September 15, 2013

Board of Directors

Internet Corporation for Assigned Names and Numbers

12025 Waterfront Drive, Suite 300

Los Angeles, CA 90094-2536

**Re: ICANN’s Proposal to Mitigate Name Collision Risks – .CBA Case Study**

Dear Members of the ICANN Board:

On August 27, 2013, Verisign submitted several comments regarding ICANN’s New gTLD Collision Risk Mitigation proposal. In our comment, “New gTLD Security, Stability, Resiliency Update: Exploratory Consumer Impact Analysis,” we demonstrated that query volume alone is an inadequate measure of risk arising from name collisions; provided a candidate risk assessment matrix; and advocated that ICANN finally implement the prior recommendations from ICANN’s own Security and Stability Advisory Committee (“SSAC”), including the Scaling the Root studies. These recommendations were in line with Interisle Consulting Group’s observation in its August 2013 report prepared at the direction of the ICANN Board that stated “[a]n additional qualitative analysis of the harms that might ensue from [name] collisions would be necessary to definitively establish the risk of delegating any particular string as a new TLD label…”[[1]](#footnote-1)

Others choosing to prioritize speed over a secure and stable DNS operation have also submitted comments critical of ICANN’s risk categorization based solely upon query volume, but have drawn the incorrect conclusion. These applicants contend that ICANN’s proposal is too conservative and that delegations should be expedited, because, in their view, the risk of internal network name collisions is acceptable, even absent the qualitative analysis of each string as discussed in the Interisle Report. Other than Verisign’s Exploratory Consumer Impact Analysis, no effort has been made to perform a qualitative analysis as recommended repeatedly, and absent this analysis, the potentially harmful consequences associated with the delegation of a new TLD label, and the associated risks, simply cannot be assessed.

Verisign’s analysis has focused on identifying some of the systematic risks that will be exposed by the new gTLD program and who the impacted parties are likely to be. In this context, we were intrigued when the Commonwealth Bank of Australia (“CBA”) filed a public comment taking responsibility for the name collisions identified in the Interisle Report and associated with its .CBA application.

**Commonwealth Bank of Australia - .CBA**

CBA has applied to operate the TLD string .CBA. The .CBA string was placed by ICANN in the “uncalculated risk” group (specifically at position 153) based upon the analysis set forth in the Interisle Report. In an effort to follow the guidelines of ICANN’s New gTLD Collision Risk Mitigation proposal, and thus assess the risk of delegation of the .CBA string, CBA concluded in an August 23, 2013 comment to ICANN that after “some internal investigation,” the cause of the name collisions is “primarily from CBA internal systems” and “that it is within the CBA realm of control to detect and remediate said systems and internal certificate use.” Thus, CBA concluded that it could self-mitigate the name collision risks resulting from delegation of the .CBA TLD and that ICANN should therefore move the .CBA string to the “low risk” group of applications. CBA also represented that it would undertake a further investigation and verify the origins of the .CBA requests, and that it would conduct appropriate remediation upon the completion of its internal investigation. While we await that investigation and remediation plan, we conducted our own analysis of the .CBA queries. We believe our data and analysis shows without a doubt that CBA’s initial conclusions are incorrect.

More broadly, we believe that the .CBA assessment can serve as a useful case to test the components of ICANN’s risk mitigation proposal. Using .CBA as an example, we can assess whether ICANN’s interpretation of the Interisle Report and ICANN’s risk categorization is appropriate. Further, we can assess how effective ICANN’s plan to require applicants (and not ICANN) to conduct risk mitigation is likely to be.

**Analysis of .CBA Queries**

Verisign conducted a focused study on .CBA and then further narrowed its focus on two of the most active geographies (namely Japan and Brazil) in terms of errant queries to the root server system for .CBA for seven weeks based on data from 1.5 roots (100% of “A,” and ~50% of “J”). While the coverage from the vantage points of these servers suggests that our data has a correspondingly limited scope, we believe our analysis demonstrates that CBA’s analysis is measurably unreliable and inaccurate, as root server system query behaviors simply do not exist within CBA’s observation space, and are themselves source-anonymized or otherwise incomplete within the annual “day in the life (DITL)” repositories. Furthermore, we believe that a reasonable conclusion to draw is that ICANN’s risk mitigation proposal is not a practical or reliable option.

During the seven-week study period, Verisign observed approximately 10,000 root queries for the .CBA TLD per day. Many of the queries we observed (~80%) related to .CBA are from systems or devices utilizing DNS-based Service Discovery protocols such as BONJOUR, which, when signaled, typically respond with available services. These services often include printers, smart home and industrial automation systems, or other specialized devices/services. (BONJOUR predates ICANN’s new gTLD program by several years, and DNS-SD was recently published as a Standards Track RFC by the IETF.) Other queries appear to be the result of standards-based DNS resolution search list processing issues, and originate from McAfee’s popular anti-virus software, which transmits queries to confirm in real-time that certain resources are virus-free prior to execution and processing. Finally, the originator of many of the queries simply could not be identified absent direct interaction, which was deemed out of scope of this study but considered necessary to fully understand the scope of the problem in any qualitative manner.

