



Smart Contract Summit 2021

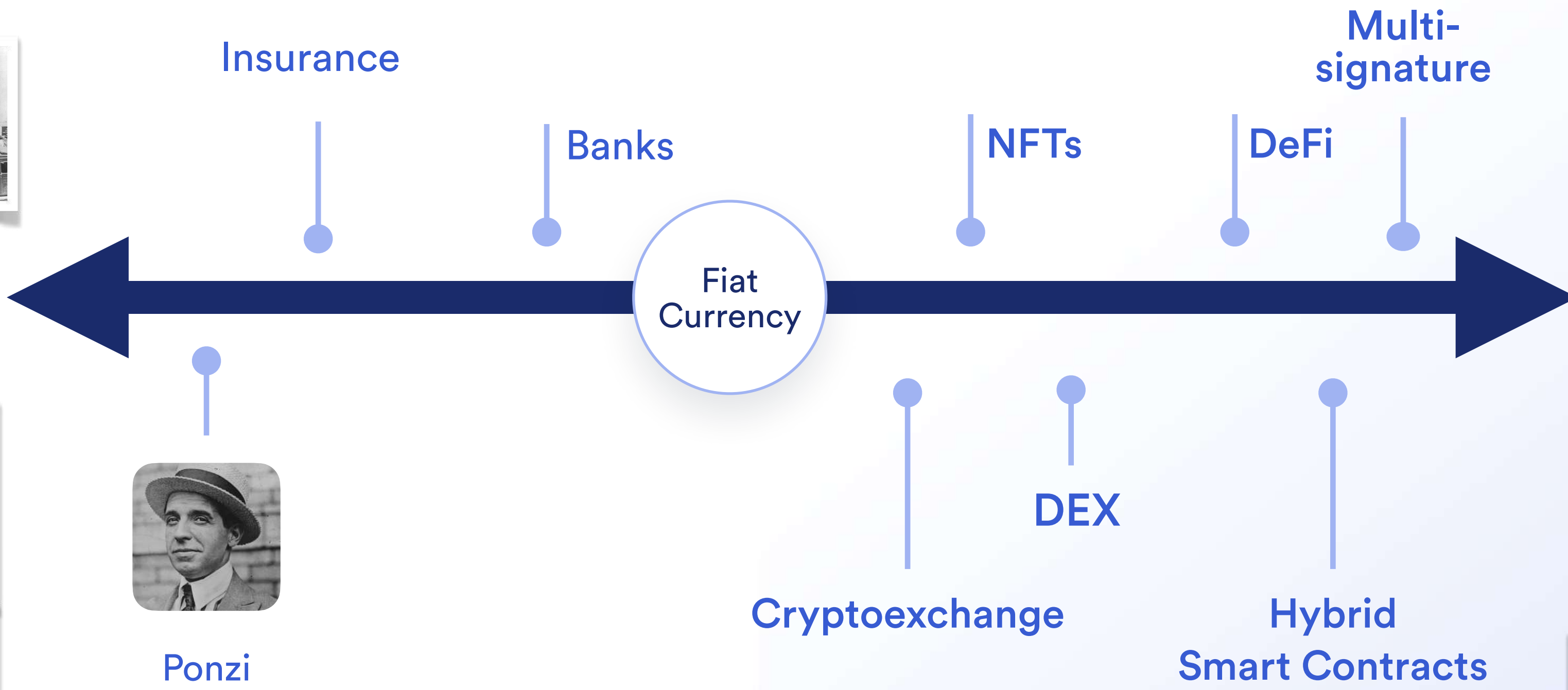
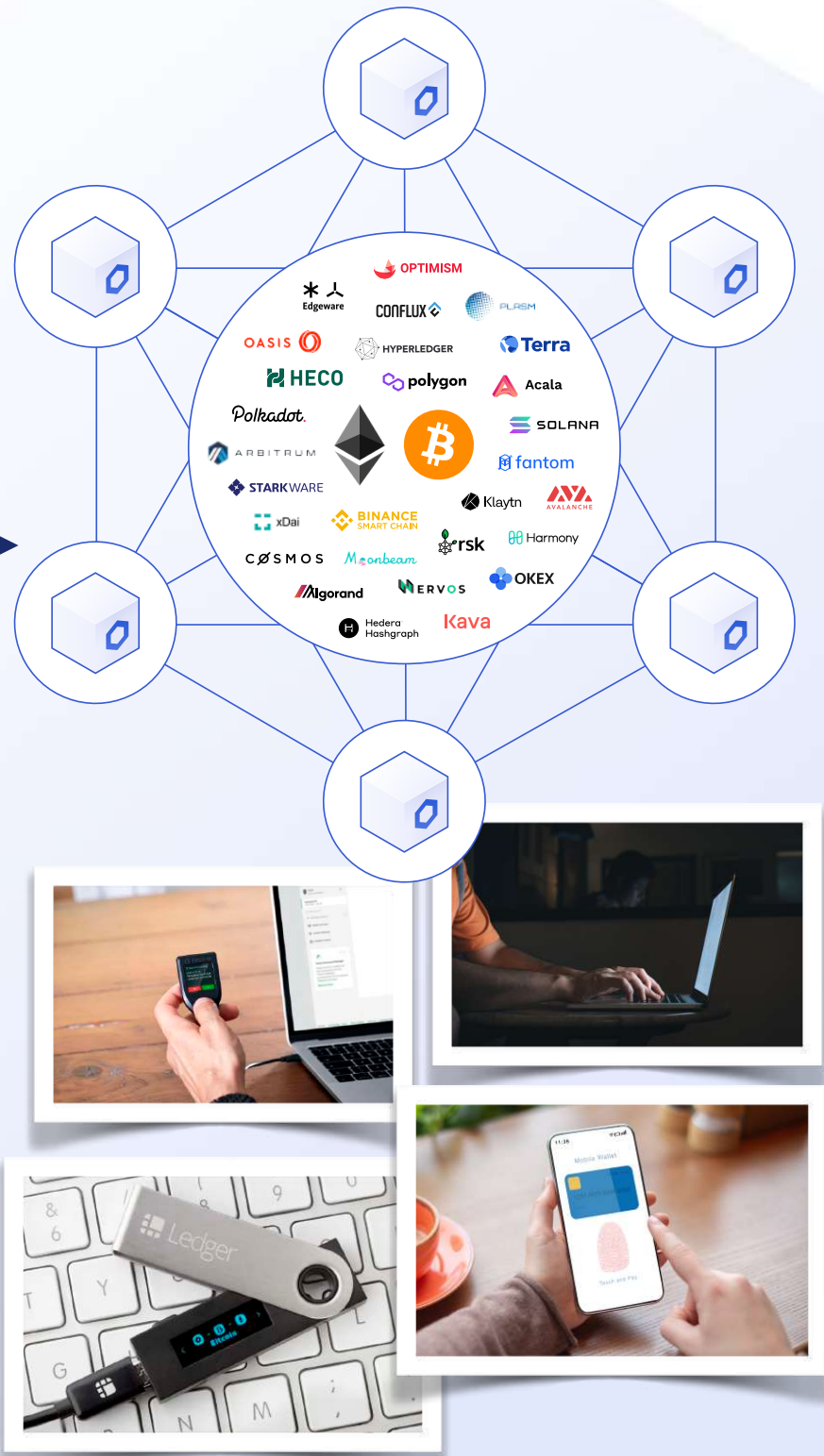
Sergey Nazarov

Cryptographic Truth is Strictly Better than “Just Trust Us”

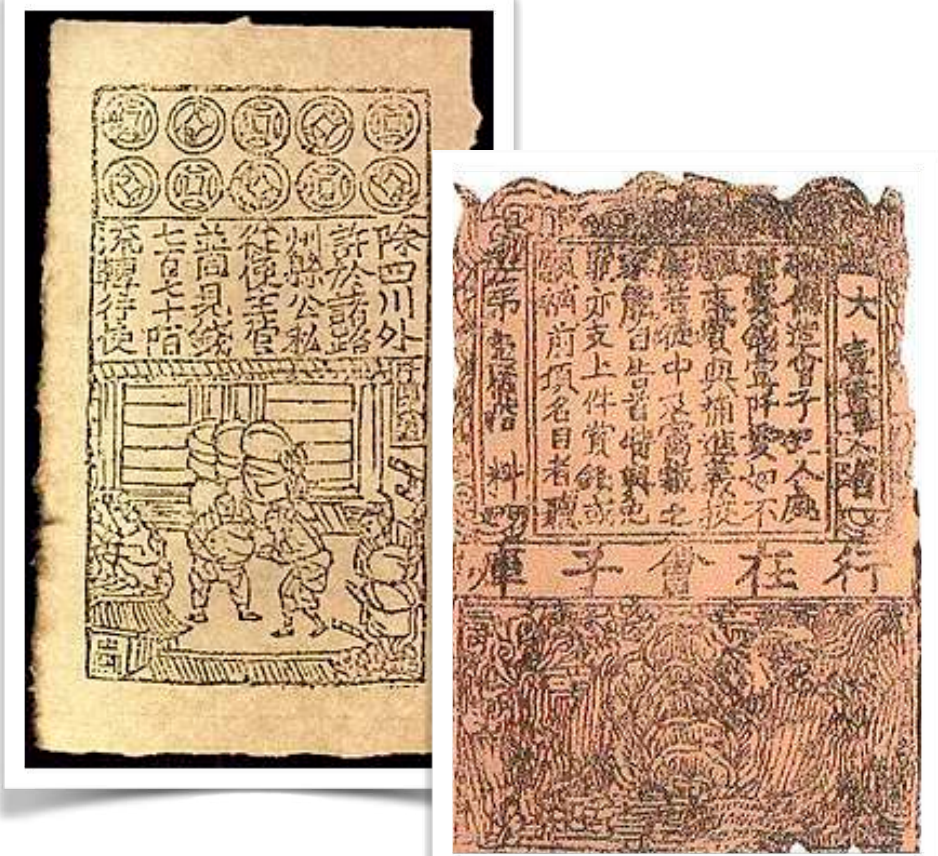
“Just Trust Us” Paper Promises



Cryptographic Truth



“Just Trust Us”: A Recurringly Flawed Foundation for Society



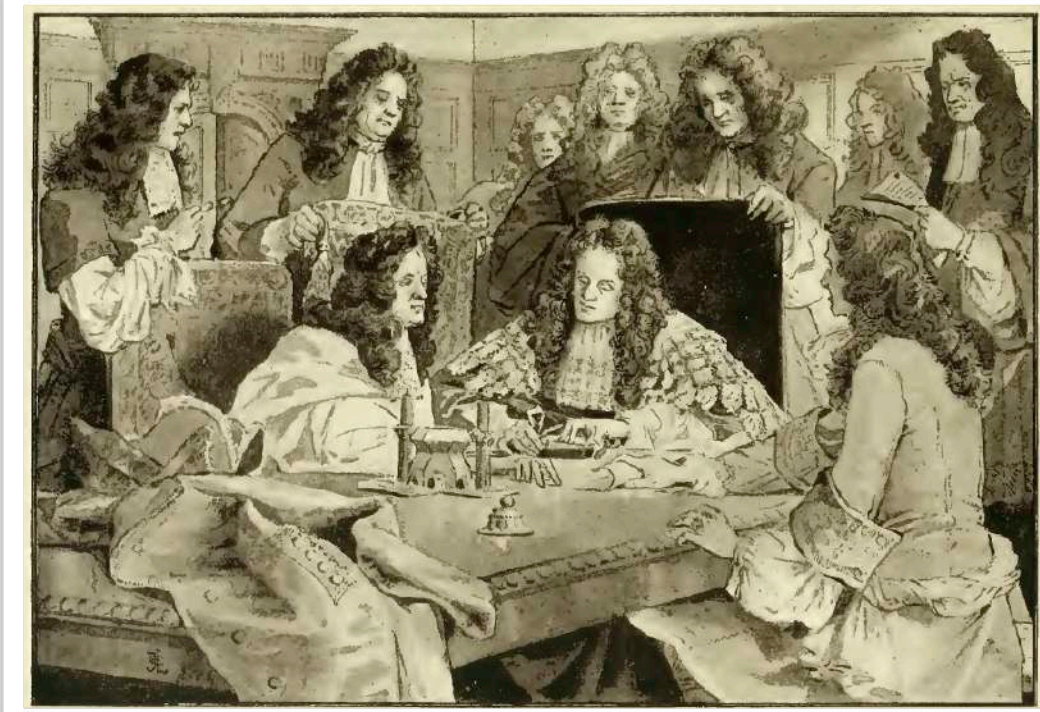
11th – 12th century

Jiaozi Bank Notes were introduced in China’s Song Dynasty, causing large inflation due to overprinting, replaced by Huizi bank notes, with similar inflation issues.



1661

Stockholm Banco created the first Bank Notes in Europe, leading to rapid inflation and overprinting of the notes and eventual default in only a few years.



1694

Despite past Bank Note Failures. The Bank Of England Charter is signed, generating the Bank of England Notes.



1932

Ongoing bank runs in the US, due to the great depression, lead to the creation of the FDIC, which allows the government to back bank deposits, restoring trust.

“Just Trust Us” Has and Will Continue to Fail Society's Needs

“Henceforth the United States would cease to convert foreign-held dollars into gold.”



U.S. Currency Becomes Fully Fiat

1971

INDEPENDENT

We were two hours from the cashpoints running dry



Global Credit Crisis

2008

thejournal.ie

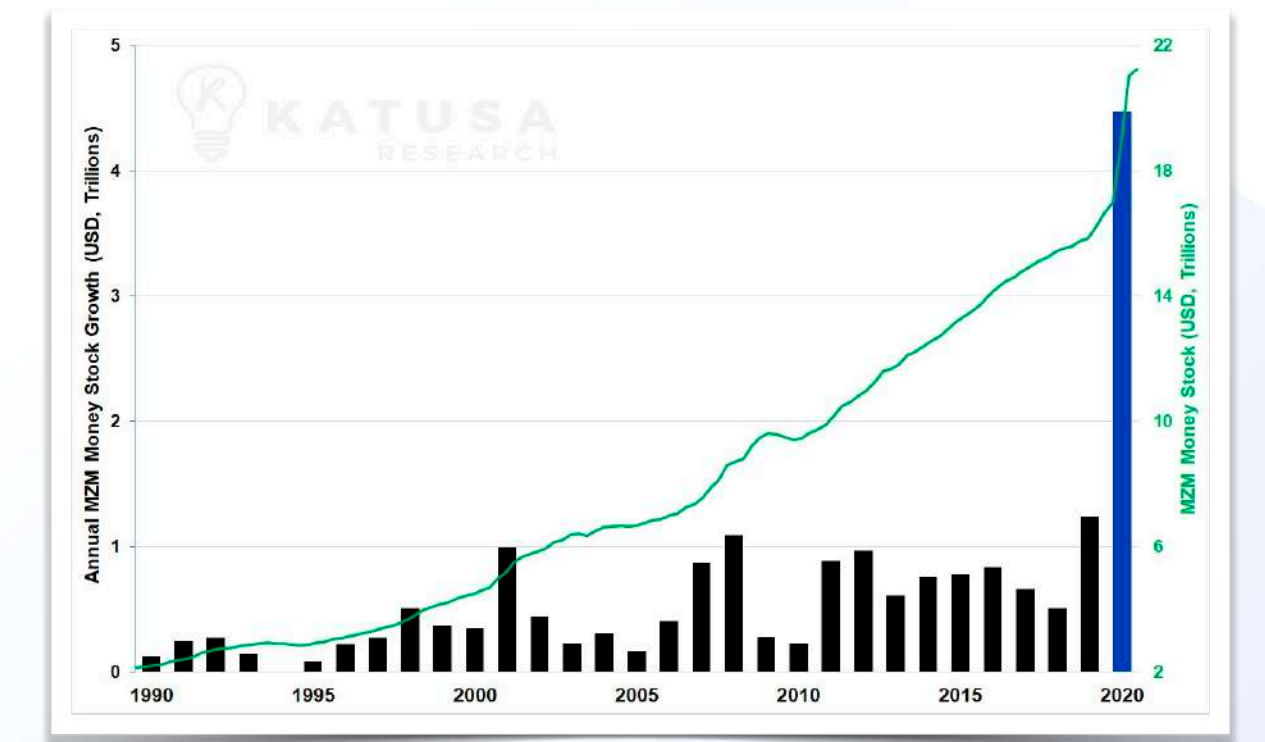
People are queuing for ATMs in Greece - but they can only get €60



