


Distributed Ledgers

- A digital ledger is a digital record of **who** owns **what**
- A **distributed** digital ledger is a ledger that is replicated among many nodes
 - The main innovation is the underlying **distributed consensus** mechanism

Alice



I sent \$2 to Bob
I sent \$5 to Bob
Bob sent \$3 to me

Alice	Bob
-2	+2
-5	+5
+3	-3

I owe Bob \$4

Bob



Alice sent \$2 to me
Alice sent \$5 to me
I sent \$3 to Alice

Alice	Bob
-2	+2
-5	+5
+3	-3

Alice owes me \$4

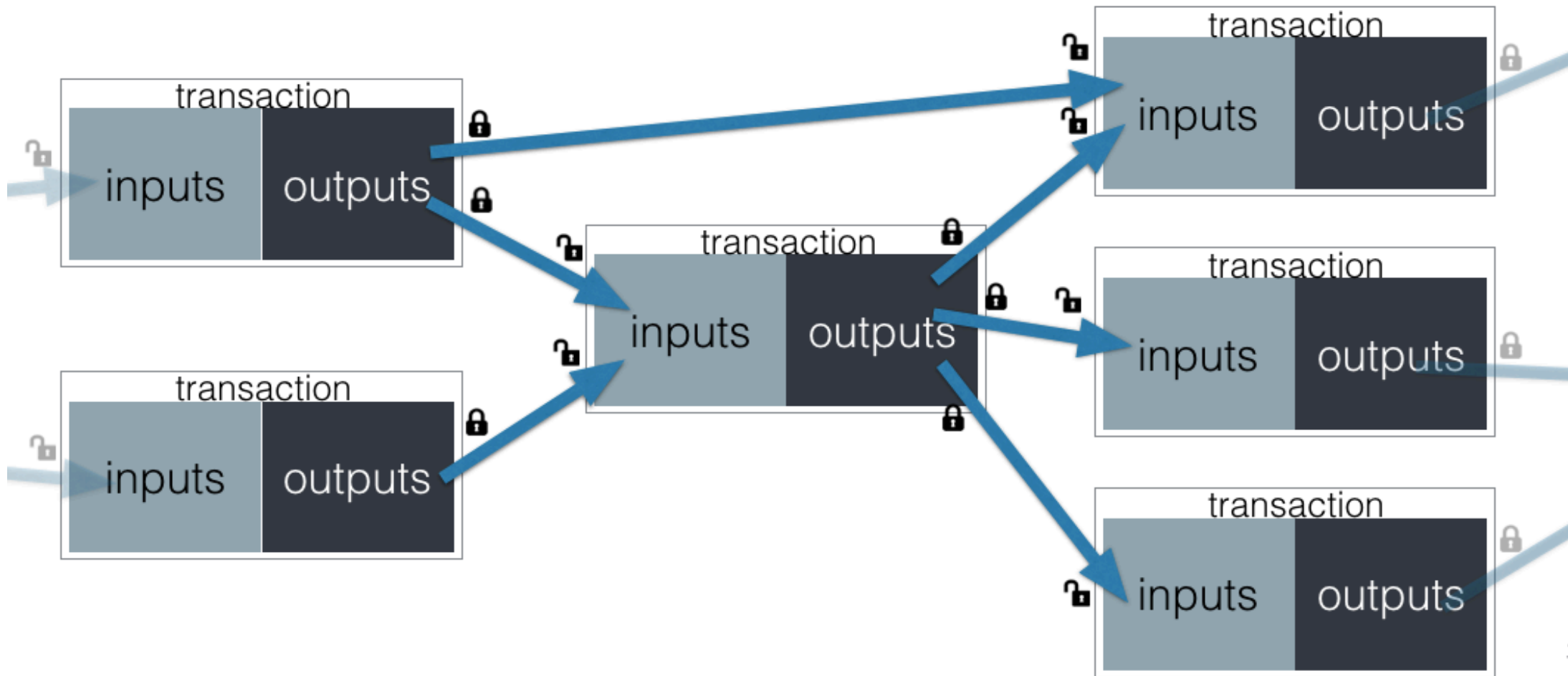
Distributed Ledgers

- There have been other good algorithms that have been used for distributed consensus
 - Paxos, PBFT
 - However, besides distributed consensus, blockchains also:
 - **Scale** relatively better than existing consensus algorithms
 - **Compensate** for the costs of verifying and generating consensus
 - **Disincentivise** attacks
 - Blockchains work in practice, not theory.
-

