An Update on DNS Integration Measurements and Challenges (abstract)

Swapneel Sheth, Andrew Kaizer, and Will Naciri, Verisign Labs

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This is a proposal for presentation at the upcoming DINR 2024.

One of the key measurements from our DINR 2023 presentation was that 23% of DNS domain names integrated into the Ethereum Name Service's (ENS) original DNSSEC-based approach[i] were not clearly synchronized – i.e., it was not clear if the same registrant controlled the name in both the DNS and ENS. Concerningly, this situation could lead to confusion from users and pose security and stability concerns to both the global DNS and the integrating application.

Over the last year, even more blockchains, alternative naming systems, social media platforms, and other applications have proposed or started to integrate global DNS domain names, further expanding domain names' utility beyond their traditional website and email use cases. Some examples of these DNS domain use cases include web3, social media handles, and displays of a "verified" indicator in an application's UI to impart trust and familiarity to the application's users.

Given the rapid rise of DNS integrations, our goal of presenting at DINR 2024 is two-fold. First, measurement results will be provided for additional DNS integrations to show that the concerns described at DINR 2023 are widespread and do not appear to be limited to web3 related integrations. Second, we will use these results to motivate discussion around standardization of responsible DNS integrations.

Regarding measurements, the ENS related synchronization concerns presented at DINR 2023 have gotten worse over time as nearly 40% of DNS domain names integrated into ENS were out of sync in March 2024 – an increase of ~17%. Furthermore, we find that synchronization is a persistent concern across other integrations. For example, ~42% of organizations that are verified on GitHub were not clearly synchronized.

The persistent occurrence of synchronization concerns in different DNS integrations indicates a need for the DNS community to provide operational guidance on how to responsibly integrate with the global DNS. Importantly, there is already movement and a receptiveness in some of these integrations to work with the DNS community to address such issues. For example, the Bluesky social network has built in a 24-hour re-synchronization check into their system. Another example by ENS is called gasless ENS DNSSEC[ii]. It was launched in early 2024 and avoids the synchronization concerns identified in ENS' original approach by directly reading web3 data stored in DNS zone files as TXT records.

In raising awareness of these topics[iii] now, it is hoped that DNS integrations can emerge that address the identified concerns and consider concepts such as DNS lifecycle management to ensure that both the global DNS and the integrating application can safely, reliably, and responsible integrate with the global DNS.

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[i] Nick Johnson. Announcing support for .xyz on ENS. Sep. 5, 2018. https://medium.com/the-ethereum-name-service/announcing-support-for-xyz-on-ens-7f5bc7fe1b24.

[ii] Greg Skril. Gasless DNSSEC on Mainnet. Jan. 29, 2024. https://blog.ens.domains/post/gasless-dnssec.

[iii] Swapneel Sheth. Traditional Domain Names, New Environments: Integrating into Blockchains and Beyond. https://dnib.com/articles/blockchain-DNS-responsible-integration.