



Build on the network

ICP | Internet Computer



DFINITY Foundation

- Emerged from early Ethereum community in 2015
- DFINITY Foundation established October 2016
- Swiss not-for-profit foundation not a corporation
- Research centers in Zurich and San Francisco
- World's largest team of cryptographers
- 270+ people globally

1600+

research papers

100 000+

academic citations

250+

technical patents

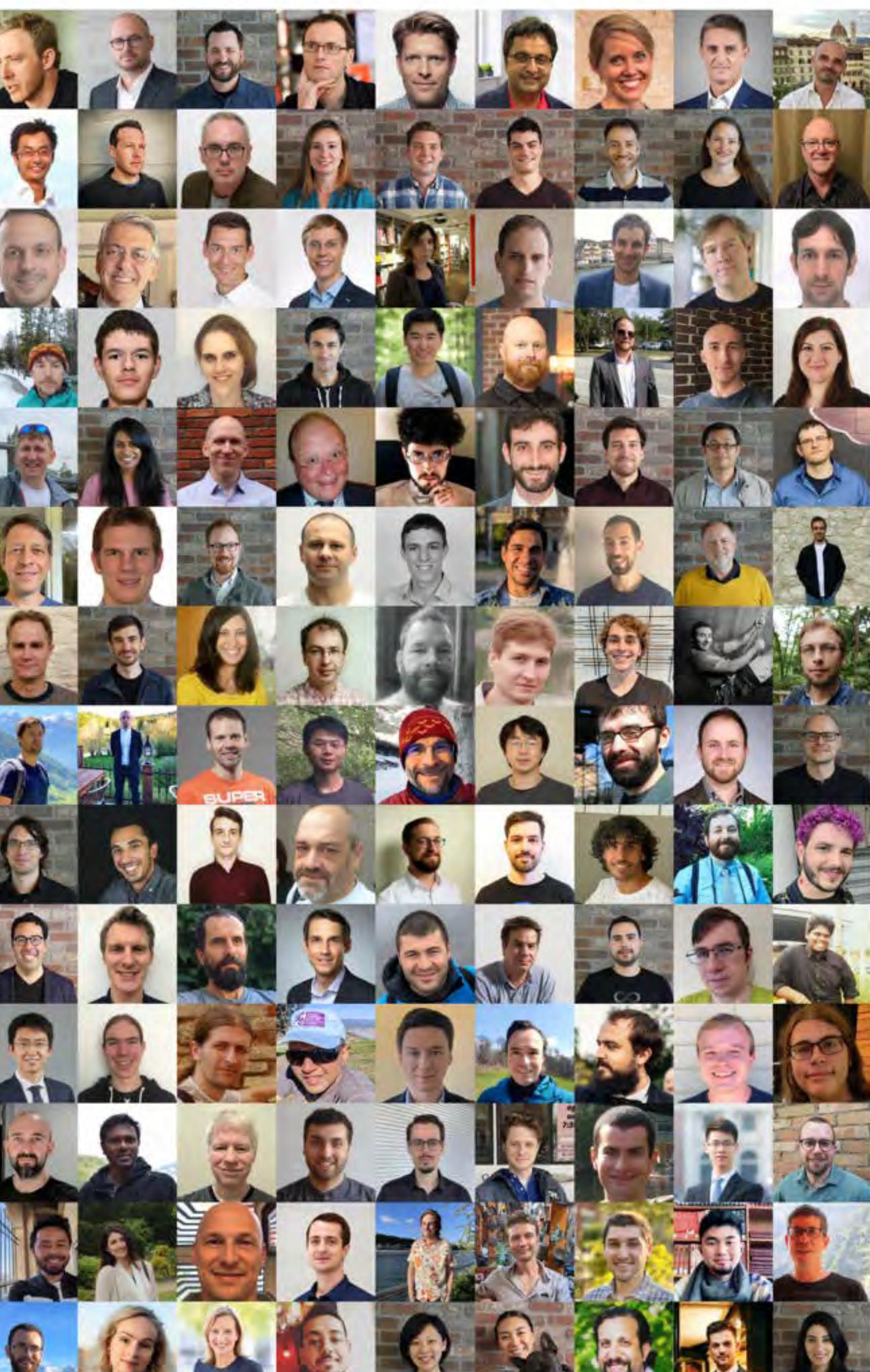


Crypto People +

Google

IBM

facebook



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 open global network

TRADITIONAL IT

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



INTERNET COMPUTER

private node machines connected by ICP
create a serverless autonomous cloud





INTERNET COMPUTER



INTERNET IDENTITY



build on the network



OPEN INTERNET SERVICES

build transparent web3 services run by their communities using autonomous automated governance, without backdoors for devs, organizations or CEOs

SOVEREIGN ENTERPRISES

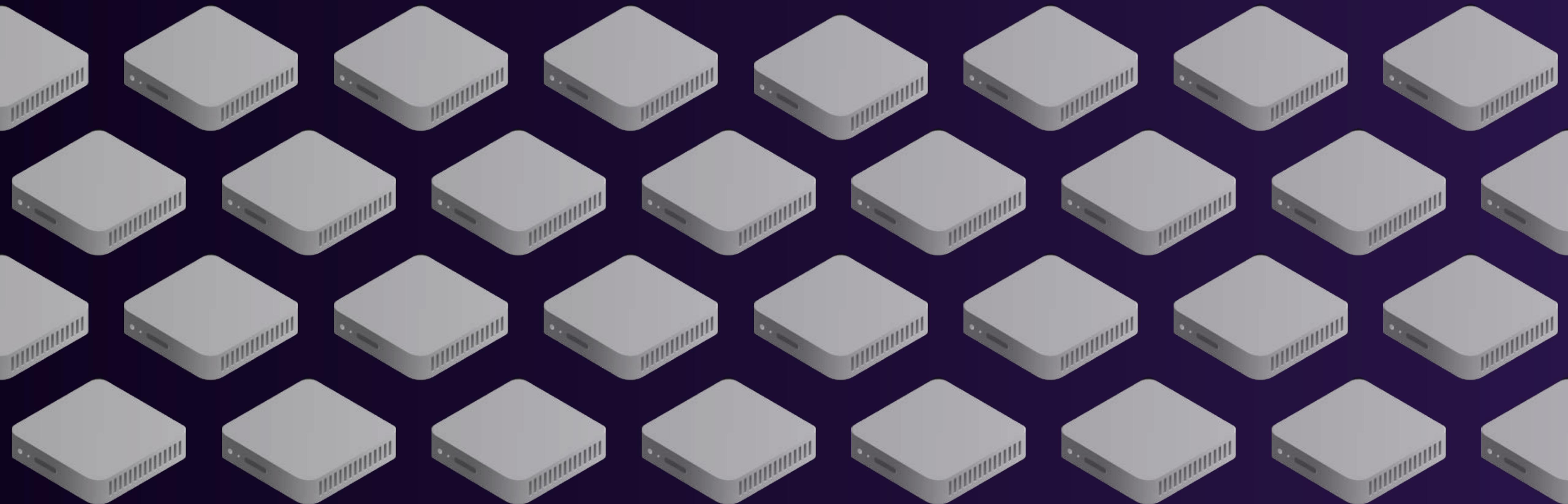
build systems and tech foundations on an open network using tamperproof software, w/o need for firewalls, no fear of backdoors, and no corporate cloud kill switches

network

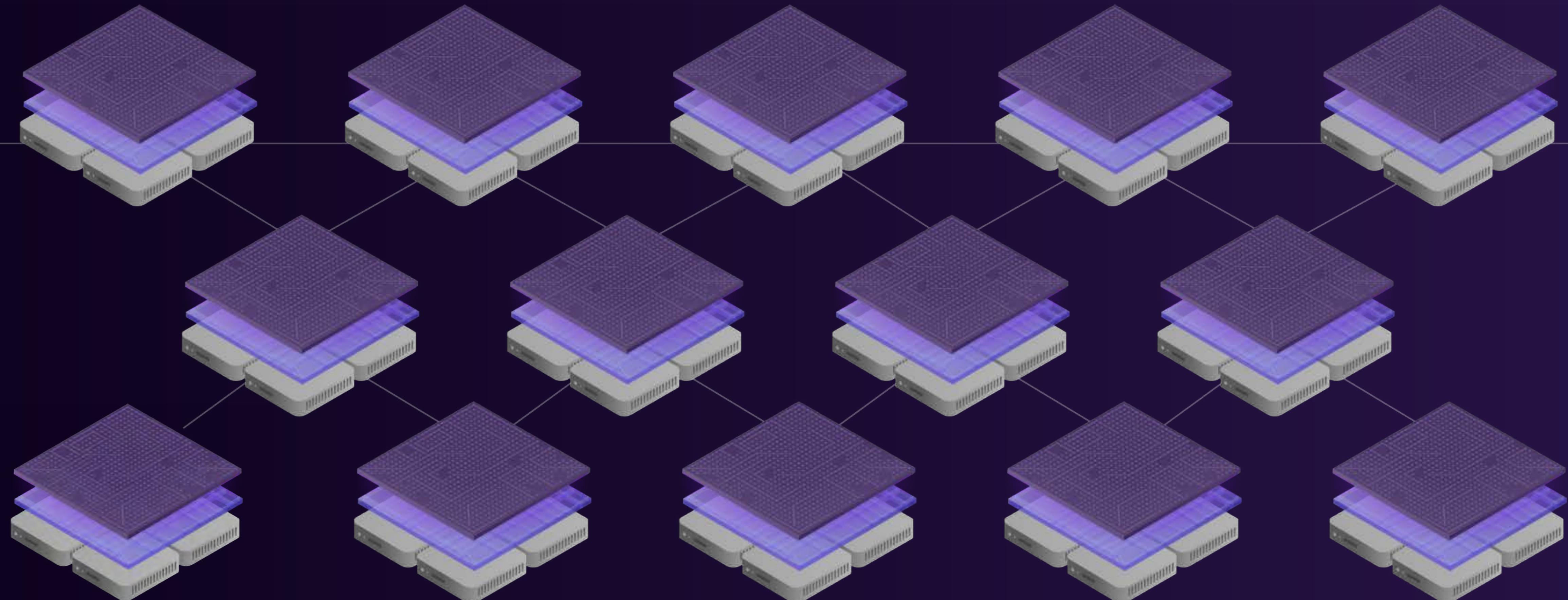
the Internet Computer is created by the ICP, the most advanced network protocol ever devised



