



Build on the network

ICP | Internet Computer



tech history arcs towards open networks

PRIVATE

INFRASTRUCTURE



OPEN

NETWORKS

INFORMATION SUPERHIGHWAY

curated walled-garden network proposed by
Microsoft and Oracle (1990s), AOL...



THE INTERNET

private routing devices connected by TCP/IP
create a public global network

TRADITIONAL IT

cloud services, databases, middleware,
web servers, CDNs, firewalls...



INTERNET COMPUTER

private node machines connected by ICP
create a public serverless autonomous cloud





INTERNET COMPUTER



INTERNET IDENTITY



build on the network

OPEN INTERNET SERVICES

build transparent autonomous web3 services that communities run using powerful decentralized governance, with no backdoors for devs, organizations or CEOs

SOVEREIGN ENTERPRISES

build unstoppable systems and tech infrastructure on an open network from tamperproof software, w/o need for firewalls, no fear of backdoors, and no corporate cloud kill switches

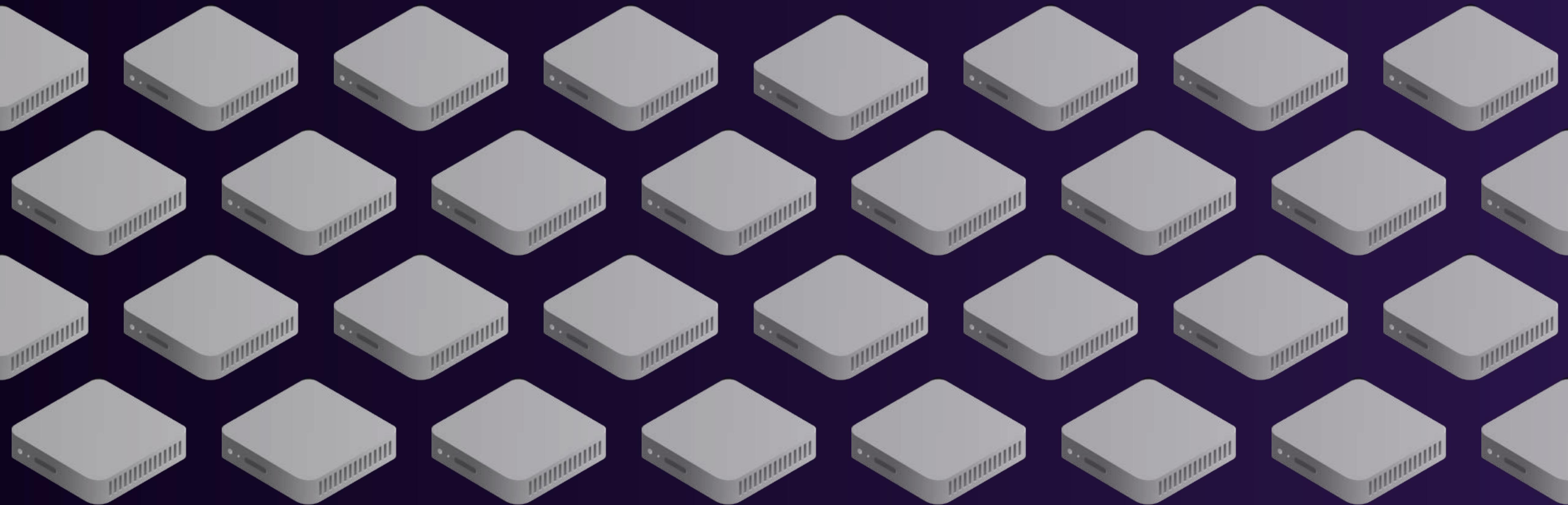


network

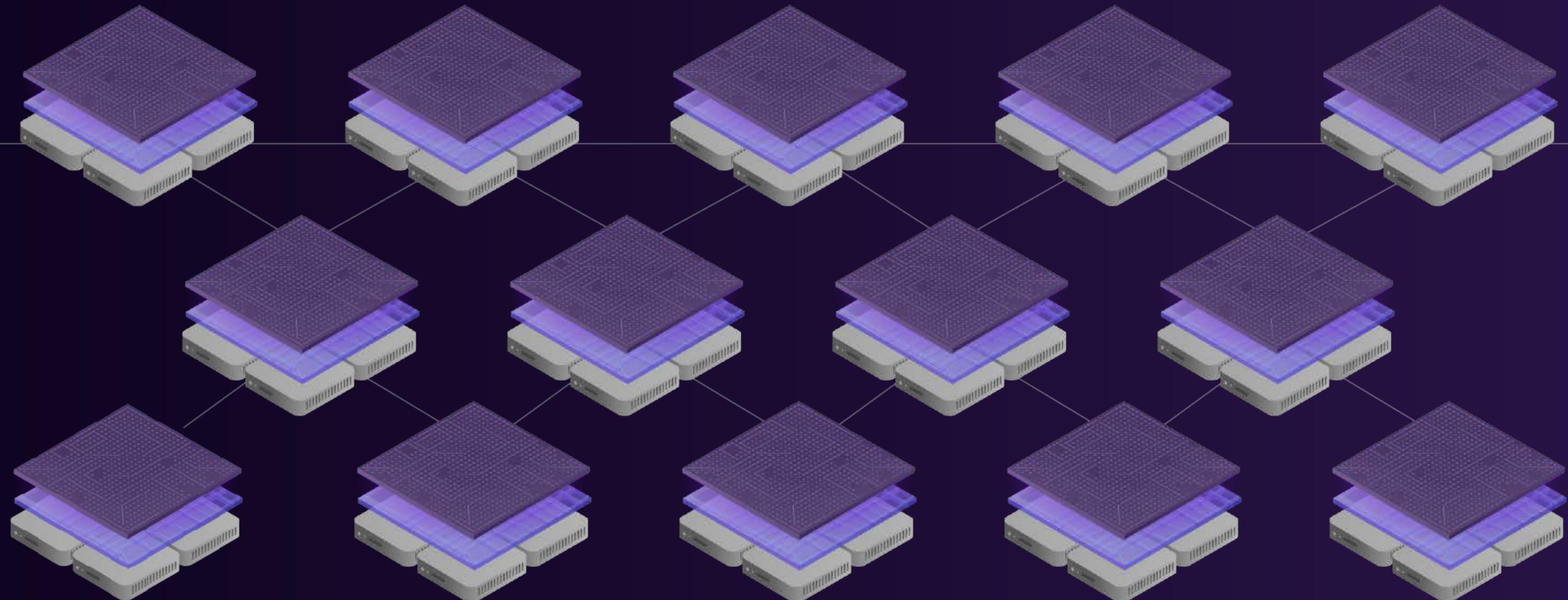
the Internet Computer is created by the ICP, the most advanced network protocol ever devised



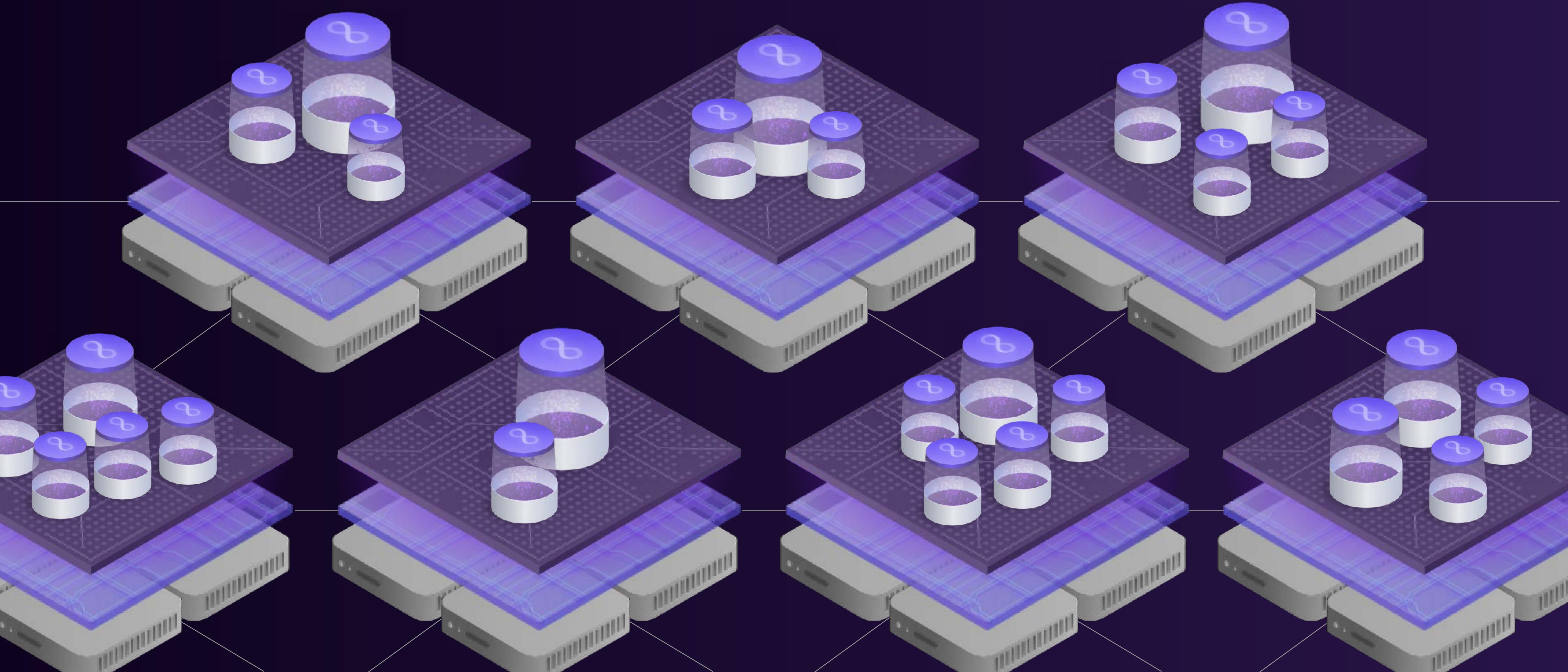
**independent node providers own and operate
node machines in data centers worldwide**



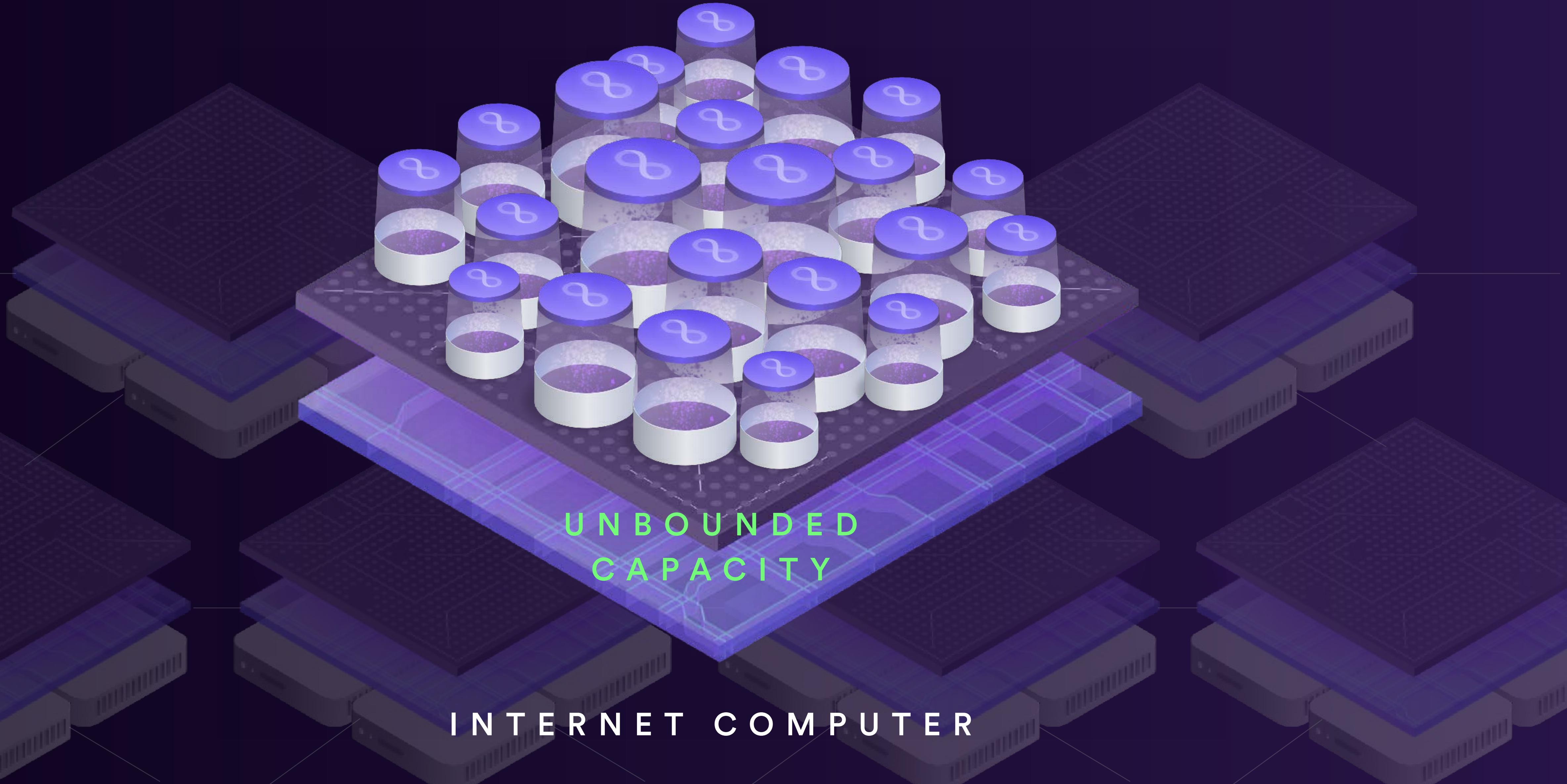
**Internet Computer Protocol (ICP) combines nodes
to form efficient subnet blockchains**