Transaction structure

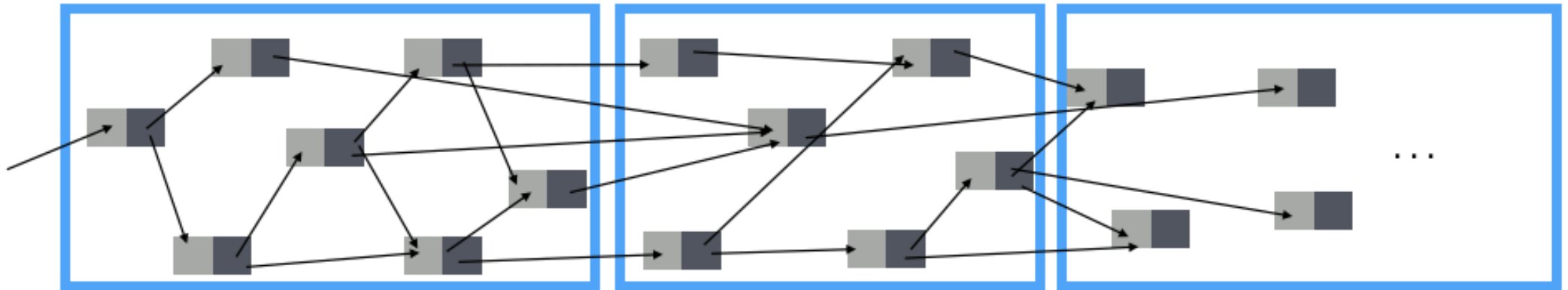
- A transaction is a record that contains **inputs** and **outputs**
 - An input has to reference a previous transaction's output
 - In order to do this successfully, the correct key has to be provided
- Exception: the very first transaction in a block has no inputs and simply generates a set number of bitcoins for the miner (i.e. miner's reward)

Transaction structure



Blockchain structure

- Blocks exist on top of the complex network of transactions
- They ensure that:
 - transactions are formatted and ordered correctly
 - transactions do not try to double spend



Ethereum Name Service



What is ENS?

- Map human-readable names to resources

What is ENS?