Greek Banks Deny Access to Funds

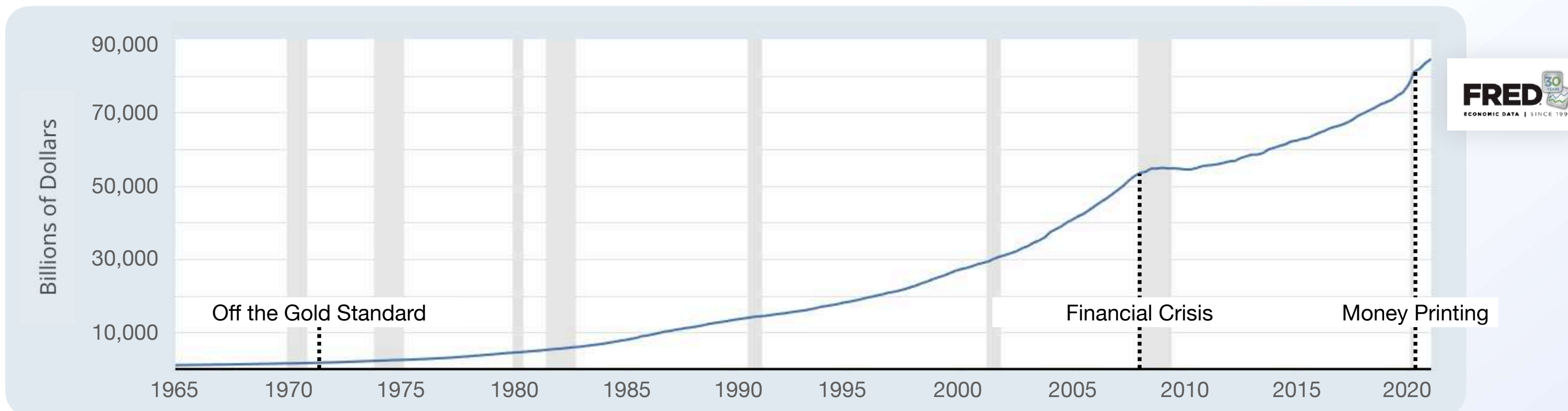
2015

21% of All US dollars Were Printed in 2020

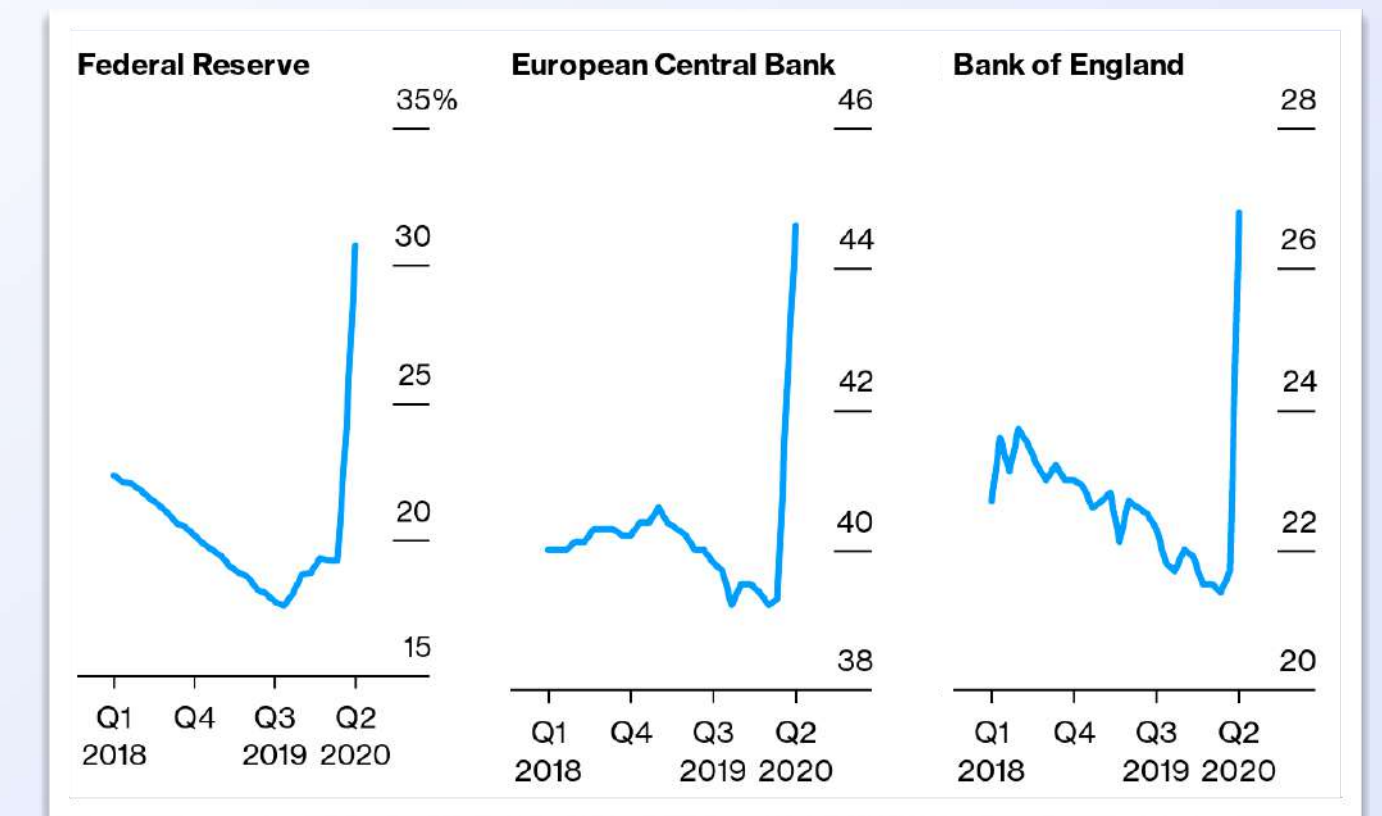


Unprecedented 2020 Money Printing

2020



All Sectors; Debt Securities and Loans; Liability, Level.



Central bank's balance sheet as share of GDP

TradFi Products Can Only Provide a “Just Trust Us” Promise

MarketWatch

Need to Know

Robinhood day traders are squeezing the hedge funds — here’s why it may continue

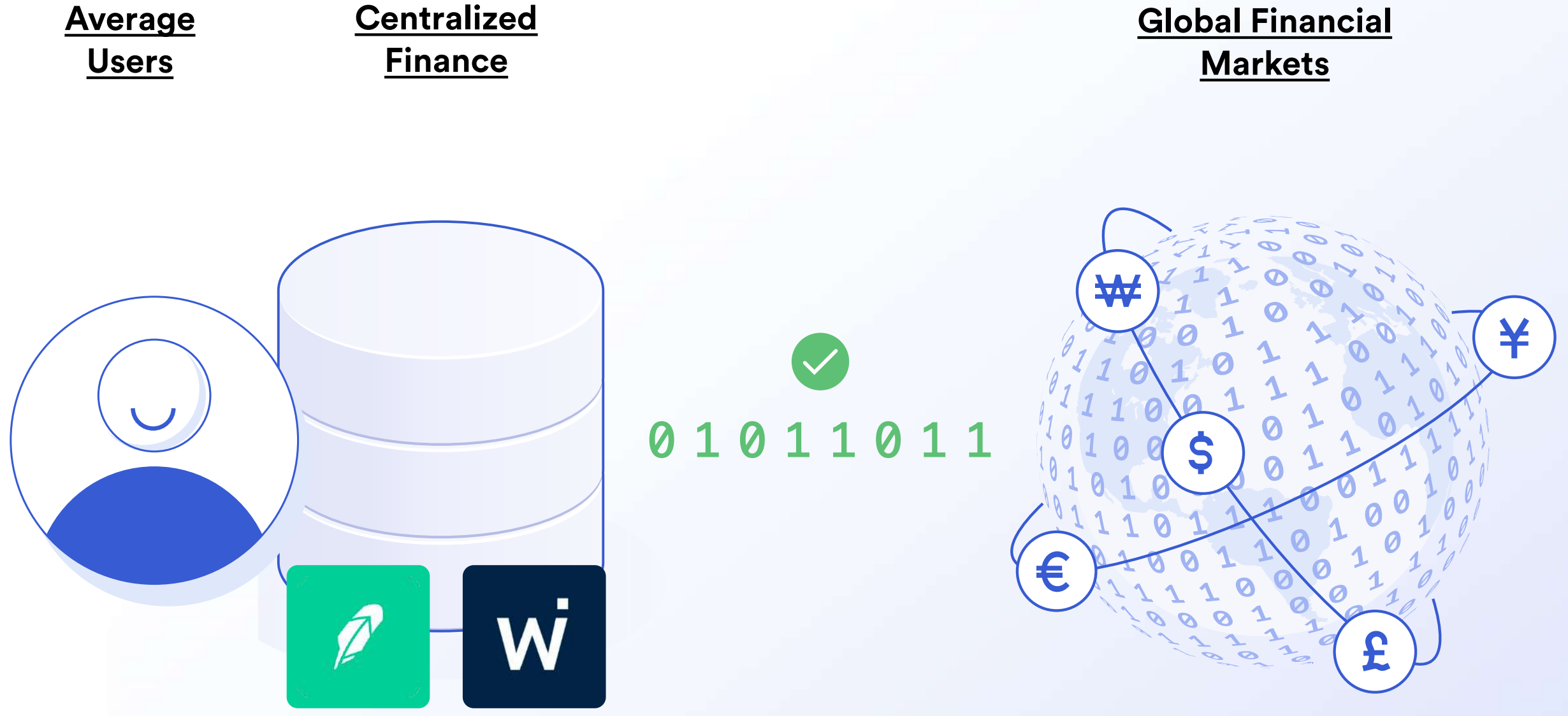
Published: Jan. 20, 2021 at 3:14 p.m. ET

By [Steve Goldstein](#)

Critical information for the U.S. trading day



Stocks are getting squeezed. GETTY IMAGES



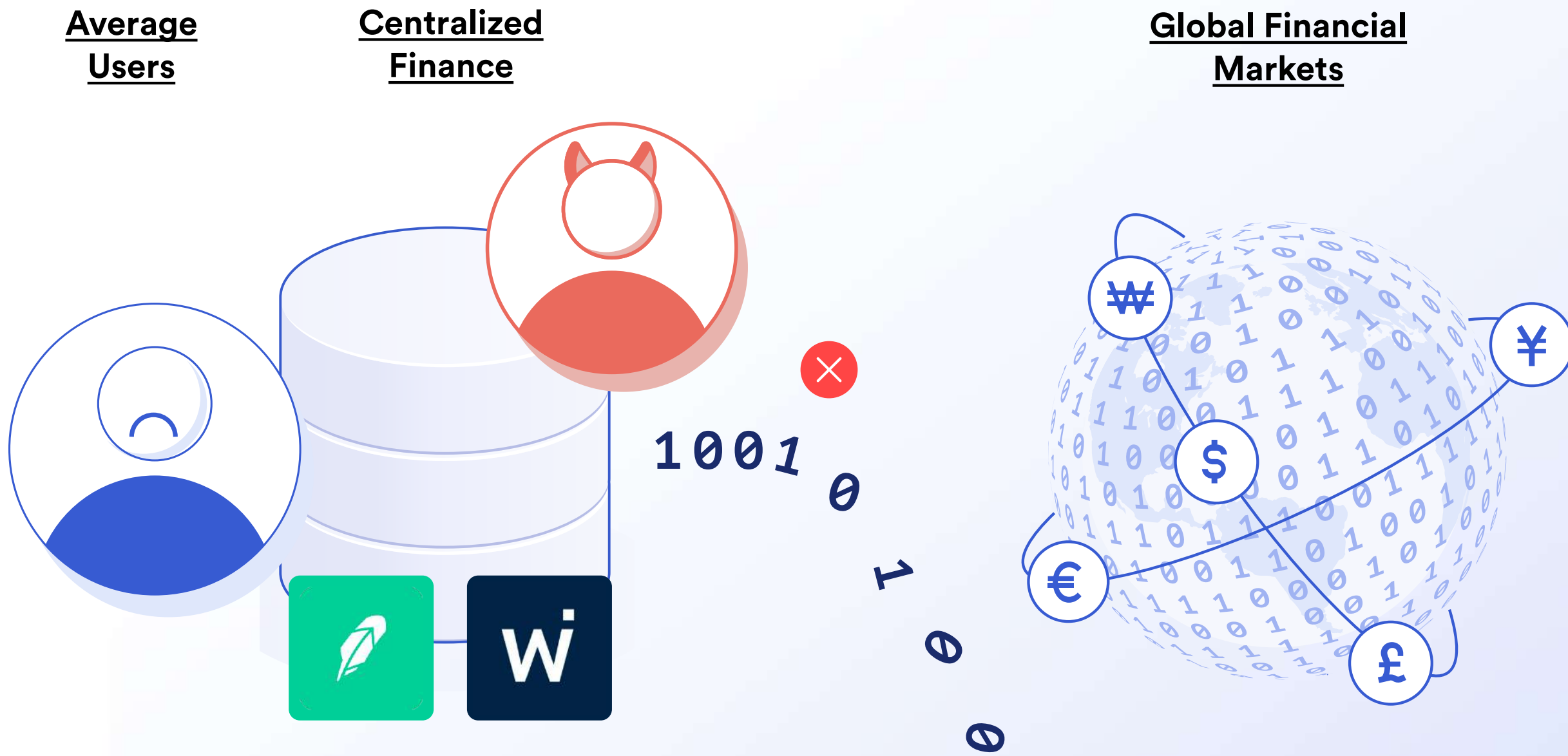
TradFi “Just Trust Us” Promises Often Fail Today’s Consumers

VICE

Robinhood Stops Users From Trading GameStop Stocks, Other Reddit YOLO Picks

5 KPIX CBS SF BayArea

Brokerages Limit Trading on GameStop Stock, Sparking Outcry and Protest



DeFi Provides a Unique “Cryptographic Truth” Guarantee



DeFi Trend: The Solution – and Huge Opportunity – to the Robinhood Fiasco

CONTRIBUTOR
Matt McCall — InvestorPlace

PUBLISHED
FEB 6, 2021 5:30PM EST



Source: Shutterstock

Average Users

Decentralized Finance

Global Financial Markets



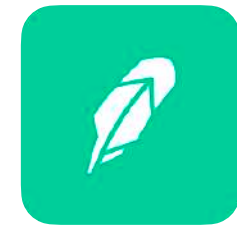
Cryptographic Truth is Strictly Better than “Just Trust Us”



“Just Trust Us” Paper Promises



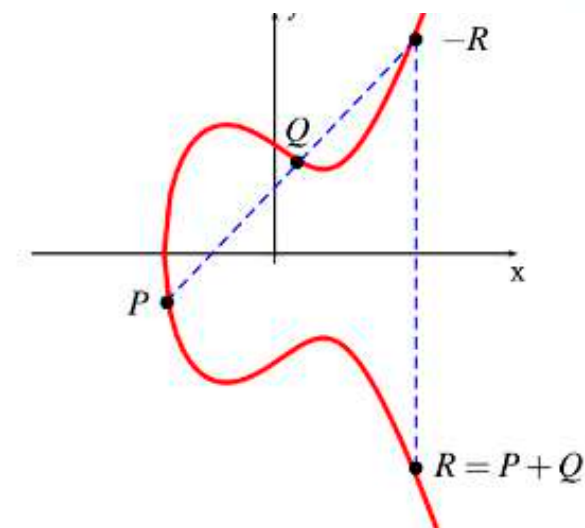
Trust my Brand!



- Control is completely given away
- Counterparty risk is high and opaque
- Transparency is purposefully removed



Cryptographic Truth Guarantees



$$y^2 = x^3 + 7$$



- Control is in the user's hands
- Counterparty risk is low and transparent
- Transparency is unavoidably built-in