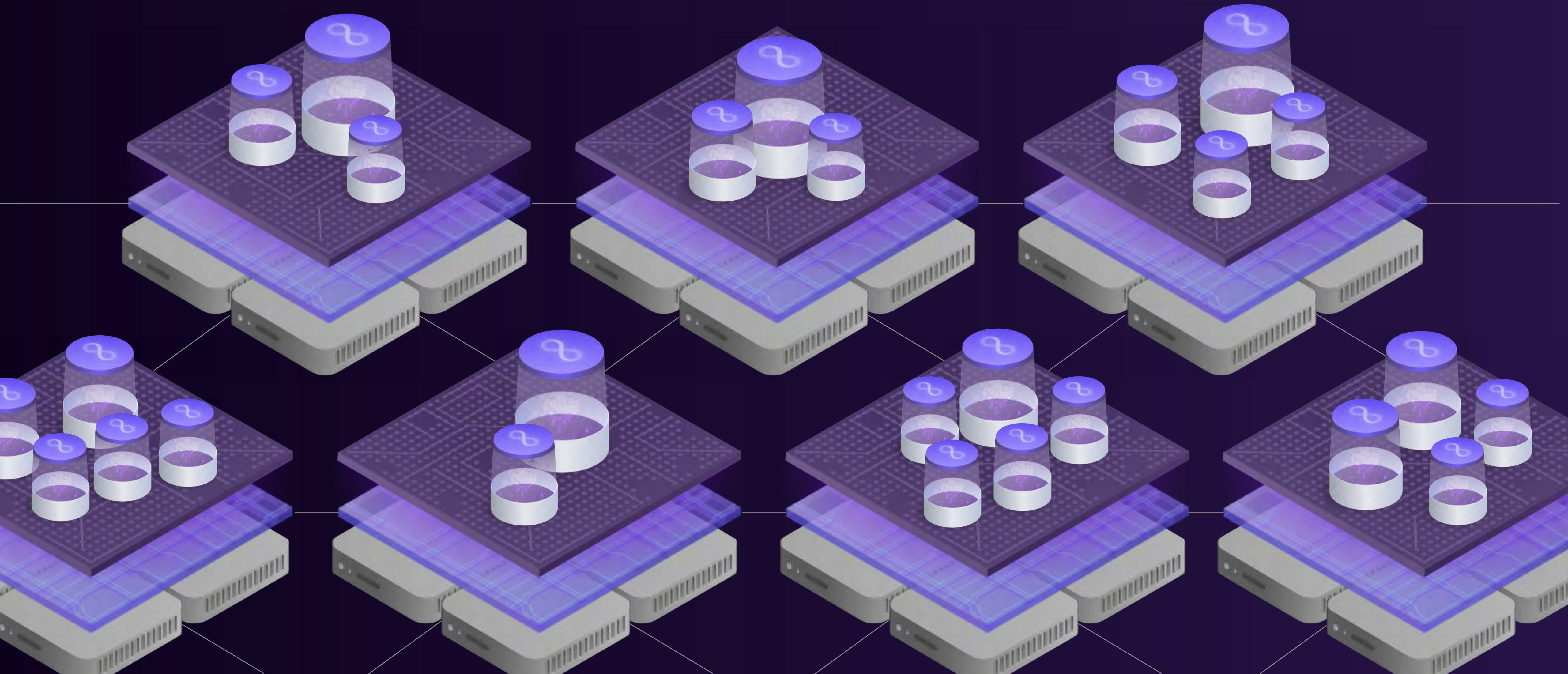
**independent node providers own and operate
node machines in data centers worldwide**



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



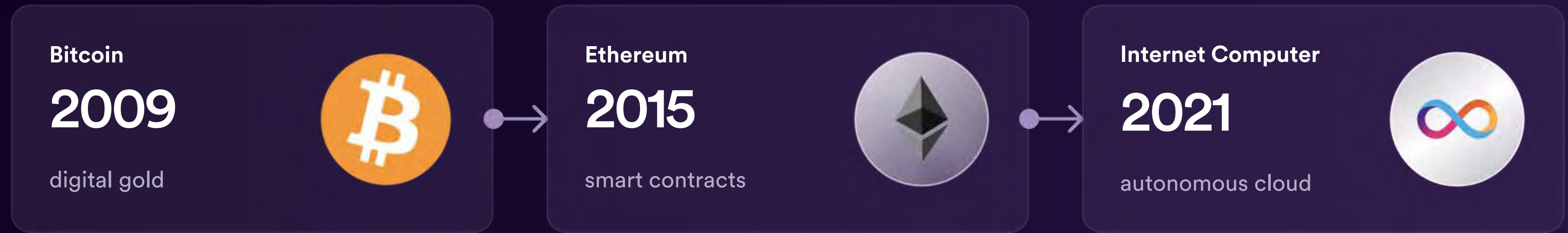
subnet blockchains add capacity for running
canister smart contracts



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



software will eat the world. smart contracts will eat software



web server



cloud code



database



middleware



backend OS



memcached



SIEM logging



blockchain smart contracts are a magical *new form* of software



SMART CONTRACT SOFTWARE

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



C A N I S T E R S O F T W A R E

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



autonomy

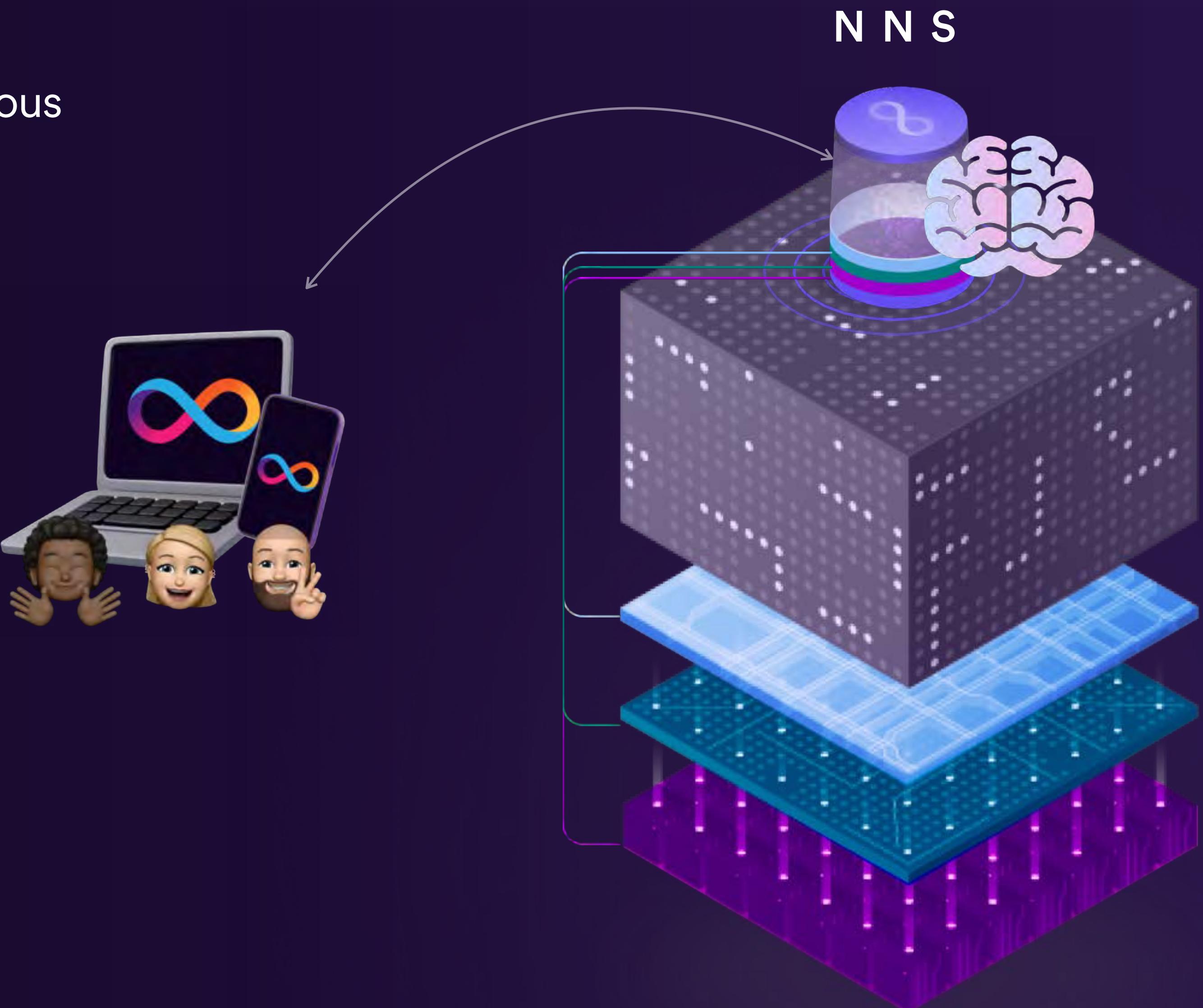
an evolution of DAO technology governs both the network and,
optionally, hosted systems and services



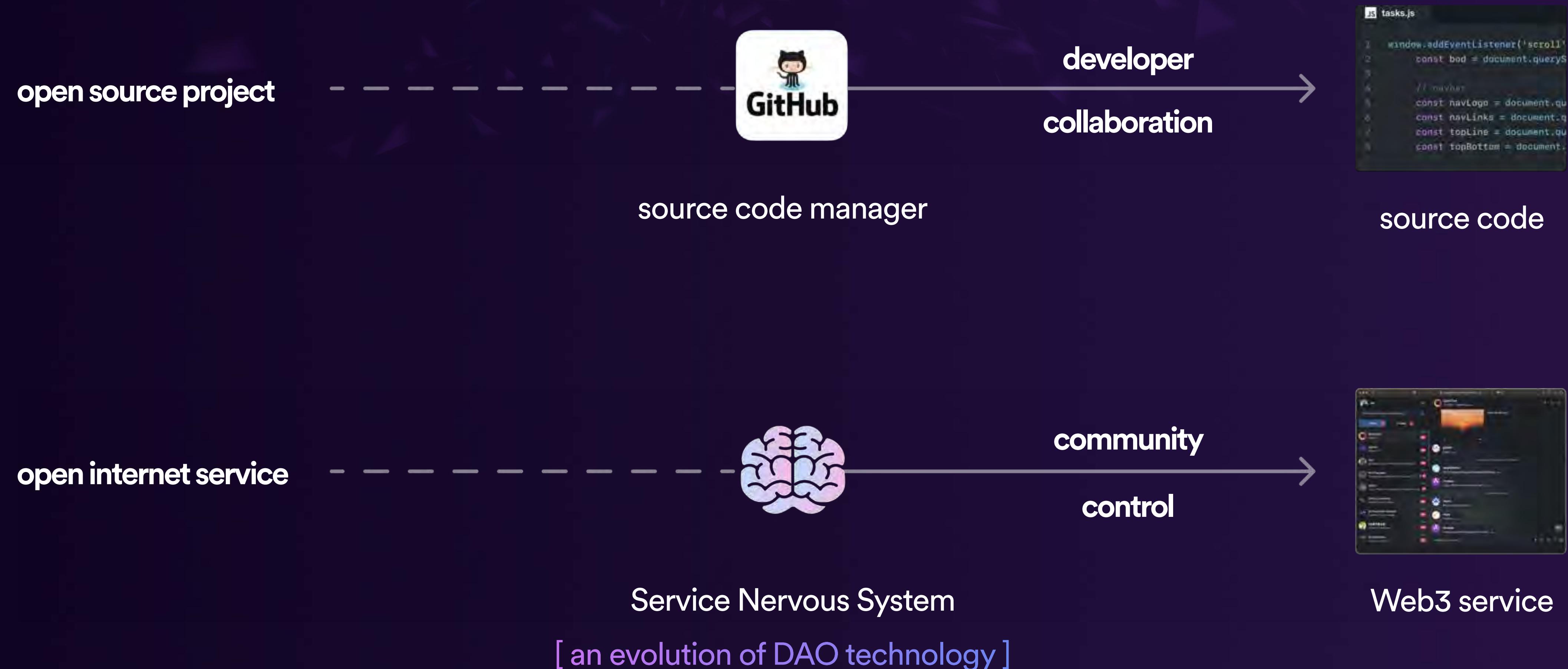
Network Nervous System runs network

the Internet Computer network is fully autonomous thanks to an evolution of DAO technology integrated into its ICP protocols:

- open and permissionless
- node machines obey the NNS
- on instruction, they update the ICP protocol
- on instruction, they form new subnets
- submitted proposals are adopted or rejected
- adopted proposals are executed automatically
- 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 now created neurons
- during first 2 years, protocol upgraded 145 times
- human control removed to make network autonomous