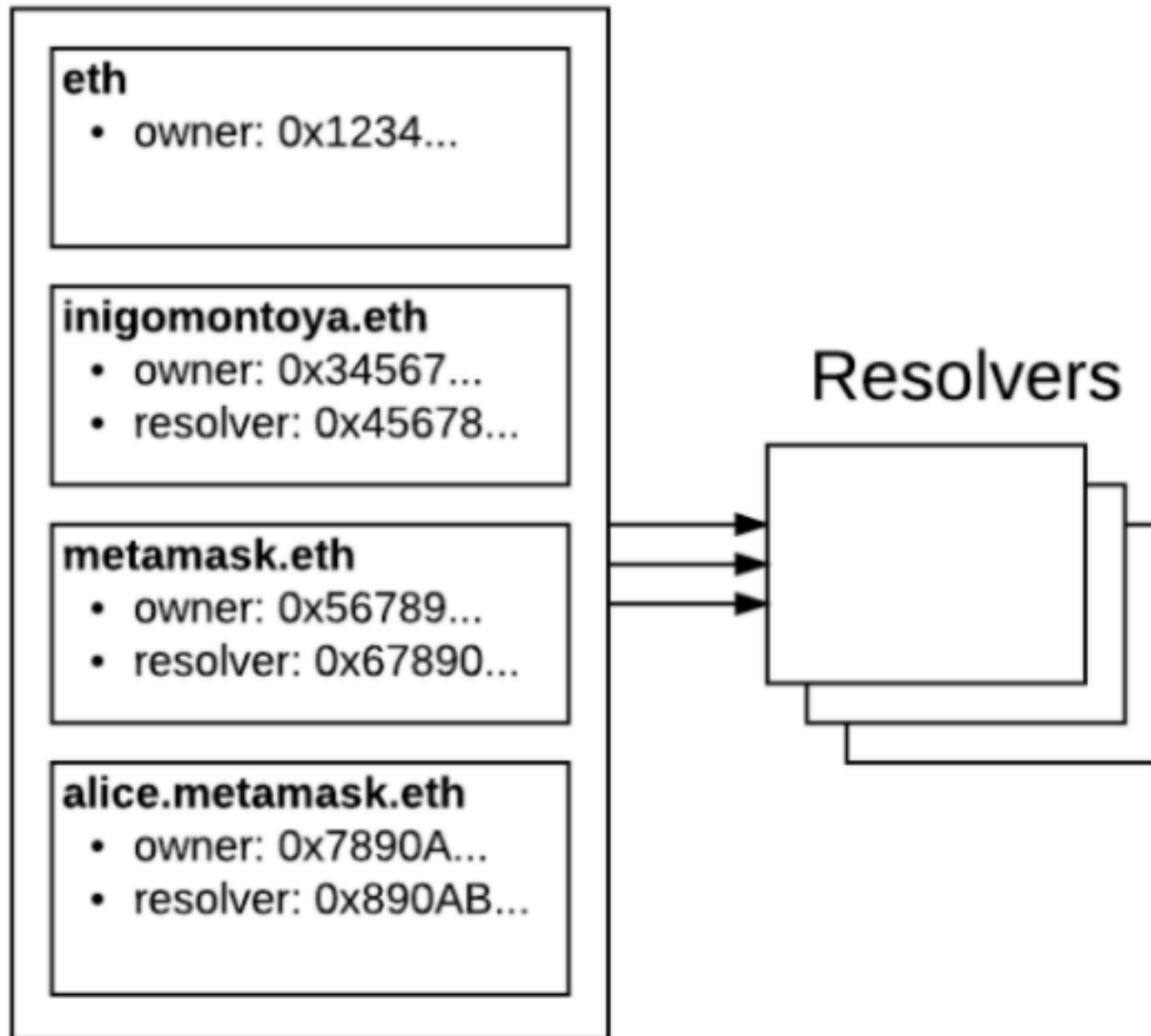
- Map human-readable names to resources
 - Ethereum accounts and contracts
 - Swarm & IPFS records
 - Public keys

What is ENS?