Vision

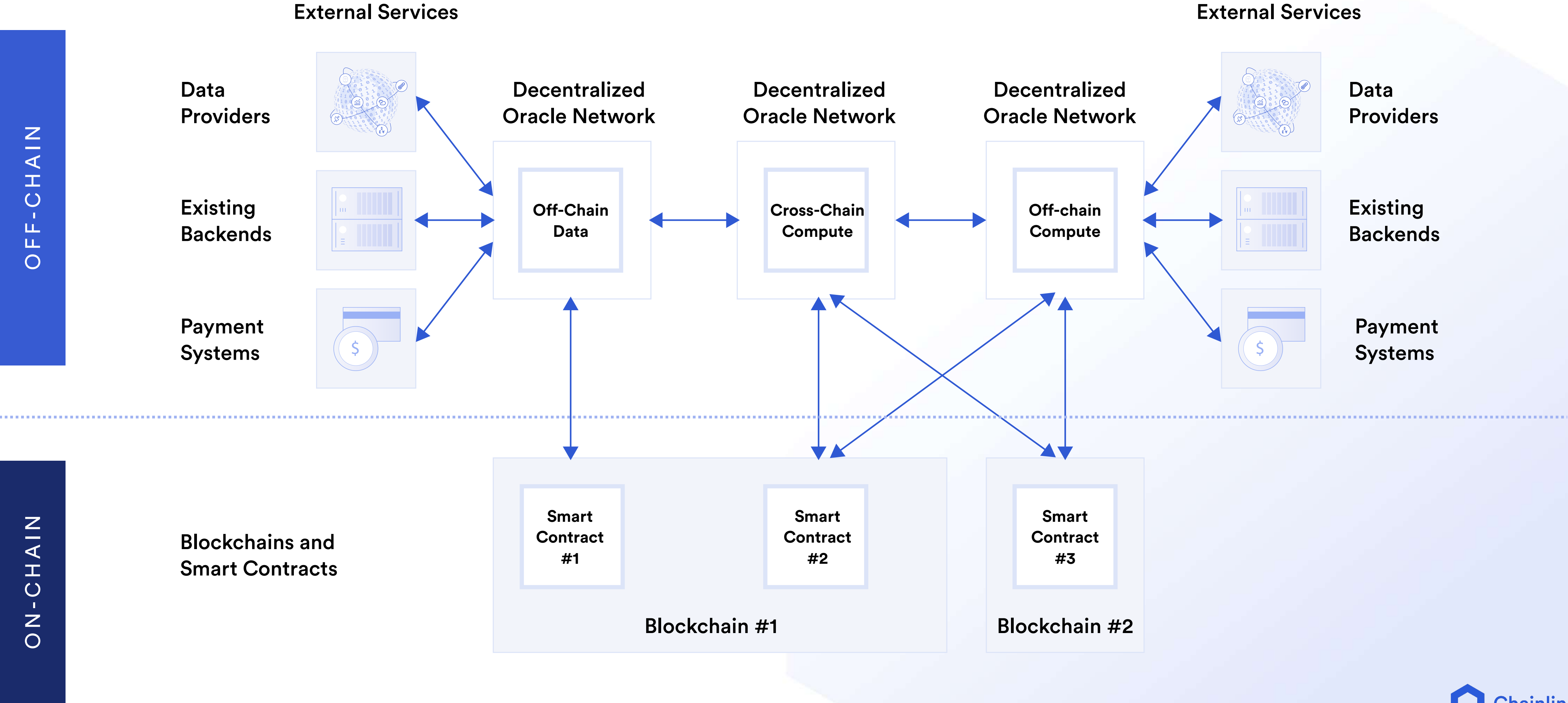
**Build a World
Powered By Truth**

TRUTH > TRUST

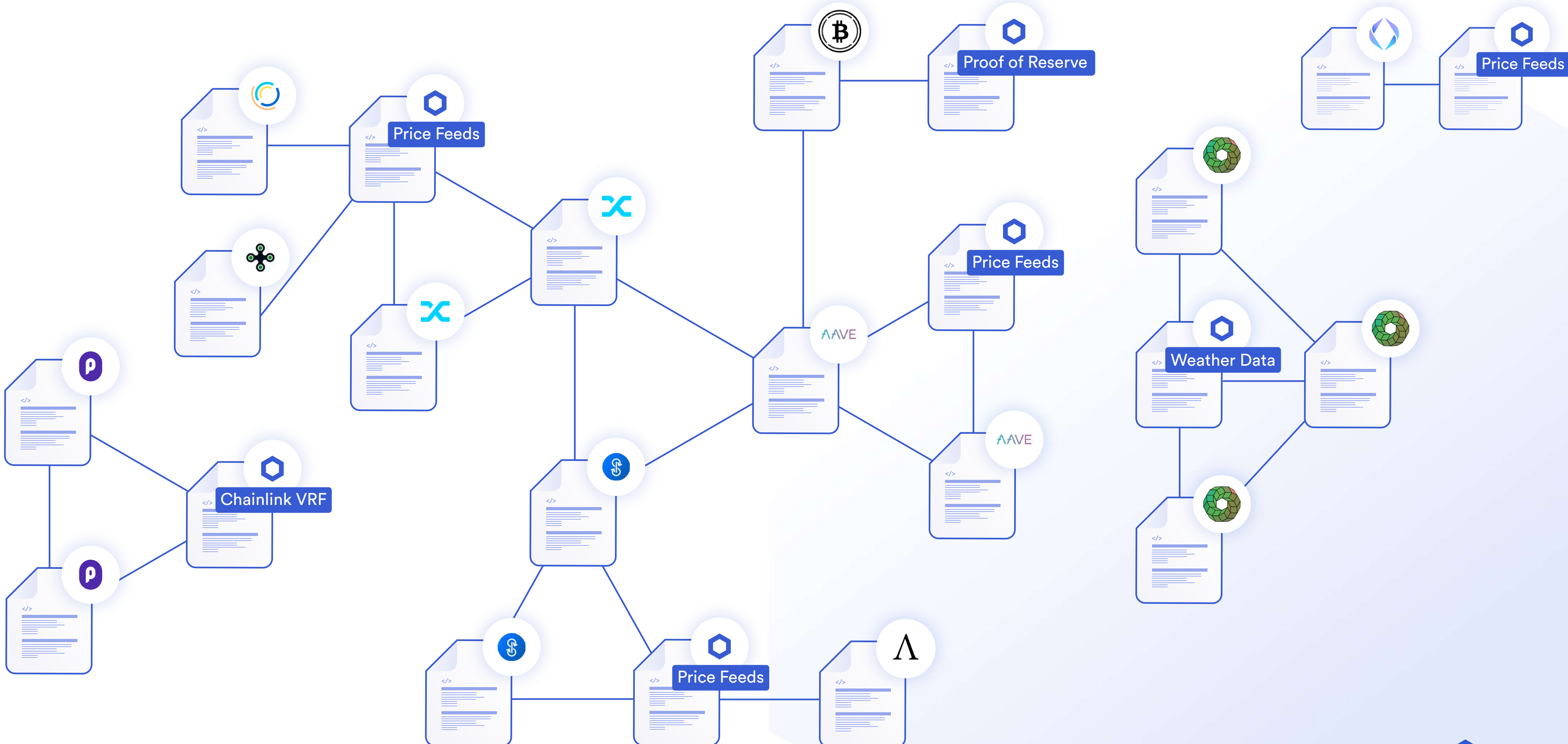
Mission

**Build decentralized systems
that link everything to truth,
creating a fair, unbiased world.**

Hybrid Smart Contracts Will Be Continually More Advanced

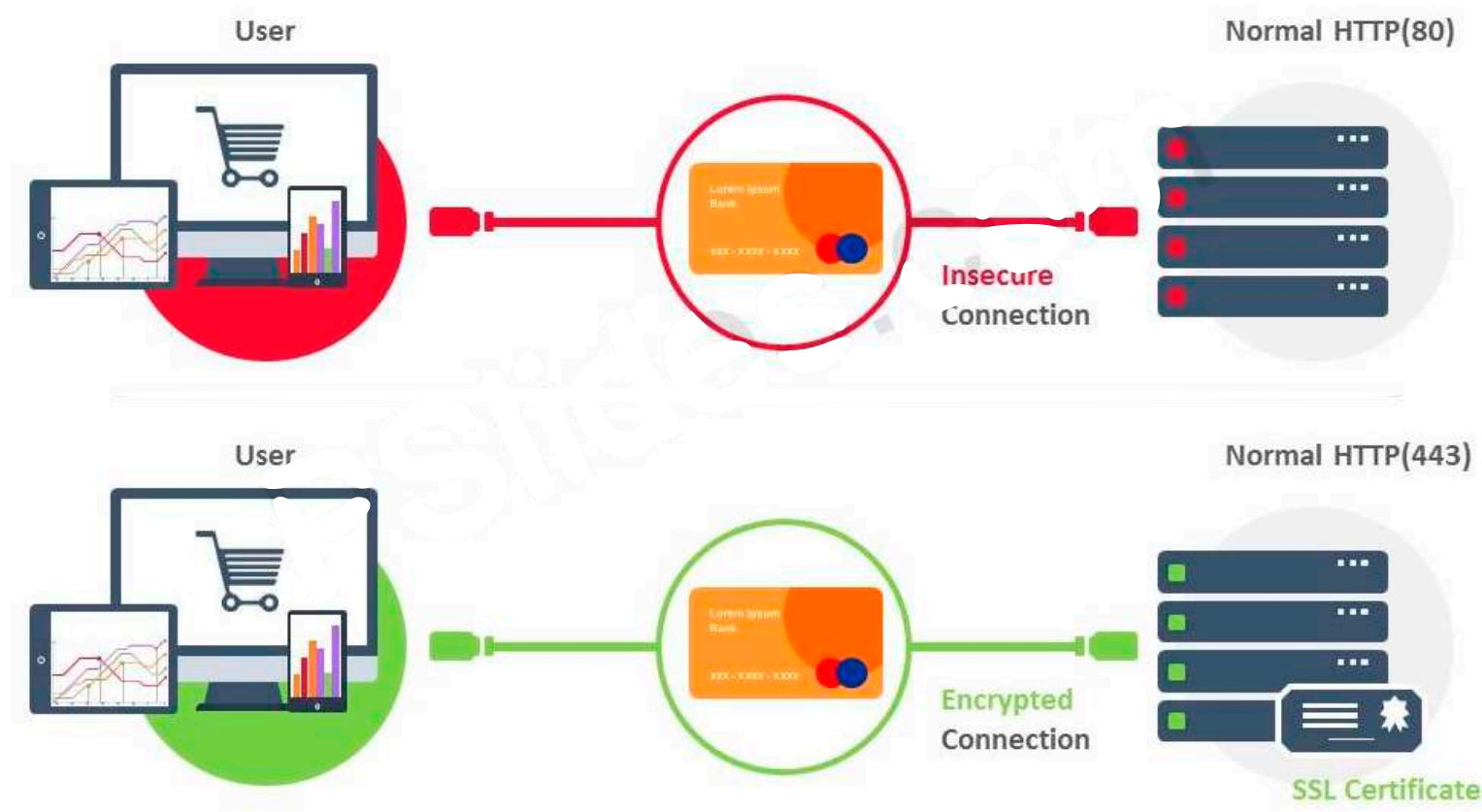


Hybrid Smart Contracts Already Happening as DeFi



Building a Global Standard for Cryptographic Truth

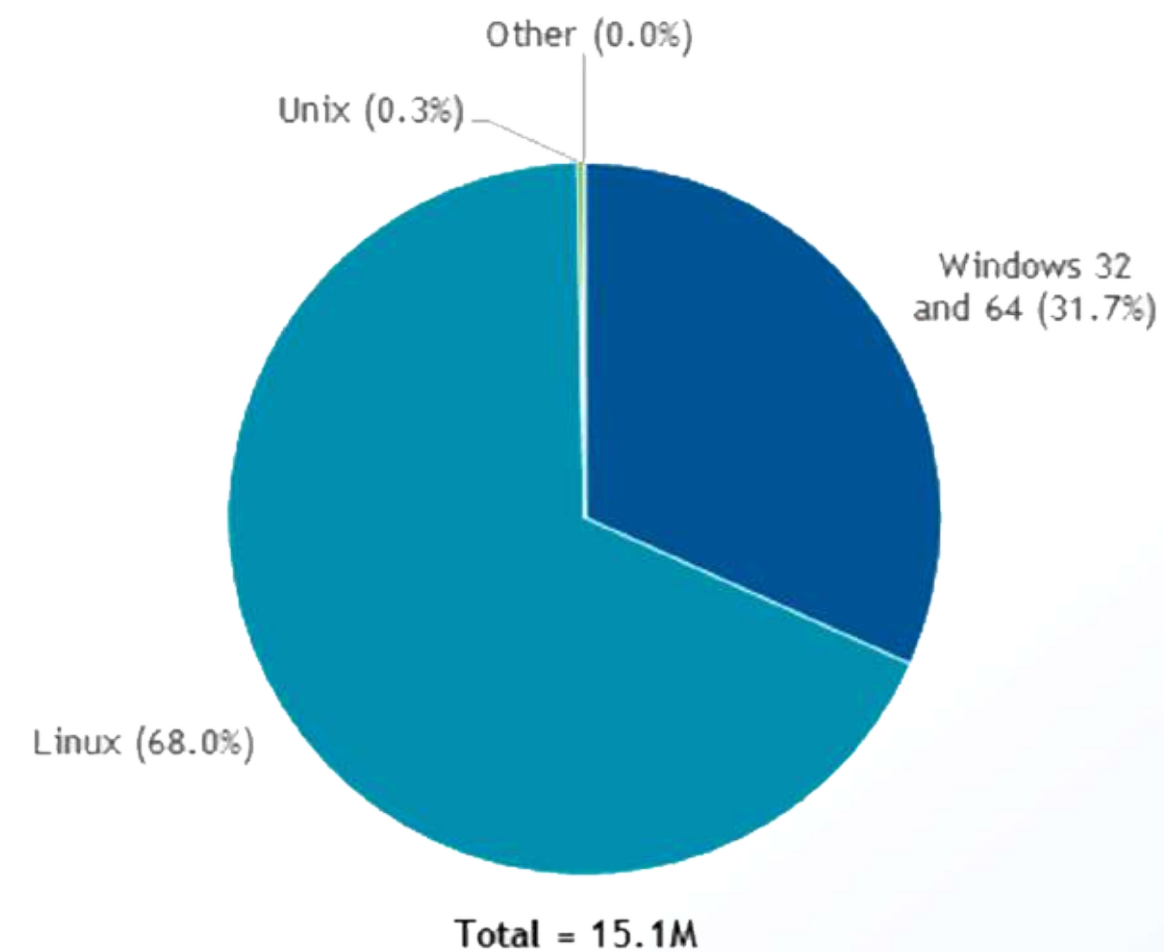
HTTPS



- Services most private web traffic
- Built on better security
- Innovative first mover
- Open source standard

Linux

Worldwide Server Operating Environment Shipments/Subscriptions and Nonpaid Deployment Share by Operating Environment, 2017



- Services most web servers
- Built on better security
- Innovative first mover
- Open source standard

Chainlink

Chainlink Integrations in the Top 20 DeFi projects by TVL (DeFi Pulse)

Rank	Name	Chain	Category	Locked (USD)
1.	Aave	Multichain	Lending	\$12.44B
2.	Curve Finance	Multichain	DEXes	\$8.59B
3.	Compound	Ethereum	Lending	\$8.55B
4.	InstaApp	Ethereum	Lending	\$8.56B
5.	Koala	Ethereum	Lending	\$7.03B
6.	Uniswap	Ethereum	DEXes	\$5.69B
7.	Convex Finance	Ethereum	Assets	\$4.55B
8.	Sushiswap	Ethereum	DEXes	\$3.34B
9.	yearn.finance	Ethereum	Assets	\$3.27B
10.	Liquity	Ethereum	Lending	\$1.86B
11.	Flexa	Ethereum	Payments	\$1.67B
12.	Balancer	Ethereum	DEXes	\$1.59B
13.	Synthetix	Ethereum	Decentralized	\$1.48B
14.	Bancor	Ethereum	DEXes	\$1.28B
15.	Quickswap	Polygon	DEXes	\$1.08B
16.	Alpha Home	Ethereum	Lending	\$1.02B
17.	Tornado Cash	Ethereum	Payments	\$634.9M
18.	Fel Protocol	Ethereum	Assets	\$557.9M
19.	Badger DAO	Ethereum	Assets	\$496.9M
20.	Bank	Ethereum	Assets	\$493.9M



60.02%
Of All DeFi Apps
That Need Oracles

- Services most smart contracts
- Built on better security
- Innovative first mover
- Open source standard

Decentralized Price Data Enabled DeFi to Rapidly Grow

Highly Validated Data

Price and Market Data



Chainlink Network

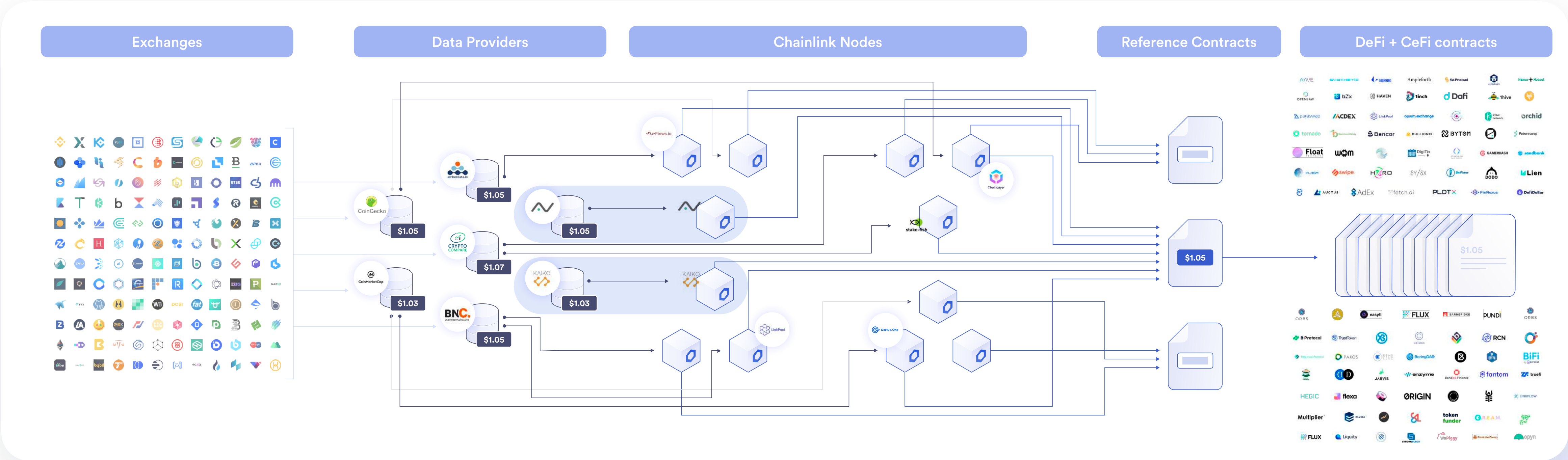


DeFi Contracts + CeFi



Global Finance Industry

Chainlink's Decentralized Data Feeds Secure Most of DeFi



“With partnerships across DeFi and traditional markets, the ground the Chainlink team has covered in a short time is nothing short of breathtaking.”

Forbes

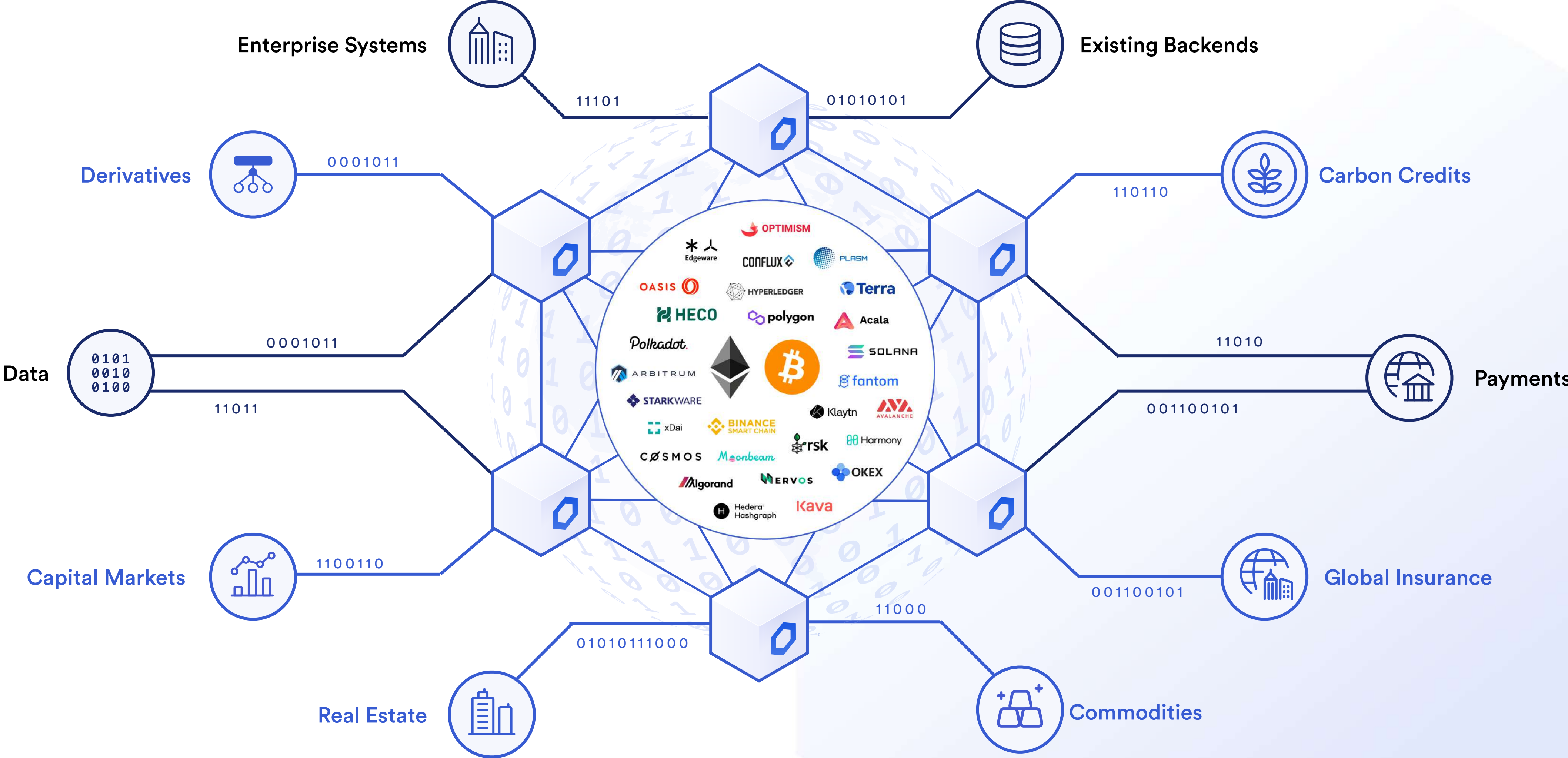
“Chainlink has taken a commanding lead among DeFi oracles, a perch that’s been strengthened with frequent announcements of new partnerships and node operators.”