It should be noted that the Internet Service Providers (“ISPs”) that operate the network connectivity services and recursive name server infrastructure (including NTT-ME, Stelmat, AT&T, Comcast, Telefonica, Telstra, Level(3) Communications, Embratel, Cox, Bell Canada, etc.) for the observed .CBA query sources may be impacted by the end system operators. This is because these end system operators will most likely contact these ISPs for support services, and problem resolution assistance resulting from impacts of name collisions. The disruption to the ISP’s business and residential networks and their subscribers could be substantial. Under ICANN’s proposed risk mitigation plan, there is no mechanism to assist these infrastructure operators, or any acknowledgment of them as impacted parties. Commonwealth Bank of Australia, as registry operator, will bear sole financial liability to any third party, whether it be an injured ISP, network systems operator or otherwise, arising from the results of name collisions that occur as the proximate result of delegation and operation of the .CBA TLD.  Indeed, should an injured third party seek to hold ICANN accountable for its losses in this regard, Commonwealth Bank of Australia as registry operator will be obligated to indemnify and defend ICANN and its agents for such claims.[[2]](#footnote-2) Furthermore, it should be noted that Commonwealth Bank of Australia’s indemnification obligation to ICANN, and as a result its liability, is uncapped.[[3]](#footnote-3)  These uncapped indemnification obligations, as well as uncapped liability, exist for all applicants that execute the New gTLD Registry Agreement.

While there were two major functional namespaces observed and identified, .CBA is used by more than 100 others in Japan alone. A sampling of the DNS-SD and McAfee queries can also be seen in the accompanying .CBA Focused Analysis presentation. These represent two new functional namespaces, beyond those identified in Verisign’s Exploratory Consumer Impact Analysis. It should be noted that whatever the nature of many of the applications relying on non-delegation of .CBA, some at least appear sufficiently important to justify the use of real-time malicious software (malcode) protection techniques. The reliance on the non-delegation of .CBA for the correct operation of the malcode protection software itself is likely a result of standard search list processing issues that permeate nearly all of the applied-for strings. In addition to inherent privacy issues with potentially sensitive information leakage, this finding may more specifically signal the expanded potential and ease of launching Man-In-The-Middle (MiTM) attacks as well as more easily enable the injection of malicious software when .CBA begins to resolve. Simple explanations of how spoofing could target these networks can be found in the public comment on the Proposal to Mitigate Name Collision Risks submitted by Dr. Eric Osterweil on September 11, 2013.[[4]](#footnote-4)

Our measurement study reveals evidence of a substantial Internet-connected infrastructure in Japan that lies beneath the surface of the public-facing Internet, which appears to rely on the non-resolution of the string .CBA. This infrastructure appears hierarchical and seems to include municipal and private administrative and service networks associated with electronic resource management for office and residential building facilities, as well as consumer devices. However, further study is required to determine the nature and full extent of this infrastructure. A sampling of these queries can be seen in the accompanying .CBA Focused Analysis presentation.

While predominantly originating in Japan and Brazil, the data shows .CBA queries originating from more than 170 countries over less than two months of observation within a fraction of the root server system. Most registry operators much like Commonwealth Bank of Australia and their new gTLD partners, would face significant challenges in studying and identifying queries that originate from all over the globe. Preparing effective notifications in the official languages of the more than 170 countries from which .CBA queries originated in order to warn potentially impacted parties is a challenging task for anyone and even more so under the short, 30-day time frame proposed by ICANN. Further, assuming Commonwealth Bank of Australia successfully notifies the impacted parties, ICANN’s plan provides limited time for the impacted parties to actually remediate the name collisions and prevent disruptions or the introduction of vulnerabilities, and does not even provide for any means of educating potentially impacted parties of how to mitigate the issue once they are notified. And, finally, under ICANN’s proposal, ICANN is and will remain unaware of the naming collisions that Commonwealth Bank of Australia identifies and seeks to remediate.