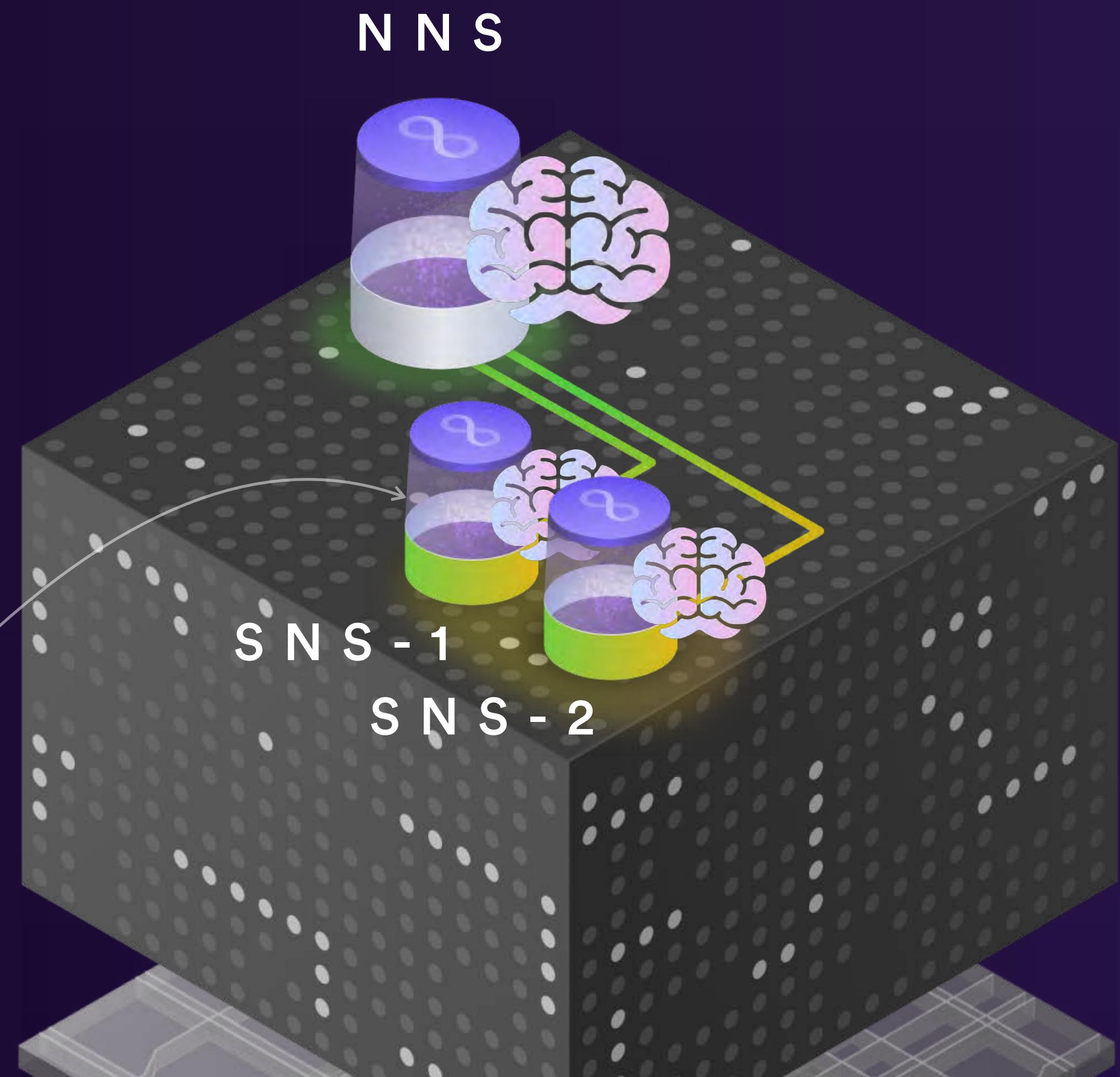
open internet service (OIS) grants full control to a community



create a democratic service using a Service Nervous System

SNS DAOs make decisions similarly to the NNS,
but run fully autonomous “open internet services,”
or enterprise systems:

- 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 can create decentralized community workforce
- 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

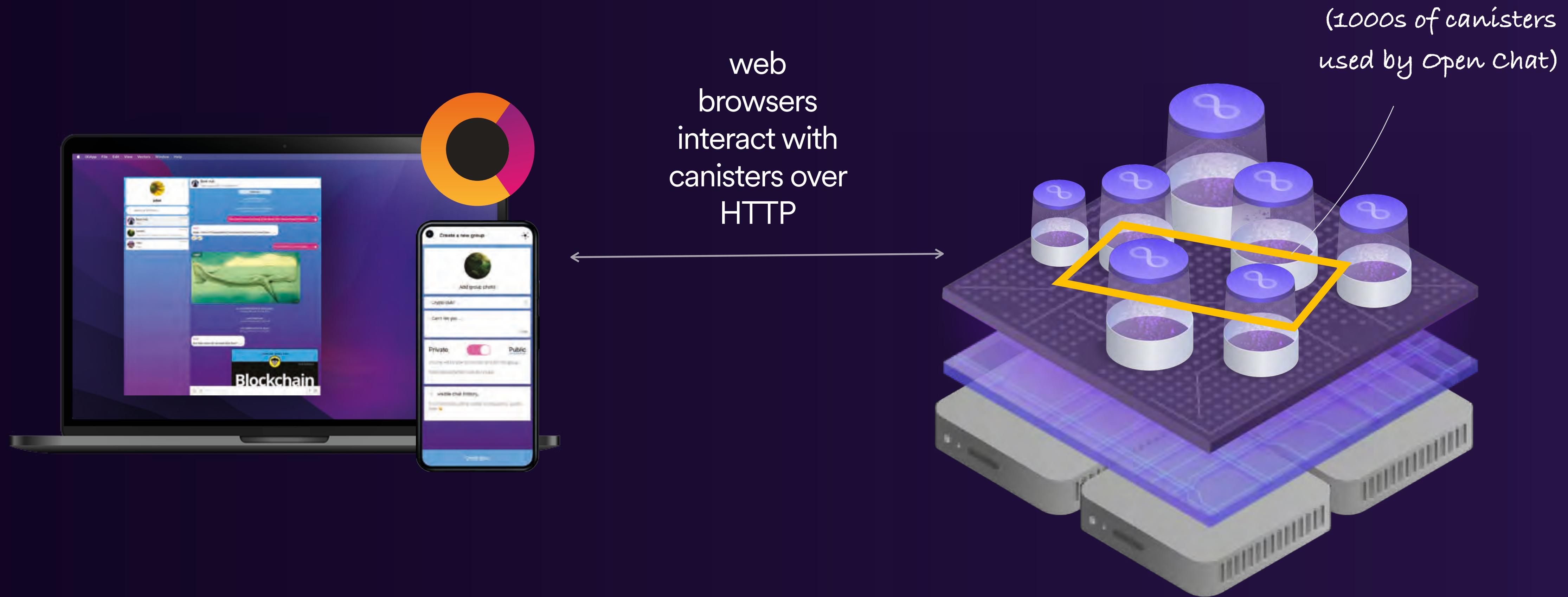


pure web3

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 master 48-byte 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.