 **coindesk**

“Chainlink’s price oracles are quickly emerging as the industry-standard data source for the DeFi sector”

 **COINTELEGRAPH**

Global Markets will Interoperate via Hybrid Smart Contracts



Additional Data Enables More Hybrid Smart Contracts

Highly Validated Data

Price and Market Data

Proof of Reserve Audits

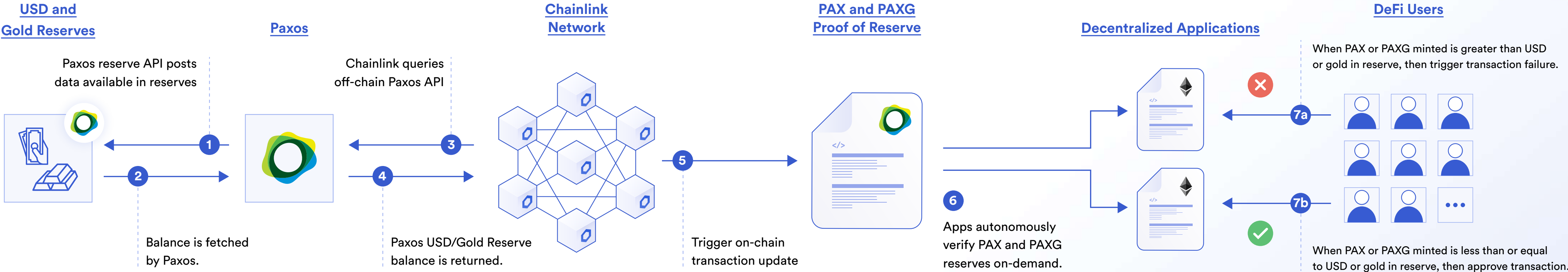
Chainlink Network

DeFi Contracts + CeFi

Wrapped Assets



Proof of Reserve Creates Automated and Reliable Audits



The Largest Marketplace for Various On-chain Data Sources

Highly Validated Data

Price and Market Data

Proof of Reserve Audits

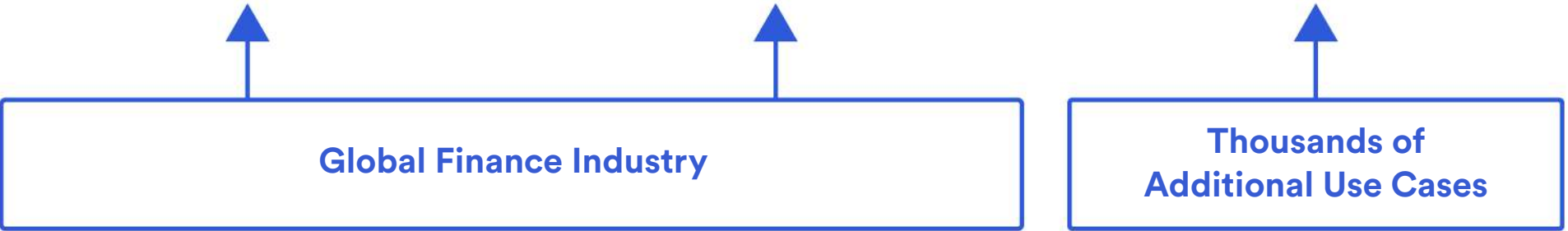
All Off-Chain Data

Chainlink Network

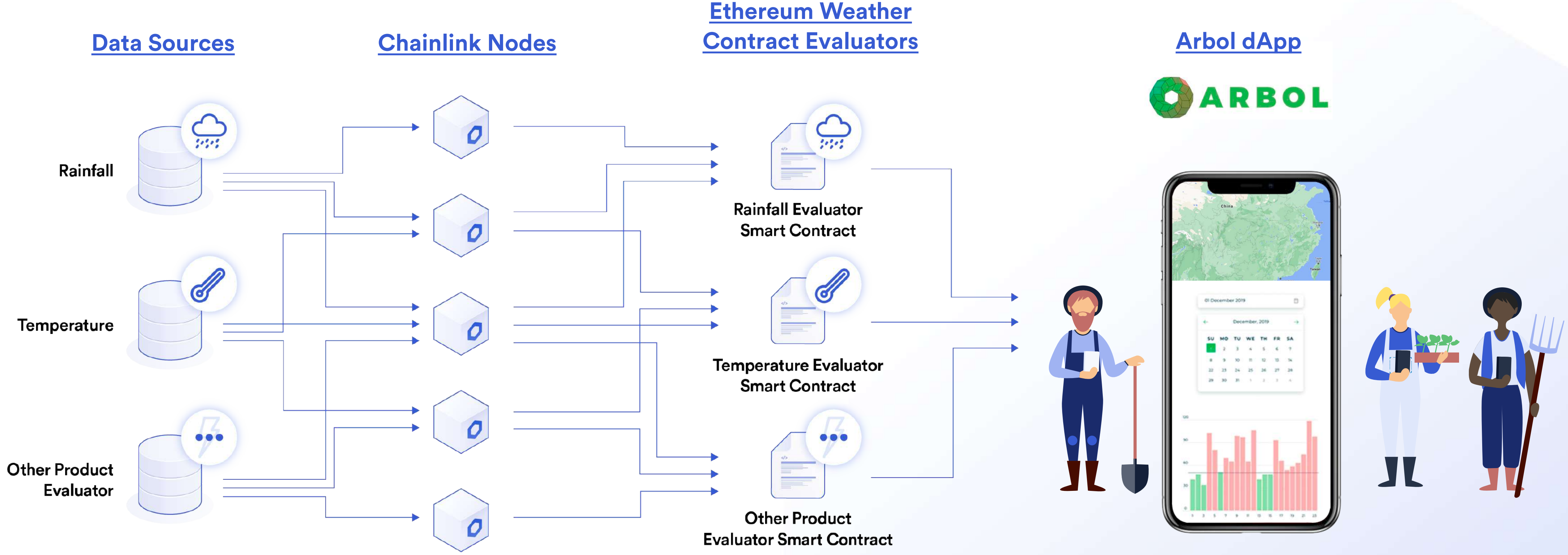
DeFi Contracts + CeFi

Wrapped Assets

New Hybrid Smart Contracts

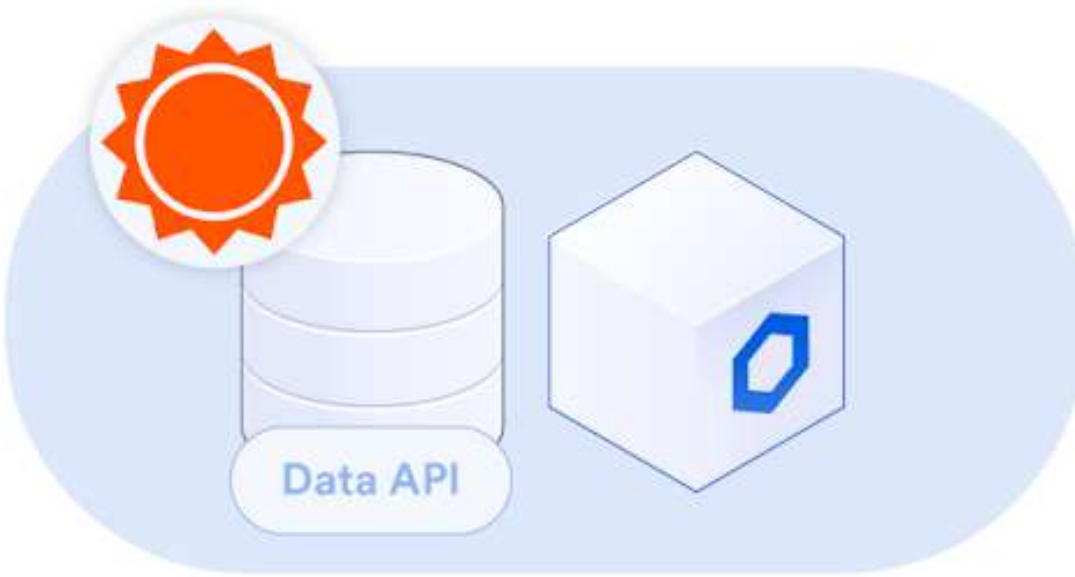


Weather Data Creates Smart Contract Crop Insurance



Providing Weather Data for Decentralized Crop Insurance

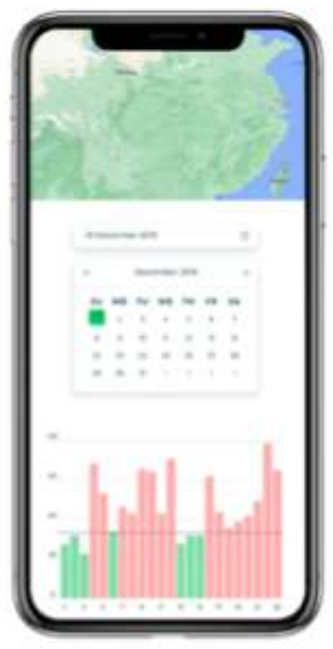
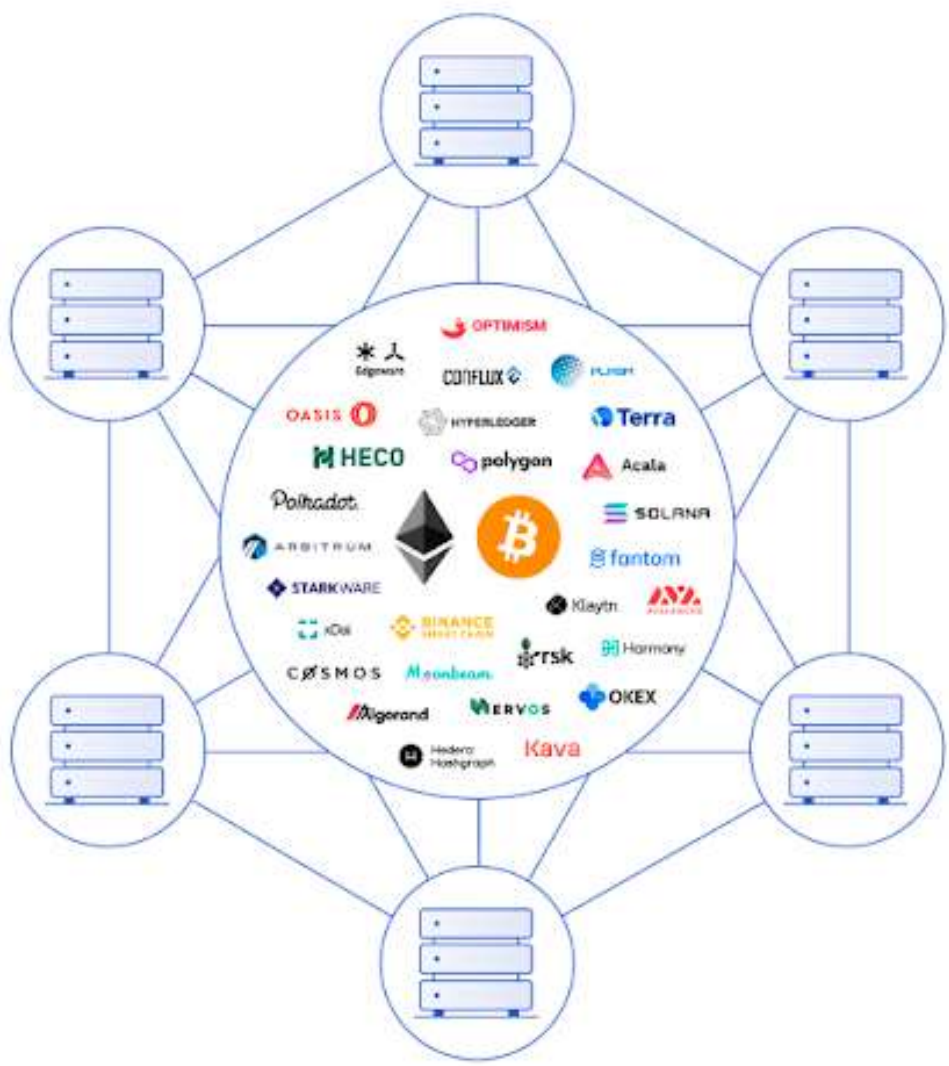
AccuWeather Chainlink Node



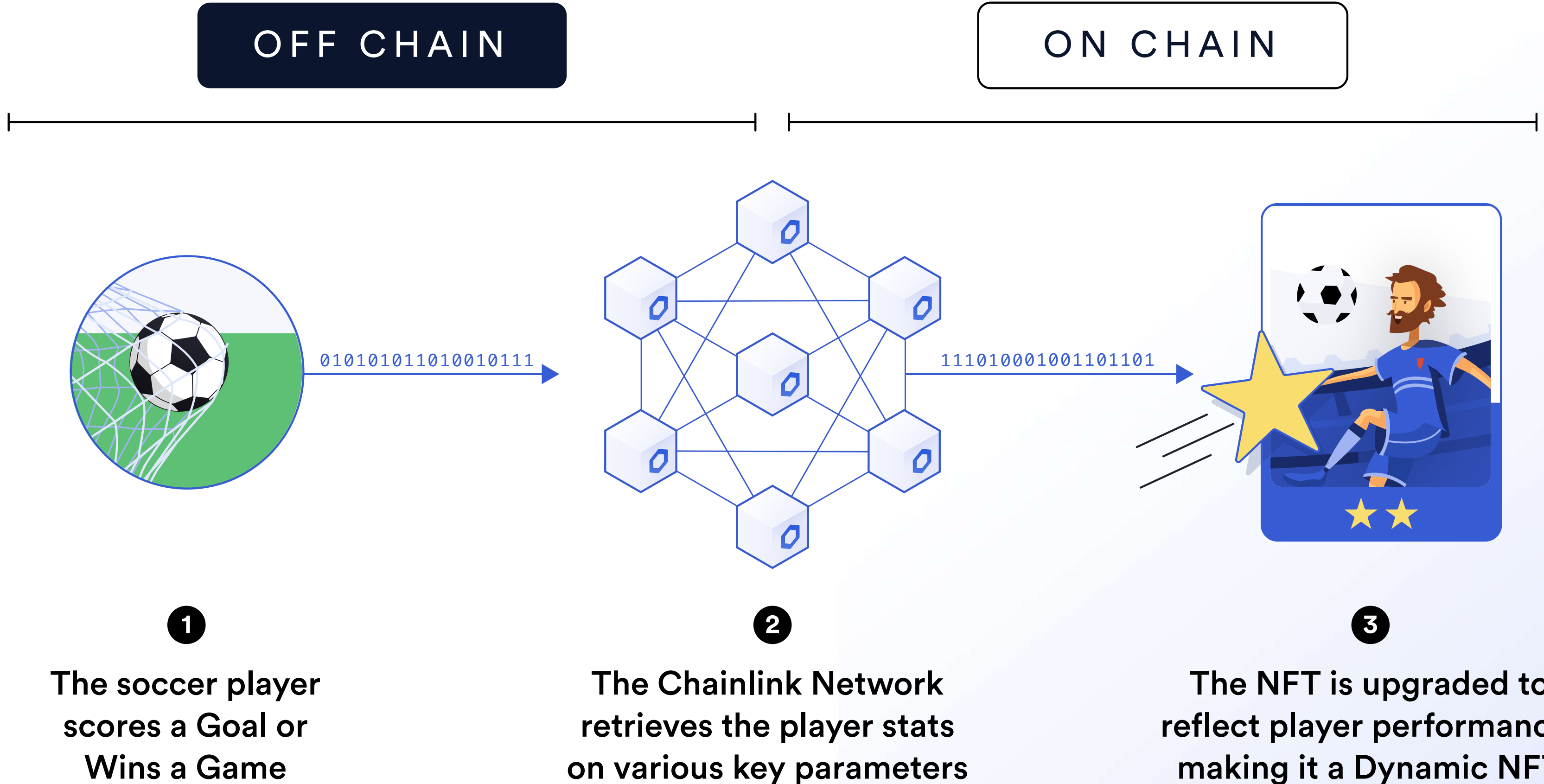
Data Feed

0101110101000001101110111001100110101101
1010000011011101110001011000100010101101

Any Blockchain Network



Sports Data Verification to Keep NFTs Updated



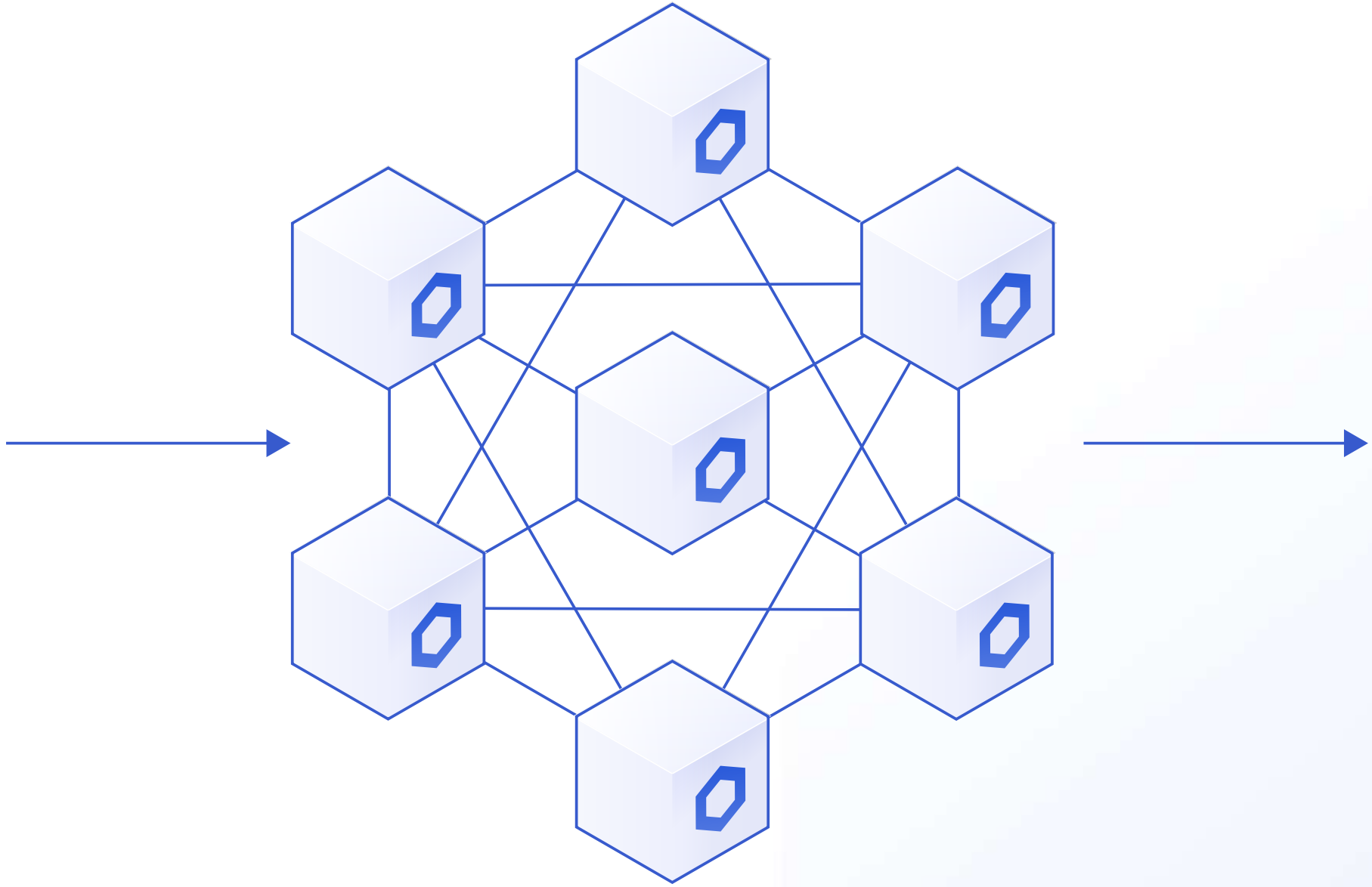
Verifying Identity For Decentralized Domain Names

