# Design Team F - Relationship between IANA and the Root Zone Maintainer in the absence of the NTIA

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## Summary Recommendations

1. Elimination of NTIA Authorization of changes to the Root Zone content and the associated Whois database.

   Post-transition, as per DT-D, no authorization for TLD change requests is needed. As such there is a need to:

   a. Ensure that the transaction software and associated processes and procedures used by IANA to request changes to the Root Zone no longer require NTIA approval.

   b. Ensure that post transition, the Root Zone Maintainer can and will make changes to the Root Zone as requested by IANA (as is currently specified in the Cooperative Agreement). The NTIA has said that there will be a parallel but separate transition process (yet to be defined) to disengage the NTIA from the Root Zone Maintainer.

      i. If the Root Zone Maintainer transition is not completed prior to the IANA transition, the Cooperative Agreement will have to be amended by the NTIA to allow for Verisign acting as the Root Zone Maintainer to implement changes to the root zone requested by IANA Functions Operator (IFO) without requiring approval from the NTIA.
      ii. If the Root Zone Maintainer transition is completed prior to, or in conjunction with, the IANA transition, the new arrangements must provide a clear and effective mechanism to ensure that post transition IANA can have its change requests for the Root Zone implemented in a timely manner by the Root Zone Maintainer (possibly an agreement between the Root Zone Maintainer and IANA).

   c. Determine if additional checks/balances/verifications are required post transition (transferred from DT-D)
      i. Relative to IANA processes - DT-F cannot at this time determine if specific additional elements are required due to time constraints. DT-F does recommend that this issue be considered and recommendations made to the CWG prior to the transition.
      ii. Overall operational arrangements - DT-F recommends that the CWG require that a formal study be carried out post transition to investigate whether there is a need, and if so, how to increase the robustness of the operational arrangements for making changes to the Root Zone content to reduce or eliminate single points of

failure. This study should include a risk analysis and cost/benefit analysis factoring in the history and possibility of such problems.

2. Elimination of NTIA Authorization of changes to the Root Zone Management environment (not considered by DT-D).

   Per the IANA Functions Contract NTIA approval was required for the implementation of all changes to the Root Zone environment such as DNSSEC and many classes of changes to IANA processes (including what may be published). As such:

   a. DT-F recommends that the CWG replace this approval function for major architectural and operational changes prior to the transition after consulting all the relevant and affected parties ("Council of Elders").
      i. The replacement approval function should coordinate with the NTIA at the time of transition to transfer relevant information about any ongoing major architectural and operational changes so that any such ongoing activities are not negatively impacted by the transition.
   b. DT-F recommends that for internal or communications-related processes IANA no longer be subject to external approval, but should make such decisions, when appropriate, in consultation with the community, or the approval function referenced in sub-section a.
   c. DT-F recommends that post transition IANA budgets must support IANA's capability to investigate, develop and deploy the type of Root Zone enhancements required to keep the Root Zone and its management evolving.

3. Principle regarding transparency of actions by IANA

   DT-F recommends that, to the extent allowed by external agreements and as necessitated by security issues and the need to respect business confidentiality, IANA should operate in a transparent manner.

4. Principle regarding a single entity.

   Currently updating the Root Zone requires the active participation of three parties, the IANA Function Operator, the Root Zone Maintainer and the NTIA. Post transition there will only be the first two. DT-F recommends that the remaining two functions should not be awarded to a single entity. Note that the implications of this might vary depending on the outcomes of the robustness study.

## Full Recommendations

1. Recommendations related to the elimination of NTIA Authorization of changes to the Root Zone content and the associated Whois database.

   Currently, changes to the DNS Root Zone File, as well as changes to the DNS Root Zone WHOIS Database, are transmitted to the NTIA for authorization. Such changes cannot be enacted without explicit positive authorization from the NTIA. Post-transition, as per DT-D, no authorization for TLD change requests will be needed.

   a. Changes will be required to the IANA Functions Operator and Root Zone Maintainer software to remove this requirement. In the very short term, if making the software changes cannot be completed before the transition and/or to avoid multiple coincident changes, the existing software could be used and IANA staff could authorize the changes (effectively masquerading as the NTIA).

