



22 December 2017

Subject: SAC100: SSAC Response to the New gTLD Subsequent Procedures Policy Development Process Working Group Request Regarding Root Scaling

To: Avri Doria and Jeff Neuman, Co-Chairs  
Policy Development Process Working Group on New gTLD Subsequent Procedures

Dear Avri and Jeff,

The SSAC welcomes this opportunity to provide input on the issues related to root scaling. The SSAC understands the working group's request on 14 September 2017 to be:

1. whether the limitations on delegations per annum (1000 / year) could be revisited given the results of the Continuous Data-driven Analysis of Root Stability (CDAR) study and if so, what guidance can the SSAC provide to maintain the security and stability of the root;
2. suggestions on ways that might mitigate potential issues in the event the working group recommends to increase the maximum annual delegation rate; and
3. inputs on the total number of TLDs that could be delegated without negative impact to root server performance.

Based on a review of past SSAC advisories on root scaling (SAC042,<sup>1</sup> SAC046<sup>2</sup>), reports on root scaling (Root Scaling Study Team Report,<sup>3</sup> TNO's Root Scaling Study,<sup>4</sup> ICANN's Summary Report<sup>5</sup>) and the CDAR study,<sup>6</sup> the SSAC offers the following advice:

**Recommendation (1) : ICANN should continue developing the monitoring and early warning capability with respect to root zone scaling.**

As noted in the Root Scaling Study Team (RSST) Report, "root system oversight should focus on 'early warning' rather than threshold prediction. [...] The focus of root zone management policy should be the establishment of effective mechanisms for detecting and mitigating risks as they become visible."

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<sup>1</sup> See <https://www.icann.org/en/system/files/files/sac-042-en.pdf>

<sup>2</sup> See <https://www.icann.org/en/system/files/files/sac-046-en.pdf>

<sup>3</sup> See <https://www.icann.org/en/system/files/files/root-scaling-study-report-31aug09-en.pdf>

<sup>4</sup> See <https://www.icann.org/en/system/files/files/root-scaling-model-description-29sep09-en.pdf>

<sup>5</sup> See <https://archive.icann.org/en/topics/new-gtlds/summary-of-impact-root-zone-scaling-06oct10-en.pdf>

<sup>6</sup> See <https://www.icann.org/en/system/files/files/cdar-root-stability-final-08mar17-en.pdf>

Recommendation 4 of SAC046 states:

ICANN should update its "Plan for Enhancing Internet Security, Stability, and Resiliency"<sup>7</sup> to include actual measurement, monitoring, and data sharing capability of root zone performance, in cooperation with RSSAC and other root zone management participants to define the specific measurements, monitoring, and data sharing framework.

According to the October 2017 Board Advice Status Report,<sup>8</sup> this recommendation is still in implementation phase. The SSAC believes this recommendation is still valid and should be implemented.

The CDAR study also recommends a set of "risk parameters" that they believe are worth monitoring. These are: (i) multiple .com-sized gTLDs, (ii) post-retirement and pre-delegation traffic, and (iii) an increase in server-side processing on the root DNS system. The SSAC recommends ICANN consider including this list as a set of parameters to be part of the early warning system.

There has been some progress made on the monitoring of individual root servers and the stability of the root server system when individual root servers are unavailable.<sup>9</sup> However, the SSAC believes that there has not yet been an investigation into the comprehensive measurement of the root server system. This investigation should be completed prior to increasing the number of delegations in the root zone.

**Recommendation (2): ICANN should focus on the rate of change for the root zone, rather than the total number of delegated strings for a given calendar year.**

The RSST reports states, "In order for 'early warning' to be effective, changes to the root must be made gradually. Except in the very short term, we cannot confidently predict what the effect (and side-effects) of making a particular change to the root will be."

That SSAC belief that it is wrong to talk about specific numbers was also pointed out in a letter from SSAC to the ICANN Board on 2nd of July 2012.<sup>10</sup>

The SSAC believes such conclusions are still valid. Should ICANN entertain an increase of the delegation rate, it needs to consult with the root server operators and the root zone maintainer to ensure the effects (and side-effects) of the delegation rate can be managed. Likely the human administrative processing limit will limit the addition of new entries to the root zone, but this should not be assumed and ICANN should not rely on the processing speed of administrators to limit the rate of change to the root zone. This consultation should be completed prior to increasing the number of delegations in the root zone.

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<sup>7</sup> See <https://www.icann.org/en/system/files/files/ssr-draft-plan-fy11-13sep10-en.pdf>

<sup>8</sup> See <https://www.icann.org/en/system/files/files/board-advice-status-report-pdf-31oct17-en.pdf>

<sup>9</sup> See <https://www.icann.org/en/system/files/files/rssac-021-statement-unavailability-single-root-server-08sep16-en.pdf>

<sup>10</sup> See <https://www.icann.org/en/system/files/correspondence/faltstrom-to-icann-board-02jul12-en.pdf>

**Recommendation (3): ICANN should structure its obligations to new gTLD registries so that it can delay their addition to the root zone in case of DNS service instabilities.**

In RSSAC022,<sup>11</sup> the RSSAC states:

[T]he RSSAC advises root zone management partners and root server operators to implement coordination procedures so that root server operators can notify ICANN in the event of stress on the root name service. As a result, changes to the root zone can be temporarily reduced or suspended in order to maintain the stability of root name service. Similarly, ICANN should structure its obligations to new gTLD registries so that it can delay their addition to the root zone in case of root name service instabilities.

The SSAC supports this advice and adds that the coordination procedures should be expanded to include public recursive resolver operators and Internet service providers that operate caching resolvers. The SSAC also believes that ICANN should study the possibility of backing out, or undoing, changes to the root zone should complications with a change arise. This recommendation and the latter proposed study should be completed prior to increasing the number of delegations in the root zone.

**Recommendation (4): ICANN should investigate and catalog the long term obligations of maintaining a larger root zone.**

A larger root zone may increase the complexity and cost of activities that operate on the entirety of the root zone. ICANN should investigate how increasing the size of the root zone will impact activities such as the DNSSEC Key Signing Key (KSK) rollover, IANA root zone change requests, TLD transfers, contract negotiations, the operations of the root zone maintainer, and any other administrative overhead. The ongoing management of these activities should be investigated prior to increasing the number of delegations in the root zone.

Patrik Fältström  
SSAC Chair

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<sup>11</sup> See <https://www.icann.org/en/system/files/files/rssac-022-response-newgtld-06oct16-en.pdf>