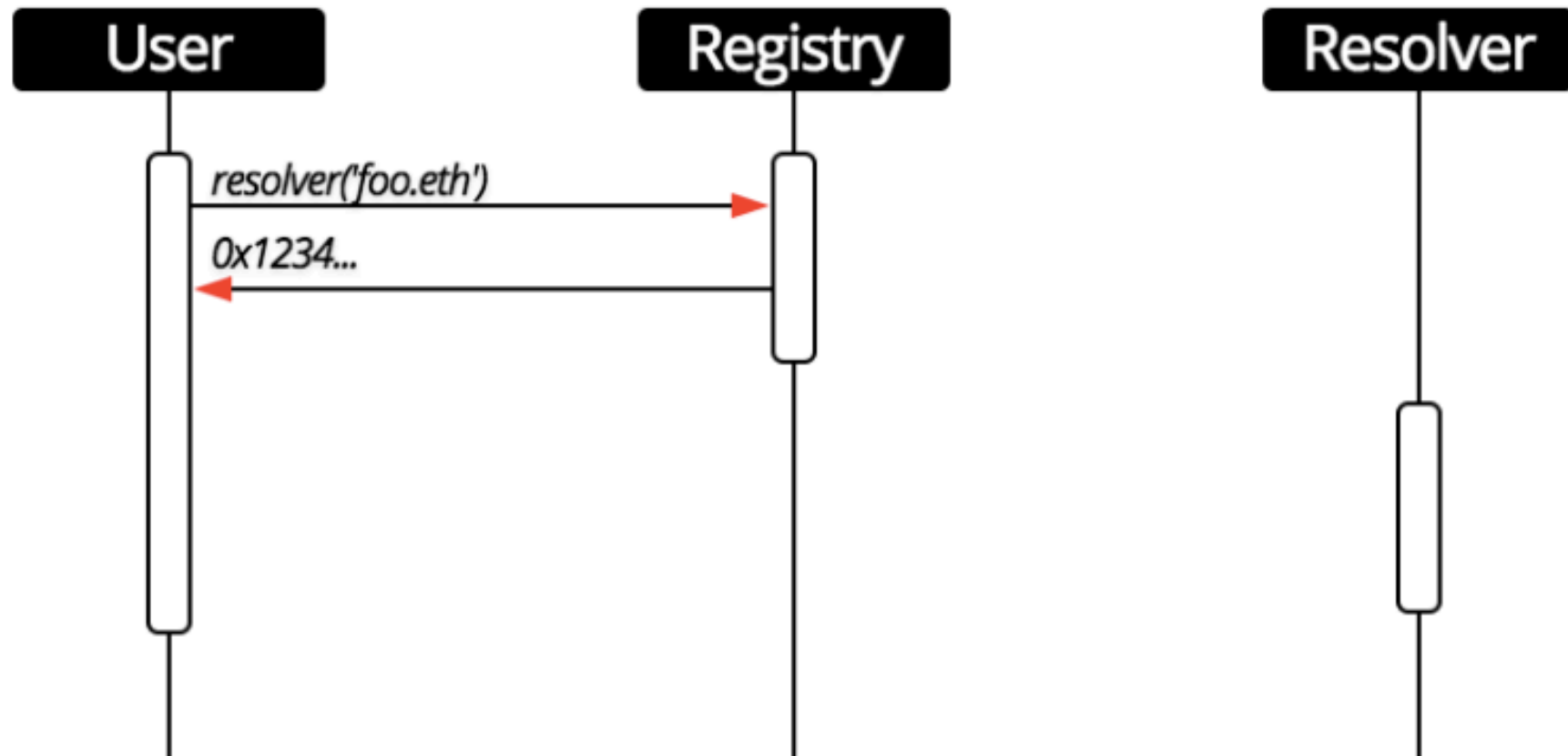
- Map human-readable names to resources
 - Ethereum accounts and contracts
 - Swarm & IPFS records
 - Public keys
- Distributed lookup service
 - Resistant to DDoS attacks
 - Transparent transactions
 - Upgradeable