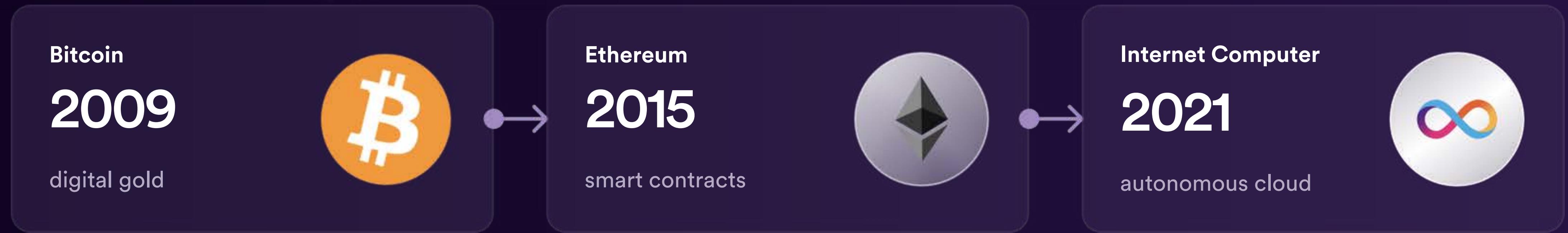
subnet blockchains add capacity for running
canister smart contracts



subnets combine into ONE serverless *autonomous* cloud



a new form of blockchain network emerges



canister code

canisters are a new form of smart contract
that have general application



smart contracts are a *new form of software*



ETHEREUM SMART CONTRACTS

tamperproof

no firewall or security team necessary

tokenization

hold, process & transmit value like data

unstoppable

nuke proof, no servers or failing over

composable

trustless dynamic collaborative building

autonomous

can remove human control & backdoors

borderless

code/services have no geography



canisters are a *new form of smart contracts*



CANISTER SOFTWARE

fast

web speed not blockchain speed

efficient

reduces IT carbon footprints

scaling

scales services more easily than traditional IT

low cost

compute costs approach traditional IT

multi-chain

natively interacts with external blockchains

http (user experience)

canister code speaks web (http) directly



software will eat the world. smart contracts can eat software



CANISTER-BASED SYSTEMS

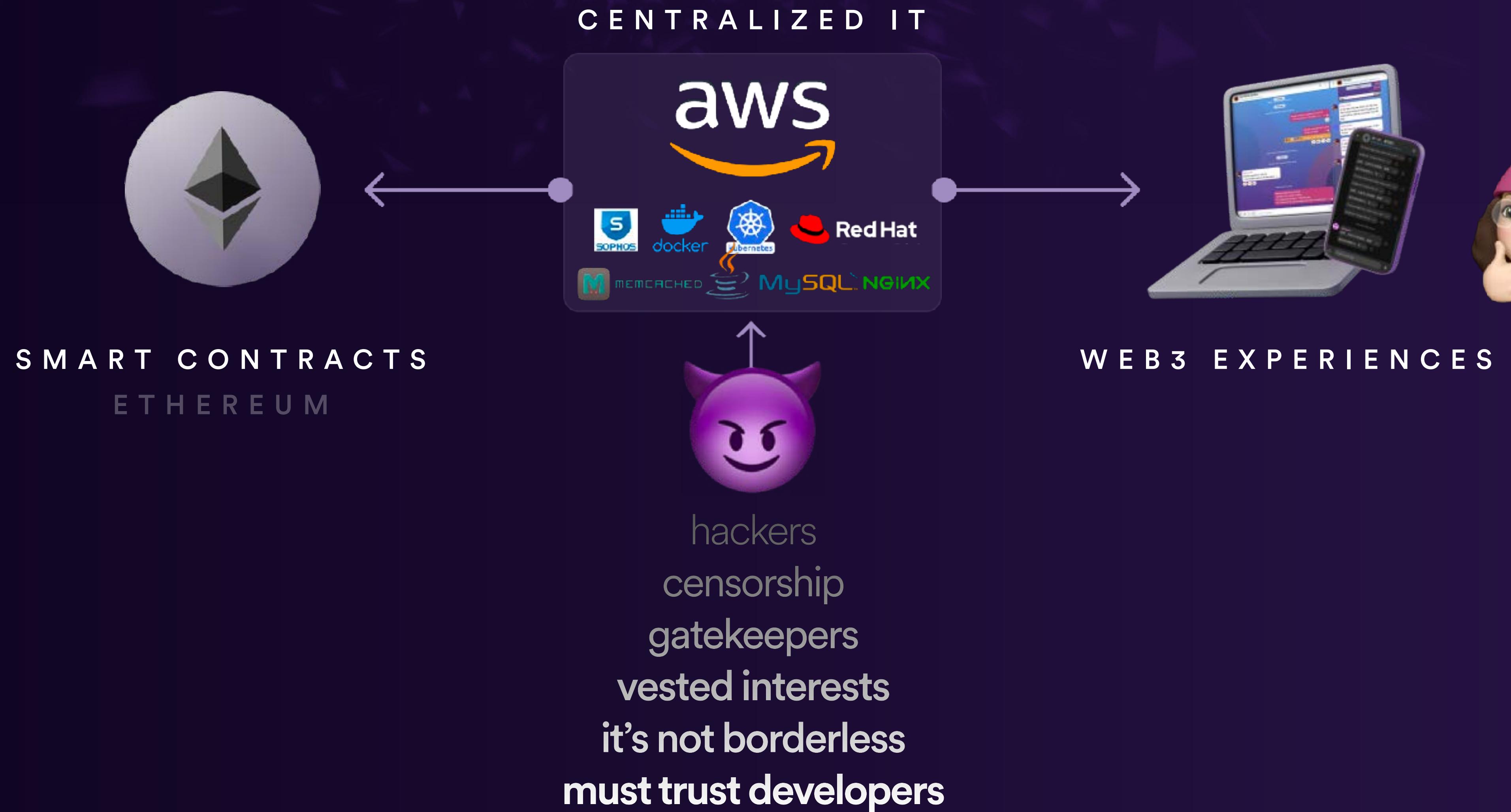


web3+

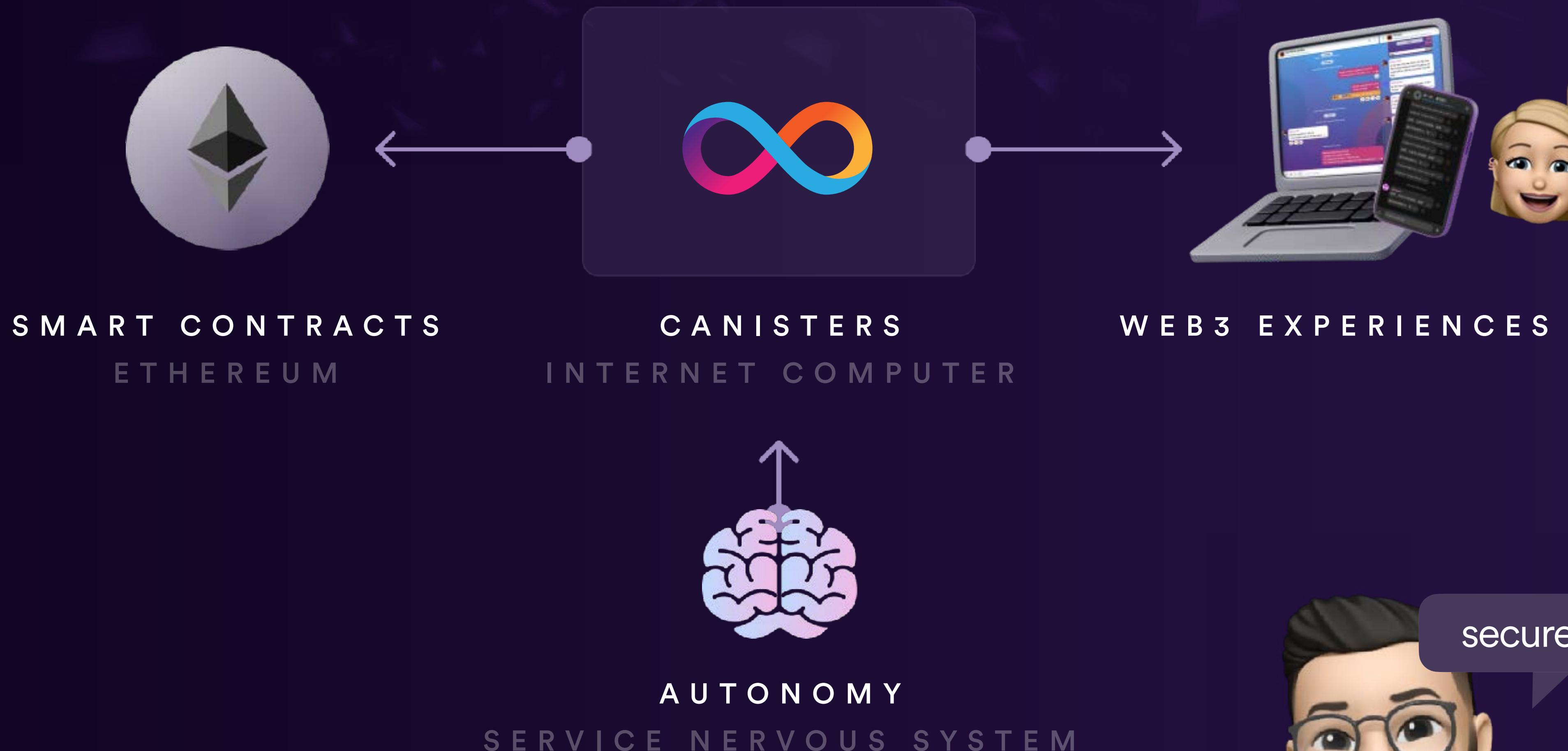
what the Internet Computer can solve for web3 builders
in today's blockchain ecosystem



ICP solves for the final frontier of decentralization



replace centralized IT using Internet Computer canister contracts



autonomy

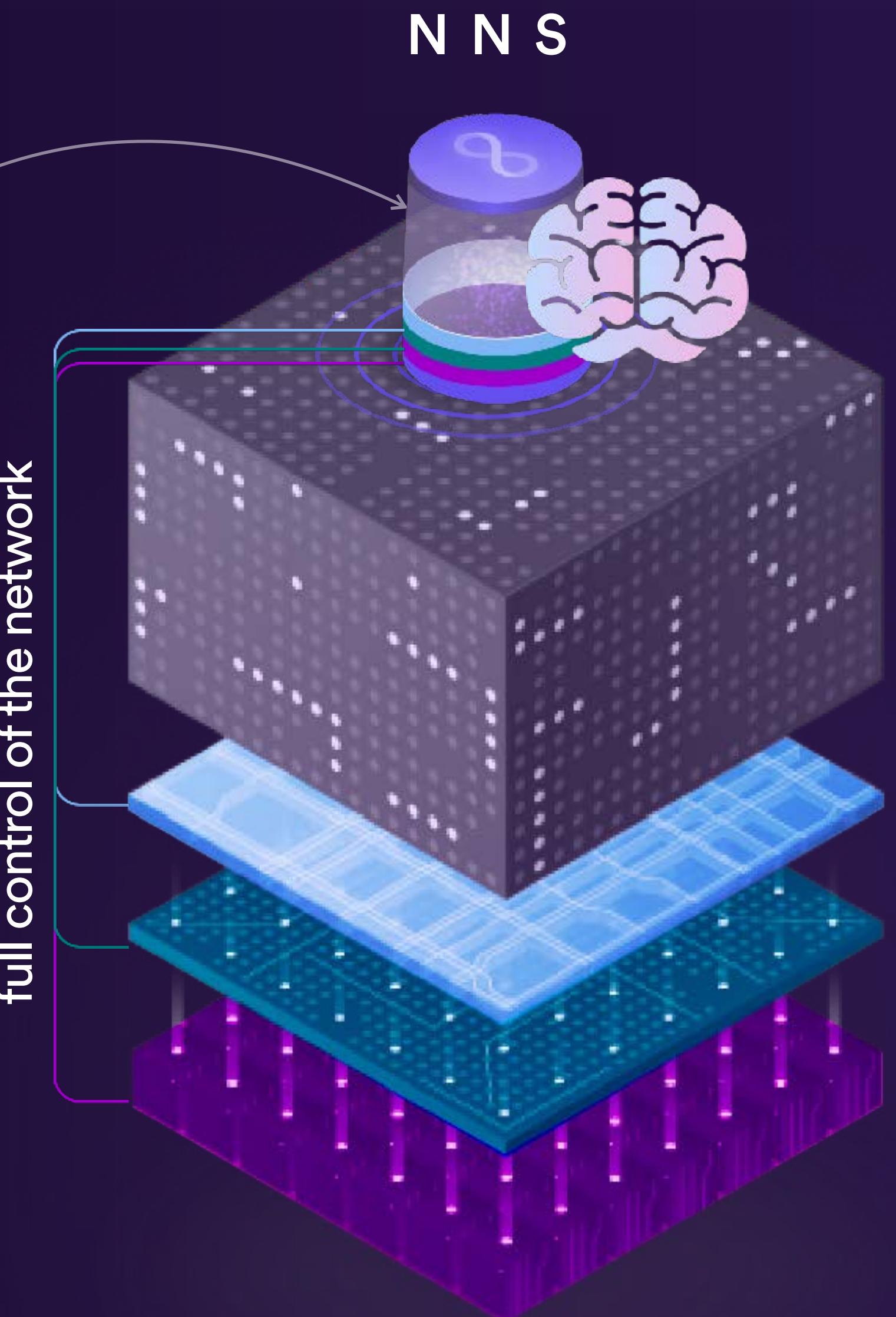
the Internet Computer runs autonomously under the control of decentralized governance... so can web3 online services and systems



Network Nervous System

the Internet Computer network adapts and evolves autonomously without backdoors using advanced protocol-integrated DAO governance:

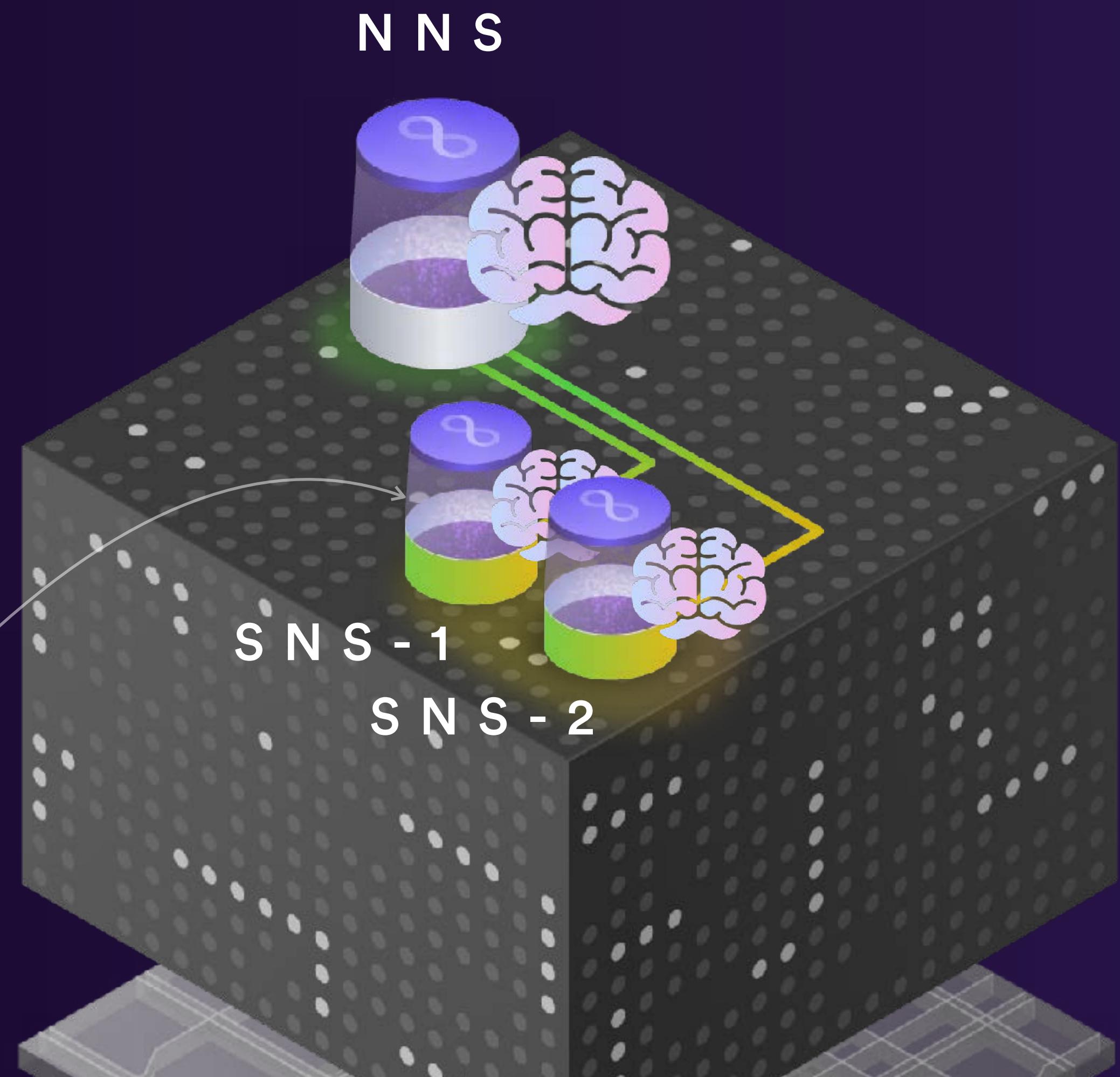
- public, open, transparent and permissionless
- proposals submitted and adopted or rejected
- adopted proposals are executed automatically
- on instruction, nodes update ICP protocol
- on instruction, nodes form into new subnets
- decisions made by algorithmic liquid democracy
- users lock ICP tokens to create “voting neurons”
- neurons can vote automatically by following others
- tens of thousands of users have created neurons
- in 2 years, mainnet upgraded its protocols 145 times
- human control removed to make network autonomous



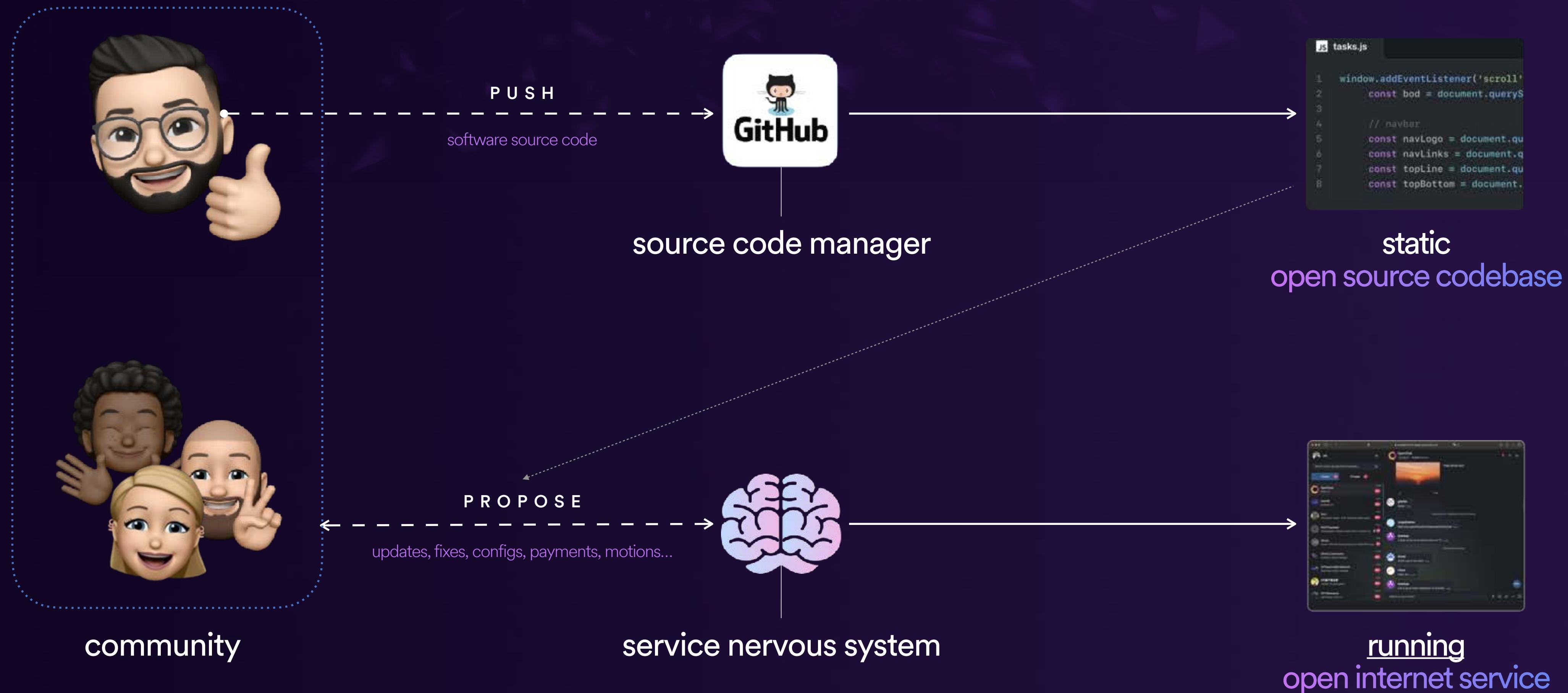
democratic web3 services use “service nervous systems”

an SNS DAO works similarly to the NNS, but is used to create a web3 “open internet service” or secure enterprise system:

- open/permissionless or private
- the SNS updates its service’s canisters
- the SNS can perform arbitrary configurations
- an SNS can manage a token treasury (value)
- services can be controlled by communities of millions
- each SNS creates a ledger of native tokens for its service
- tokens incentivize decentralized community workforces
- community fundraising into the SNS is possible
- enterprise systems can distribute control for security
- any complex service can be made autonomous
- the NNS is an SNS factory



an open internet service (OIS) gives its community 100% control

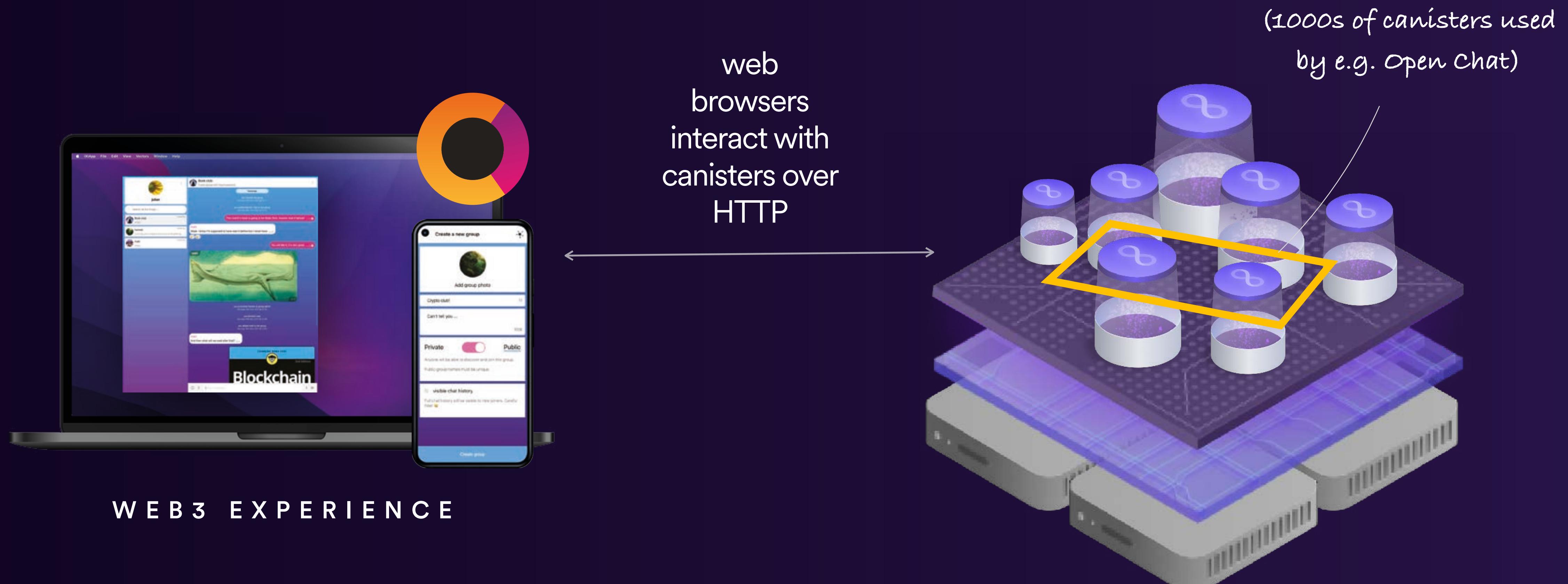


pure web3

the Internet Computer is a Web3 platform that provides a complete alternative to the traditional IT stack



end-users interact with services over HTTP (the web)

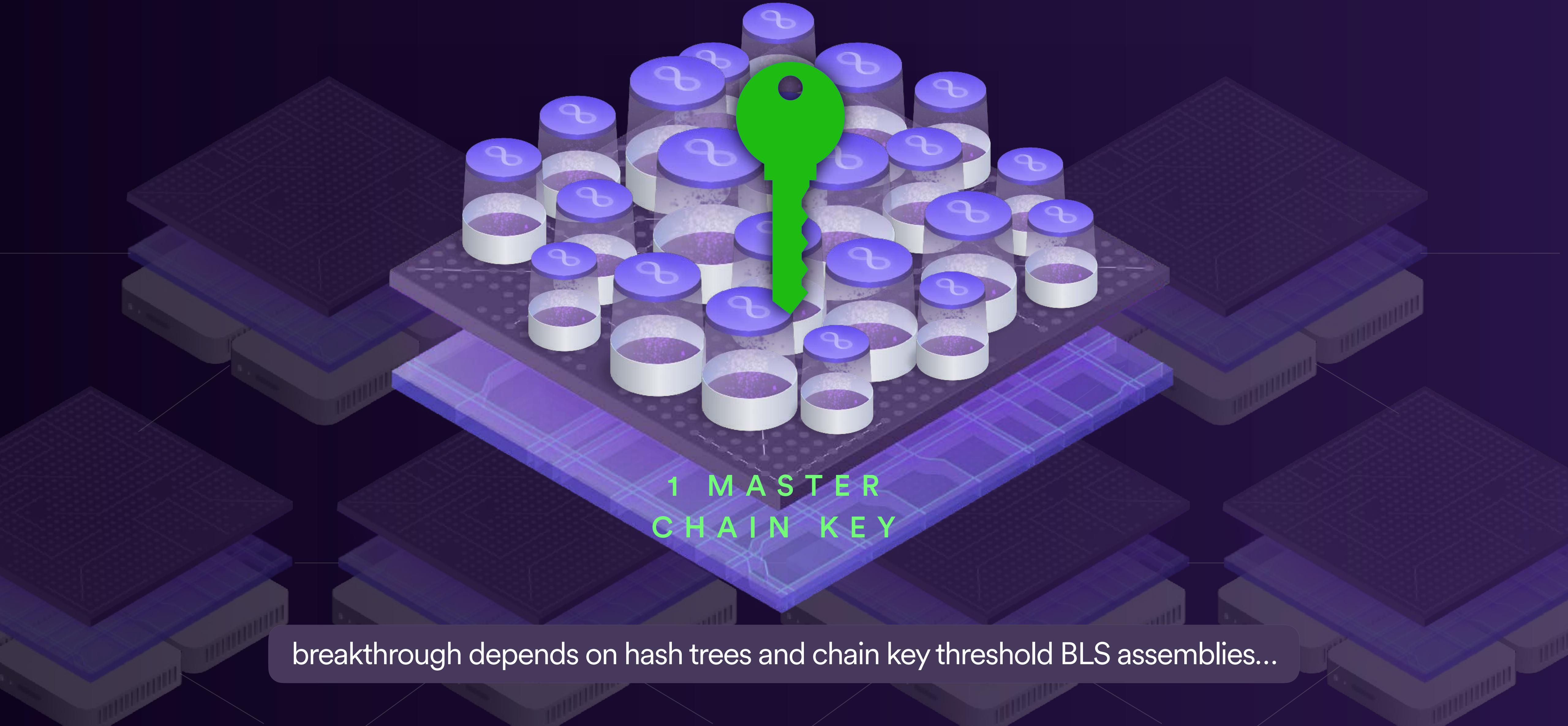


canister software pays the network for its own computation (“reverse gas”)

Internet Identity creates RPC transaction sessions



actually, the entire network has 1(one) master 48-byte chain key!!



1 MASTER
CHAIN KEY

breakthrough depends on hash trees and chain key threshold BLS assemblies...

Internet Identity

The Internet Computer's identity layer



Interoperable

Share credentials across different web services and platforms in a privacy-preserving manner.



Easy to use

No need to remember private keys or manage endless usernames and passwords. Simply unlock your device to connect.



Controlled by owner

Internet Identity is controlled by the NNS, decentralized control system (or DAO) that manages the Internet Computer's functions.



Highly secure

Based on FIDO Alliance and W3C standards, cryptographic key pairs are stored in the secure hardware on your device.



Open source

Developers can audit and contribute to the codebase to ensure that it meets the highest standards of security and transparency.



No tracking

Based on FIDO Alliance and W3C standards, cryptographic key pairs are stored in the secure hardware on your device.