Controlled by owner

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



Open source

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

Easy to use

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



Highly secure

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



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

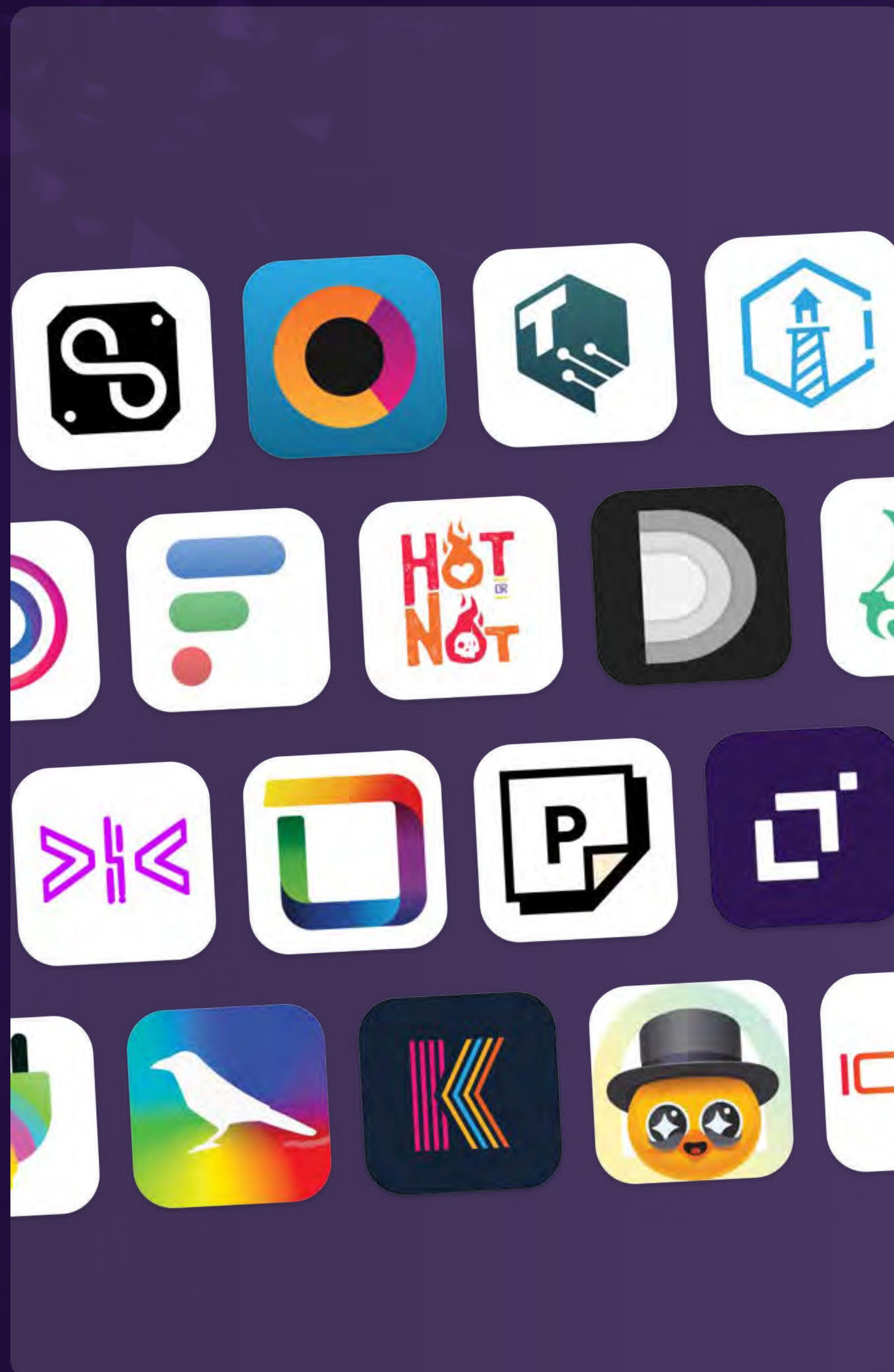
2.2M+

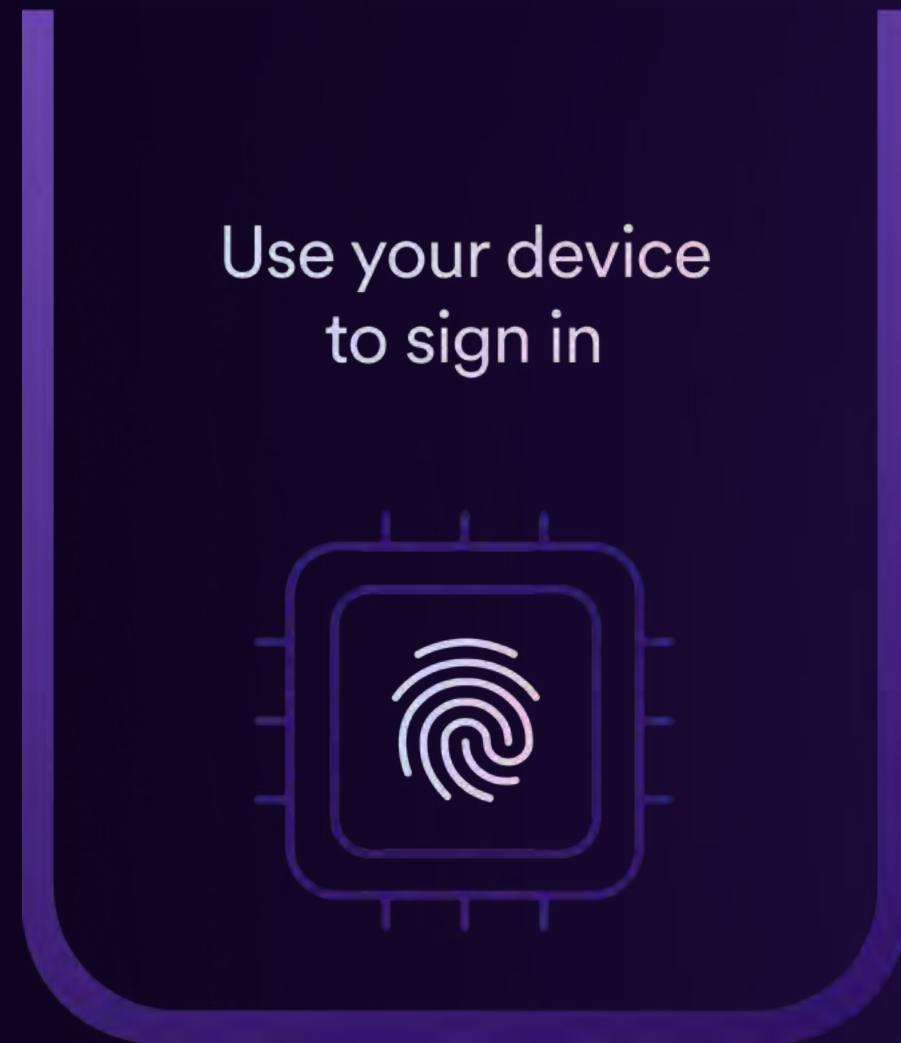
identities created

100+

dapps using II for authentication

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





Use your device
to sign in



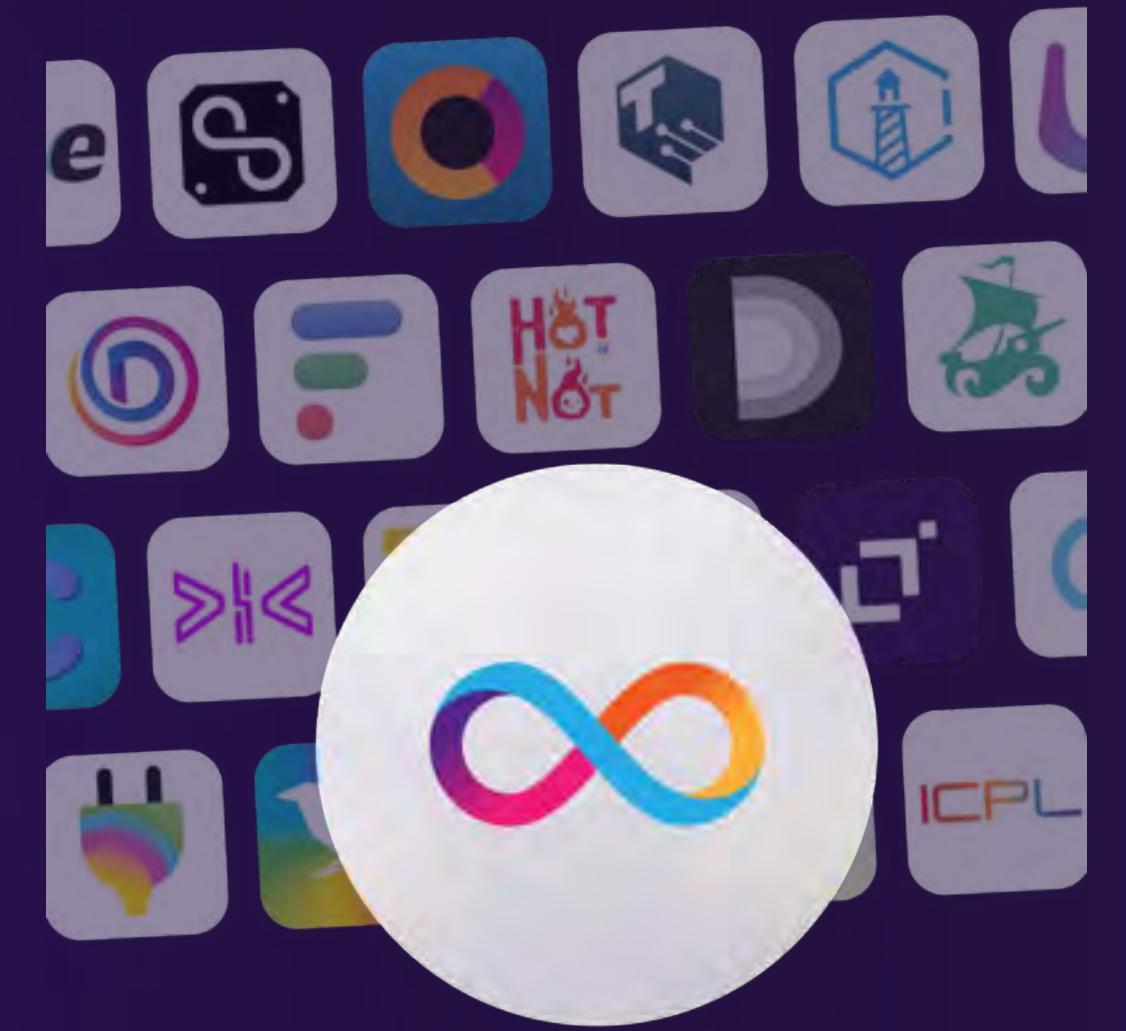
TPM

+



WebAuthn (+ FIDO)

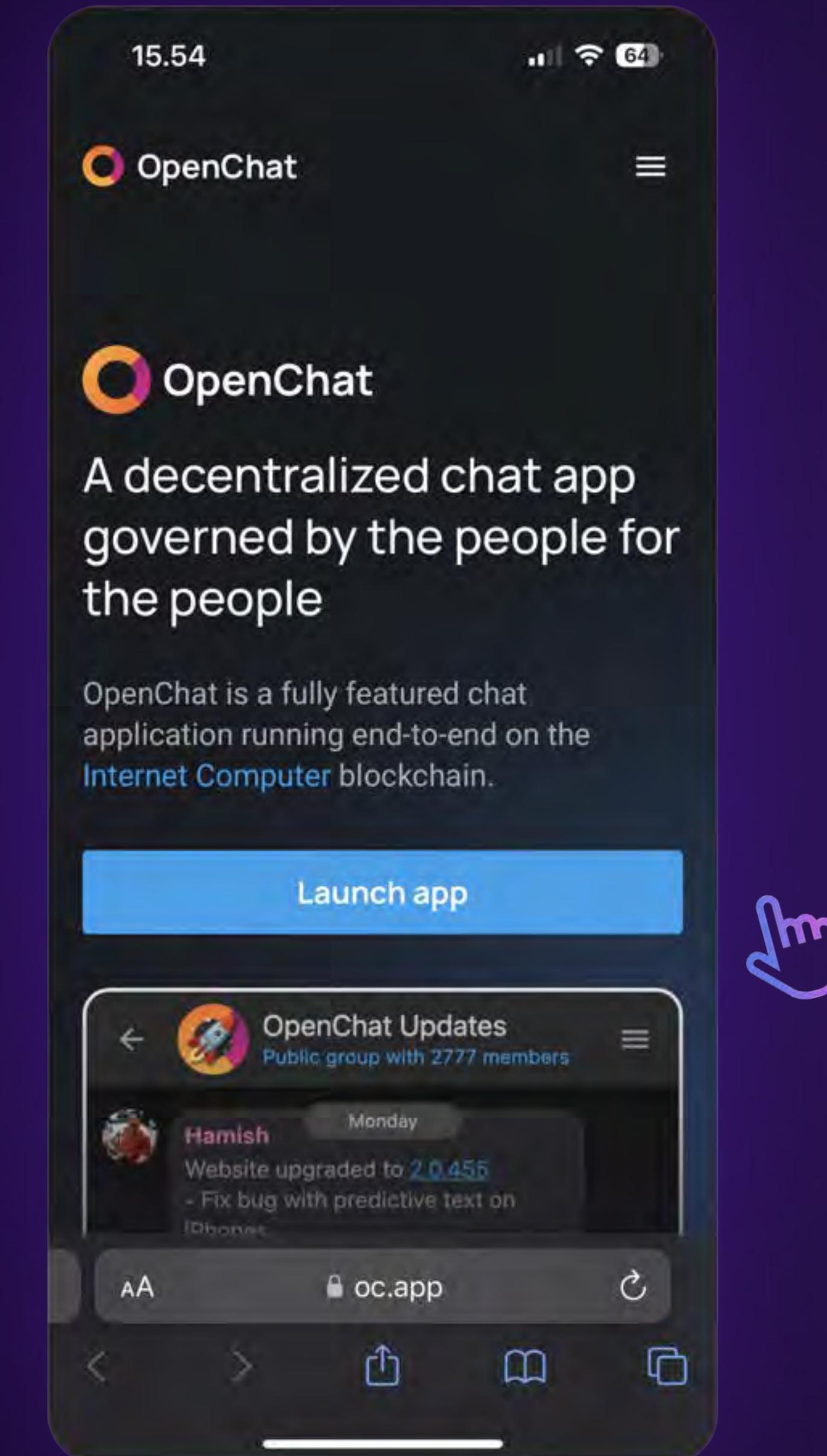
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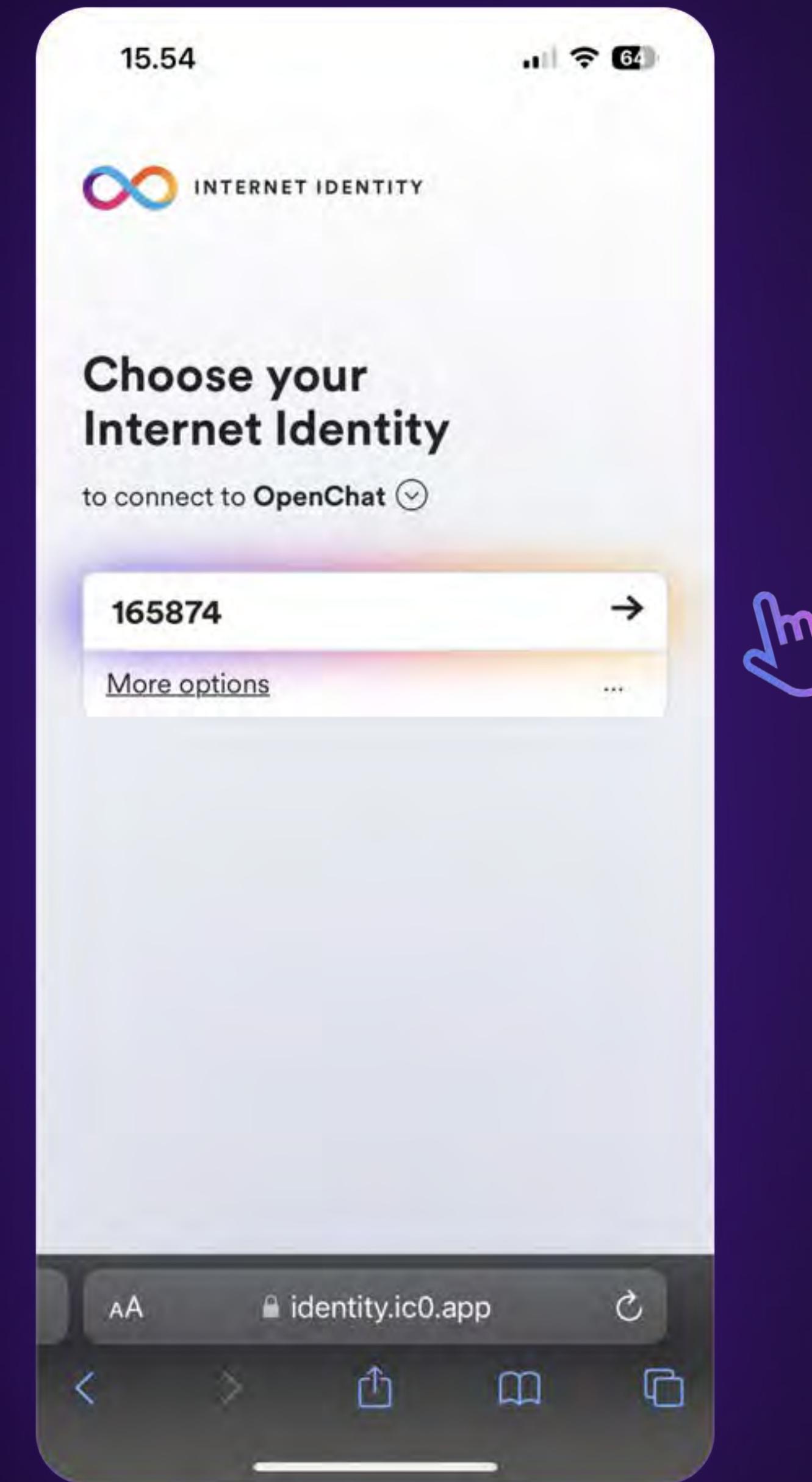
Internet Computer