ENS Architecture

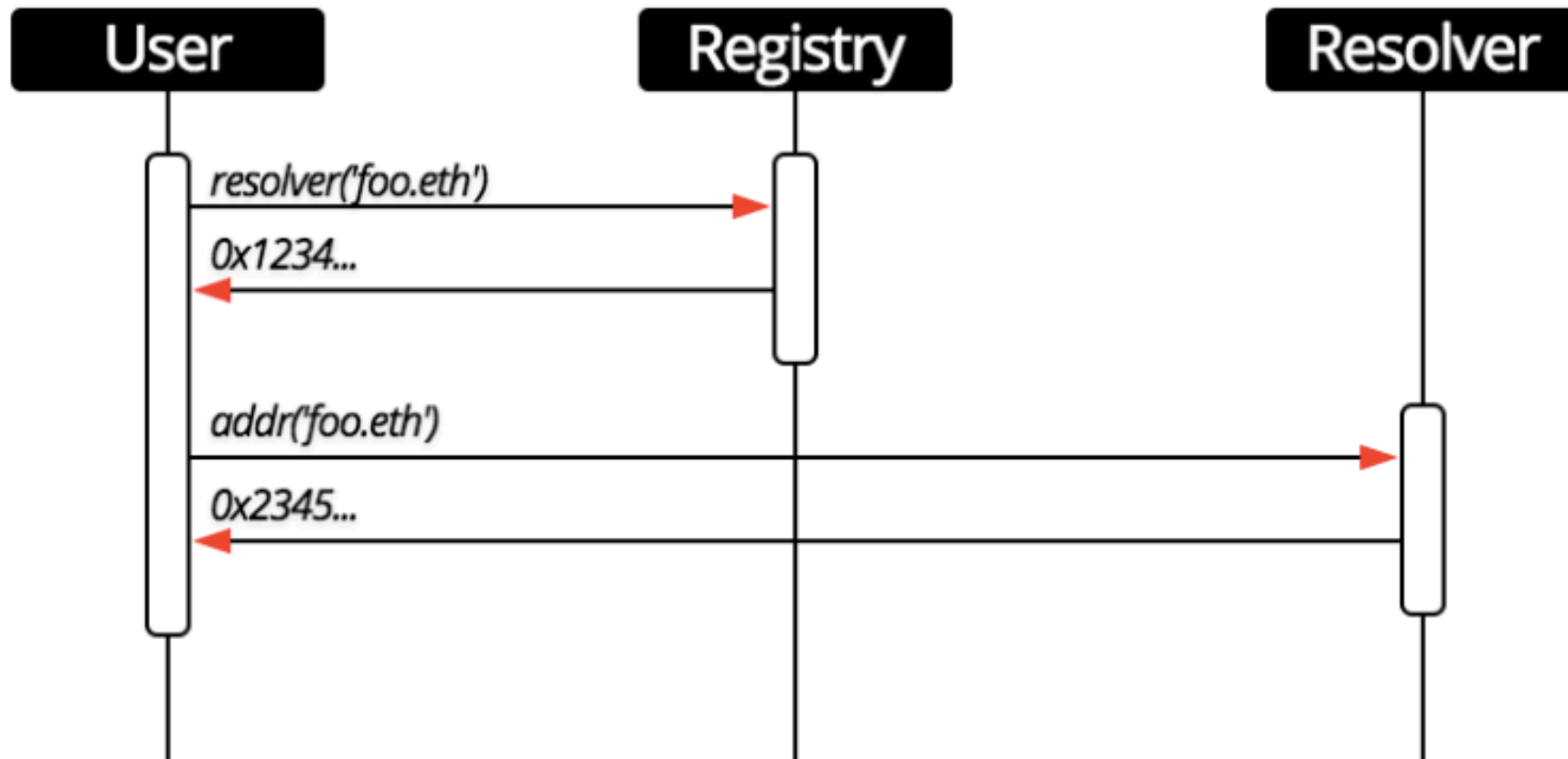
ENS Registry



Name resolution in ENS



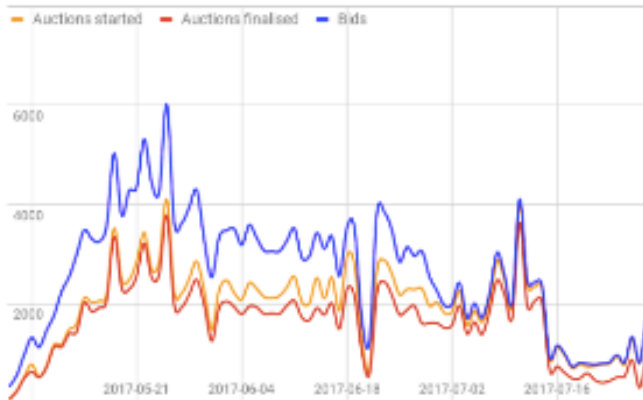
Name resolution in ENS



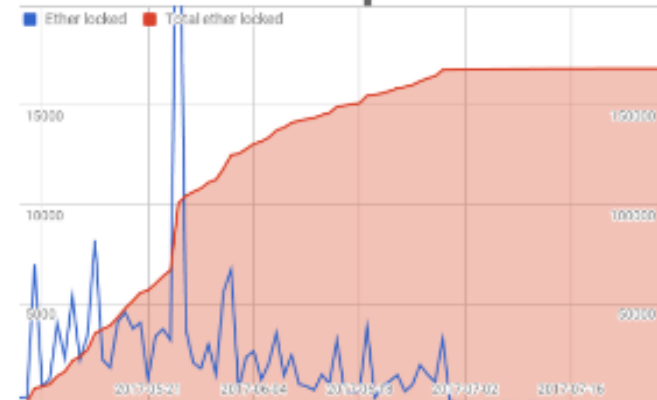
ENS Soft Launch

As of 2017-07-31

180,822
Names auctioned



Ξ168,595
Ether deposited



Client Adoption



swarm



First ENS Workshop

August 2017

- 27 participants
- 3 days of discussion, covering:
 - Dispute resolution
 - Permanent registrar design
 - Securing subdomains
 - DNS integration