Twitter

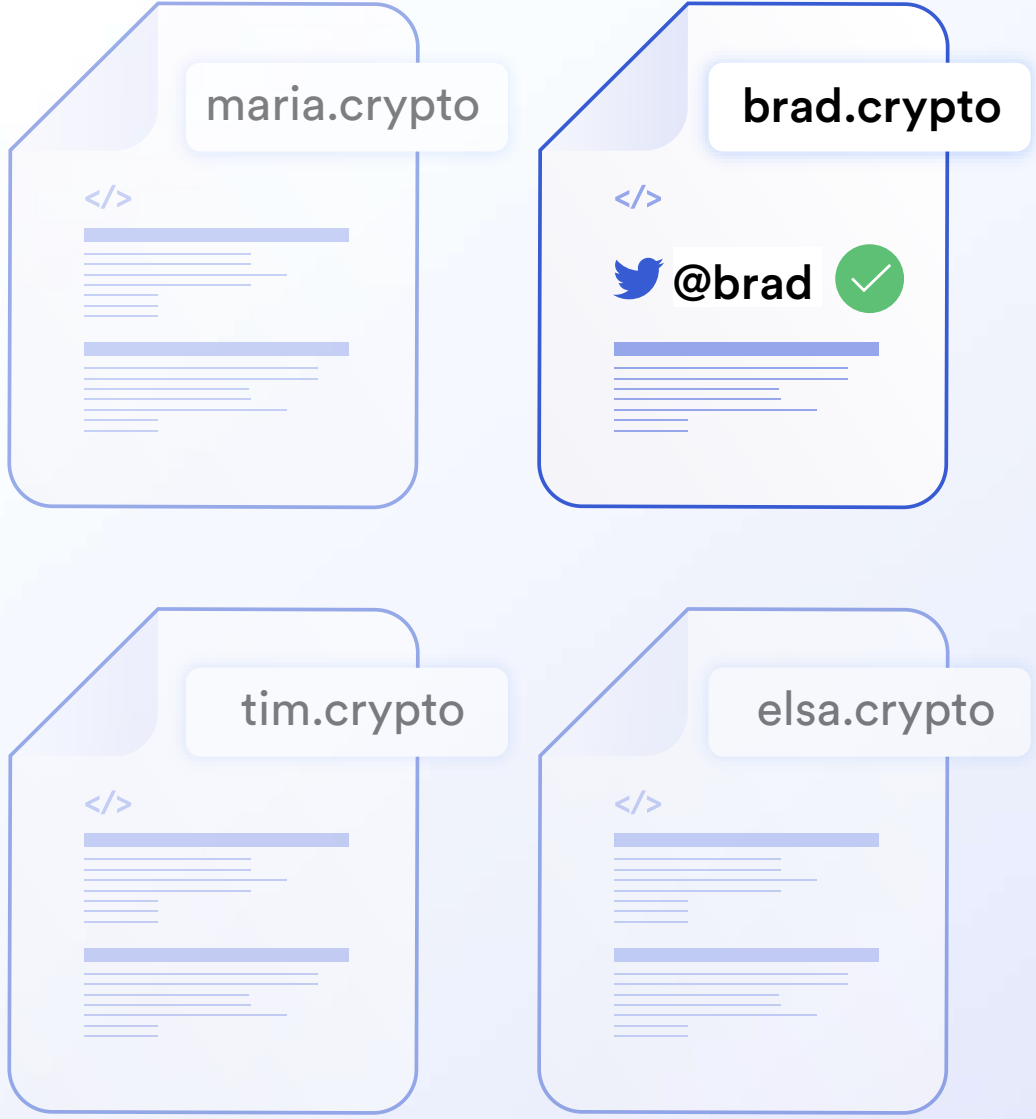


A Twitter profile card for the user @brad. It features a profile picture icon, the handle @brad, and the Twitter bird logo. Below the profile information, the text reads: "I want to tie this Twitter account to brad.crypto".

Chainlink Network

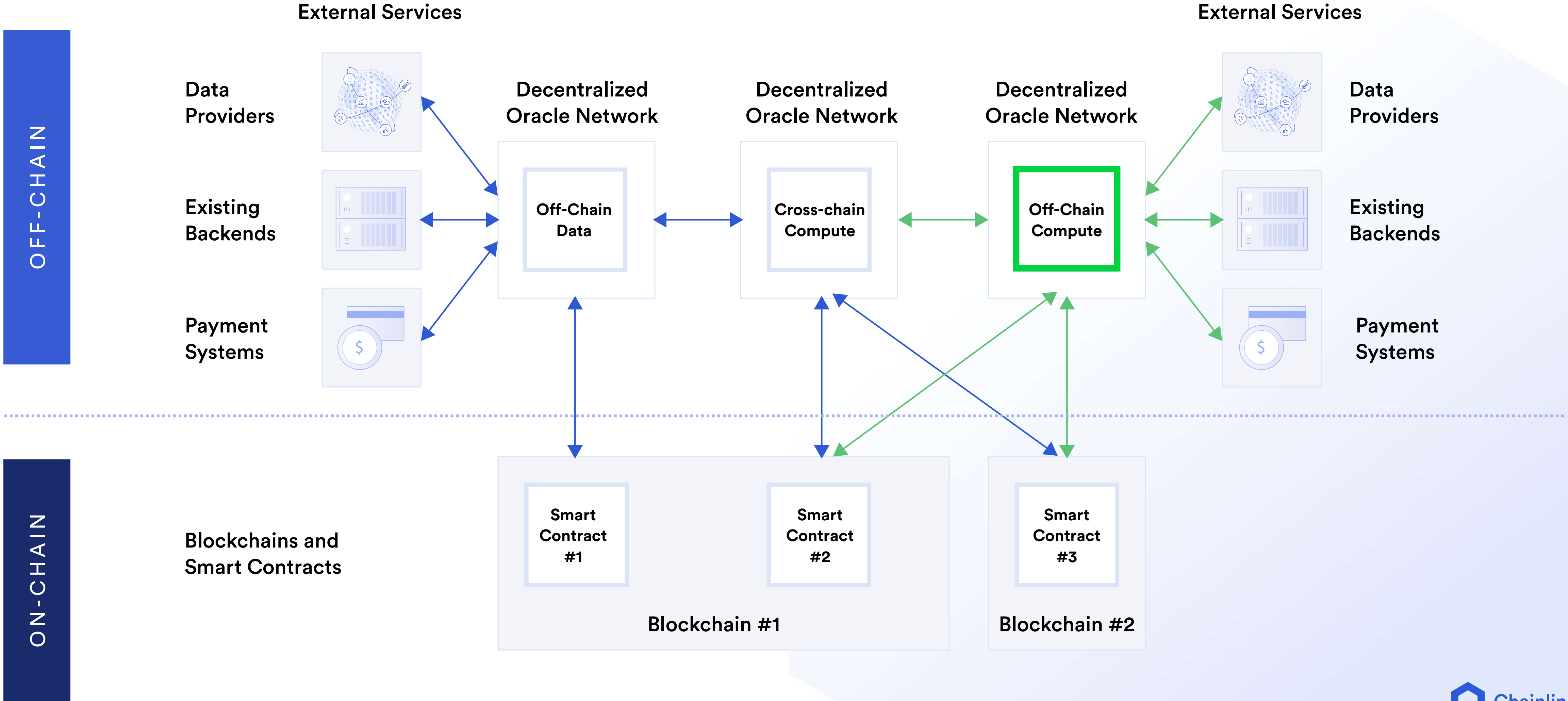


Unstoppable Domains



Four Unstoppable Domain cards are shown, each representing a domain name and its associated metadata. The cards are: maria.crypto, brad.crypto, tim.crypto, and elsa.crypto. The brad.crypto card is highlighted with a green checkmark and a Twitter bird icon, indicating that the domain is successfully linked to the Twitter account @brad.

Hybrid Smart Contracts Will Be Continually More Advanced



Access to Off-chain Resources Enables More Contracts

Highly Validated Data

Price and Market Data

Proof of Reserve Audits

All Off-Chain Data

Trust Minimized Off-Chain Computation

Verifiable Randomness

Keepers / Automation

Expanded Computation

Chainlink Network

DeFi Contracts + CeFi

Wrapped Assets

New Hybrid Smart Contracts

Gaming Contracts

DeFi Contracts + CeFi

New Hybrid Smart Contracts

↑

Global Finance Industry

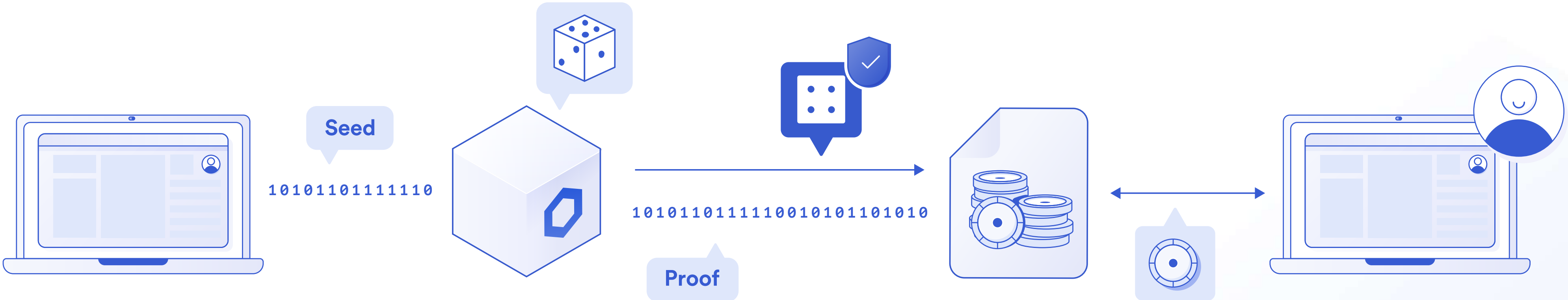
↑

Thousands of Additional Use Cases

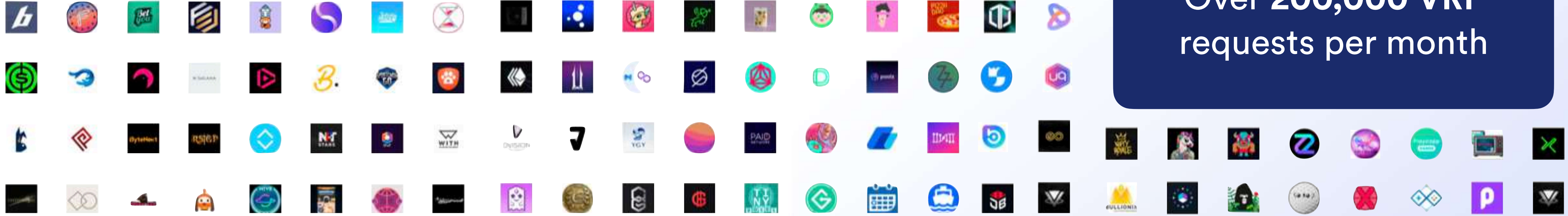
↑

Global Demand for Off-Chain Computation

Verifiable Randomness That Eliminates Fraud in Gaming



Over 200,000 VRF requests per month



“VRF can make games more fun by generating challenging and unpredictable scenarios and environments, and assigning unpredictable player rewards like loot drops.”



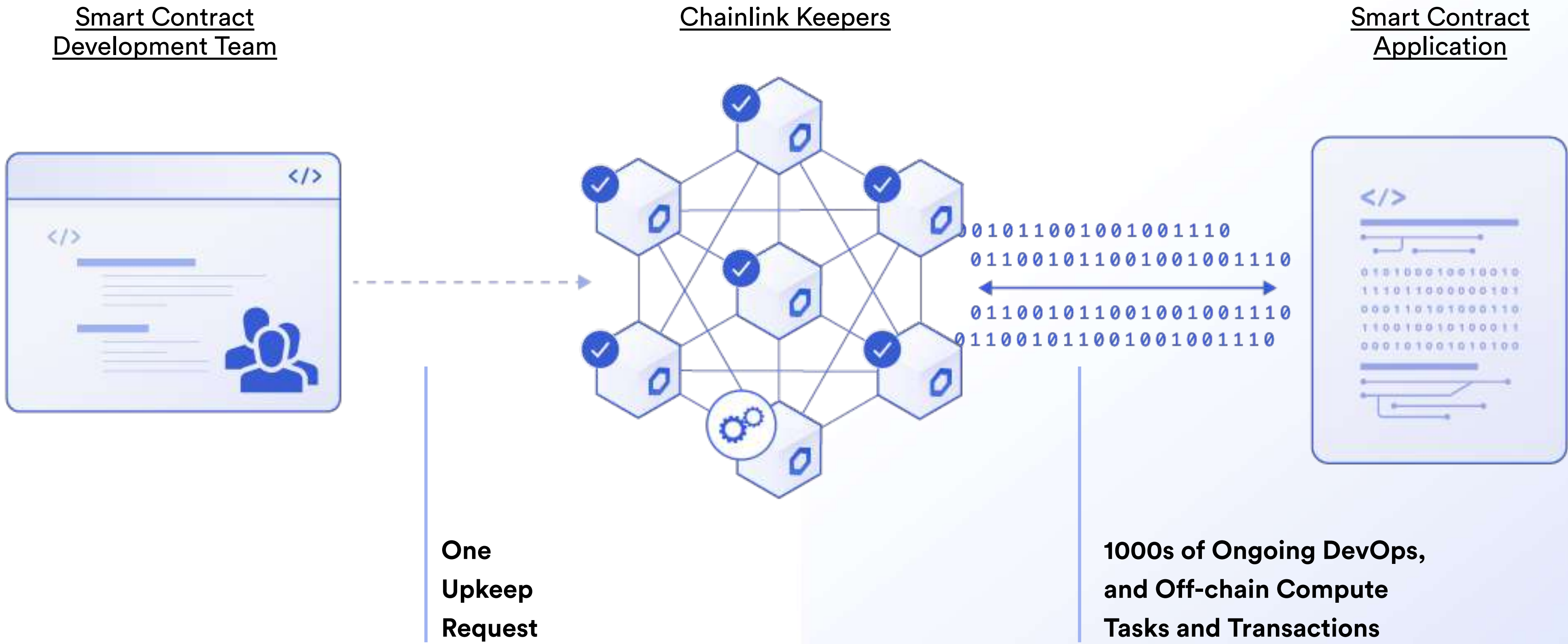
“By publishing and verifying the proof on-chain, it’s guaranteed, that it can’t be tampered with or manipulated by anyone including smart contract developers or oracle operators.”



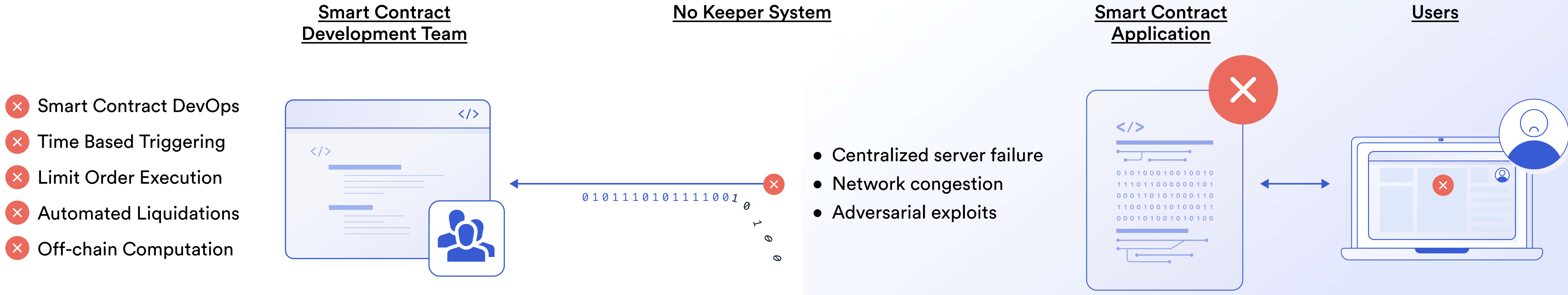
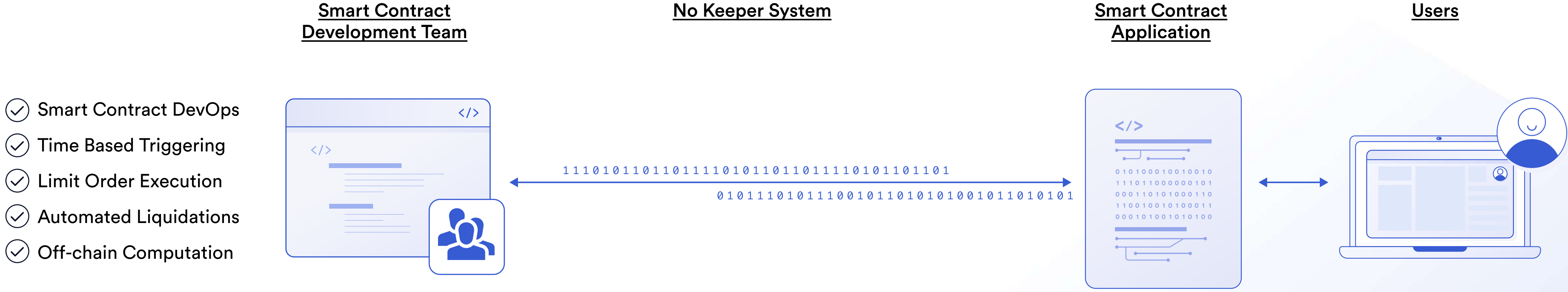
Chainlink Keepers is Live on Mainnet



Chainlink Keepers is Decentralized Off-chain Compute



Systems without Keepers Seem Reliable but are Often Not



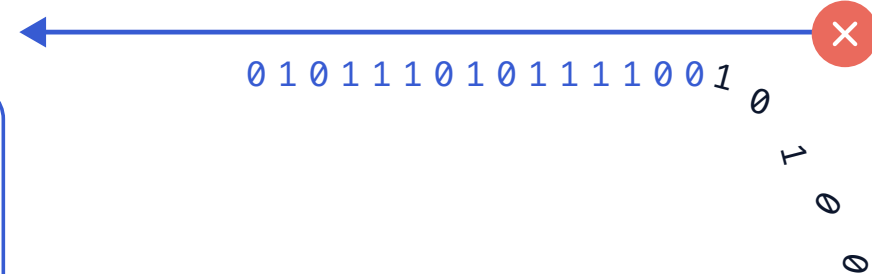
Chainlink Keepers Provides Decentralization and Security

- ✗ Smart Contract DevOps
- ✗ Time Based Triggering
- ✗ Limit Order Execution
- ✗ Automated Liquidations
- ✗ Off-chain Computation