Where we are now

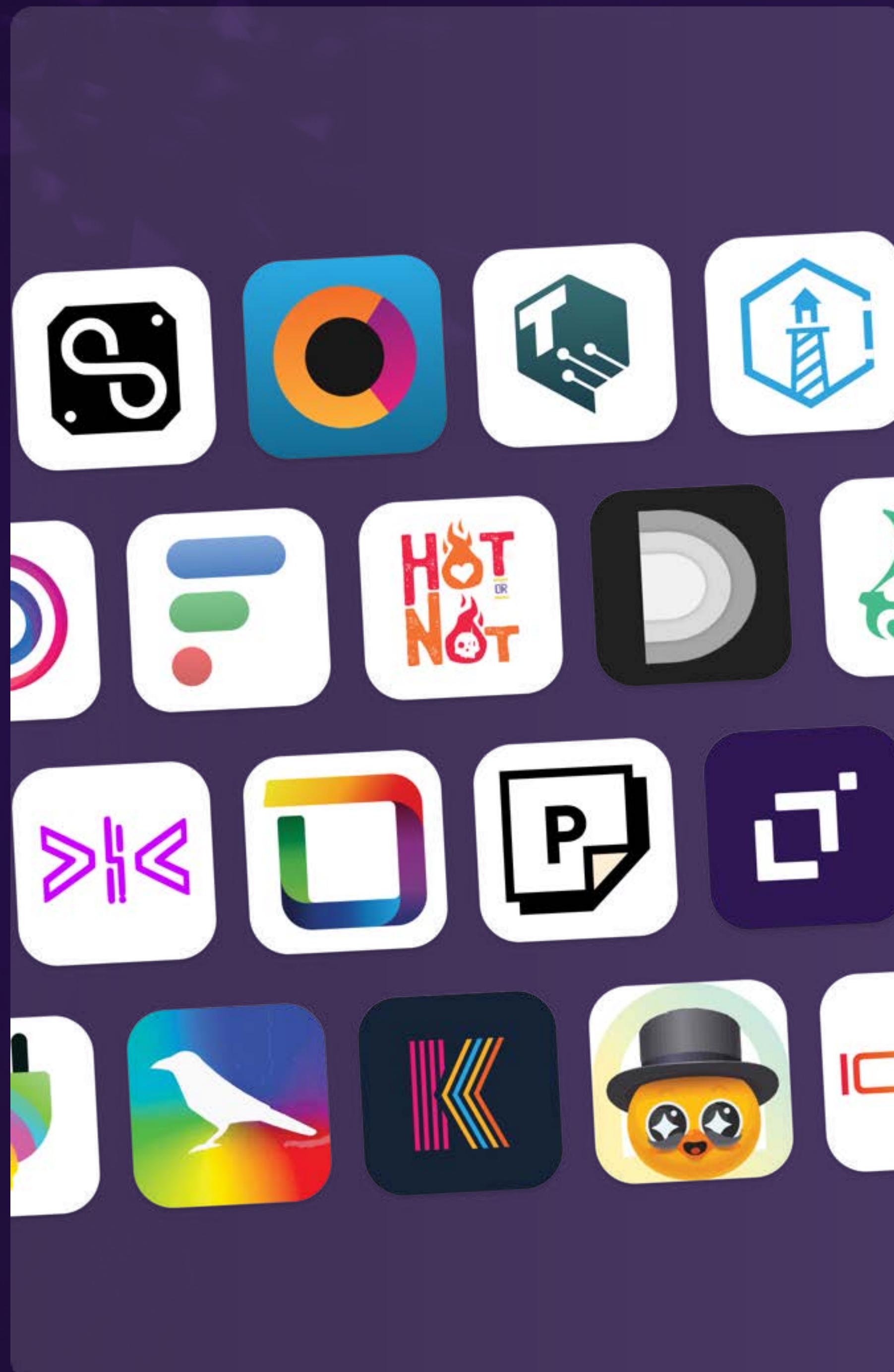
2.2M+

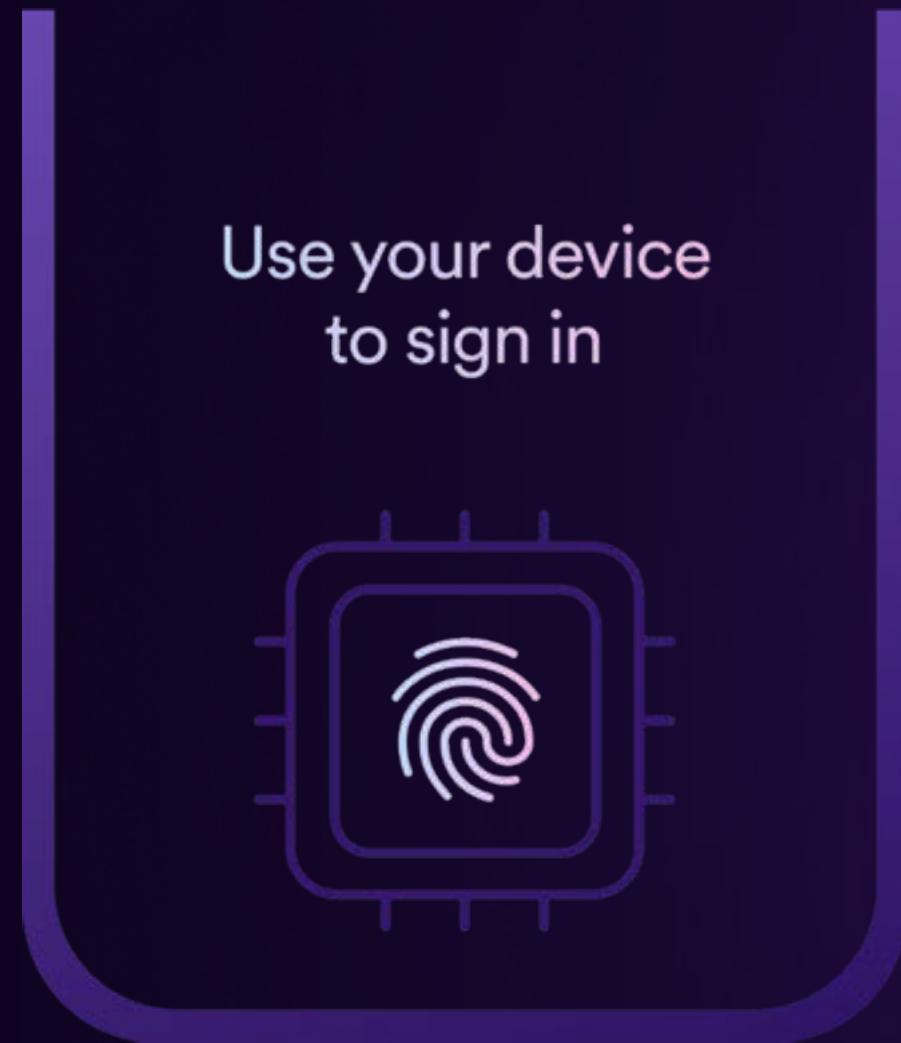
identities created

100+

dapps using II for authentication

Support for relying parties and identity providers coming in 2023...





Use your device
to sign in

+



+



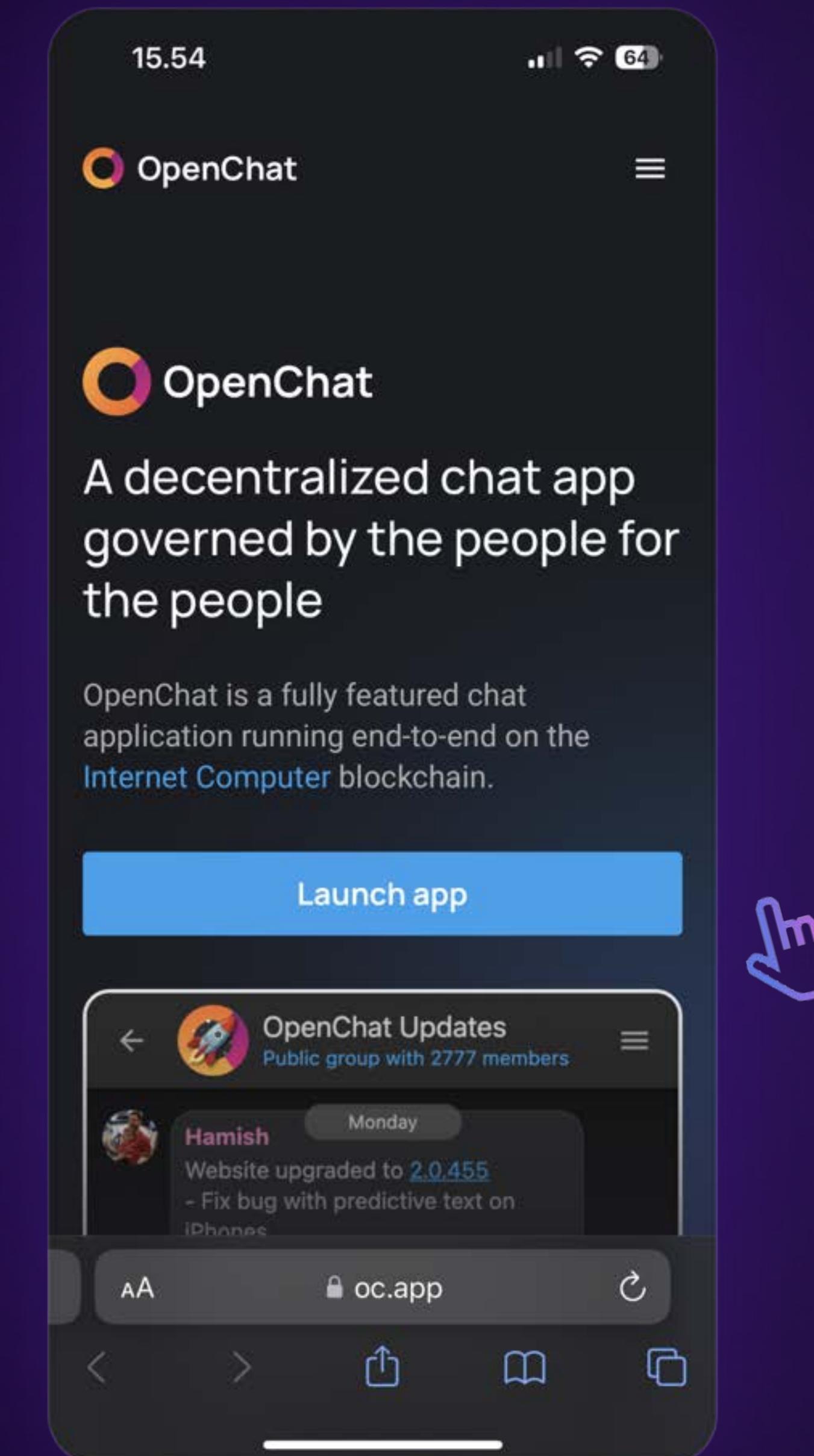
TPM

WebAuthn (+ FIDO)

