

Web3 and the DNS

Lessons from History

Gavin Brown, Technical Fellow, CentralNic Group PLC

APTLD 83, Vientiane, Laos, February 2023

“Web3” and alternate naming systems

- **Namecoin (namecoin.org)**
 - A fork of Bitcoin, launched in 2011
 - Offers names ending in “.bit”
- **Ethereum Name Service (ens.domains)**
 - Launched in 2016
 - Based on Ethereum smart contracts
 - Offers names ending in “.eth”
- **Handshake (handshake.org)**
 - Launched in 2015
 - Operates its own blockchain network
 - Allows anyone to create any “TLD” they want, and then offer subdomains

Common characteristics

- They all aim to replace a centralized authority (whether for the root zone or TLD) with a decentralized ledger (i.e. a blockchain)
- They use cryptography to guarantee the integrity of the system
- Entries into the ledger must be paid for using cryptocurrency
- Censorship resistance is a design goal
 - little to no protection for third-party rightsholders
 - no way to suspend, block or delete names that are abusive
- **Incompatible with traditional DNS:**
 - Require a plugin or custom DNS server to resolve names
 - Causes name collisions (now or in the future)

“History does not repeat itself, but it
rhymes”

- Mark Twain (attributed)

Why do we use the IANA root zone?

- The IANA managed root zone is used by ~99.999%* of all internet users. Why?
- Because of **Metcalf's Law**:

“The value of a telecommunications network is proportional to the square of the number of connected users of the system.”

- If you can only use one DNS root, then the traditional DNS is about 10 billion times more “valuable” than the all the blockchain-based naming systems combined!
- This was not always the case!

* Assuming ~50,000 users of other systems, out of ~5.16Bn internet users

Alternative DNS Root Systems

- During the late 90s and early 00s, many people tried to create competitors to the Internic:
 - AlterNIC (1995-1999)
 - New.net (1996-2012)
 - Realnames (1997-2002)
 - Enhanced Domain Name System (EDNS) (1997)
 - OpenNIC (2000-)
- Most only lasted a few years, with only OpenNIC surviving to the present day
- While some were noble in intent, many were little more than shakedown operations, generating revenue from defensive registrations, squatters, and gullible buyers.

A confession

- CentralNic built and operated the registry backend for New.net in the last years of its existence, under contract with its (then) owner.
- As a result, I saw first-hand many of the problems that plagued these systems while they existed.
- Hypothesis: we are likely to see reoccurrence of these problems with the new "web3" era of alternate naming systems.

Problem 1. Using the system

- Most normal internet users are practically incapable of:
 - installing software
 - Installing browser plugins
 - Configuring a custom DNS server
- As a result, alt-roots suffer a chicken-and-egg problem (as a manifestation of the network effects mentioned previously).
- Some alt-root operators did deals with ISPs and browser vendors
- Some (notable New.net) resorted to bundling their plugin with others, including malware
- ***All web3-era alt-roots suffer the same problem***
 - Sure, Google, Microsoft or Apple might be persuaded to implement an alt-root, but how likely is it that they would implement one they didn't control themselves?

Problem 2. Names not working

- Someone registers a name in an alt-root, and advertises it (online or offline)
- They then discover that 99.999% of their users/customers/prospects cannot reach their website
- Web3 alt-roots tried to solve this using proxies, for example eth.link
 - But the owner of eth.link was a criminal and was sent to jail
 - While in jail, the domain expired and was sold off
 - Every link to a .eth.link domain stopped working
- **The same thing will still happen with web3 alt-roots, if they fall into the hands of non-enthusiasts**

Problem 3. Names go to different places

- Some alt-roots had TLDs that conflicted with TLDs in the IANA root
- Sometimes this was deliberate!
- Users would go to different places depending on which device or network they used
- **Most Web3-era alt-roots have avoided deliberately colliding with the IANA namespace, but...**

Problem 4. Names stopped working

- New.net had a .travel TLD before the same TLD was delegated in the IANA root
- When .travel was delegated, every .travel domain in the New.net root stopped working
- New.net customers expected their domains to be “grandfathered” into the IANA TLD
- **Web3-era alt-roots have had this exact problem**
 - Most span up in the “quiet” period after most “new” gTLDs had been delegated
 - The developers for some reason assumed that no new TLDs would ever be delegated
 - When .MUSIC was delegated, it caused panic because that name existed in their
 - We were contacted by alt-root operators begging us to “claim” the TLD in their namespace, only to discover that ICANN rules forbade it

Summary

- Web3-era alt-roots suffer from all the same problem as the OG alt-roots from the 90s.
- Nothing about the technology they uses mitigates these problems.
- They try to solve a problem that very few other than Silicon Valley libertarians seem to care about and do so in ways that cause a proliferation of other problems.
- The ongoing crypto crash is likely to see them off in the same way as the dot-com crash did at the turn of the millennium.
- Thanks to Metcalfe's Law, the IANA root zone is probably safe for the time being!

Questions and answers

Email: gavin.brown@centralnic.com

Mastodon: [@gbxyz@noc.social](https://noc.social/@gbxyz)