Smart Contract Development Team

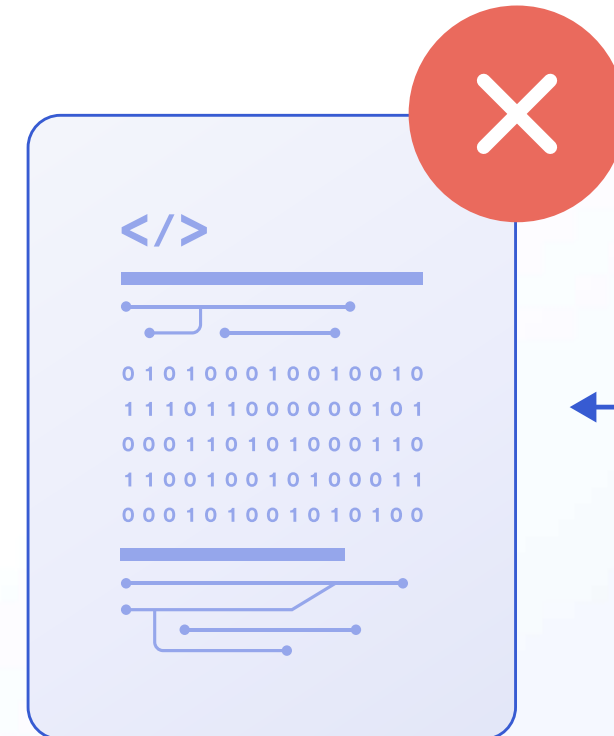


No Keeper System



- Centralized server failure
- Network congestion
- Adversarial exploits

Smart Contract Application



Users



- ✓ Smart Contract DevOps
- ✓ Time Based Triggering
- ✓ Limit Order Execution
- ✓ Automated Liquidations
- ✓ Off-chain Computation

Smart Contract Development Team



Chainlink Keepers

One Upkeep Request

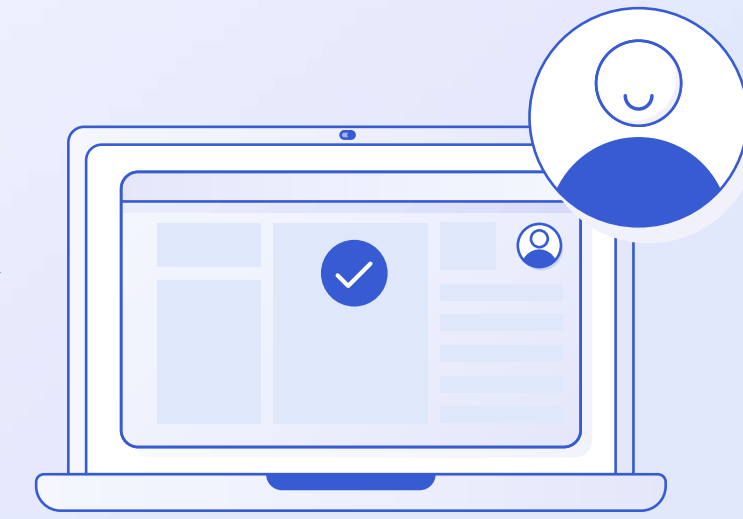


1000s of Ongoing DevOps, and Off-chain Compute Tasks and Transactions

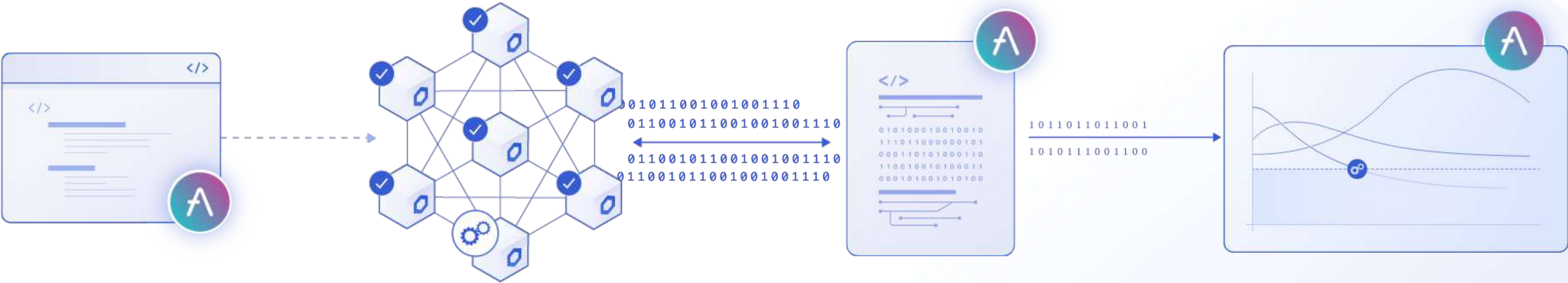
Smart Contract Application



Users



Keepers for AAVE: Reliably Managing Liquidations



1

Aave registers a Chainlink Keepers job to trigger the liquidation function any time a user's loan falls below their specific liquidation threshold.

2

Chainlink Keepers monitor user loan collateralization off-chain and call Aave's liquidation function when loans are under-collateralized.

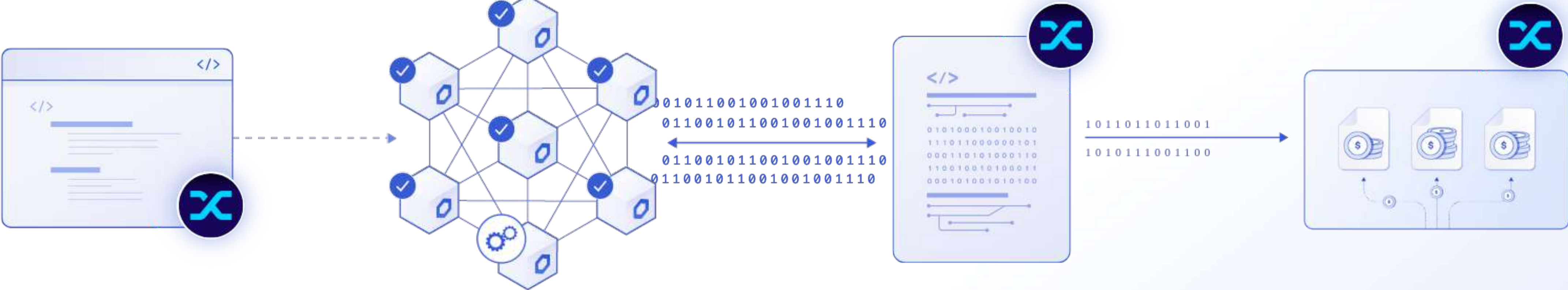
3

Aave's smart contract refers to Chainlink Price Feeds to calculate user collateralization ratios and verifies they are under-collateralized.

4

Aave's smart contract liquidates under-collateralized users, ensuring continued solvency of the lending pool.

Keepers for Synthetix: Reliably Distributing Fees and Staking



1

Synthetix registers a Chainlink Keepers job to distribute sUSD exchange fees and SNX rewards to SNX stakers when the fee period duration has passed.

2

Chainlink Keepers monitor the FeePools contract off-chain and call Synthetix's token distribution function at the end of each fee period.

3

Synthetix's smart contract verifies the fee period has ended.

4

The transfer function is called and stakers are granted their share of sUSD exchange fees and SNX staking rewards.

Keepers for PoolTogether: Reliably Starting/Ending Games



1

PoolTogether registers a Chainlink Keepers job to automatically start and end on-chain no-loss prize games.

2

Chainlink Keepers monitor time off-chain, triggering PoolTogether's smart contract when it's time to end and begin games.

3

PoolTogether's smart contract verifies the predefined time interval has passed.

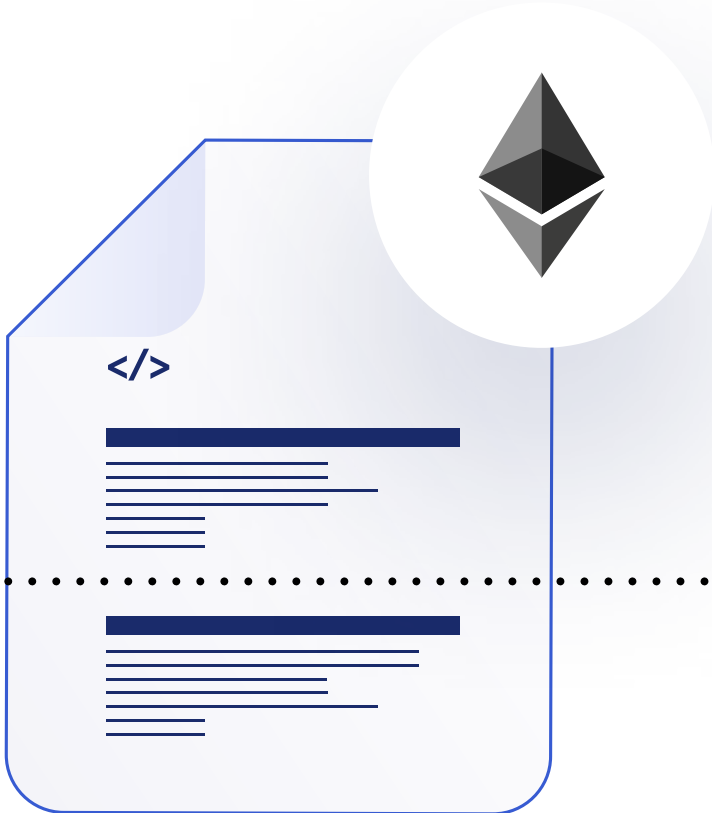
4

PoolTogether's smart contract automatically end games and begin new game rounds, creating a fully automated no-loss prize game with payouts.

