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)
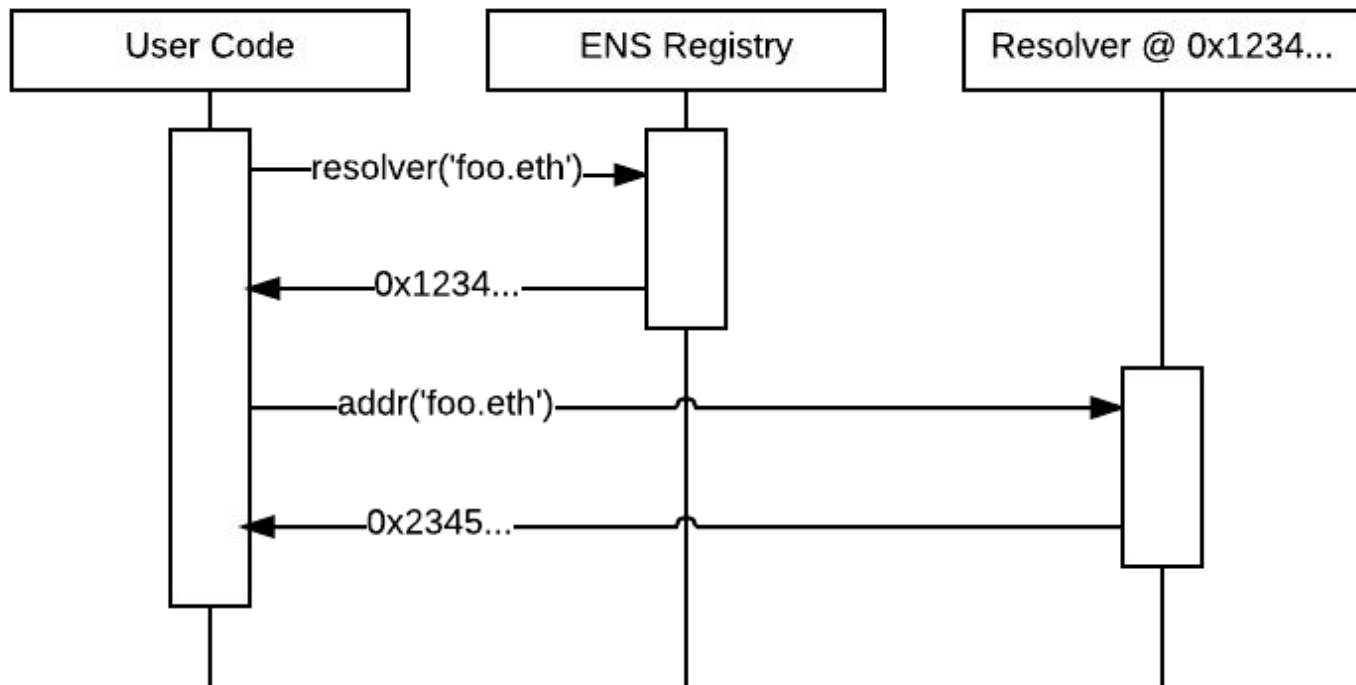
How **ENS Works**

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**

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

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=[insert your Ethereum address]

e.g.
a=0xfB6916095ca1df60bB79Ce92cE3Ea74c37c5d359

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

DNS TLD Integration

DNS TLD **Integration**

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

.LUXE **ENS Integration**

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.

helen.luxe BUY → → 0X32A4C9FA3 D46AB6E87F

.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