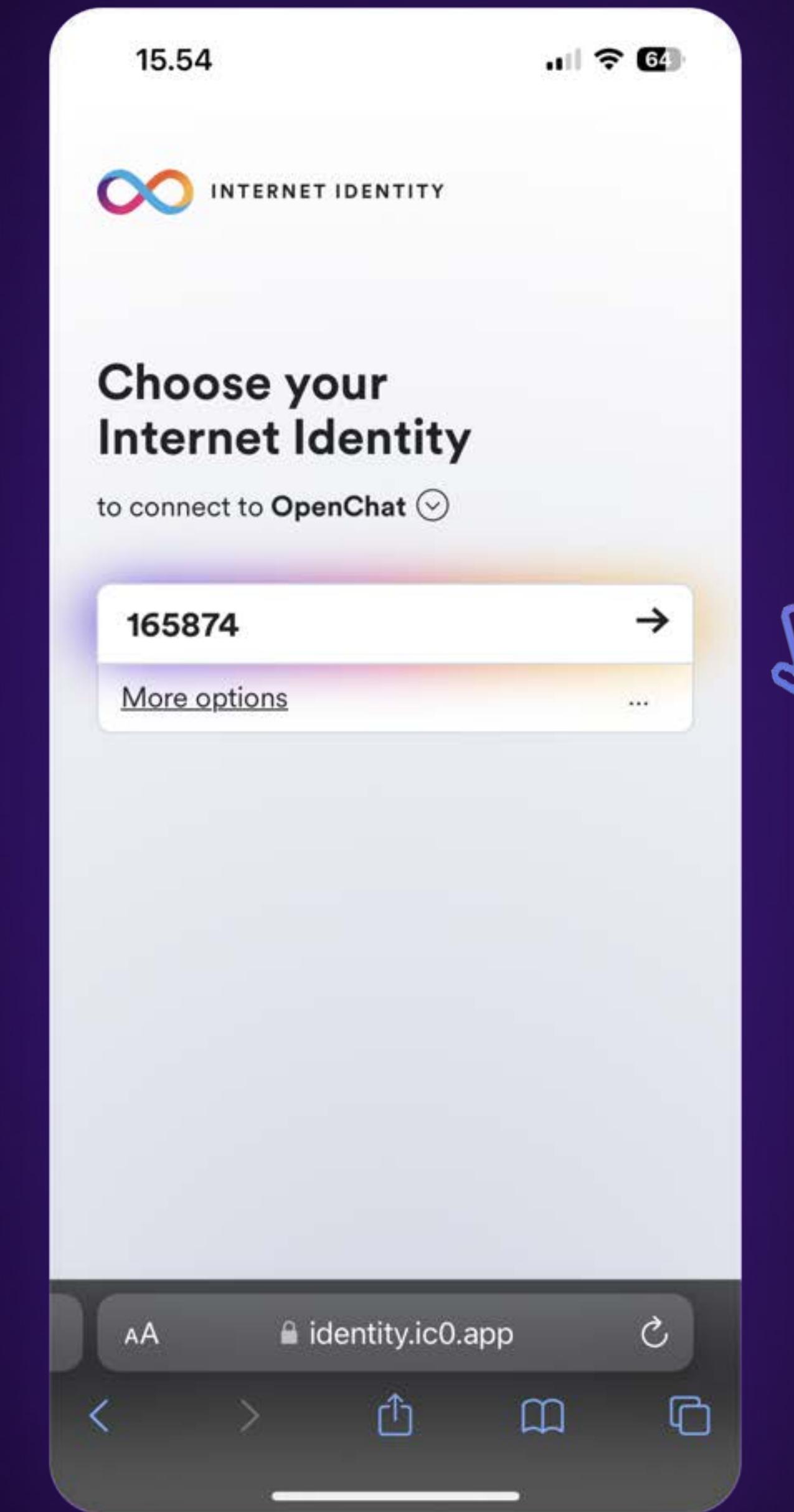
Internet Computer



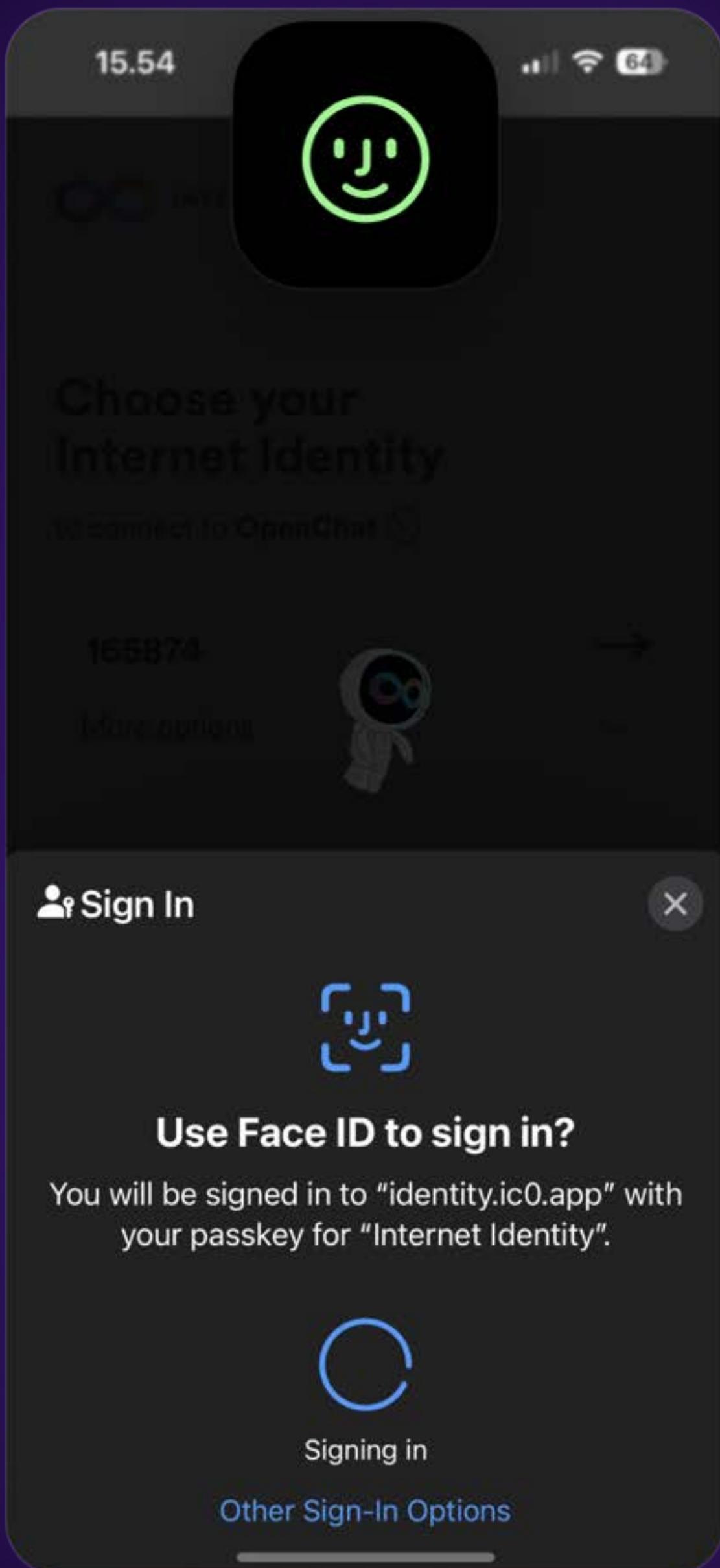
INTERNET IDENTITY



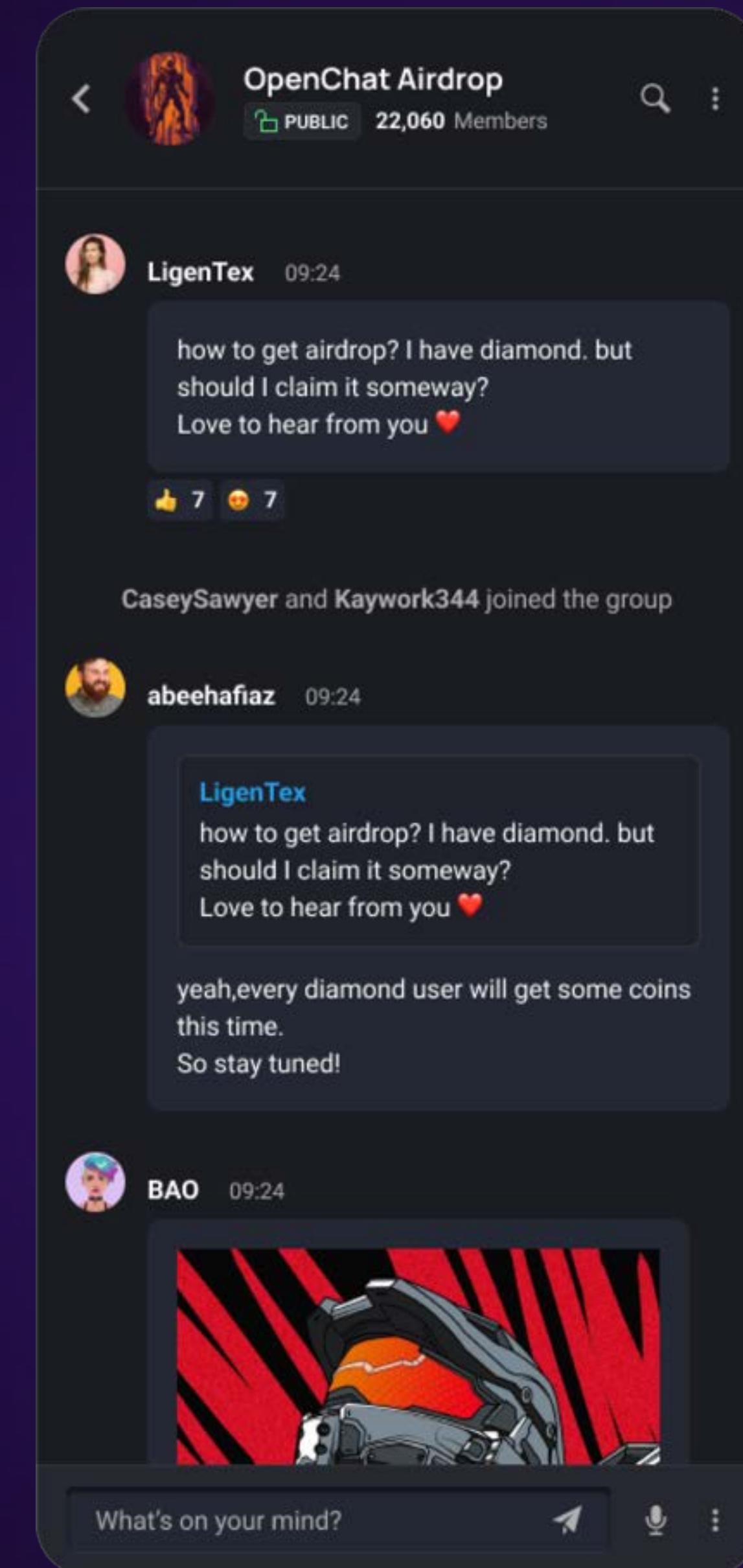
INTERNET IDENTITY



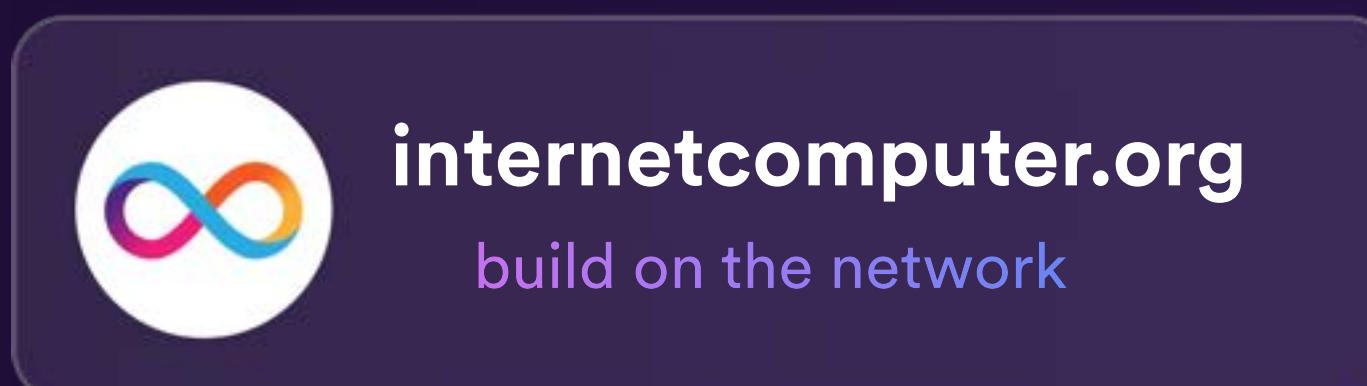
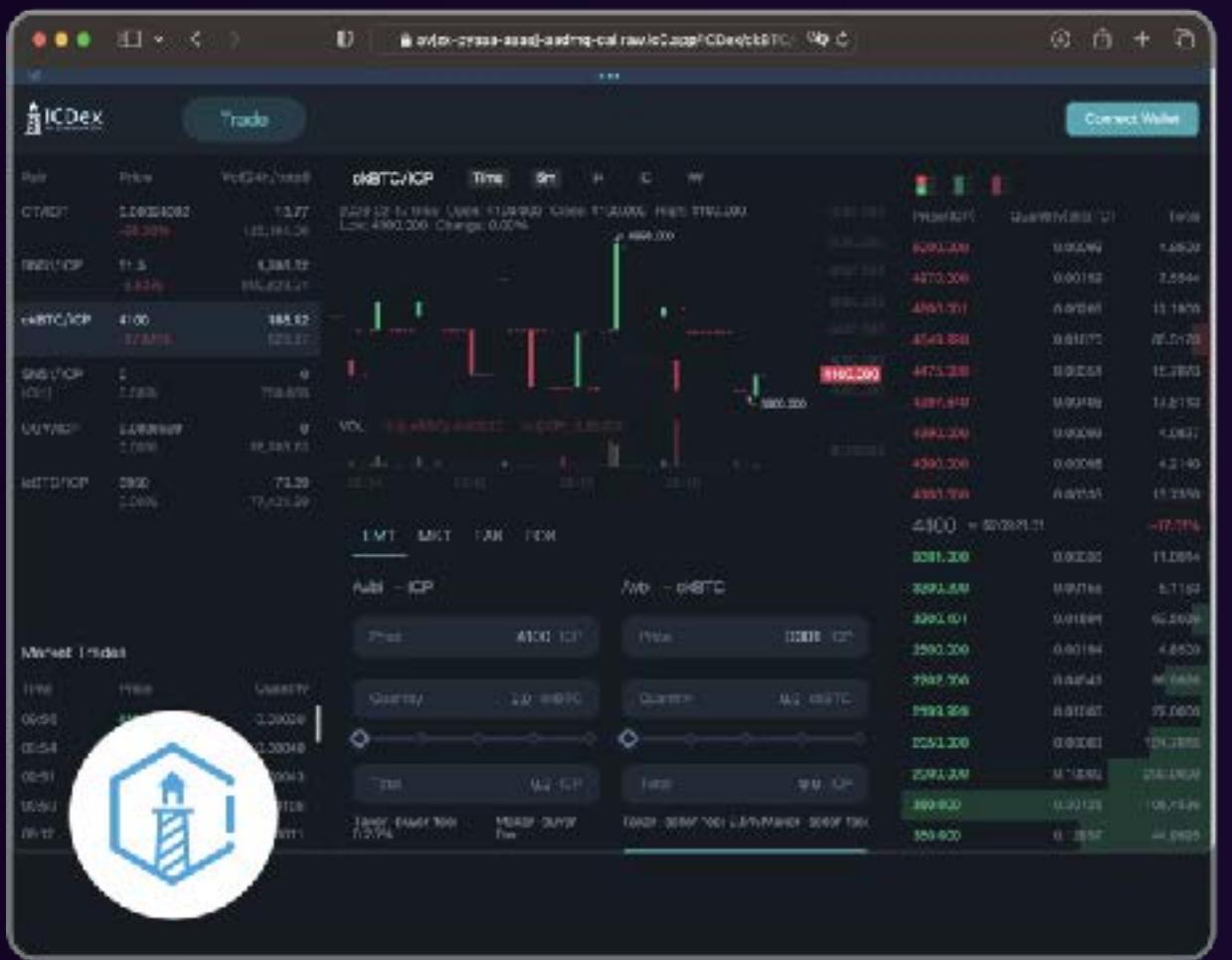
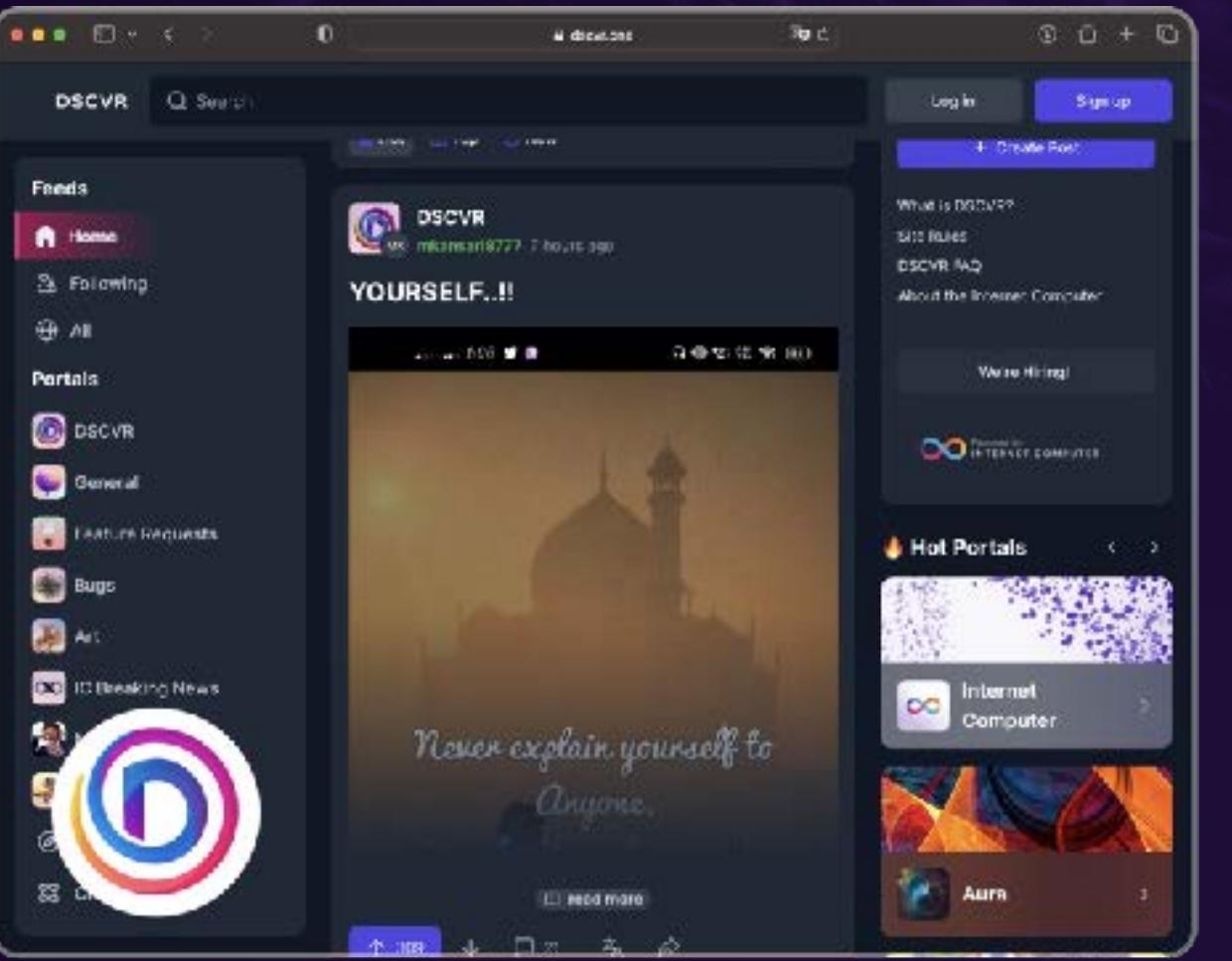
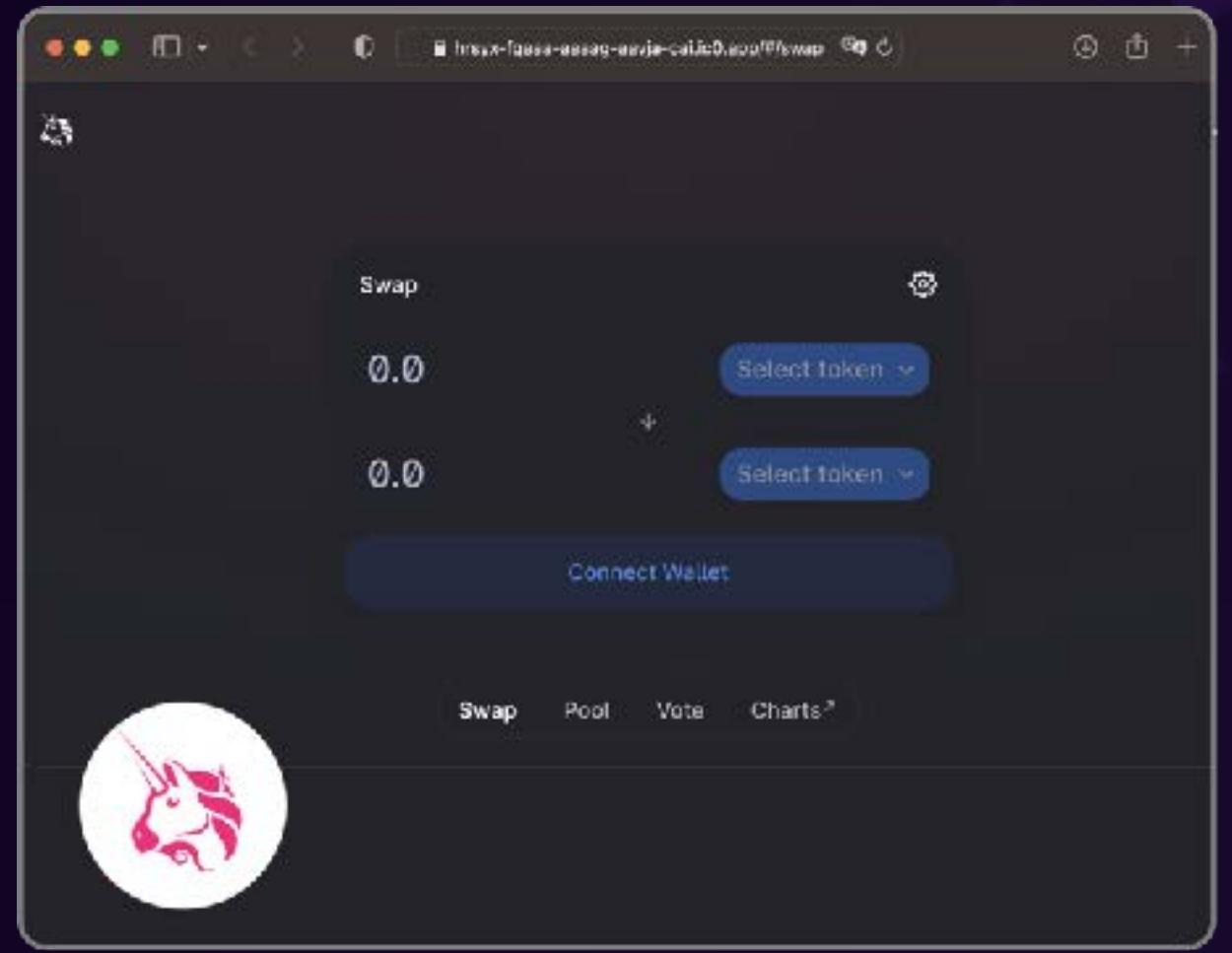
INTERNET IDENTITY