Chainlink Keepers as Trust Minimized Off-chain Compute

ON-CHAIN

Smart Contract



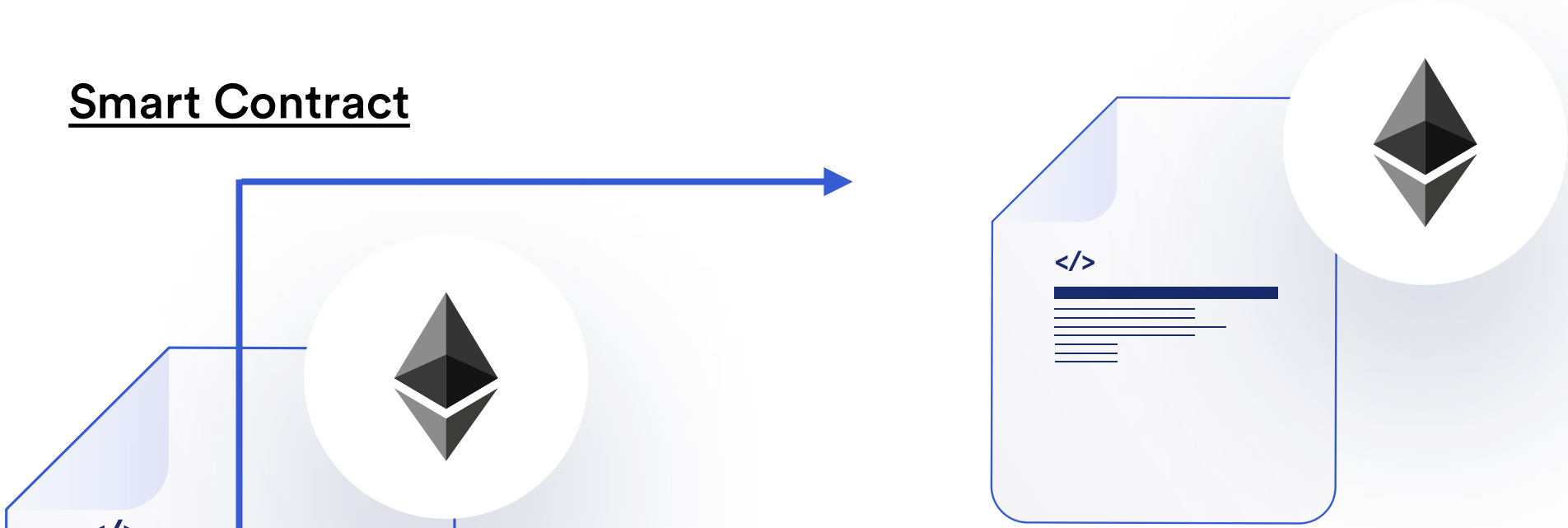
OFF-CHAIN

Chainlink Keepers as Trust Minimized Off-chain Compute

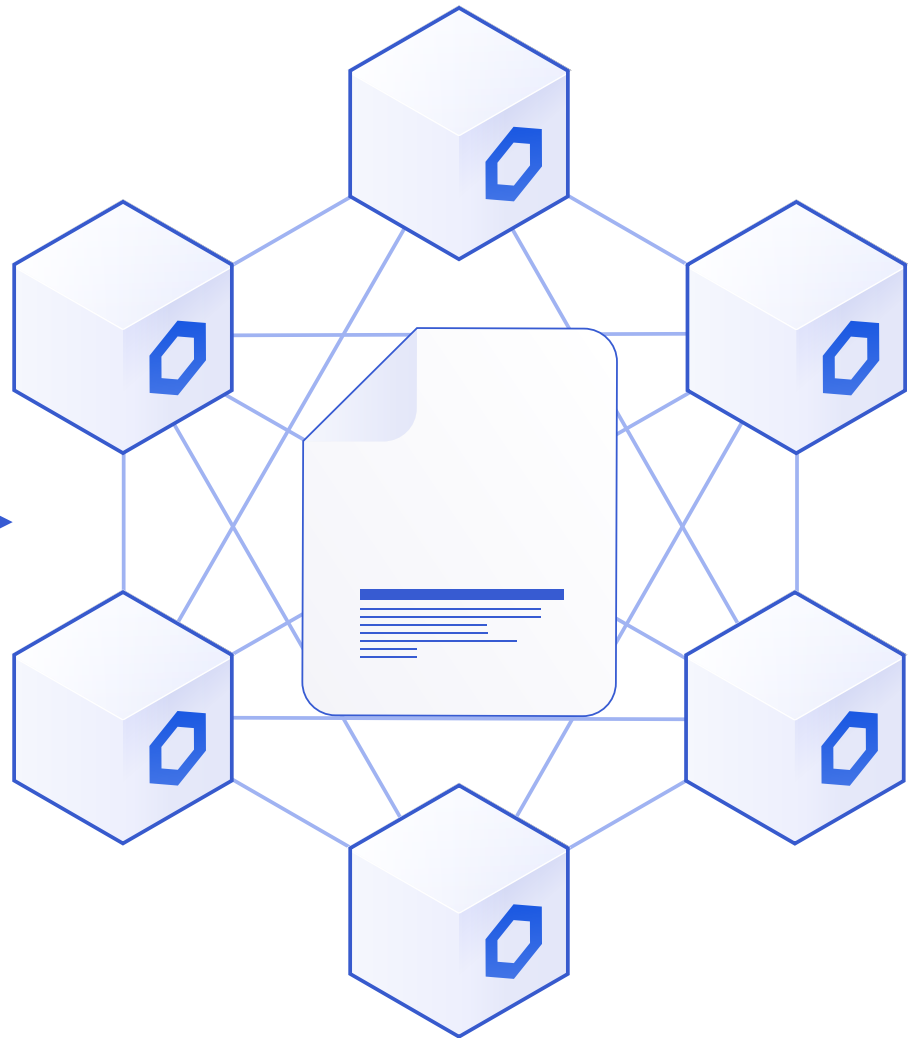
ON-CHAIN

Ethereum Network

Smart Contract



OFF-CHAIN

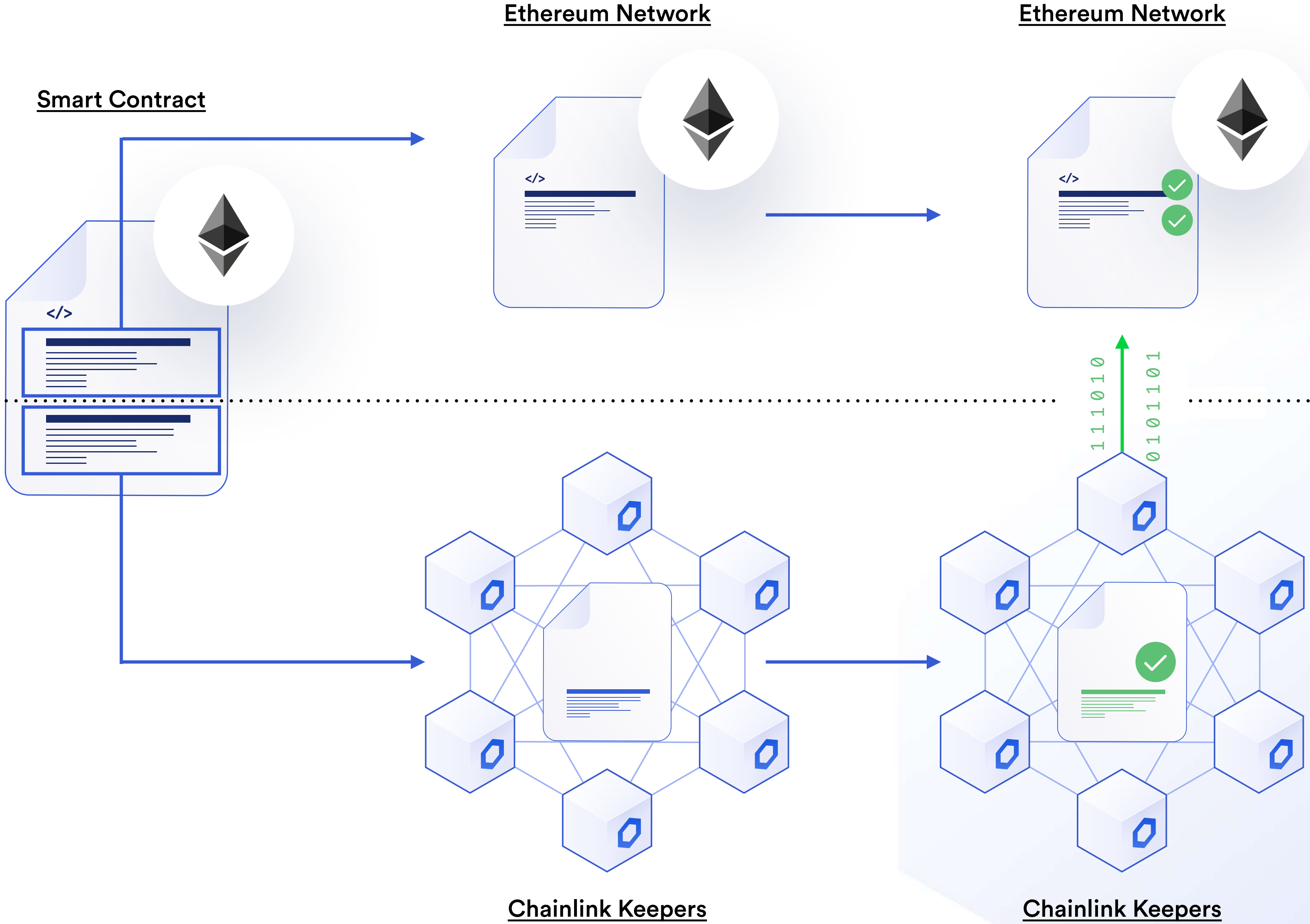


Chainlink Keepers

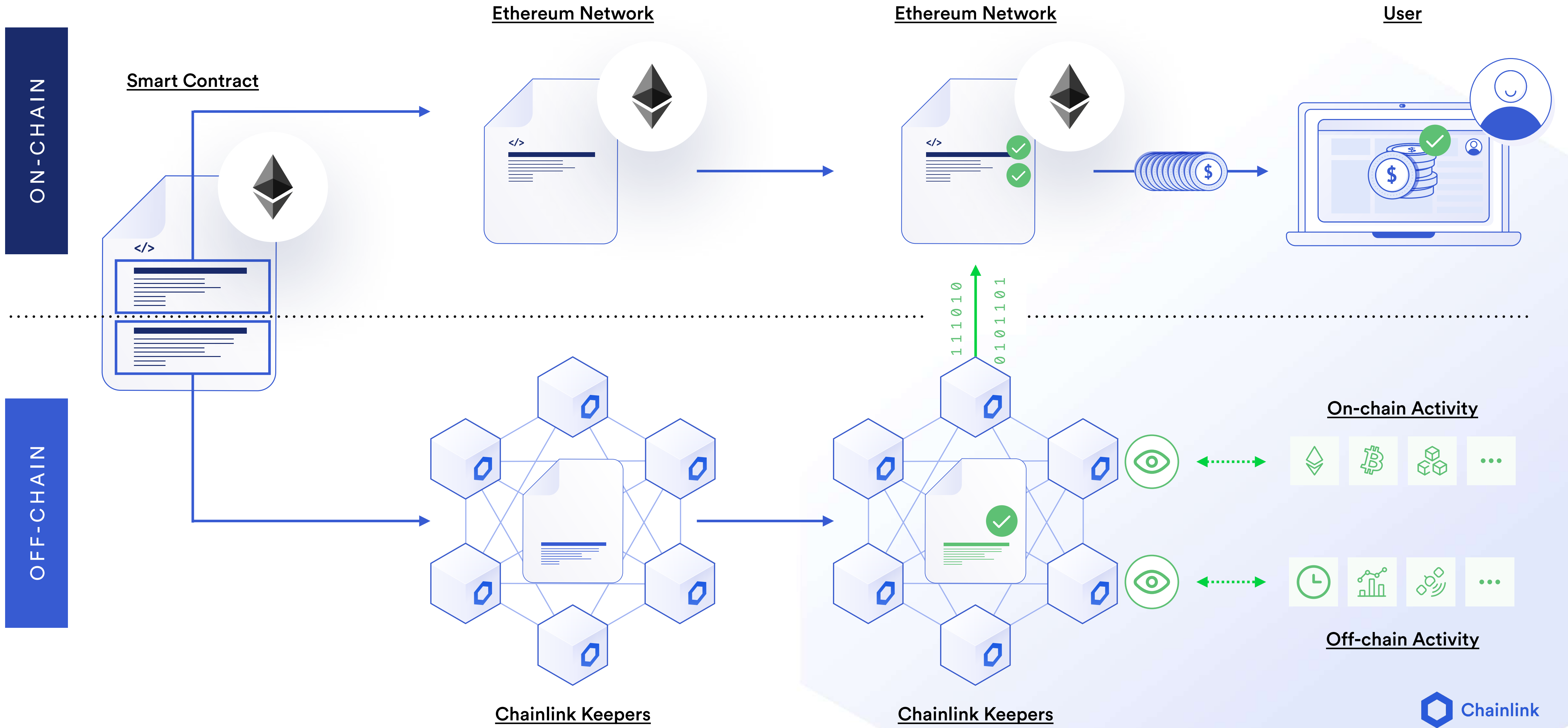
Chainlink Keepers as Trust Minimized Off-chain Compute

ON-CHAIN

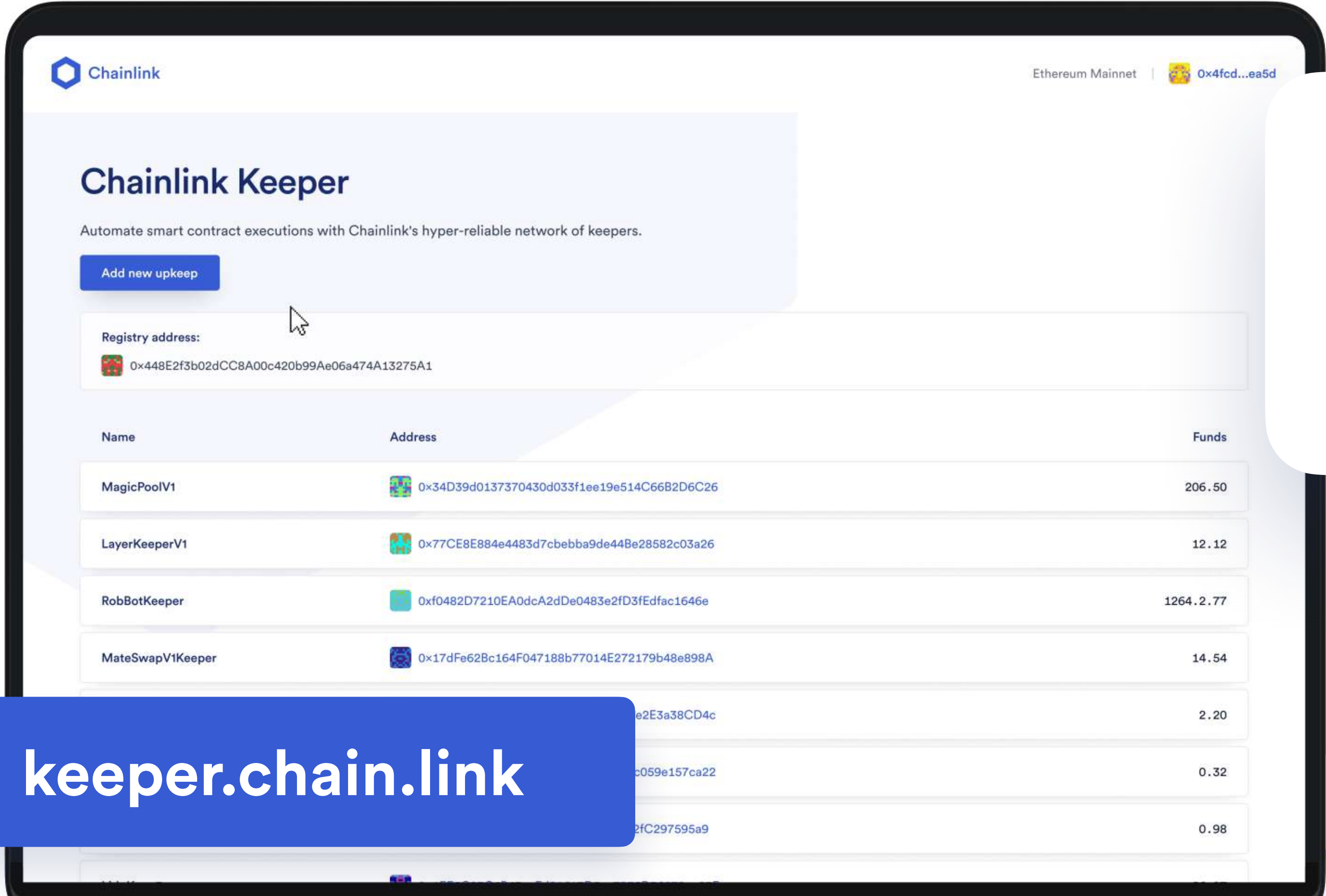
OFF-CHAIN



Chainlink Keepers as Trust Minimized Off-chain Compute



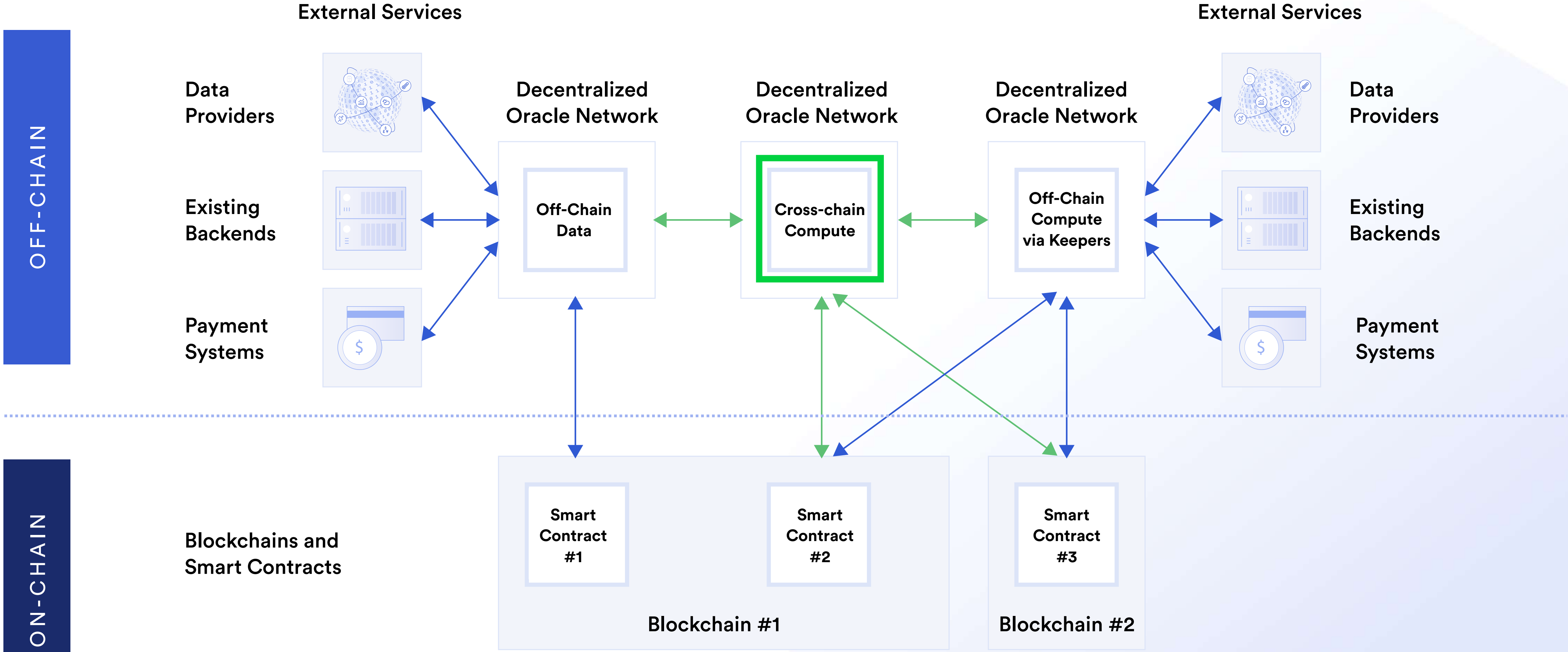
Decentralized, Secure and Easy to Use Off-chain Compute



- Decentralized
- Easy to Use Securely
- Off-chain Computation

keeper.chain.link

Hybrid Smart Contracts Will Be Continually More Advanced



Announcing CCIP

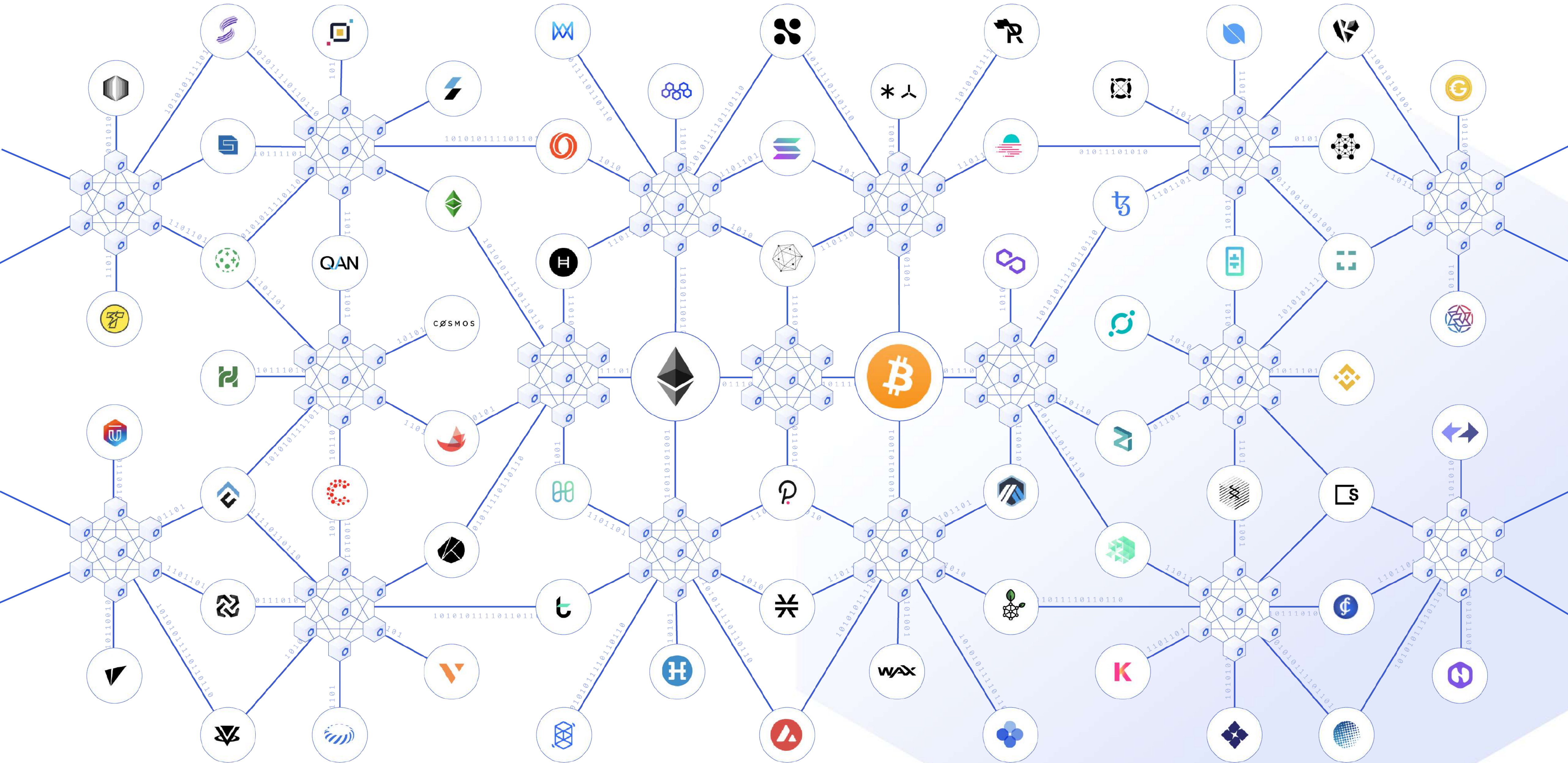
Cross Chain Interoperability Protocol

[...] “support all leading smart contract networks for both off-chain and cross-chain interactions.”

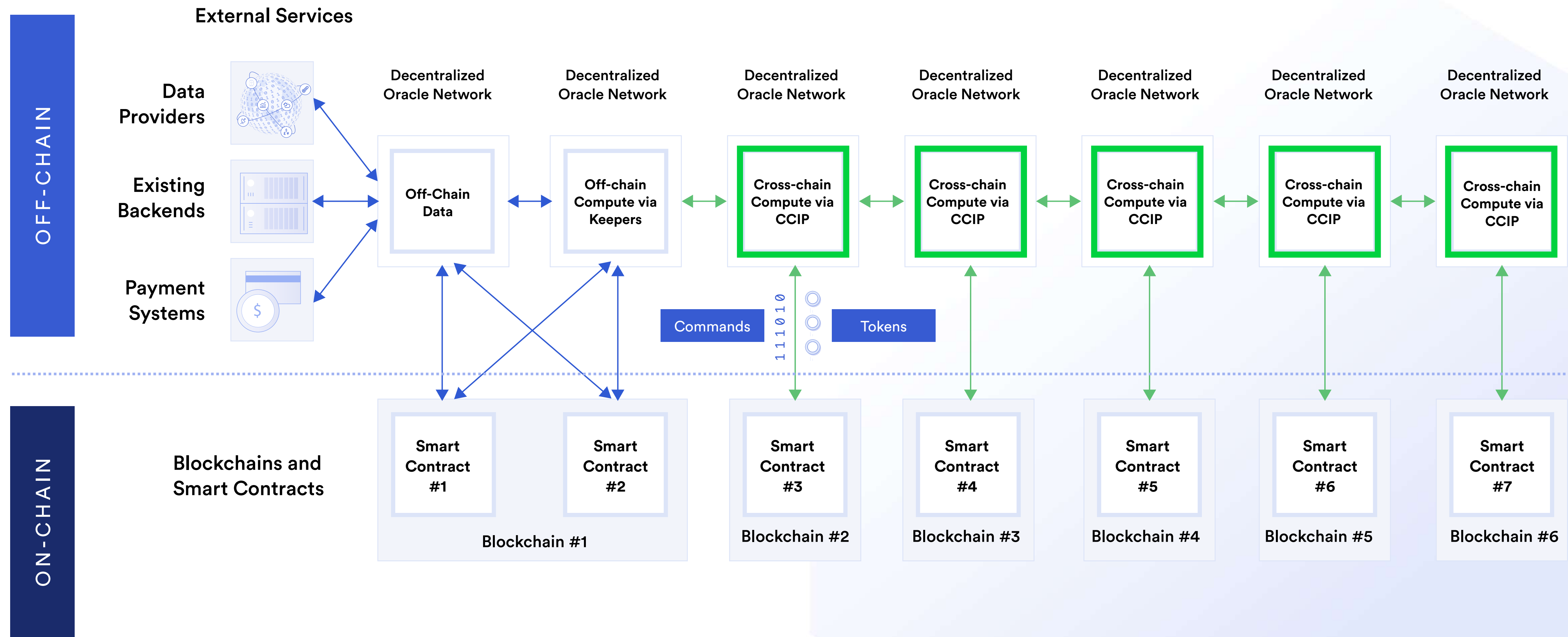
Chainlink 1.0 Whitepaper, page 4, September 2017



