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Applied Learning: How blockchains name systems works

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ICANN 78
22 October 2023



- ⦿ Already covered: how the **global DNS** works, **alternative name systems** and their challenges, and how blockchains work
- ⦿ Next up: **blockchain name systems**
- ⦿ What you get when resolving blockchain names
- ⦿ Types of data in blockchain name systems
- ⦿ The variety of blockchain name systems
- ⦿ What to expect in the future

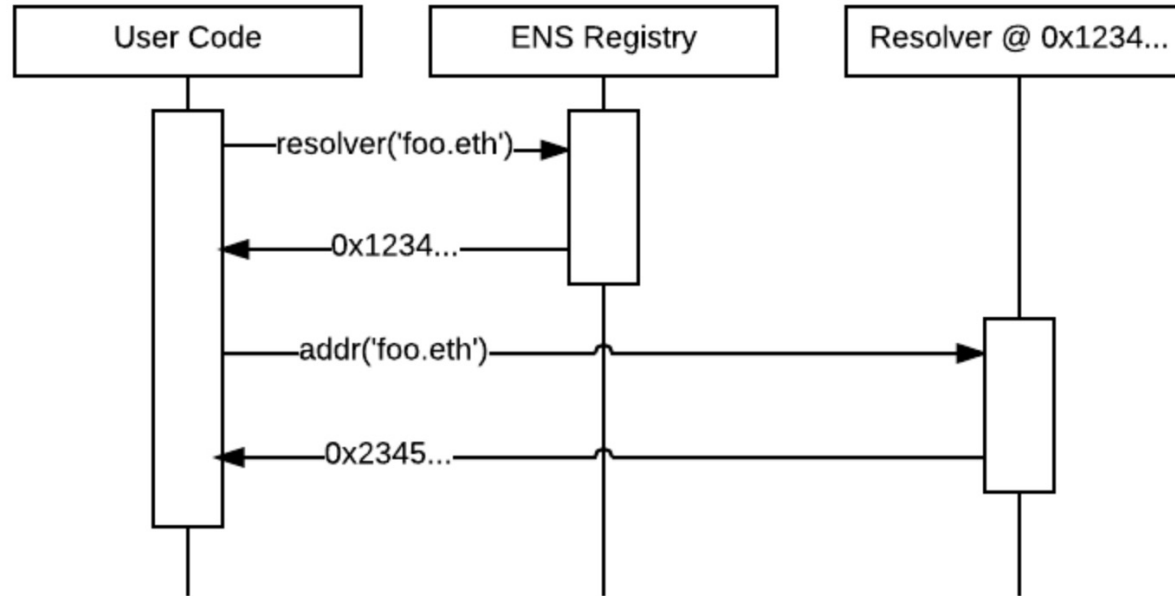
Blockchain name systems

- ⦿ The primary stated motivation for blockchain name systems is to have an easy mapping of a **user-friendly name** to a **wallet address**
- ⦿ A second motivation is have this mapping stored in a blockchain so that access and update happen using the same mechanisms as the rest of the data in the blockchain
- ⦿ Wallet addresses are like **bank account identifiers**, not at all like IP addresses or DNS nameserver names
 - Bank accounts in many parts of the world look like:
 - Routing: 324877702
 - Account: 84226780
 - Wallet addresses look like:
 - 0xe479da58C99f038a500134Ef4439816092fe38b8
- ⦿ Blockchain wallets can contain **digital assets** like cryptocurrencies and NFTs

Resolving blockchain names

- ⊙ Blockchain name systems are primarily used to map a name that look like a global DNS name to a wallet address
 - **Name** → **wallet address**
- ⊙ A typical blockchain application uses blockchain names **move items** (cryptocurrencies, NFTs, ...) from one wallet to another
- ⊙ Having a user enter their blockchain name system name is easier than having them enter their wallet address
- ⊙ If a user pastes in their wallet address, the application can use that directly, but if they pasted in a blockchain name, the application must **resolve** the name using the associated blockchain
- ⊙ Blockchain name systems also have other types of data, but they are rarely used in blockchain applications
 - The valuable mapping is to the wallet address

Resolution example: Ethereum Name System



First request is to the registry for the resolver of the name

Second request is to the resolver for the wallet address

Quick review: comparing simple resolution to the global DNS

- ⦿ In the global DNS
 - **Name** → **IP address**
 - “I want to know the **Internet host** associated with this name”
 - The typical next step is to start communicating to that host system
- ⦿ In blockchain name systems
 - **Name** → **wallet address**
 - “I want to know the **wallet** associated with this name”
 - The typical next step is to interact with that wallet, such as to transfer funds

Additional types of data in name systems

- ⦿ The global DNS can hold additional types of data associated with a name
 - **Finding services, cryptographic keys**, wallet addresses, ...
- ⦿ Blockchain name systems can hold additional types of data associated with a name
 - Link to **avatar picture, non-Internet web page**, personal name, ...
- ⦿ In both systems, these are niche but sometimes important uses of the name
- ⦿ The additional data is **sometimes useful** in browsers when the user types into the address bar
- ⦿ Today's web browsers use the "finding services" data type to lead to the fastest web server for the name
- ⦿ In some blockchain-enabled browsers, typing a blockchain name into the address bar leads to a non-Internet web page if the name owner has filled that in

Comparing more advanced resolution to the global DNS

- ⊙ In the global DNS
 - **Name** → **preferred host**
 - “I want to know the **preferred** Internet host associated with this name”
 - The typical next step is to start communicating to that host system
- ⊙ In blockchain name systems
 - **Name** → **non-Internet web page**
 - “I want to know the **non-Internet web** page associated with this name”
 - The typical next step is to display that web page

Variety of blockchain name systems (1)

- ⦿ There are more than a dozen blockchain name systems, but less than half are popular
- ⦿ Popularity changes from year-to-year based on number of names in use, how applications use names, marketing campaigns, price of names, and so on
- ⦿ The TLDs used by blockchain name systems differs widely between blockchain name systems
 - Some systems only use **TLDs not yet in the global DNS** root, such as .wallet and .crypto
 - Some systems use **the same TLDs as each other**; for example, multiple systems use .wallet
 - Some systems use **the TLDs from the global DNS** such as .com, .org, .nl, .jp, and so on

Variety of blockchain name systems (2)

- ⊙ Different blockchain name systems can use **different blockchains** for their data
 - Ethereum Name System (ENS) uses the Ethereum blockchain
 - Unstoppable Domains uses the Polygon blockchain
 - Namecoin and Handshake use their own blockchains
 - ...
- ⊙ All systems allow linking a name to a wallet address, but beyond that, the systems differ in the kind of **additional data** that is associated with a name
- ⊙ Resolution of names **differs widely** based on the resolvers used in browsers
 - Common browsers require plugins to use blockchain names, often one plugin per system
 - Niche browsers such as Opera and Brave support a subset of blockchain name systems

Variety of blockchain name systems (3)

- ⦿ Some systems allow blockchain names to be treated as NFTs, others don't
- ⦿ The **cost** of registering and renewing a name varies widely across systems
 - The cost of registering can change minute-to-minute in some systems
- ⦿ **Integration** with the global DNS varies widely
 - Some require a signed record in the global DNS with a wallet address
 - Some require a record in the global DNS with a wallet address, but don't require that it is signed
 - Some allow copying of additional DNS records

What to expect in the future from blockchain name systems

- ⦿ **New** blockchain name systems being created
- ⦿ **Technical changes** and features added to existing systems
- ⦿ More **marketing** of existing systems, particularly about “integration” with the global DNS

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