x			x	x	x
6	factors that affect potential success of the courses of actions to mitigate harm;	x			x	x	x
7	potential residual risks of delegating Collision Strings even after taking actions to mitigate harm;	x			x	x	x
8	suggested criteria for determining whether an undelegated string should be considered a string that manifest name collisions, (i.e.) placed in the category of a Collision String;	x			x	x	x
9	suggested criteria for determining whether a Collision String should not be delegated, and suggested criteria for determining how remove an undelegated string from the list of Collision Strings; and	x			x	x	x
10	measures to protect against intentional or unintentional creation of situations, such as queries for undelegated strings, which might cause such strings to be placed in a Collision String category, and research into risk of possible negative effects, if any, of creation of such a collision string list.	x			x	x	x

5 Next Steps

The next steps for the project proposal are to conduct a community input gathering using the Public Comment process and ICANN61 sessions and then submit the proposal to the Board for approval. Project kick-off will be scheduled upon approval from the Board and allocation of the support resources by the ICANN org.

6 Acknowledgments, Disclosures of Interest, Dissents, and Withdrawals

In the interest of transparency, these sections provide the reader with information about four aspects of the SSAC process. The Acknowledgments section lists the SSAC members, outside experts, and ICANN staff who contributed directly to this particular document. The Disclosures of Interest section points to the biographies of all SSAC members, which disclose any interests that might represent a conflict—real, apparent, or potential—with a member’s participation in the preparation of this Report. The Dissents section provides a place for individual members to describe any disagreement that they may have with the content of this document or the process for preparing it. The Withdrawals section identifies individual members who have recused themselves from discussion of the topic with which this Report is concerned. Except for members listed in the Dissents and Withdrawals sections, this document has the consensus approval of all of the members of SSAC.

6.1 Acknowledgments

The committee wishes to thank the following SSAC members and external experts for their time, contributions, and review in producing this proposal.

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6.2 Statements of Interest

SSAC member biographical information and Disclosures of Interest are available at:
<https://www.icann.org/resources/pages/ssac-biographies-2016-05-31-en>.

NCAP Statements of Interest for Work Party Members are available at: <TBD>

NCAP Statements of Interest for NCAP Discussion Group Members are available at:
<TBD>

NCAP Statements of Interest associated with NCAP Data Submission Proformas are available at: <TBD>

6.3 Dissents

There were no dissents.

6.4 Withdrawals

There were no withdrawals.