INTERNET IDENTITY



software autonomy can create more powerful web3





OC.app

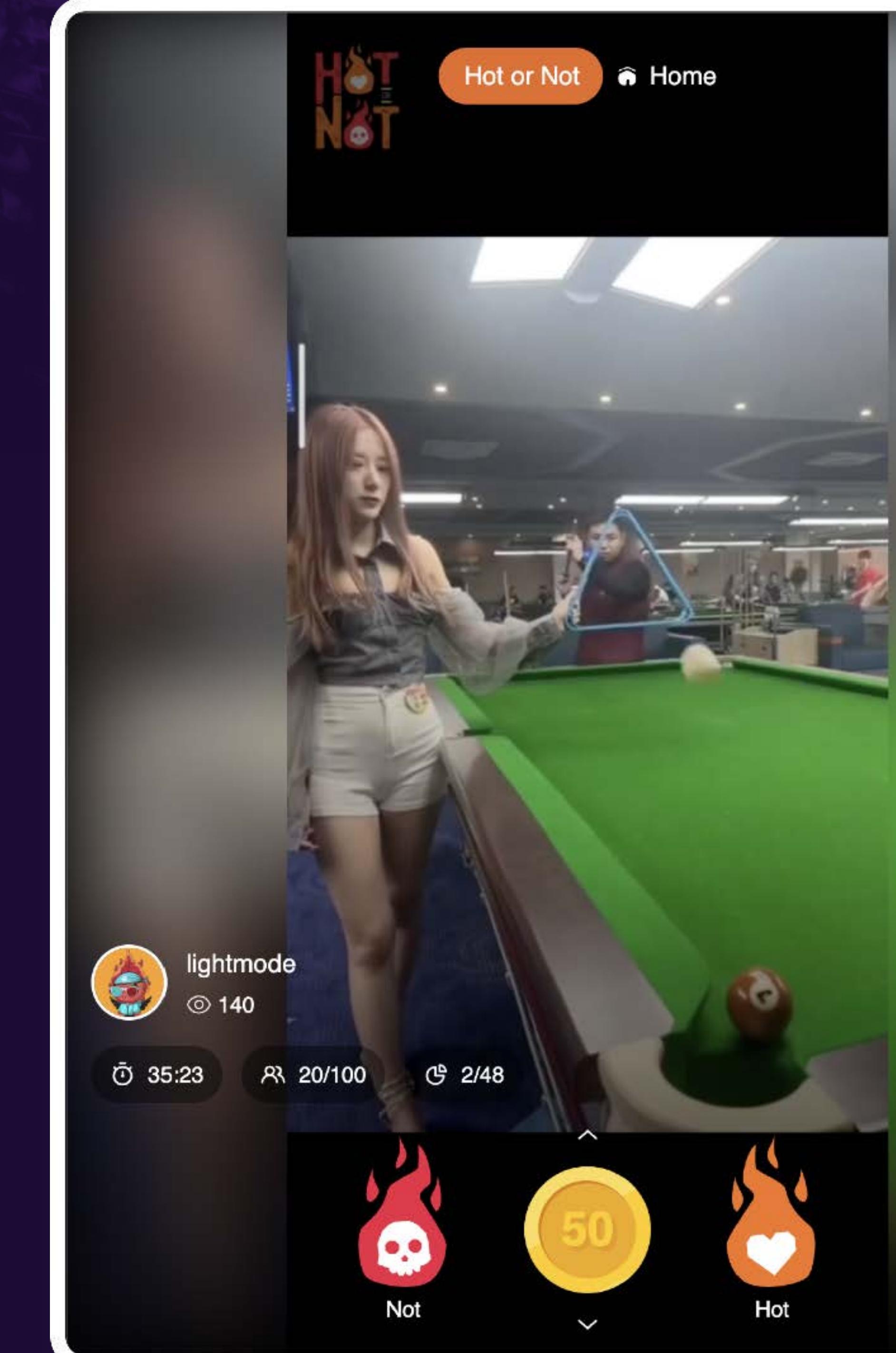
- ✓ messaging service runs 100% on network
- ✓ chat accounts also wallets i.e. full SocialFi
- ✓ send satoshis using chat messages (no wallet!)
- ✓ under skin, every message is a blockchain TX
- ✓ the service is an autonomous *protocol*...
- ✓ a community SNS DAO is in exclusive control
- ✓ was first OSI (open internet service) in history
- ✓ protocol/software updates submitted to SNS
- ✓ autonomously adapts and evolves...

The screenshot shows the OC.app mobile application interface. At the top, there's a header bar with a user profile picture, the name "Jan", a search bar, and a date "Friday 18th Nov". To the right of the search bar is a "Threads" tab with a red badge indicating 1 new thread. Below the header is a sidebar for the "OpenChat" public group, which has 15,575 members. The sidebar features a sunset image and a "What's on your mind?" input field. The main content area displays a list of messages from various users and groups. The messages are timestamped and some have red notification badges. The users listed include "diens", "distrikt", "/biz/", "NNS Proposals", "Dfinity", "Dfinity Community", "ICP Maximalist Network", "8年躺平室友群", and "ICP Metaverse". The messages range from simple greetings to links and status updates.

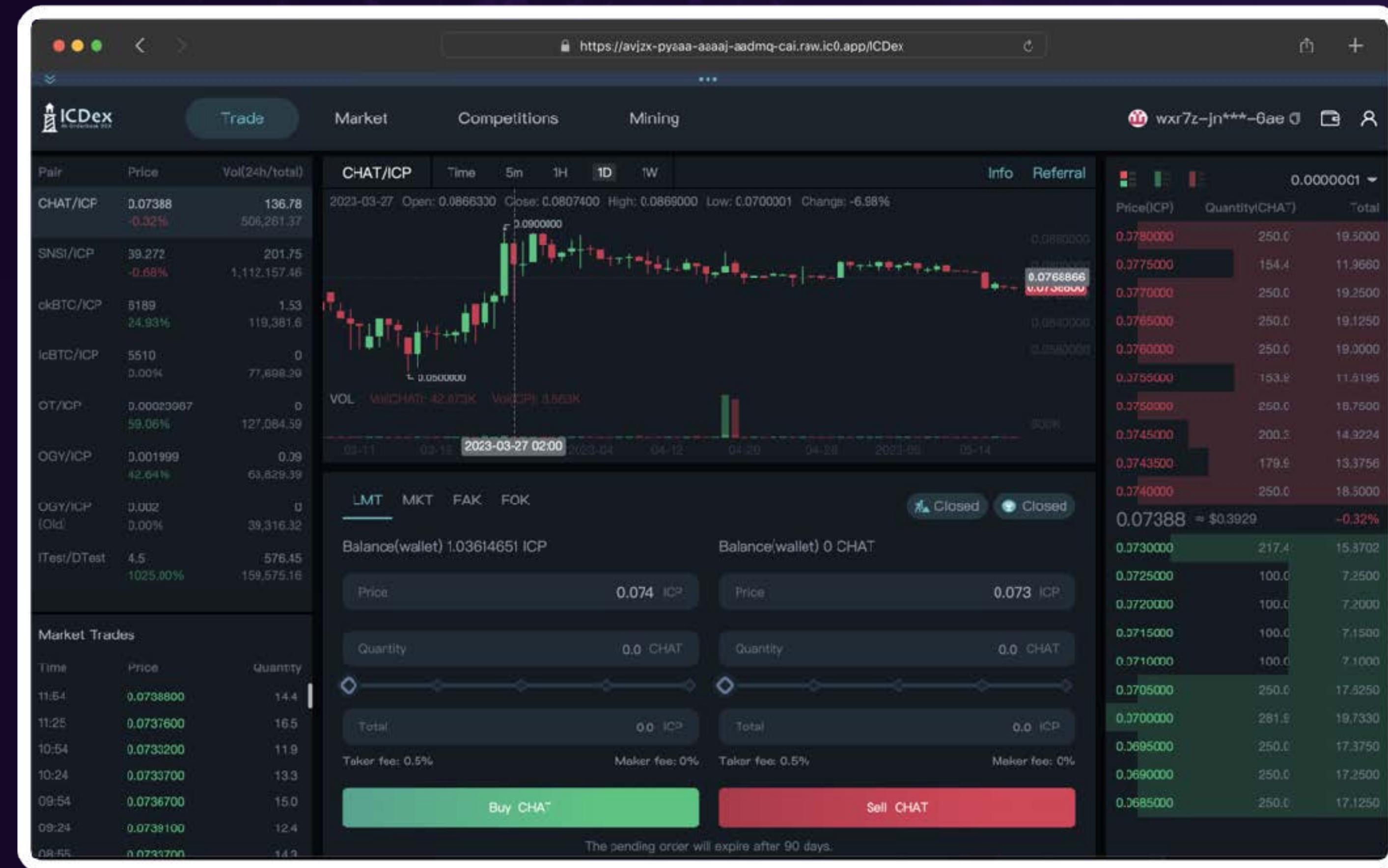


HotOrNot.wtf

- ✓ tokenized TikTok runs from the network
- ✓ creates an ingenious decentralized economy
- ✓ users bet HOT on whether videos will go viral
- ✓ users help with content moderation too
- ✓ creators of viral videos get HOT tokens
- ✓ eventually, advertisers will pay with HOT tokens
- ✓ the OSI inverts centralized business model....
- ✓ video creators, users, are founderized team members
- ✓ protocol exclusively controlled by SNS DAO



ICDEX.io – an order book exchange that is a smart contract



✓ Hackproof and transparent

a grass roots army is
now building on the
Internet Computer

join the movement



W E B 2

TikTok

Gmail

reddit

FTX

Telegram

X

Spotify

KICKSTARTER

eventbrite

GoDaddy

Dropbox

W E B 3

HOT OR NOT

DMAIL

DSCVR

ICDex
An Orderbook DEX

OpenChat

distrikt

CANISTORE

Funded

CATALYZE

ICNS ICNAMING

IC-Drive



cool services. tiny tech teams.

the web3 services just shown provide sophisticated functionality while scaling to large numbers of users, but...
only a few engineers are involved



no cloud. no database servers.

the web3 services just shown are built exclusively from
Internet Computer-hosted canister code...

the network is the entire tech stack



no firewalls. no security teams.

the web3 services just shown are not protected by security infrastructure like firewalls, or security teams, because...

that's not needed for tamperproof canister code



enterprise

web3 experience demonstrates canister smart contracts can
deliver important advantages to enterprise



the world will spend \$5 trillion on IT in 2024. 36% is personnel

T R A D I T I O N A L I T

developers, security team, maintenance...