**Conclusions**

While we believe even this analysis could be far more comprehensive, these results support the following conclusions:

* Root server system instrumentation is critically important, as ICANN’s own SSAC has recommended repeatedly since 2010. Such a capability would allow issues such as those described here to be surveyed, studied, and identified, and responded to in a consistent, cohesive and deliberate manner for all applied-for strings by experienced analysts prior to delegation and immediately upon the enablement of this capability.[[5]](#footnote-5)
* Our study vindicates the Interisle Report’s observation that additional qualitative analyses of the harms that might ensue from naming collisions is necessary to definitively establish the risk of delegating any particular string as a new TLD label.
* ICANN’s risk mitigation plan improperly categorizes strings by arbitrary risk groups based on no apparent analysis beyond query volume, and with no survey whatsoever of the possible impacts.
* Applicants lack the experience and thus are a poor choice to perform such risk assessments and to operationalize the ICANN-prescribed “customer service” (which ICANN has not defined). Lacking root instrumentation, and thus unable to see much beyond their own internal usage of .CBA, the bank wrote to the ICANN public forum claiming that .CBA collisions could be self-mitigated. However, our analysis demonstrates that the bank is the source of at most 6% of the observed query volume. We are unaware of how many of the 952 or more Internal Names Certificates they possess, a topic that would need separate study and analysis.
* Our data vindicates the observation that applicants face increased risk of liability from end users and network operators upon delegation. Under ICANN’s current constructs, applicants will bear this risk alone, and will indemnify ICANN should the delegation give rise to claims against ICANN.

Verisign’s risk analysis of just one string of more than 1,400 in just two of 170 geographies demonstrates that the as-yet unknown potential risks from new strings is real, not just theoretical. ICANN should consider this new data and analysis, and carefully review Verisign’s Exploratory Consumer Impact Analysis, integrating this with a comprehensive risk matrix and community input of what weights should be applied to each element of the risk matrix.

ICANN’s mission and primary priority is to coordinate and ensure the secure and stable operation of the DNS. ICANN, after five years and hundreds of millions of dollars invested by applicants and others in the new gTLD program, continues to ignore sound warnings from industry experts and their very own advisory committees, and as a result have failed to identify the readily discoverable and at-risk DNS usage described here. The community is owed an explanation as to why ICANN made the decision to limit the scope of the Interisle Report, and then subsequently decided not to expand the scope of the Report when its shortcomings, identified by Interisle itself as well as others, were plainly evident.

This analysis of .CBA demonstrates clearly how little can be known confidently until qualitative analysis of each individual string is conducted, and that what the community does not know can have unforeseen consequences, which could be severe. This is why SSAC, Interisle, and many others strongly advise that individual string risk analysis - the only way to categorize a string as anything other than unknown risk - should be performed and assessed prior to any delegation. The analysis also validates the concerns of parties such as General Electric, Verizon, the American Insurance Association, and the ISP and Connectivity Provider (ISPCP) constituency, all of whom asked ICANN through submitted comments for additional time and study prior to proceeding with ICANN’s plan as proposed.

ICANN has reacted late to name collisions in a manner that does not properly prioritize security and stability. The facts make this clear: ICANN failed to act on SSAC advice; the Interisle study was late, limited, with no follow-up to its findings; no SSAC analysis has been published that would inform community comments; no effort has been made to develop qualitative risk analysis; new responsibilities and risks are transferred to applicants, without the tools to address them; and the broader community of affected parties is only now beginning to research the potential for impact for themselves and their clients.

With its risk mitigation plan, ICANN proposes to transfer certain security and stability responsibilities to applicants - a policy that subverts ICANN's core mission. This should be soundly rejected by the ICANN board, not ratified and continued.

This study of only one string shows that no one, ICANN or others, should assert or assume that collision risk is understood and acceptable without conducting proper risk analysis and incorporating informed community input.

 Very truly yours,



 Patrick S. Kane

Senior Vice President, Naming and Directory Services

 VeriSign, Inc.

 Thomas C. Indelicarto

Vice President and Associate General Counsel

VeriSign, Inc.



Danny McPherson

 Vice President, Chief Security Officer

 VeriSign, Inc.

1. See *Name Collision in the DNS (Version 1.5, August 2, 2013)*, Interisle Consulting Group, LLC at 2-3 (“Interisle Report”). [↑](#footnote-ref-1)
2. See New gTLD Registry Agreement §7.1(a) (“Registry Operator shall indemnify and defend ICANN and its directors, officers, employees, and agents from and against any and all third-party claims, damages, liabilities, costs, and expenses including reasonable legal fees and expenses, arising out of or relating to…the delegation of the TLD to Registry Operator, Registry Operator’s operation of the registry for the TLD or Registry Operator’s provision of Registry Services…”).  [↑](#footnote-ref-2)
3. See New gTLD Registry Agreement §5.3. [↑](#footnote-ref-3)
4. See http://forum.icann.org/lists/comments-name-collision-05aug13/msg00038.html. [↑](#footnote-ref-4)
5. Verisign continues to convey our eagerness to stand with ICANN in their leadership role here, as well as in their role as L-root operator, and align with all other willing root operators to as quickly as possible develop a sustainable root server system measurement apparatus to provide early warning and instrumentation across the system at the root. We would also note with dismay that this work is NOT currently underway within the existent work plan, nor has it been. [↑](#footnote-ref-5)