Linking DNS with blockchain-based ENS records

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Hello!

Me: Brantly Millegan
Work: True Names LTD (Singaporean non-profit)
Open source project: Ethereum Name Service
Website: https://ens.domains
Blockchain: Ethereum
Lead developer: Nick Johnson
Initial patron: Ethereum Foundation
Outline

- Quick look at blockchain naming space
- How ENS works
- DNS-ENS domain name integration
  - How it works
  - .xyz & .luxe experiments
  - Problems with future rollout
- ENS & ICANN
Blockchain Naming Space
Blockchain Naming Space

Namecoin - 2011 - .bit

Ethereum Name Service - 2017 - .eth + DNS

EOS Name Service - 2018 - .eos et al (collisions?)

Unstoppable Domains - VC backed - 2019 - .zil

And others: RSK, ETC, ICON, et al)
ENS Ecosystem

- ~275k .eth names registered
- ~Dozen wallets
- Native integration in Opera browser
- Chrome, Firefox, Edge integration via MetaMask extension
- Partnership with IPFS
- Benefit from growing Ethereum ecosystem (Cloudflare, Microsoft, Google, Samsung, HTC, et al)
How ENS Works
How ENS Works

No servers

No permission needed to use the system

Runs entirely as a set of smart contracts on the Ethereum blockchain
How ENS Works

User Code

resolver('foo.eth')

0x1234...

addr('foo.eth')

0x2345...

ENS Registry

Resolver @ 0x1234...
Inside ENS Records

“Public Resolver”
- **Address**: Ethereum address
- **Content**: IPFS or Swarm hash
- **Text records**: We plan on using this for a future optional “Who Is” in Manager

We may expand it to include DNS records, other cryptos...

You can make your own custom resolver and record set
DNS-ENS Integration

Goal

People can make ENS records for DNS domains they already own through the normal DNS registration system.
DNS-ENS Integration

example.com → DNS record
→ ENS record

Not example.eth

E.g. Send tokens to example.com in cryptocurrency wallet, or resolve IPFS hosted website
DNS-ENS Integration

Two step process

1) Prove ownership of DNS domain to ENS contract on Ethereum

2) Create and manage ENS record on Ethereum
Proving Domain Ownership

DNSSEC

Recursive cryptographic proofs

...(3LD) → 2LD → TLD → DNS Root
Proving **Domain Ownership**

DNSSEC oracle on Ethereum w/ DNS Root public key

Can verify any DNS records

Saves proofs already submitted (which makes other proofs cheaper to verify)
Proving Domain Ownership

_ens.example.tld

At least one text record field must have this:

\[ a=[\text{insert your Ethereum address}] \]

\[ a=0x\text{fB6916095ca1df60bB79Ce92cE3Ea74c37c5d359} \]
Proving Domain Ownership

You submit the proof to the DNSSEC oracle on Ethereum as an Ethereum transaction.

→ This requires having an Ethereum wallet and some ETH to pay gas (working on UI).

If proof succeeds, the smart contract automatically grants ownership of domain to Ethereum address provided in text record.
Proving **Domain Ownership**

No registration or annual fees to have an ENS record for a DNS domain

- Unlike .eth names
- Since you’ve already paid fees (remember, we’re a non-profit!)
Create **ENS Record**

All of this is done by interacting with the ENS smart-contracts on Ethereum.

Manager app (manager.ens.domains) has an easy-to-use UI (requires Ethereum-enabled browser and some ETH).
XYZ Test Run

You can do this right now with .xyz domains

Use .XYZ as your Ethereum Wallet!

XYZ and Ethereum have partnered to allow you to pair your .xyz domain with your Ethereum wallet via the main ENS network.

For every wallet, everywhere
DNS TLD Integration
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2LD (& lower) integration could be launched for all properly DNSSEC-enabled domains (~1200 TLDs) today...

...but we’d like to get the TLD situation figured out first.
DNS TLD Integration

Just as owners can claim 2LDs and 3LDs, we’d like TLD owners to be able to claim them on ENS.

DNS and ENS both work hierarchically.

Hierarchy of control: TLD owner can control 2LDs, etc.
It's super easy...

**Step One**
Register a .luxe domain name like helen.luxe or safestore.luxe

**Step Two**
Associate the domain name to an existing 42-character Ethereum identifier. Ethereum enabled registrars have already integrated this functionality so all you have to do is add your Ethereum public identifier.
.LUXE ENS Integration

Advantages for TLD owners:

- Can make process easier for customers
- Can manage their namespace as it exists on ENS
The Problem

We need TLD owners to be able to prove their TLD ownership to us/Ethereum (if they’d like to control their ENS namespace)

Would like your input on this...
The Problem

- Can’t use _ens.TLD

- False assumption re nic.TLD (thanks Verisign!)

- Can’t make text record in TLD itself
Possible Solutions?

- Manually approve ownership. But could be a lot of work (+1200 DNSSEC enabled TLDs).

- Require a signed (but unpublished) text record (e.g. on TLD itself). But is this possible?

- Other ideas? Would like to resolve this in next few months and launch
ENS & ICANN

Respectful of existing system

Don’t pollute namespace (no more TLDs)

Open from learning from/using ICANN processes

Here for dialogue and learning
Useful Links ...Thank you!

- **Website**: ens.domains
- **Manager**: manager.ens.domains
- **Docs**: docs.ens.domains
- **Medium**: medium.com/the-ethereum-name-service
- **Twitter**: @ensdomains
- **Email**: brantly@ens.domains