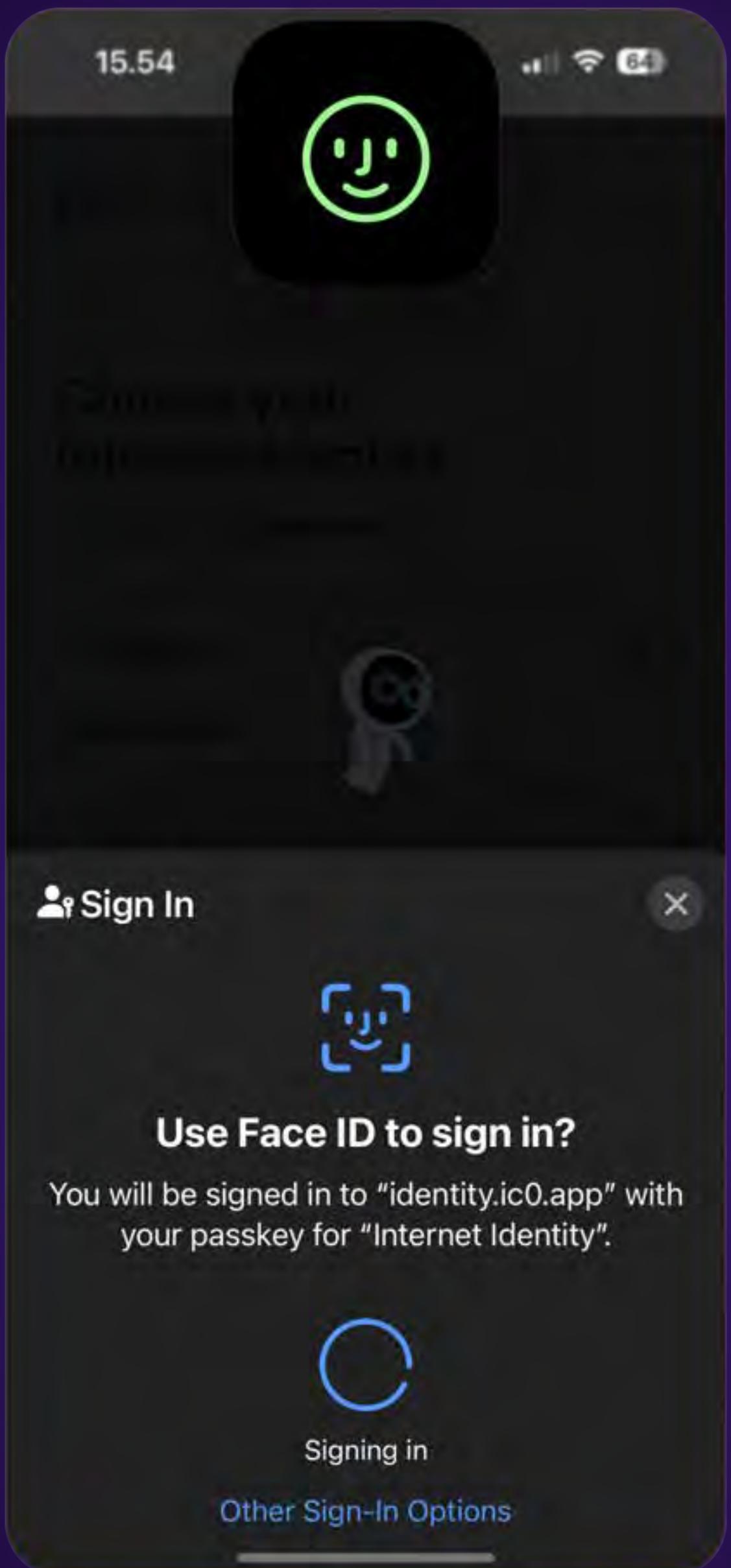
INTERNET IDENTITY



INTERNET IDENTITY



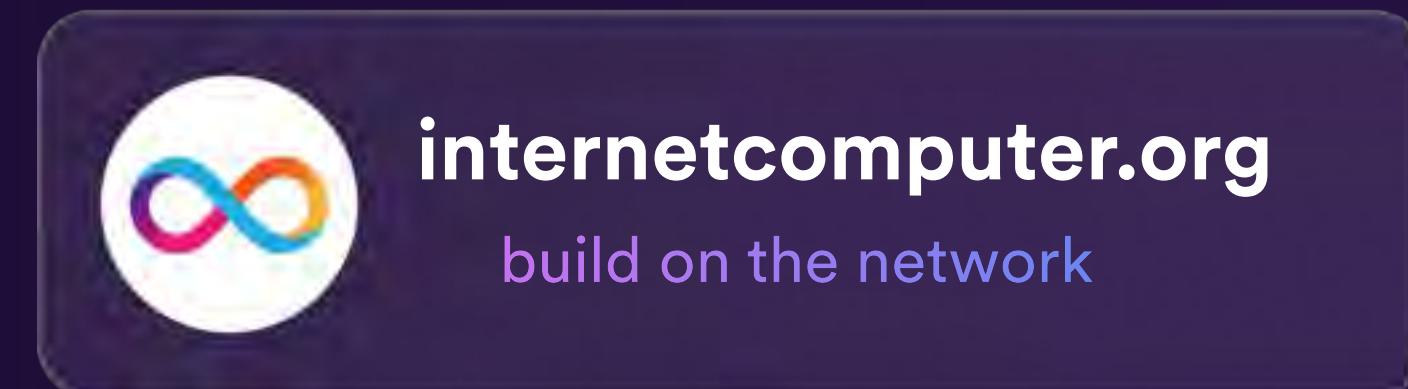
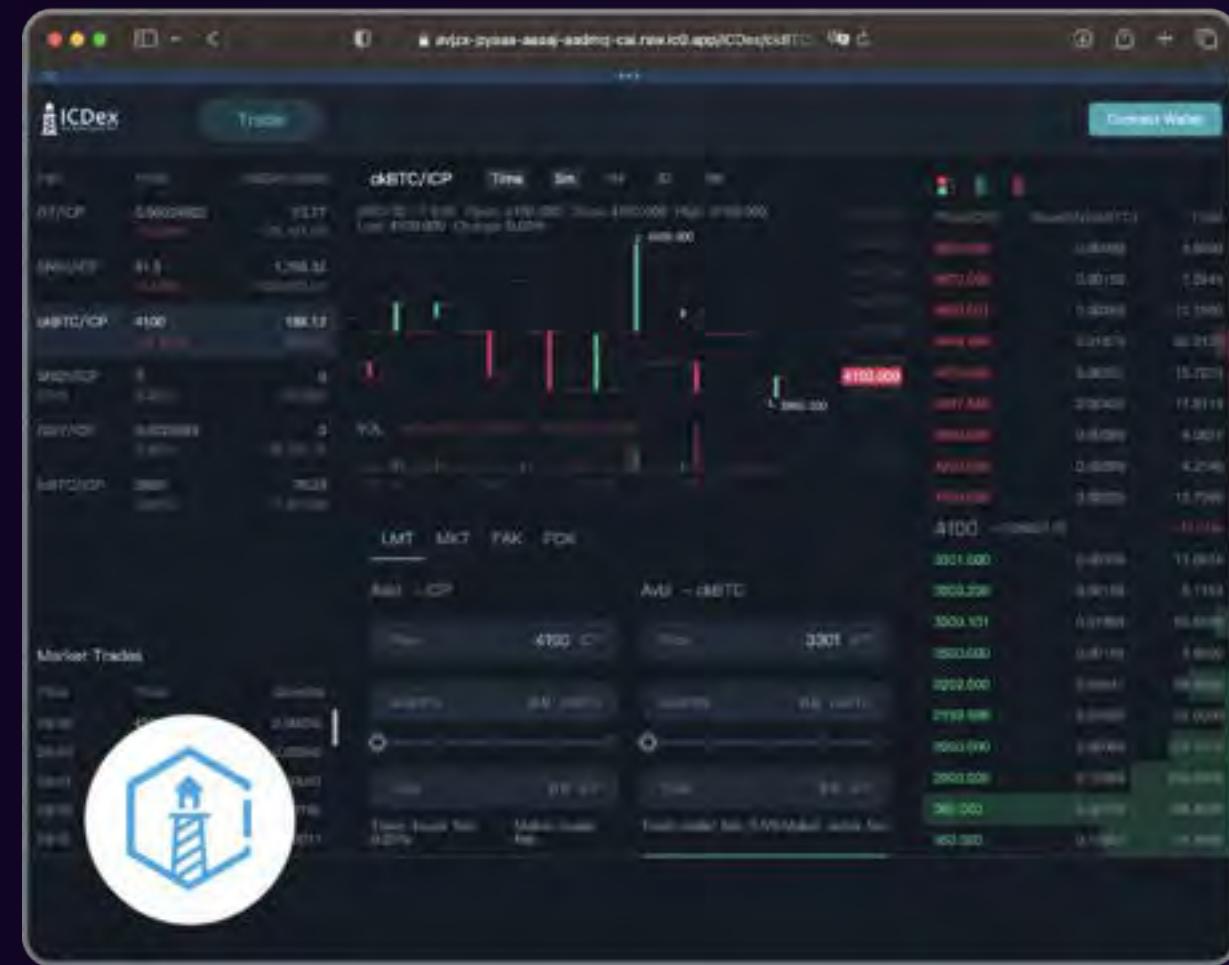
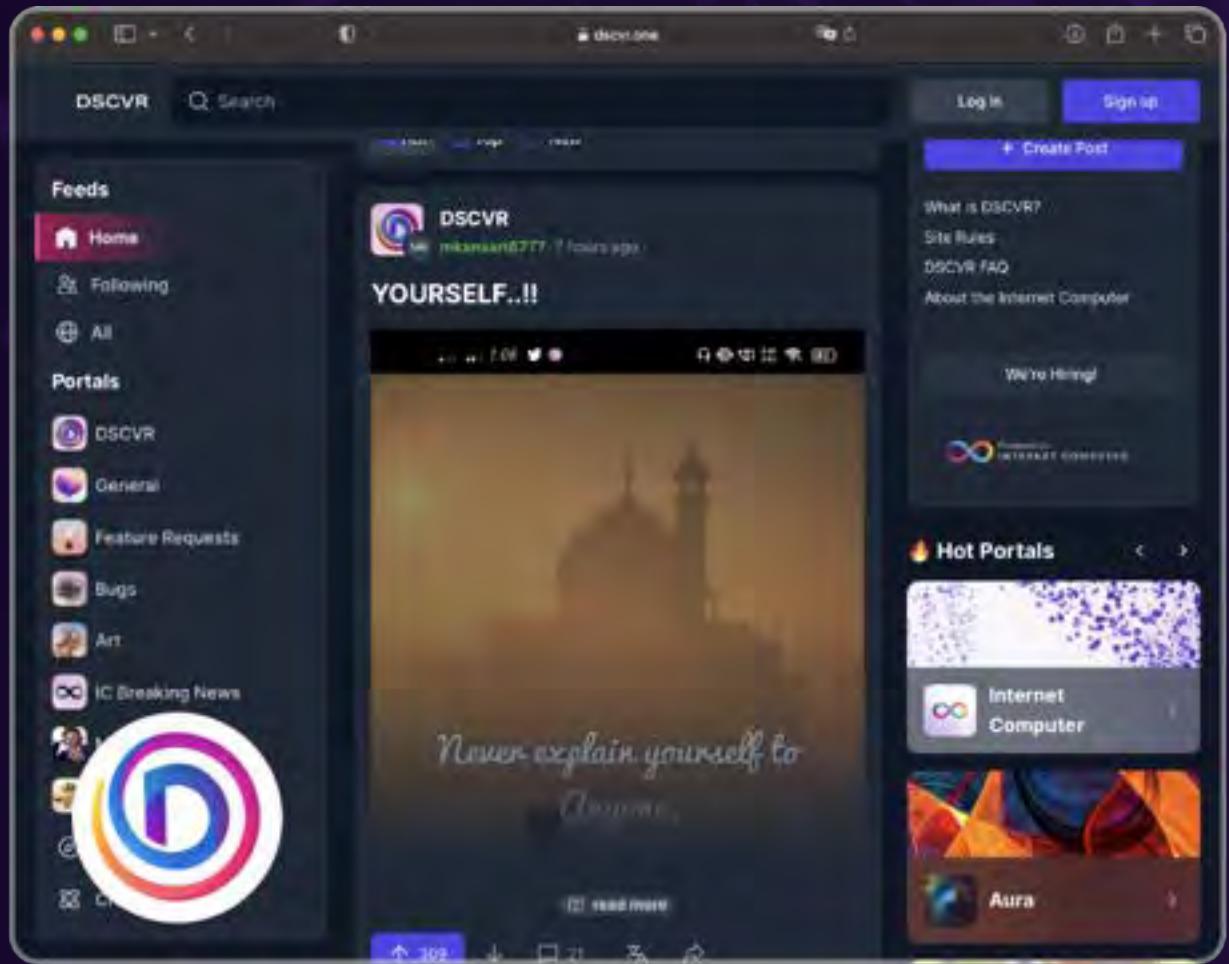
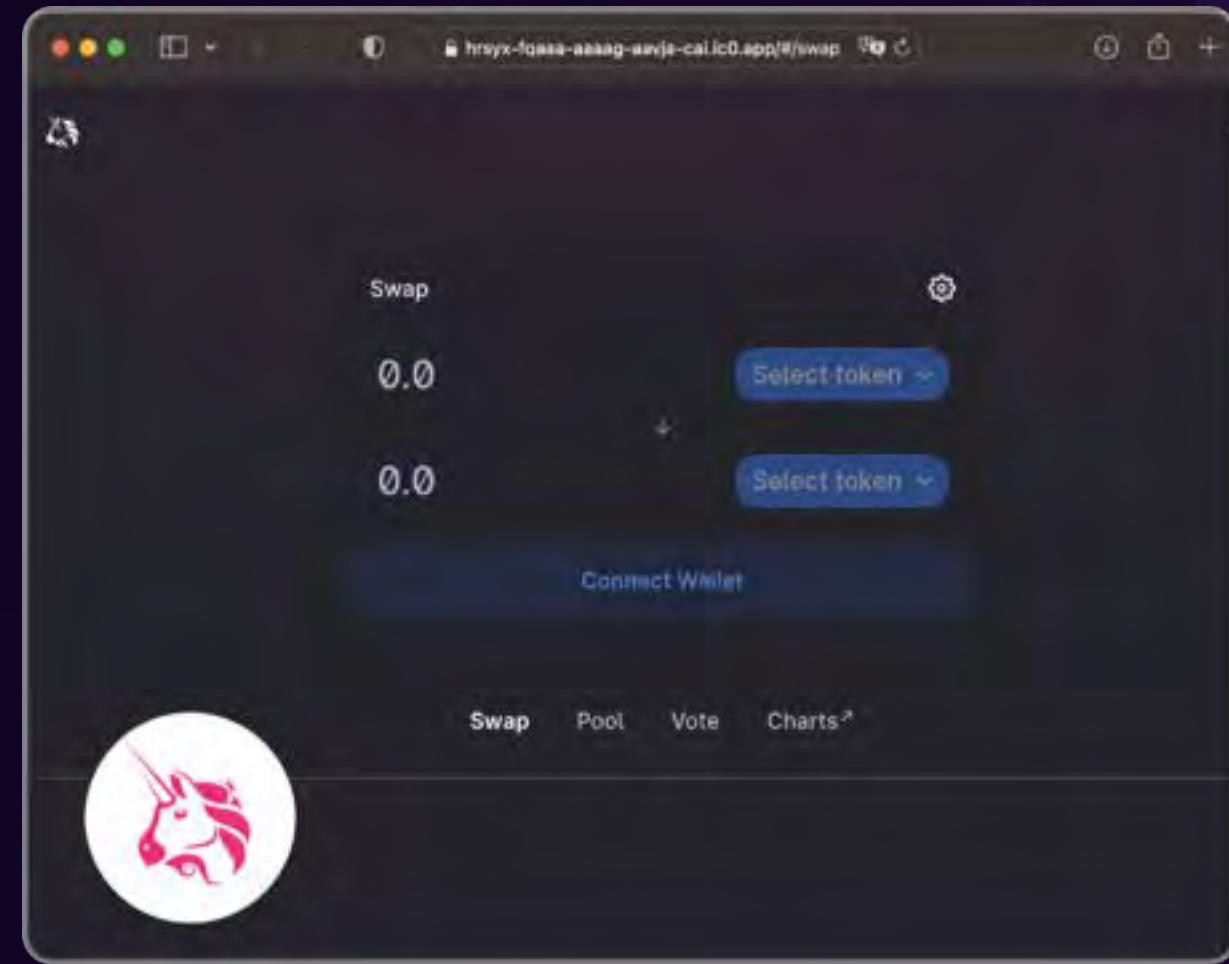
INTERNET IDENTITY



INTERNET IDENTITY



autonomous code enables Web3 that's more powerful...





OC.app

- ✓ messaging service runs 100% on network
- ✓ chat accounts also wallets i.e. full SocialFi
- ✓ send satoshis using chat messages; *no signing*
- ✓ 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 profile picture, the name "Jan", a search bar, and a date "Friday 18th Nov". On the right side of the header, it says "OpenChat PUBLIC 15,575 Members". Below the header, there are two tabs: "Chats" (with 10 notifications) and "Threads" (with 1 notification). The main area displays a list of conversations. Each conversation includes the participant's profile picture, their name, a message preview, and a timestamp. Some messages have a red badge indicating they are unread. The list includes:

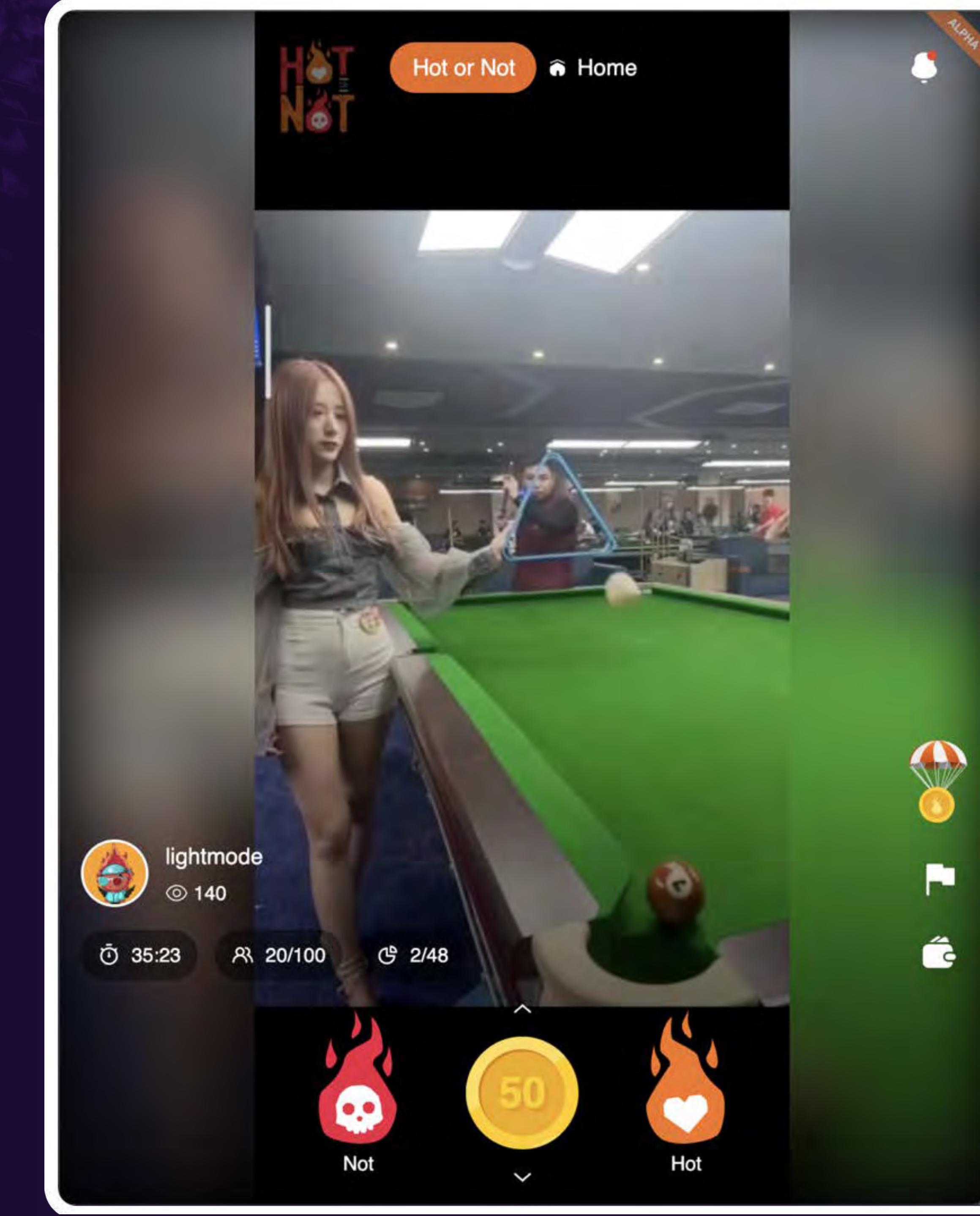
- OpenChat: diens: Hi (13:58)
- Distrikt: paribeda: hii (13:44)
- /biz/: Archetypal: image - Yeah, that looks pretty good (13:43)
- NNS Proposals: ProposalsBot: Update subnet 2fq7c to replica ve... (13:37)
- Dfinity: Virtual: "With the looming launch of official BTC sup... (13:28)
- Dfinity Community: Nhatlong: Giphy message (13:24)
- ICP Maximalist Network: Quynhnga: Giphy message (13:05)
- 8年躺平室友群: Landolt: It's quite good! (12:45)
- ICP Metaverse: Ng17Kenny: How'r u? (07:21)

On the right side of the screen, there's a sidebar with a sunset image and some user profiles. One profile is "g54GM" with the message "hguys 10:36". Another profile is "JorgeShelton" with the message "https://oc.app/#/ho3ya-saaaa-aaaaf-asnlq-cai 10:46". A third profile is "Goaliaye" with the message "2 days to the most watch sport on TV. 10:46". At the bottom right, it says "Yakvb joined the room".



