

Ethereum Name Service (ENS) Root Change Issues

Verisign Technical Note

April 12, 2019

The Ethereum Name Service (ENS) recently announced plans to integrate the majority of top-level domains (TLDs)¹ in the global DNS into the ENS root.

In the new “root contract” that ENS plans to roll out, the registrant of a domain name in a supported TLD may request linkage by publishing a specially defined record, signed with the Domain Name System Security Extensions (DNSSEC), in a zone controlled by the registrant. In addition, the new ENS root contract gives the TLD operator the option to override this default linkage configuration by publishing a separate, specially defined DNSSEC-signed record under the “nic.tld” domain name.

In the blog post announcing these plans, Nick Johnson from ENS states:

We’re now at the point where we’re comfortable with the robustness of the DNSSEC integration, and we’re ready to roll it out more widely.

Verisign has been reviewing the integration process and has two significant concerns.

Our first concern is that the process for configuring the linkage for a TLD makes the assumption that the operator controls the “nic.tld” zone.

This assumption is not necessarily correct for legacy generic TLDs (gTLDs) established before 2000. In particular, under ICANN agreements, “nic.tld” domain names registered before “nic” became a reserved label remain under their *registrant’s* control as long as they continue to be renewed by the registrant. Thus, domain name registrations, including nic.com, nic.edu, nic.net² and nic.org, are active today but they are not under the control of the registry operators. While the reservations made in Sections 3.1 and 3.1.1 of Specification 5 of ICANN’s Registry Agreement for new gTLDs³ do require allocation of “nic.tld” for the registry operation of new gTLDs, that provision does not necessarily apply to legacy gTLDs containing tens of millions of domain names. For example, the reservation of nic.com referenced in Appendix 6 of the .com Registry Agreement⁴ does not negate the current registration and retention of that domain name by a third party and is therefore not under the control of Verisign, the operator of the .com TLD.

Similar concerns may also apply to country code TLDs (ccTLDs), which are not subject to ICANN policy and may or may not have reserved the “nic” label for registry use only, creating the possibility that an

¹ N. Johnson. *ENS Root Change Will Allow Easy Integration of More Than 1300 DNS TLDs*. Feb. 25, 2019.

<https://medium.com/the-ethereum-name-service/upcoming-changes-to-the-ens-root-a1b78fd52b38>

² nic.net is registered but doesn’t currently have a website.

³ ICANN. *Registry Agreement*, Specification 5.3. July 31, 2017.

<https://newgtlds.icann.org/sites/default/files/agreements/agreement-approved-31jul17-en.html#specification5.3>

⁴ ICANN. *.com Registry Agreement Appendix 6, Schedule of Reserved Names*. December 1, 2012.

<https://www.icann.org/resources/pages/appendix-06-2012-12-07-en>

independent party could assume control and set the rules for ENS integration of these TLDs absent knowledge or consent of national governments. The situation would need to be reviewed case by case for each ccTLD.

The statement in the blog post that “The owner of a TLD can manually specify an alternate registrar they want to control registration of domains under their top-level domain” by setting up “a TXT record on `_ens.nic.tld` with the desired address” is therefore *incorrect and inappropriate* — an issue that was not noted in ConsenSys Diligence’s recently completed audit report⁵ on the new ENS root contract.

Instead, under the proposed new ENS root contract, the registrant of “`nic.tld`” — in these instances a different party than the TLD operator — will be able to specify how these TLDs are integrated into ENS, and may choose to do so in ways that are not in the interest of the registry operator or of domain name registrants. The blog post further states:

- ... the new [ENS] root will have one new function: it will allow anyone to configure a TLD if they can supply a valid DNSSEC proof.

Allowing a party other than the TLD operator to configure a TLD would introduce significant security vulnerabilities, including the potential reassignment of domain names, that ENS has not yet recognized.

The new ENS root contract must be changed to a different approach that does not rely on the “`nic.tld`” domain name for legacy gTLDs and ccTLDs. This must be done before the proposed new ENS root contract is deployed.

Our second concern is that the proposed new ENS contract, as noted in the post, still does not support a significant percentage of TLDs. The ENS post suggests two reasons: the TLD is not DNSSEC enabled; or it is DNSSEC enabled but does not “use algorithms and digests supported by our [ENS’s] integration.” In the interest of recognizing DNSSEC deployment in the global DNS — especially in view of ICANN’s call for full DNSSEC deployment⁶ — the new ENS contract should have a clear path toward adding these missing algorithms and digests.

Finally, ENS’ *Frequently Asked Questions*⁷ document states,

- We consider ENS to be part of the ‘global namespace’ inhabited by DNS, and so we do our best not to pollute that namespace.

With this in mind, it is clear that ENS intends that any integration with DNS be taken very carefully, as otherwise it risks losing user confidence. For this reason, ENS should put its TLD integration plan on temporary hold and coordinate closely with ICANN and other technical and policy-setting organizations in the DNS industry to ensure a fully reviewed introduction of any contracts involving domain names. Anything less would not be responsible and risks introducing security vulnerabilities that are not in the interest of registry operators, domain name registrants, or blockchain developers and users.

⁵ ConsenSys Diligence. *ENS Permanent Registrar Audit*. Accessed April 9, 2019. <https://github.com/ConsenSys/ens-audit-report-2019-02>

⁶ ICANN. *ICANN Calls for Full DNSSEC Deployment, Promotes Community Collaboration to Protect the Internet*. February 22, 2019. <https://www.icann.org/news/announcement-2019-02-22-en>

⁷ Ethereum Name Service. *Frequently Asked Questions*. Accessed April 9, 2019. <https://docs.ens.domains/frequently-asked-questions>