   b. Currently there is a Cooperative Agreement between the NTIA and the Root Zone Maintainer. The NTIA has said that there will be a parallel but separate transition to disengage the NTIA from the Root Zone Maintainer. The exact form of the latter transition is not currently known, nor what, if anything, will replace the current Cooperative Agreement and the parties involved in providing the services currently covered under the Cooperative Agreement. However, there may be a requirement to have a formal agreement between the IANA Function Operator and The Root Zone Maintainer. In the event that the Cooperative Agreement stays in place post-IANA transition (on a temporary or permanent basis), it is likely that some changes will be required in the Agreement to remove the requirement for NTIA authorization for Root Zone changes.

   c. Determine if additional checks/balances/verifications are required post transition. DT-F cannot at this time determine if specific additional elements are required due to time constraints. DT-F does recommend that this issue be considered and recommendations made to the CWG prior to the transition. [See section 8]

2. The NTIA has traditionally been involved in discussions related to and/or overseeing substantive Root Zone changes, (such as the implementation of DNSSEC and the deployment of IPv6), or Root Zone Management process changes (such as decisions to make specific reports public and Root Zone Management automation requirements). The NTIA has contributed and opened avenues to resources (such as those from NIST – the National Institute of Standards and Technologies, a part of the U.S. Department of Commerce in efforts surrounding DNSSEC). Moreover as the Root Zone Administrator, they have been the entity to ultimately approve the changes going forward.

a) Access to resources similar to those to which the NTIA has access will surely be possible in the absence of the NTIA acting as the Root Zone Administrator. Similarly, it is clear that among the parties who inevitably get involved in such discussions, there is no shortage of technology skills, and those who will want to take a cautious approach to any change to the Root Zone can ensure that any changes made are done with prudence. Nevertheless, DT-F recommends that for major architectural or operational changes this approval function must be retained and assigned to some entity. It is not possible to be more specific as to where this approval function should reside until the overall CWG recommendations are more fully developed.
b) DT-F further recommends that for changes internal to IANA and for those related to communications, no such external approval shall be needed, but that such decision should be made, where appropriate, in consultation with the community, or the approval function referenced above.
c) DT-F notes that changes in process at the time of transition should be carefully tracked to ensure that they are not negatively impacted by the transition.
d) The DT notes that IANA budgets must not only address operational costs, but must include a component to allow for the investigation, development and deployment of further Root Zone enhancements (requires consultation with IANA and the technical community). Such development cost might be significant.

3. Robustness – Reduction/Elimination of single points of failure
    a. Potential for accidental or malicious changes or omissions by the IANA Functions Operator.
    b. Potential for out-of-policy changes by the IANA Functions Operator. The term "policy" is used in its most general sense, representing formal Policy adopted by ICANN or some other entity with jurisdiction as well as established standards, practices and processes.
    c. Potential for accidental or malicious changes or omissions by the Root Zone Maintainer
    d. Potential for accidental or malicious errors in the communications path from the IANA Functions Operator to the Root Zone Maintainer.
    e. Potential for accidental outages or malicious actions related to the telecommunications infrastructure serving the IANA Function Operator and The Root Zone Maintainer. Such outages or actions could be related to the infrastructure shared with ICANN.

    Any such decisions should be based on a cost/benefit and risk analysis factoring in the history and possibility of such problems.

## Principles

4. Multiple-Party Organization

    Currently updating the Root Zone requires the active participation of three parties, the IANA Function Operator, the Root Zone Maintainer and the NTIA. Post transition there will only be the first two. DT-F recommends that the remaining two functions should not be awarded to a single

entity. Note that the implications of this might vary depending on the outcomes of the robustness study.

5. Transparency

   To the extent allowed by external agreements and as necessitated by security issues, IANA should operate in a transparent manner.

   a. **Change Requests:** Currently, all change requests submitted to the IANA Function Operator are treated as confidential (to the extent possible) until they are actually deployed by Root Server Operators. In addition to an overall preference for transparency, if the content of changes (or proposed changes) could be made public earlier, there are a number of possible ways of addressing some of the robustness issues. Note that there are two separate aspects to this:
      i. Changes requested by a registry. These could be made public either at the time of the request, or at the time that a request has passed all IANA Functions Operator verifications and validation. This would also apply to delegations or redelegations once a formal decision has been made.
      ii. Notice that a Delegation and Redelegation is in process. This was suggested in the 2012 Technical Proposal from IANA to the NTIA, but has not as yet been approved.

   b. **Reporting:** Reports on IANA operations should not be withheld unless there are explicit and defendable needs for confidentiality.

6. Future changes to the Root Zone Management process must be made with due consideration to the IANA ability to process change requests with due haste.