DNS integration via DNSSEC

. DS SHA256

🔑 . DNSKEY RSA

✓ # xyz. DS SHA256

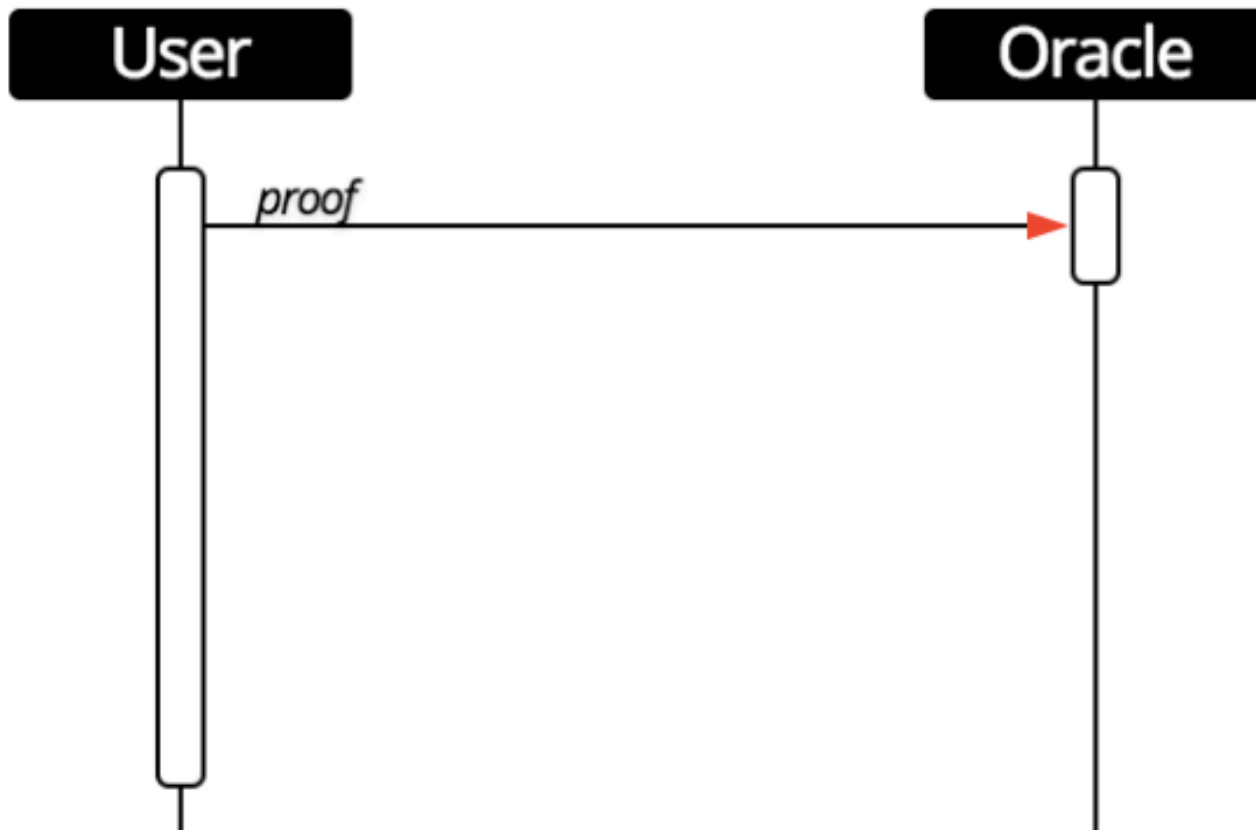
✓ 🔑 xyz. DNSKEY RSA