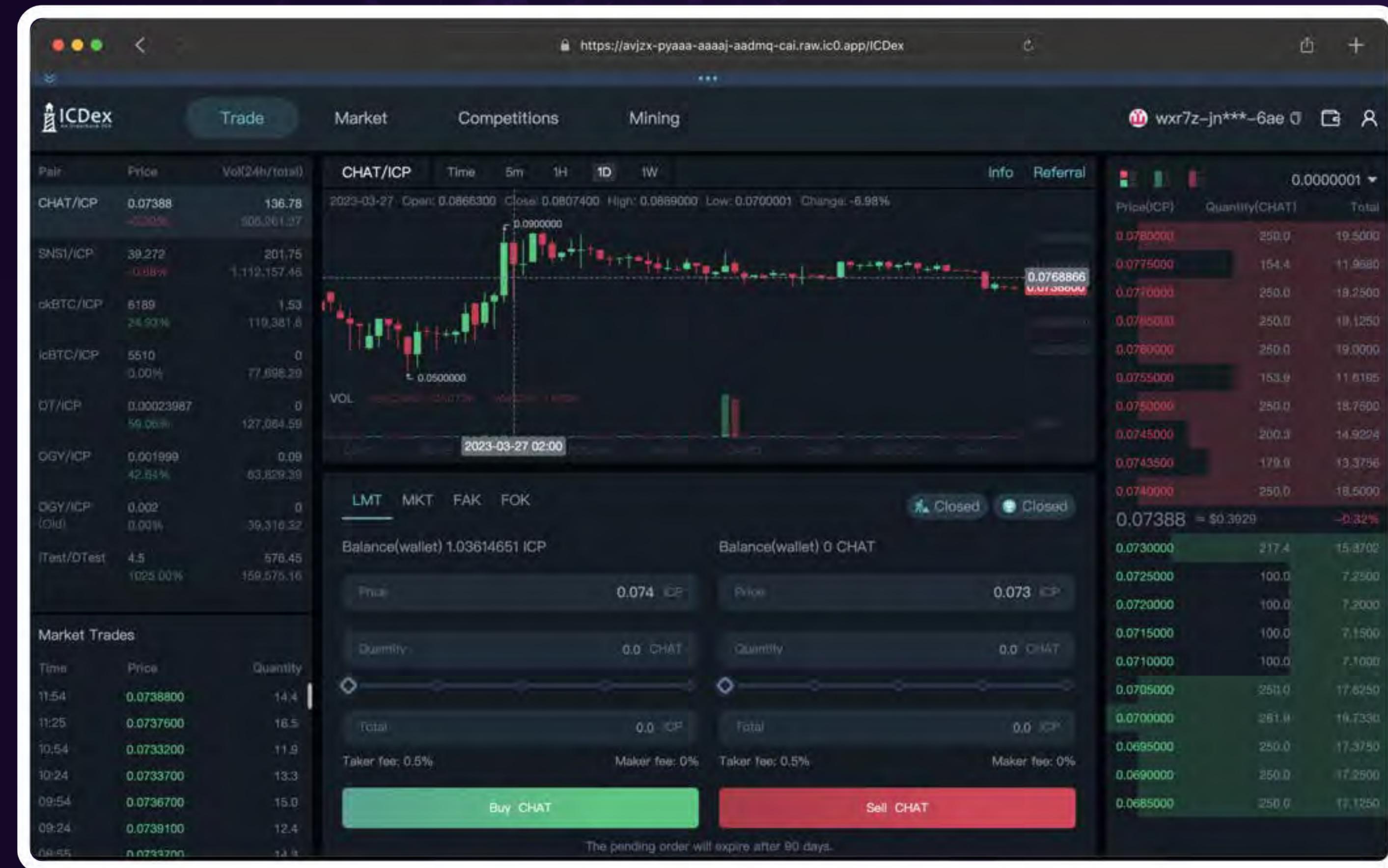
HotOrNot.wtf

- ✓ 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



ALPHA

ICDEX.io is 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

Medium

reddit

GoDaddy

Spotify

YouTube

Dropbox

Telegram

twitter

KICKSTARTER

Gmail

W E B 3

nuance

DSCVR

ICNS ICNAMING

CANISTORE

DSocial

IC Drive

OpenChat

distrikt

Funded

DMAIL



cool services. tiny tech teams.

the web3 services just shown provide complex functionality and scale to large numbers of users, but only require a few engineers to bootstrap and maintain



no cloud. no database servers.

the web3 services just shown are built exclusively from
Internet Computer-hosted canister code:
the network is the tech stack.



no firewalls. no security teams.

the web3 services just shown are not protected by security infrastructure like firewalls, or security teams:
tamperproof canisters don't need them.



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

TRADITIONAL IT

personnel

CANISTERS



complexity

\$1.35 trillion
potential savings

R E D U C E

serverless cloud model can deliver **compute efficiencies**



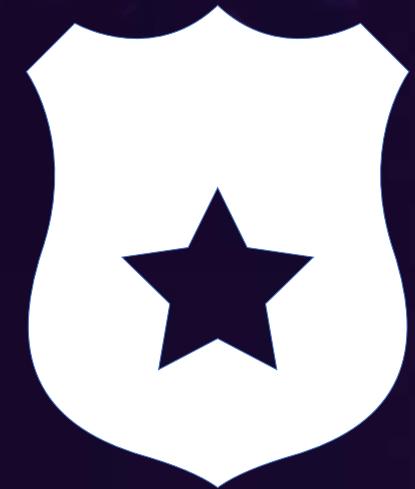
Gartner Research
Cloud services spend

2022

\$482 billion

R E D U C E

systems and services are tamperproof, no firewall necessary



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

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 nation-sovereign subnets



yup, no bridges, just
trustless cryptography

multi-chain

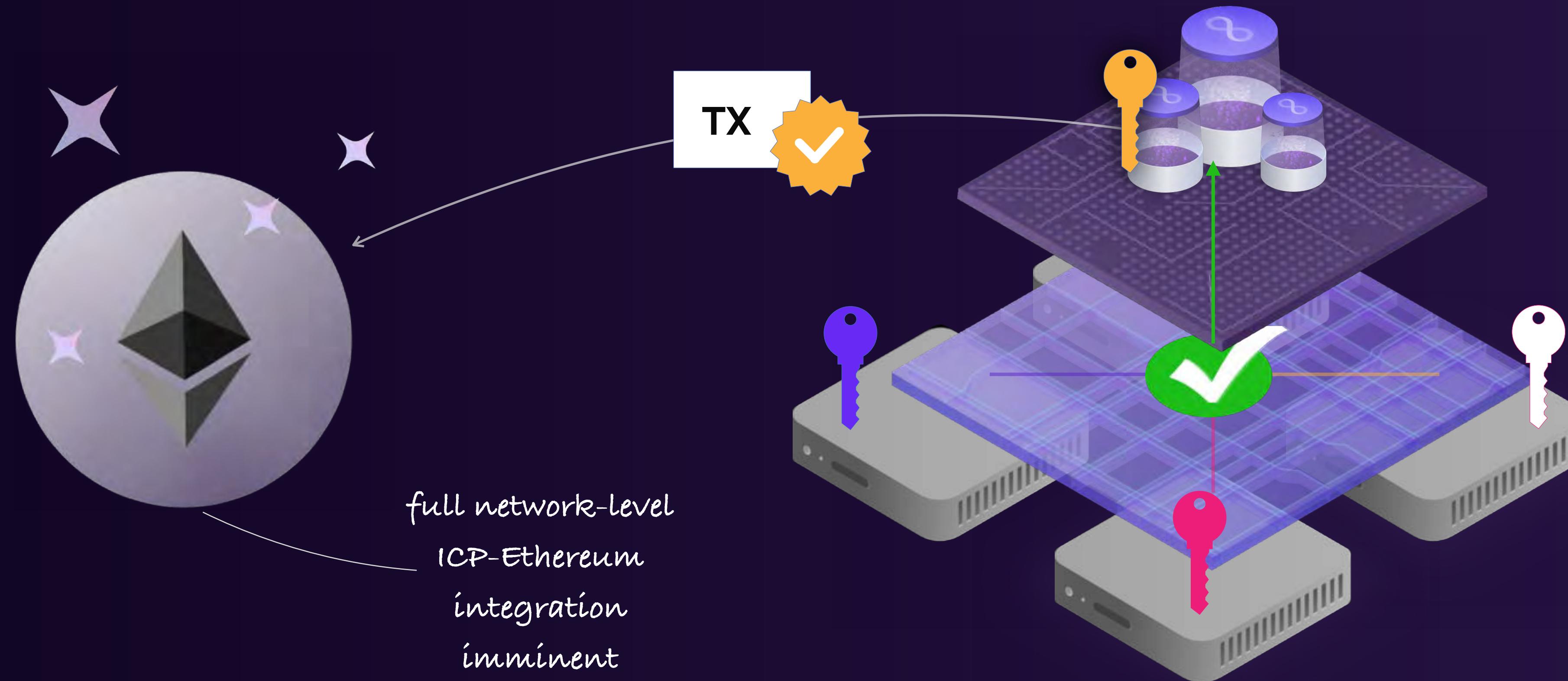
“chain key cryptography” creates transactions on other chains.
network-level integrations with Bitcoin and Ethereum