C A N I S T E R S



\$1.35 trillion
in potential savings

complexity

R E D U C E

systems and services are tamperproof



Gartner Research
Cybersecurity spend

2022
\$172 billion



Gartner Research
CPS incident costs

2023
\$50 billion

R E D U C E

R E D U C E

serverless cloud model can deliver **compute efficiencies**



Gartner Research
Cloud services spend

2022

\$482 billion

R E D U C E

sovereign

countries relying on cloud infrastructure and closed-source software
can be spied on and even “switched off”



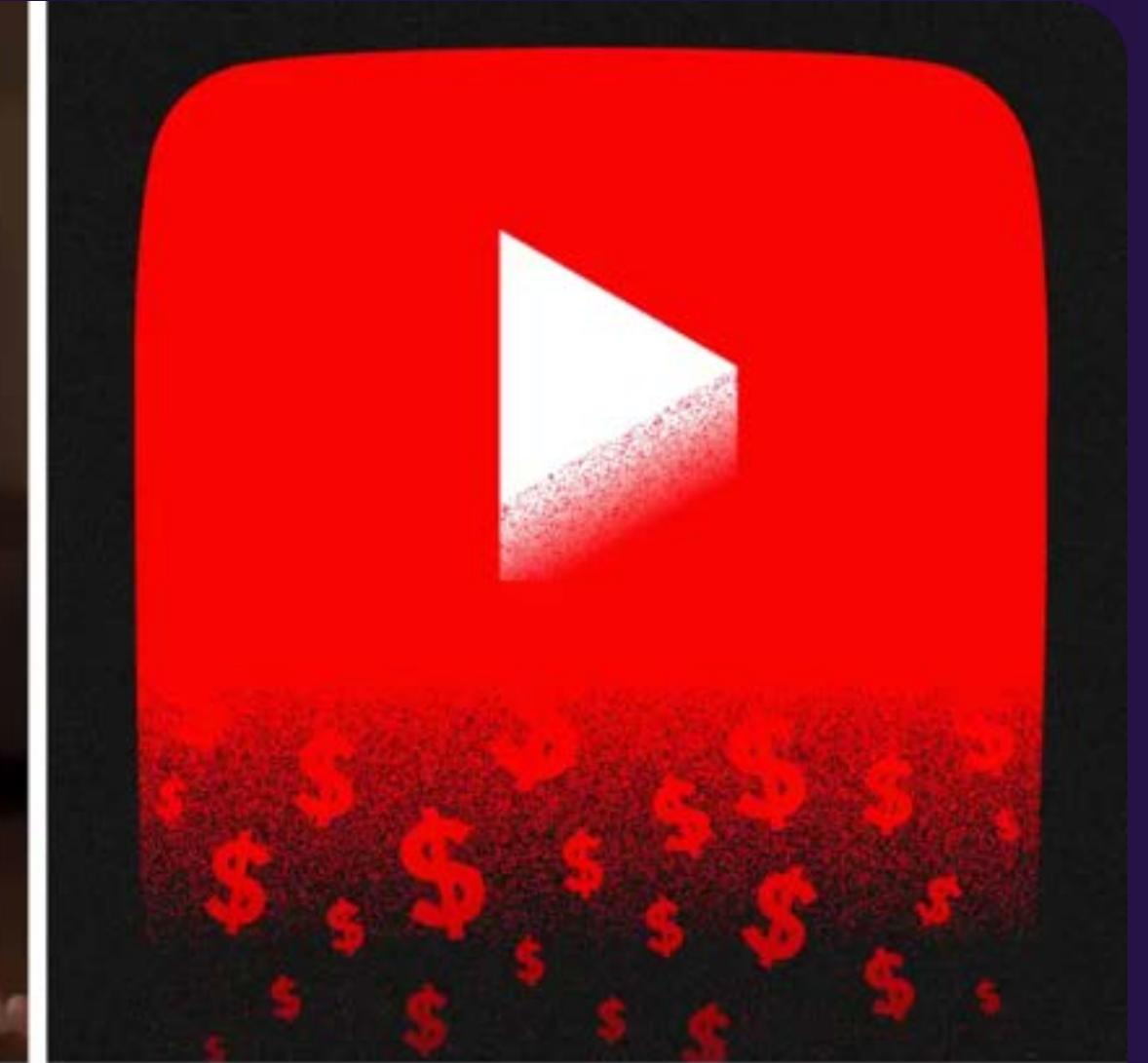
the future of global identity?



=



“I use Google for everything”



A top YouTuber is publicly sparring with the platform after he says 'hundreds' of his fans unfairly lost access to their Google accounts

businessinsider.com



depend on US corporations?

Europe and the World needs tamperproof *open* solutions



sovereign societies cannot depend on digital foundations in which other states might have kill switches and backdoors



- Cloud computing services
- Closed-source software
- SSO (single sign-on)
- Security hardware



sovereign subnets coming

the Internet Computer network will create geographically-local specialized sovereign subnets for nations



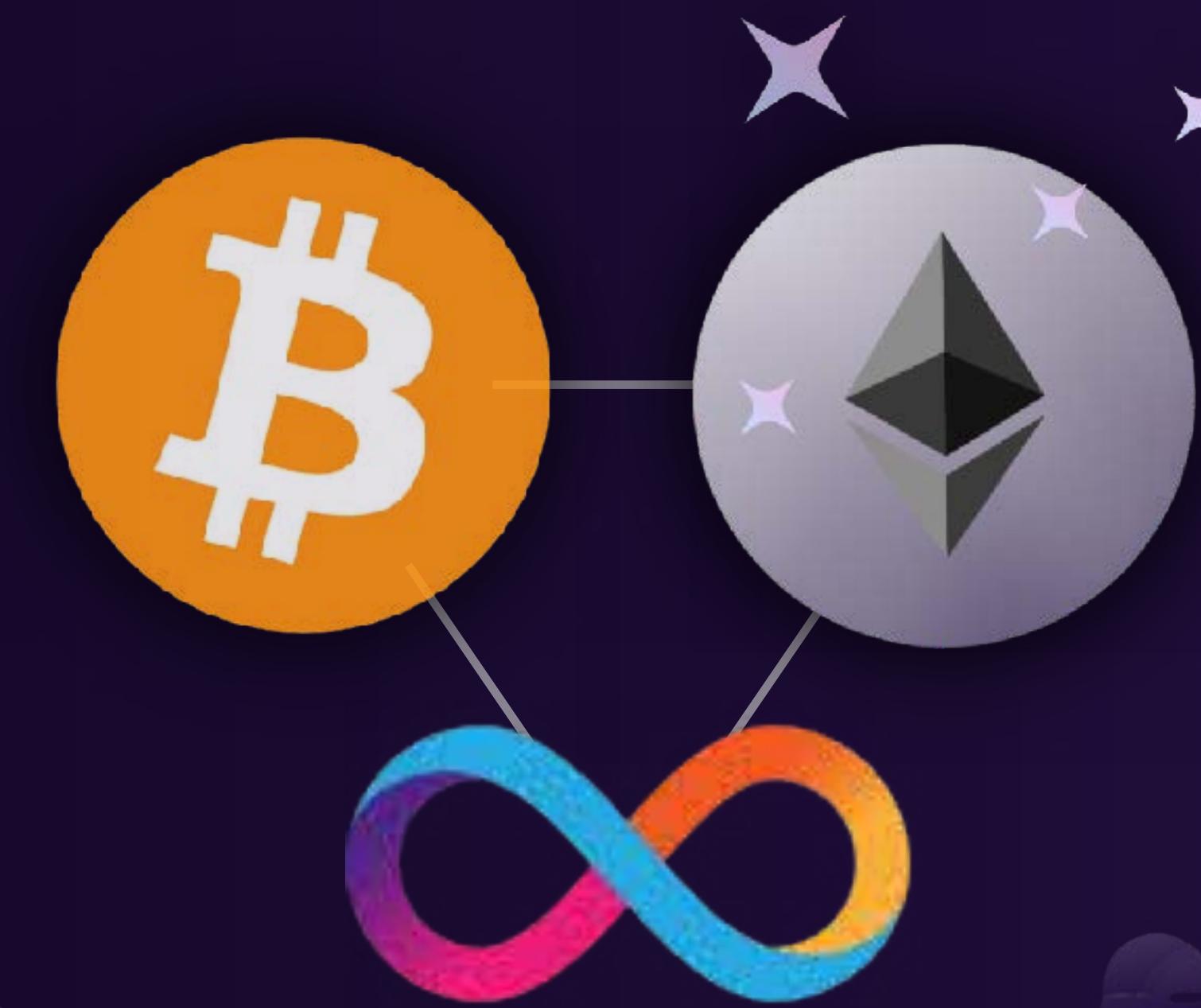
yup, no bridges, just
trustless cryptography

multi-chain

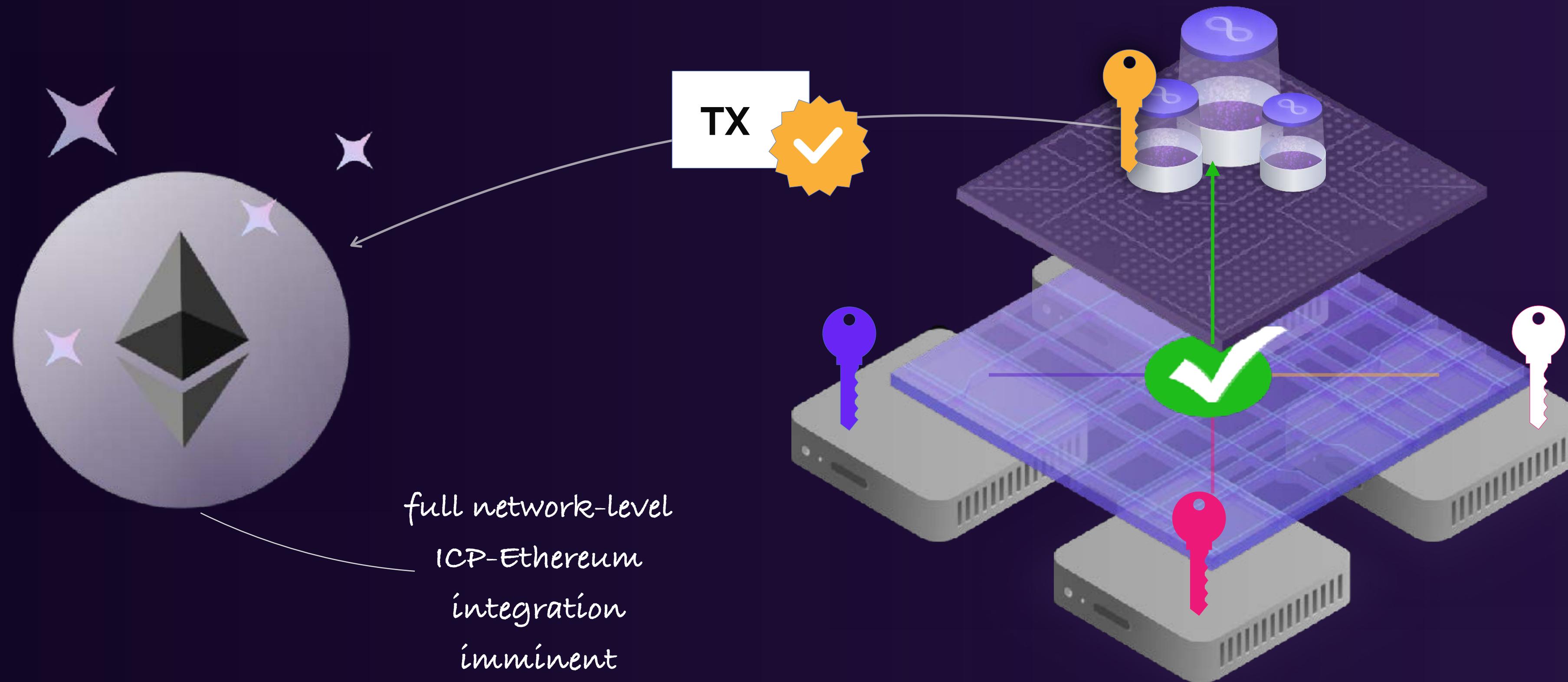
“chain key cryptography” creates transactions on other chains.
network-level integrations with Bitcoin and Ethereum