✓ # ethlab.xyz. DS SHA256

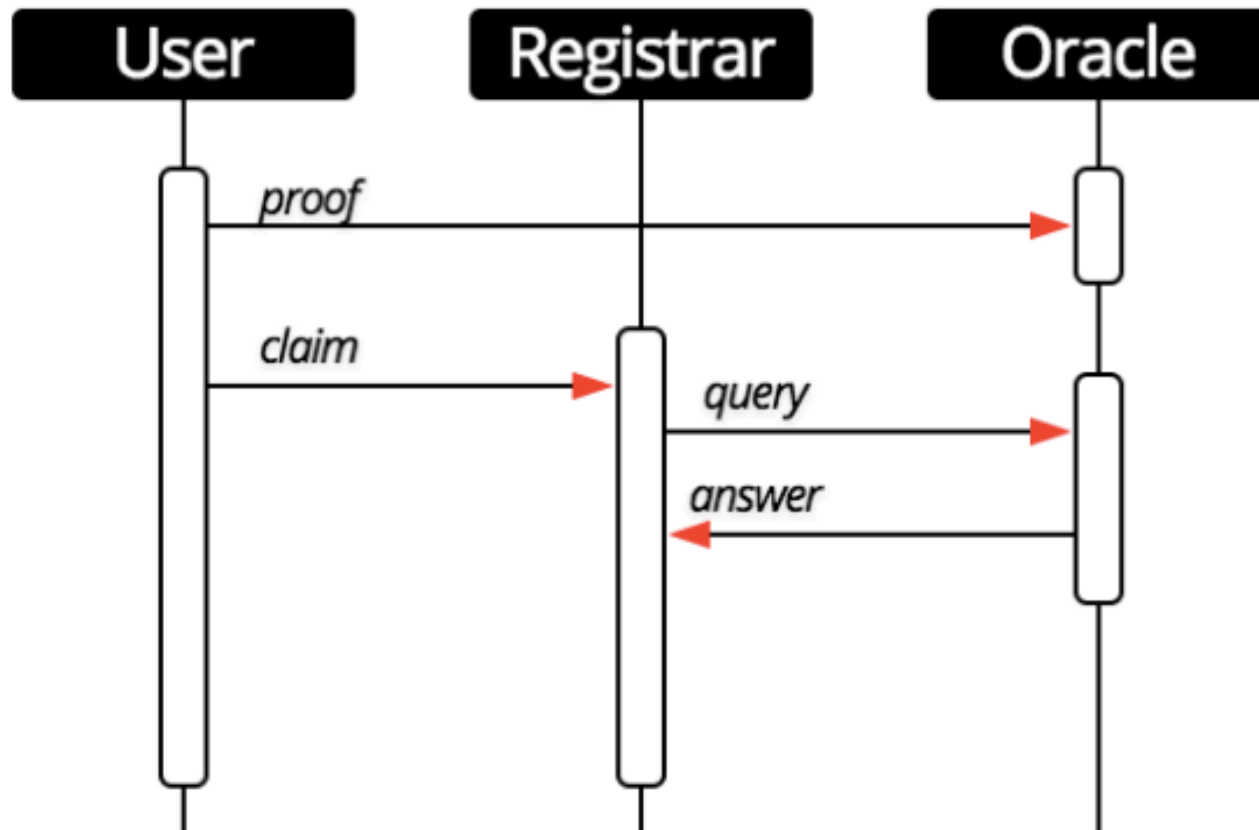
✓ 🔑 ethlab.xyz. DNSKEY RSA

✓ 📄 _ens.ethlab.xyz. TXT a=0x...