realize the Ethereum World Computer vision from 2014

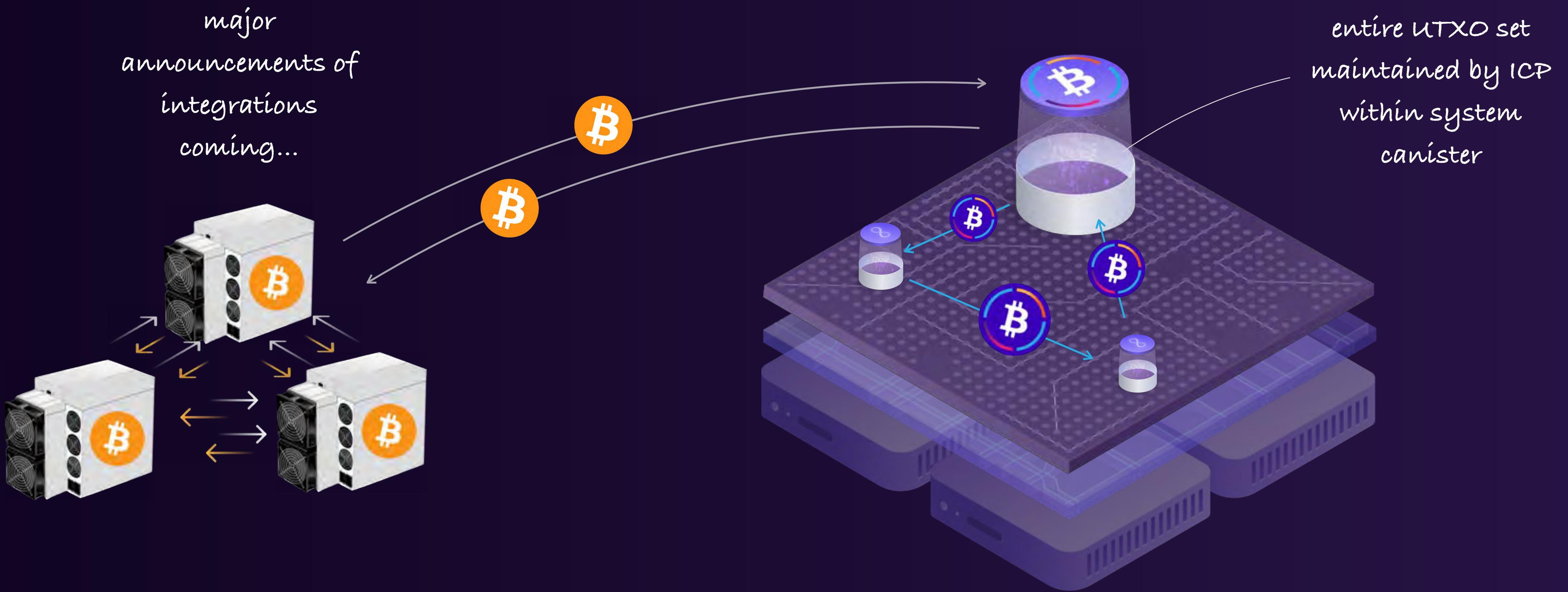


canisters create accounts and sign TXs on other blockchains



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

ckBTC is a bitcoin twin that can be directly processed by canisters



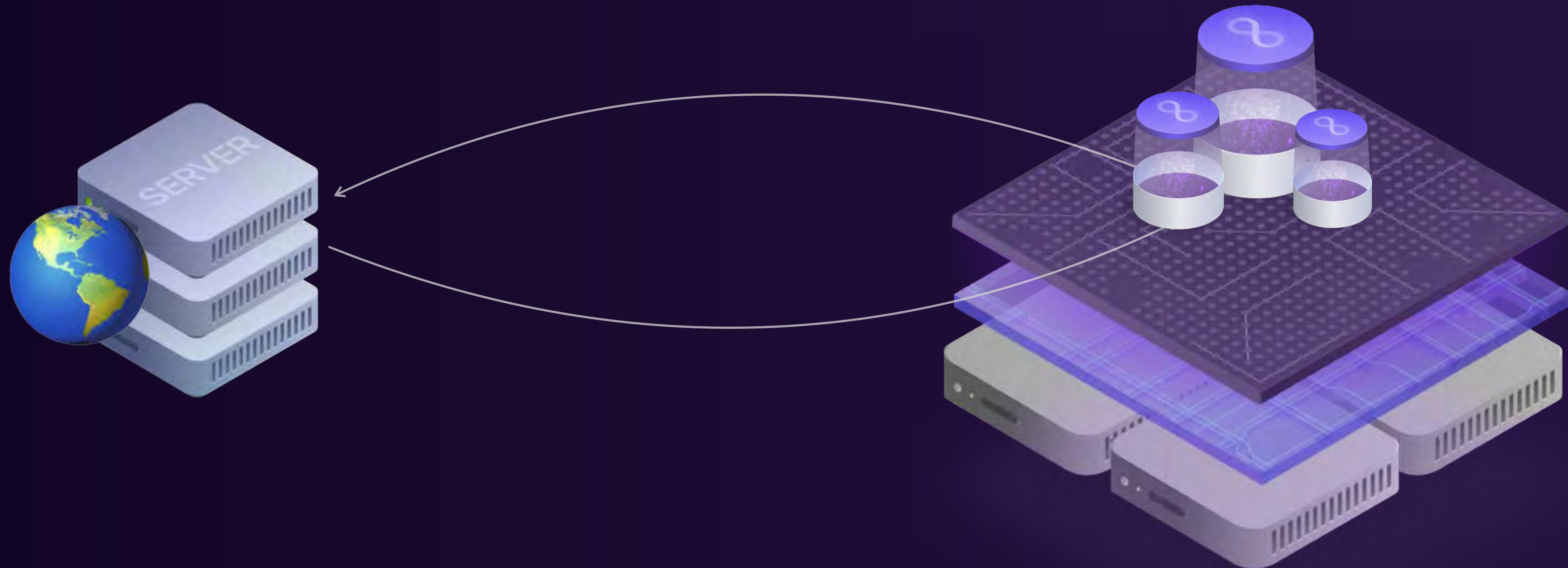
“chain-key bitcoin” supports usage of bitcoin in DeFi, social media, games, the metaverse with 1s finality

web2+3

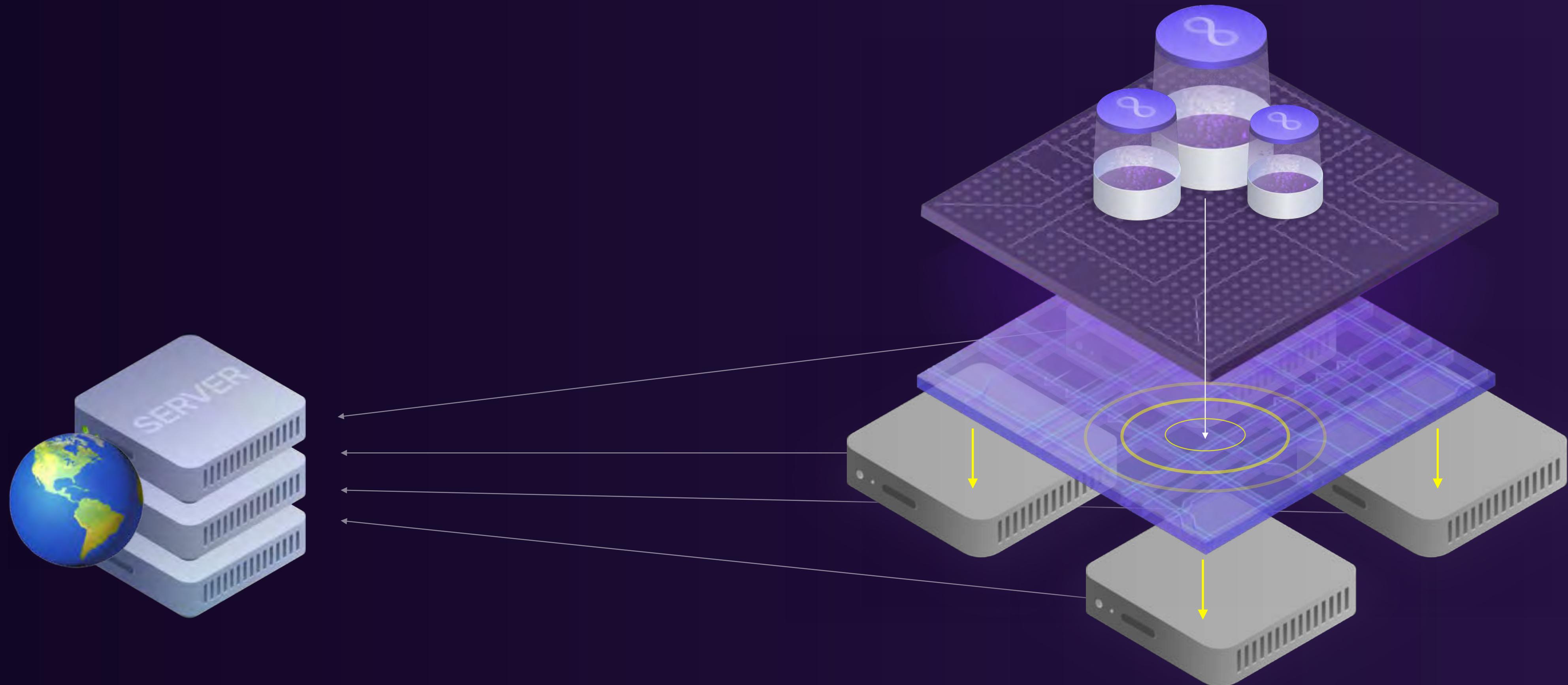
canister smart contracts can make calls to web2 systems, and the network passes results through consensus...



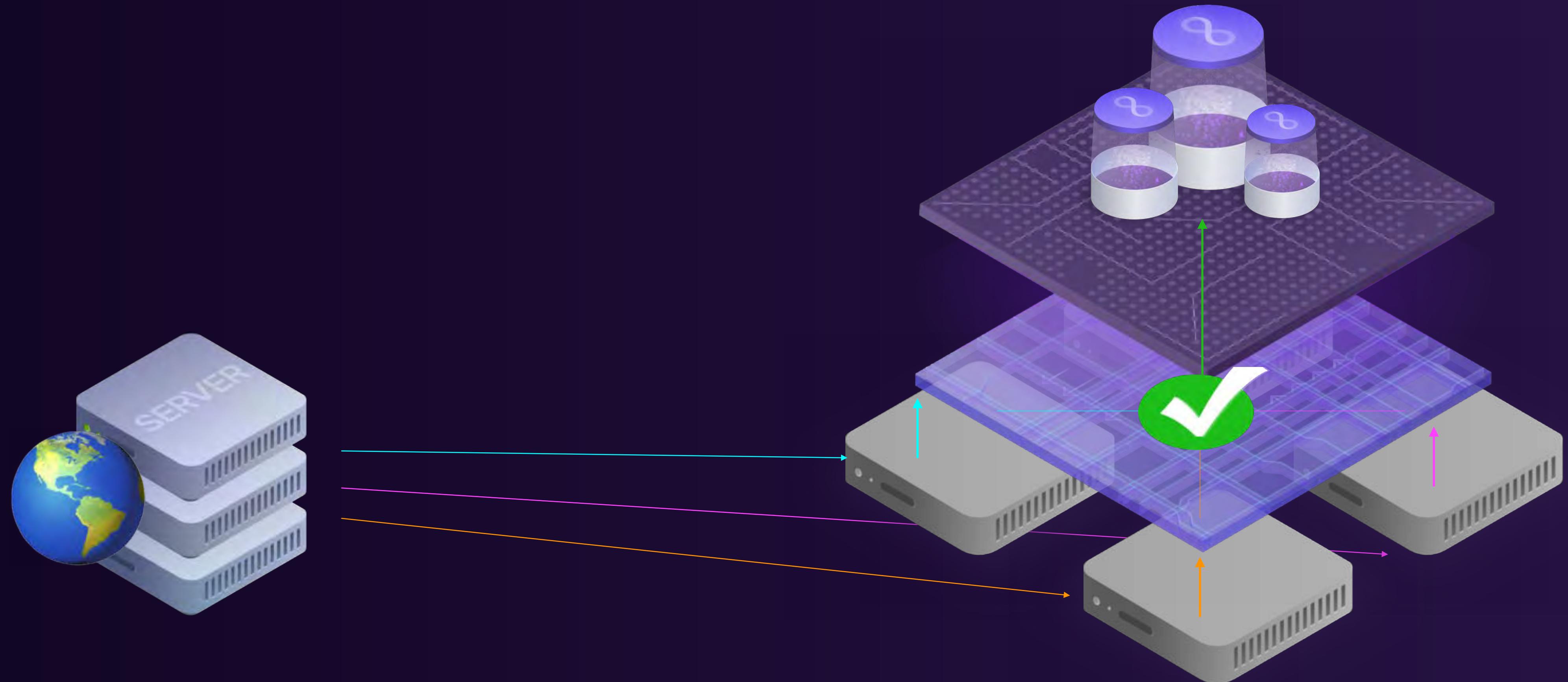
canisters make https outcalls



results normalized through consensus



enabling web2 integrations and sovereign oracle functionality



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).



build on the internet using the
Internet Computer



decentralize
everything

<https://internetcomputer.org>