time to realize the **World Computer** vision from 2014

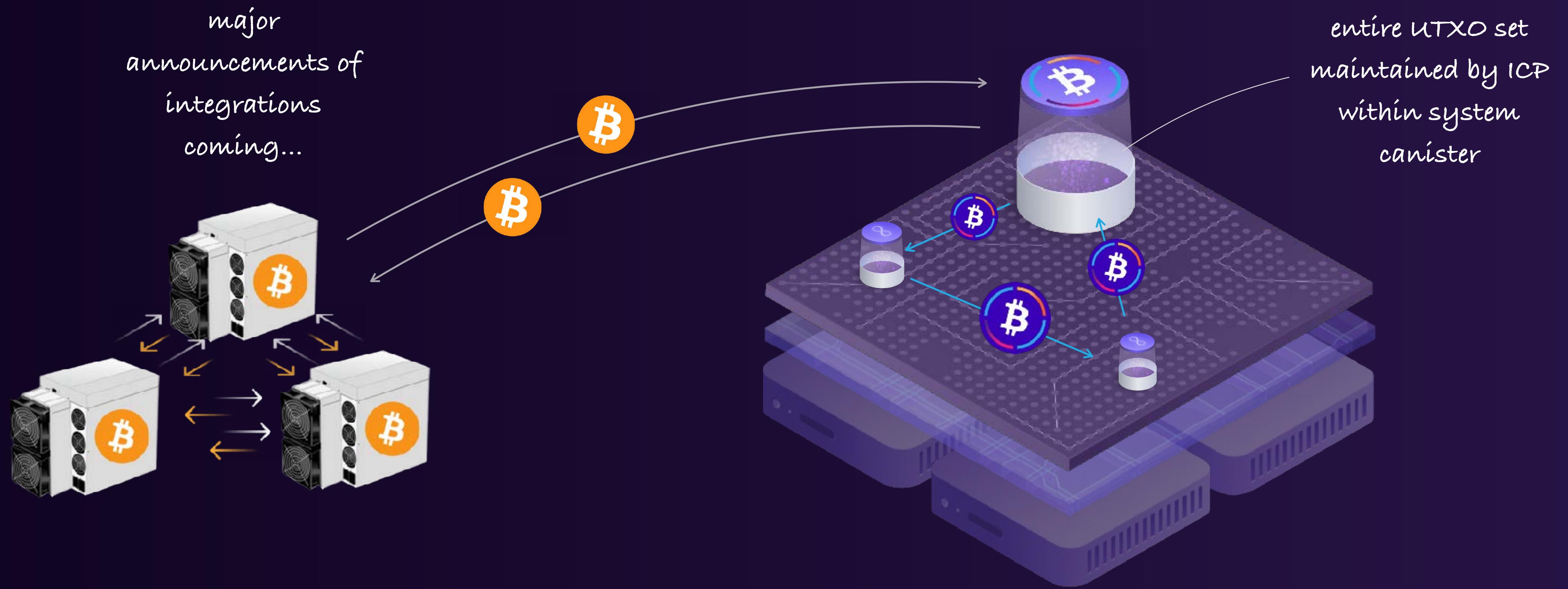


canisters create accounts and sign TXs on other blockchains



signing is done by ICP using “chain key crypto” — without traditional private keys

ckBTC is a bitcoin twin that can be directly processed by canister code



“chain-key bitcoin” supports usage of bitcoin in DeFi, social media, games, the metaverse with 1s finality

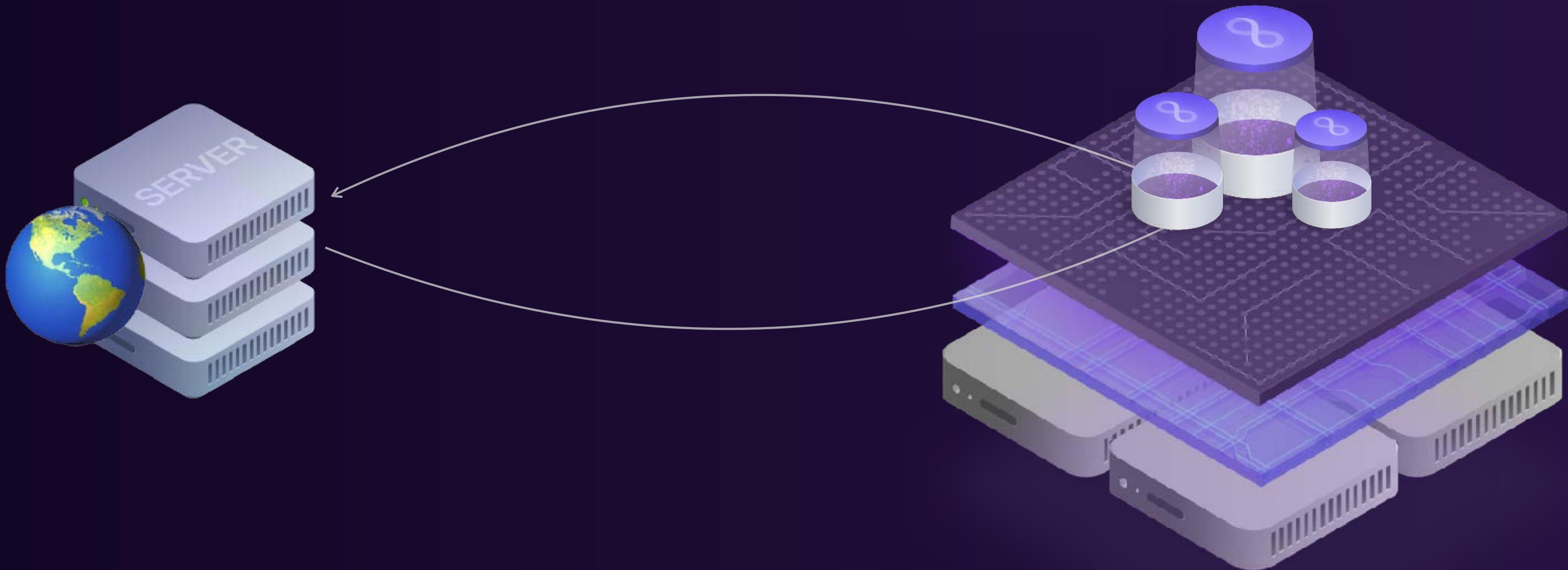
web2+3

canister smart contracts can trustlessly calls into external web2 systems – the network passes results through consensus



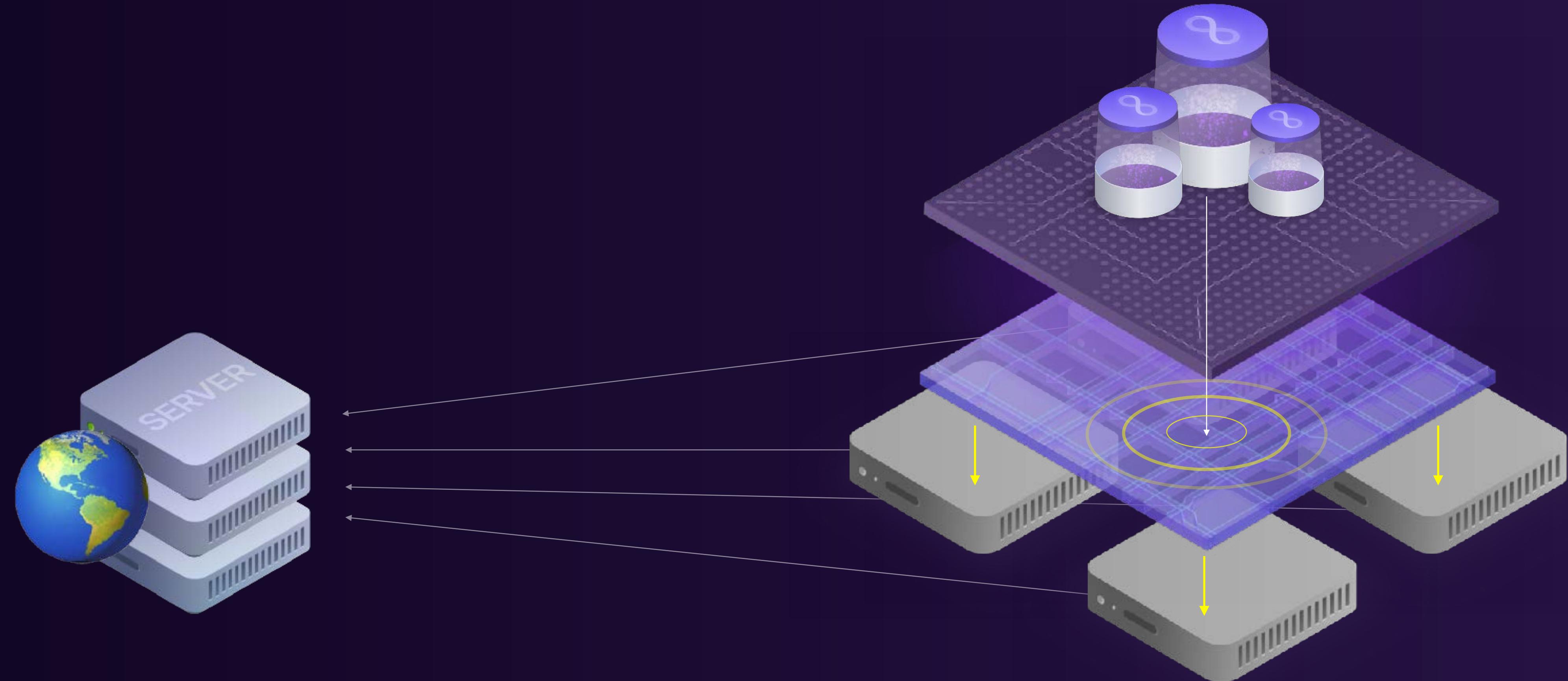
1.

a canister initiates a call to a web2 service



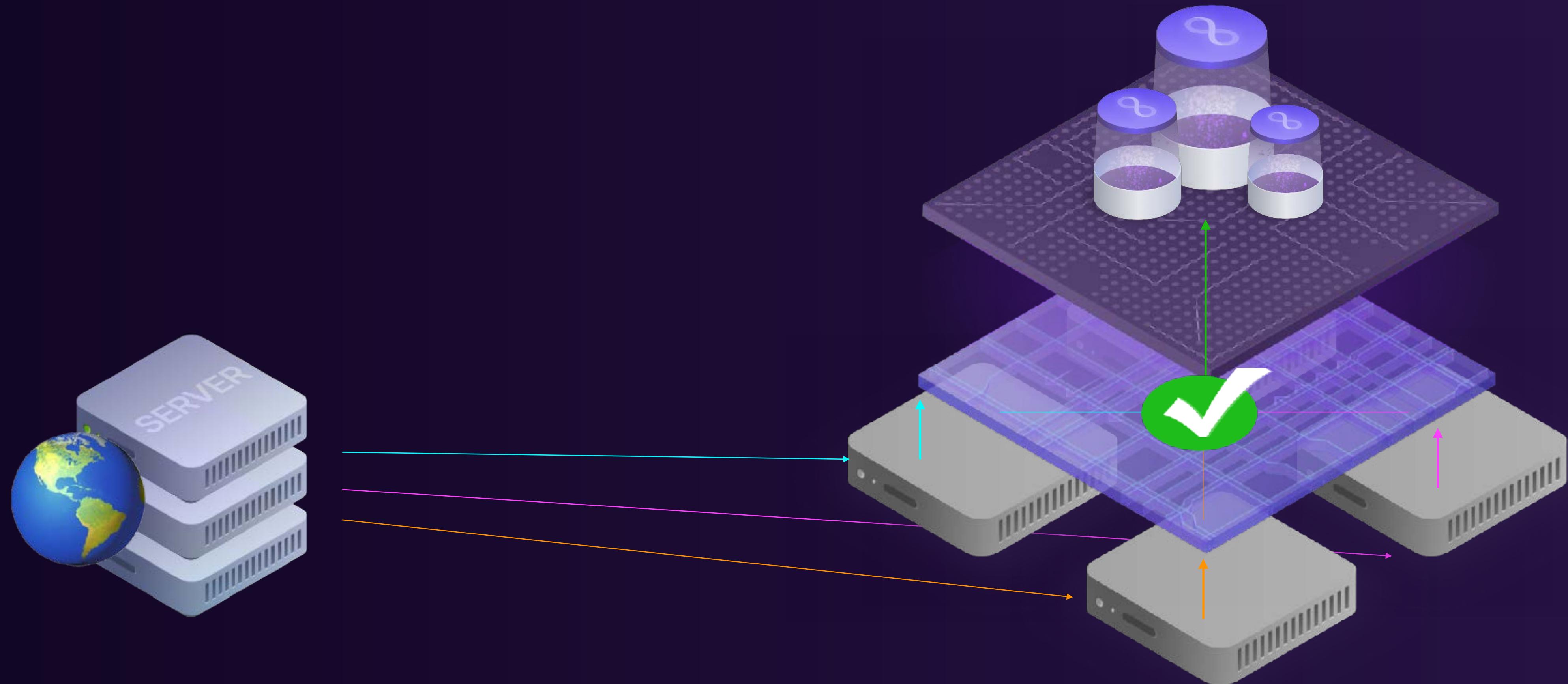
2.

multiple nodes make call, consensus normalizes result



3.

enables decentralized oracles, web2 integrations, etc



ai

ICP ai compute units coming in 2023, with a pathway
to full ai smart contracts

data security

model security

web3 integration



ai

by 2030 AI will

**in the future
ai models
will analyze
nearly all our
business
data**

increase the productivity of
knowledge workers

4X

boost global productivity
creating extra value

\$200
trillion

**in the future ai
models will
generate
nearly all our
metaverse
content**

**in the future
ai models
will be inside
systems e.g.
compressing
media data**



mission

see the majority of the world's systems and services
reimagined on the public network



growing canister compute tells a story



2 011 578 950

Blocks processed

36 parallel subnets

37.1 MB/s block throughput capacity

Throughput

Capacity horizontally scales as subnet blockchains are seamlessly combined into one unified blockchain. Blocks and transactions per second are unbounded.

259 954

ETH equivalent TX/s

4 754 Transactions/s

Comparing transactions

Transactions invoke "actor" canister smart contract computations, which subnet blockchains can run concurrently (yet deterministically).



DFINITY Foundation

- Emerged from early Ethereum community in 2015
- DFINITY Foundation established October 2016
- Swiss not-for-profit foundation not a corporation
- World's largest team of cryptographers
- Over 140 people in Zürich HQ
- 270+ people globally

1600+

research papers

100 000+

academic citations

250+

technical patents



Crypto People +

Google

IBM

facebook



build on the internet using the
Internet Computer



decentralize
everything

<https://internetcomputer.org>

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