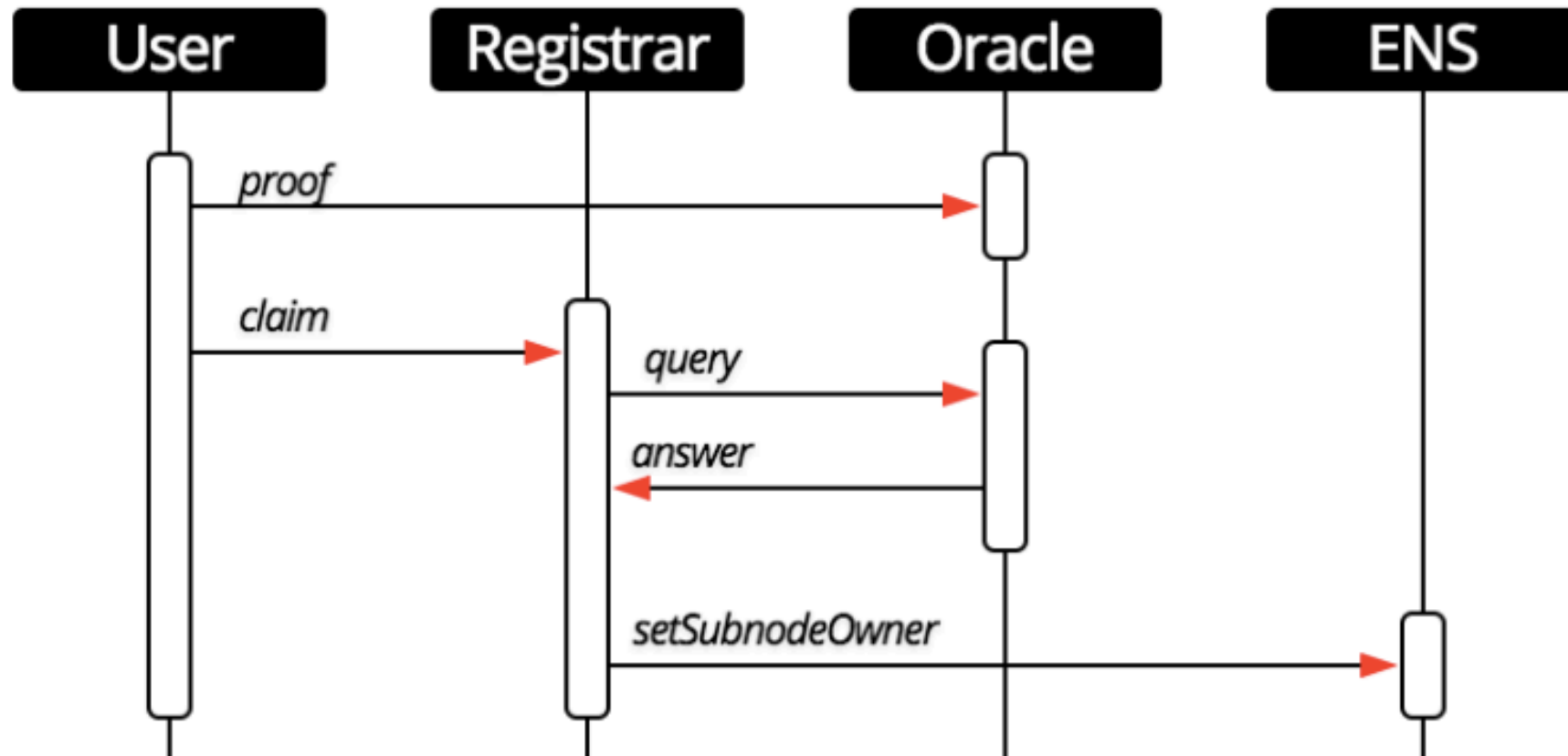
DNSSEC Oracle



DNSSEC Oracle



DNSSEC Oracle



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鎌倉	baidu	town	coop	saarland	song	大車	kddi	construction	dell	onyourside	fan	anquan	scb	cool	tickets	bauhaus	global	dish	手机	magar
school	re	staples	sakura	saarland	democrat	deals	taobao	diy	team	qpon	banamex	landrover	garden	diy	zm	پاکستان	gl	vlg	工行	tz
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total	tools	market	hotels	commbank	bayern	estate	yamaxun	army	sanofi	hospital	crown	nagoya	xfinity	next	goldpoint	mobi	组织机构	gea	vegas	浪马锁
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london	yandex	sony	jnj	fidelity	ieee	健康	industries	style	group	fit	sale	li	lv	集团	mailf	goodhands	redstone	progressive	blue	weibo
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bbva	toshiba	za	band	商標	tjx	now	day	bank	guge	name	university	nfi	rocks	lwa	courses	lotto	asia	fedex	www	gallup
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nikon	land	联通	actor	photos	navy	書籍	youtube	otsuka	aetna	ren	genting	chintai	oracle	statefarm	aramco					

Thank you, and stay tuned...