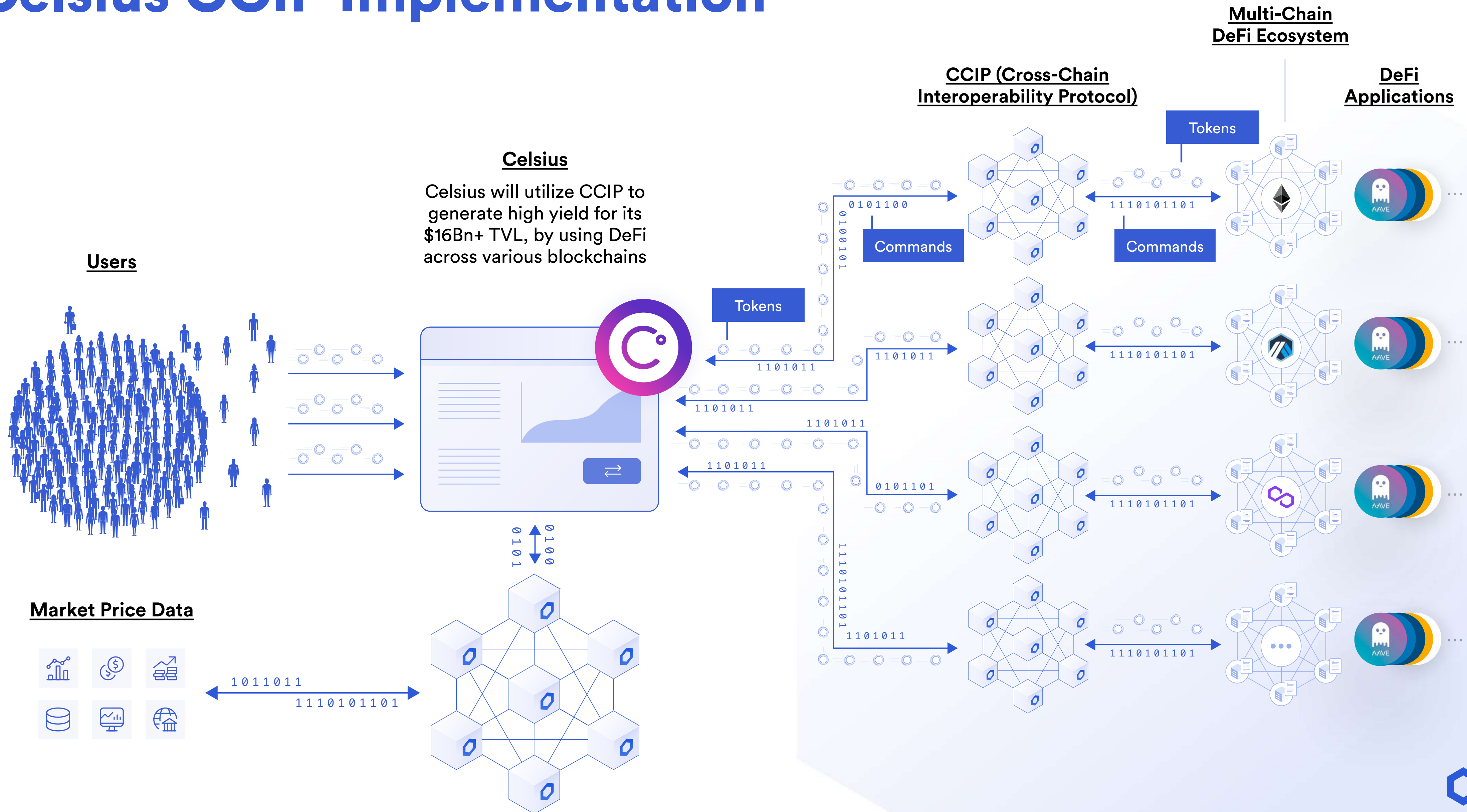
CCIP: Securely Connecting all Public and Private Blockchains



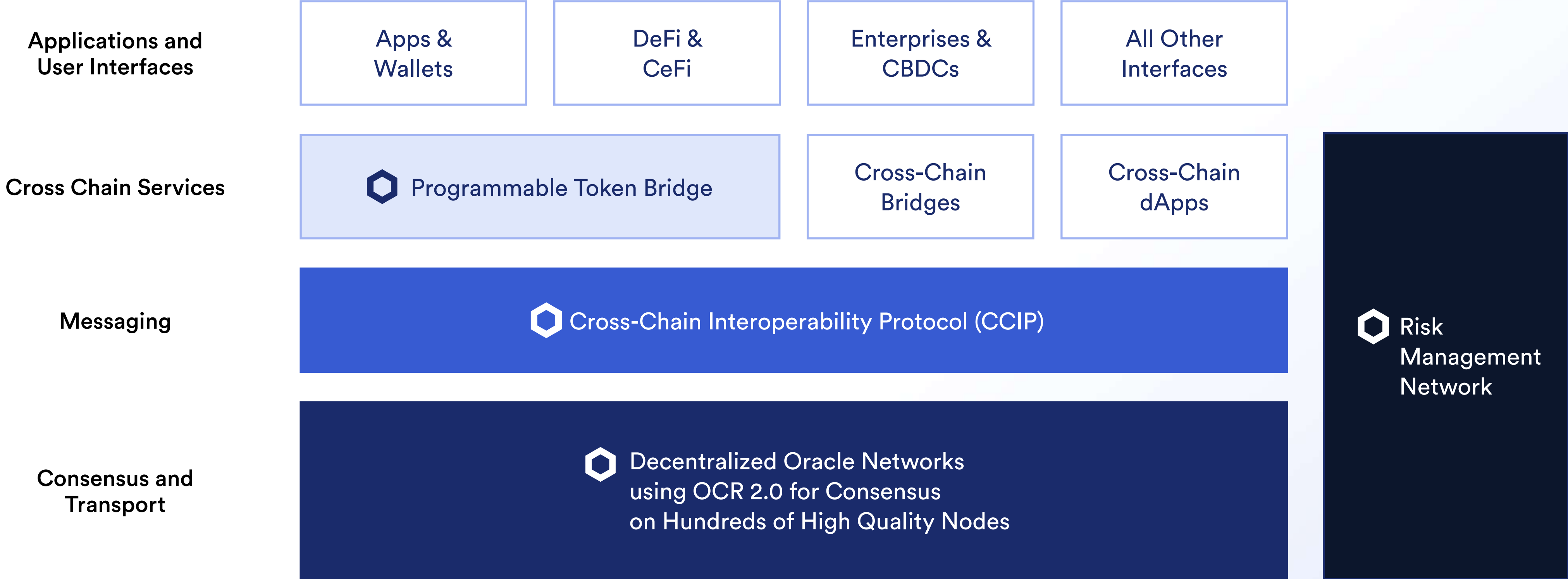
CCIP Enables 1000s of Cross-chain Programmable Bridges



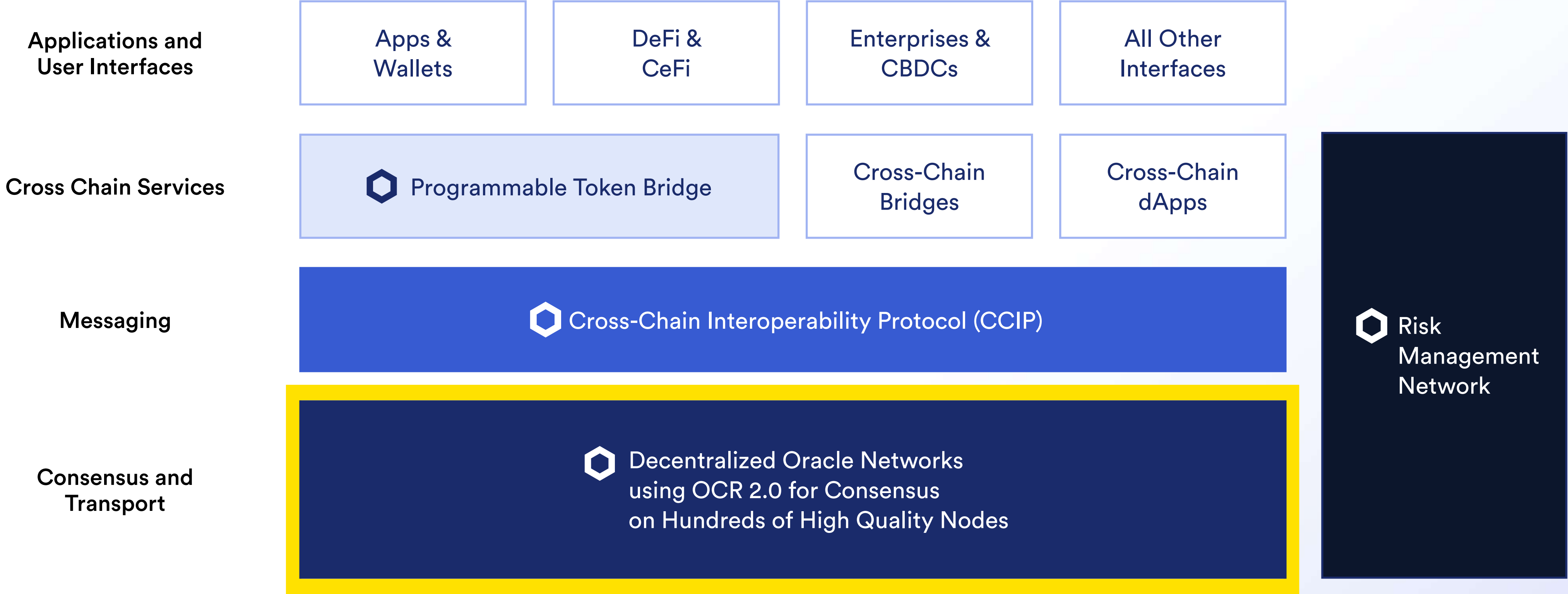
Celsius CCIP Implementation



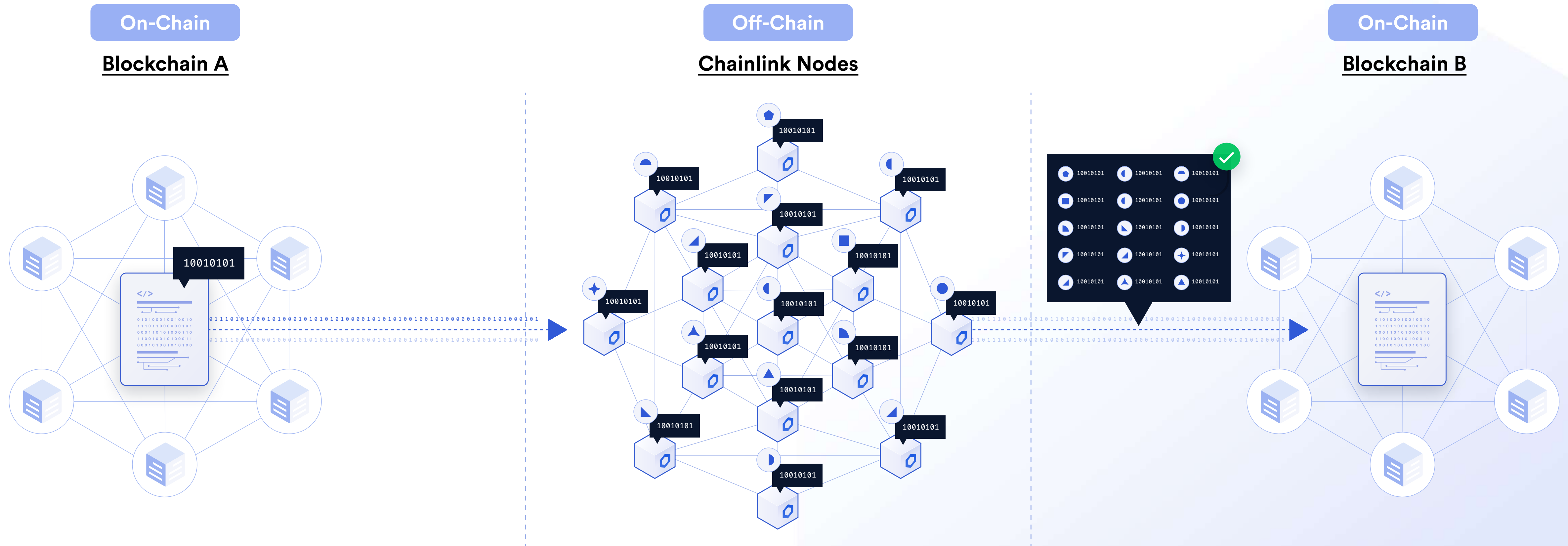
The Cross Chain Smart Contract Infrastructure Stack



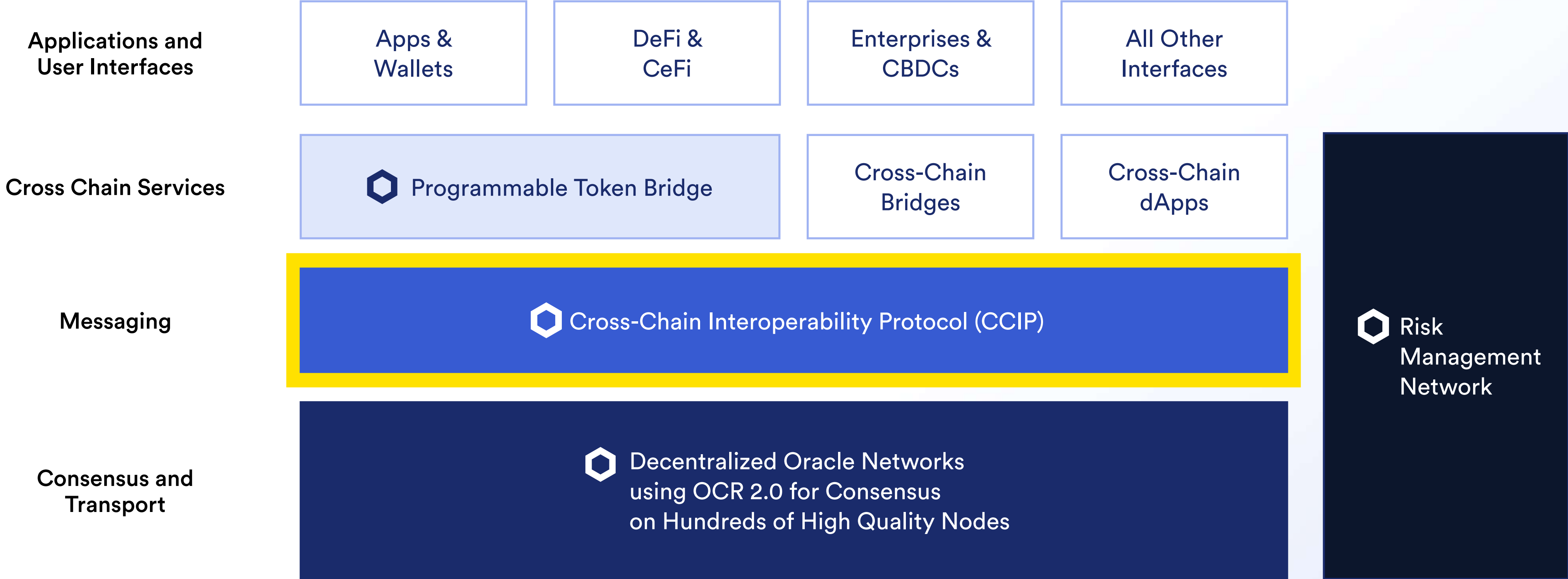
The Cross Chain Smart Contract Infrastructure Stack



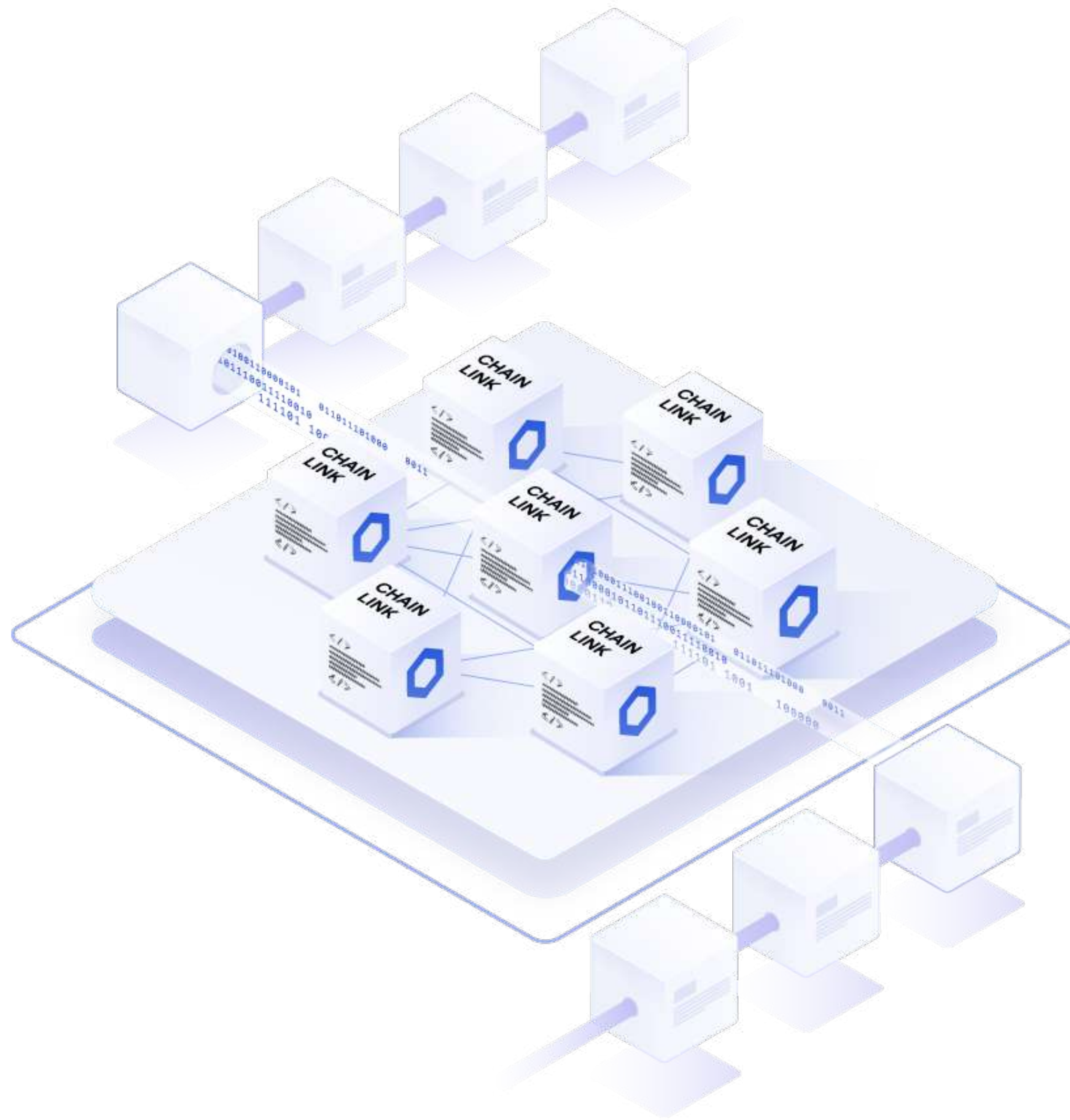
OCR 2.0: Generating Trust-minimized Off-chain Consensus



The Cross Chain Stack



Cross-Chain Interoperability Protocol (CCIP)

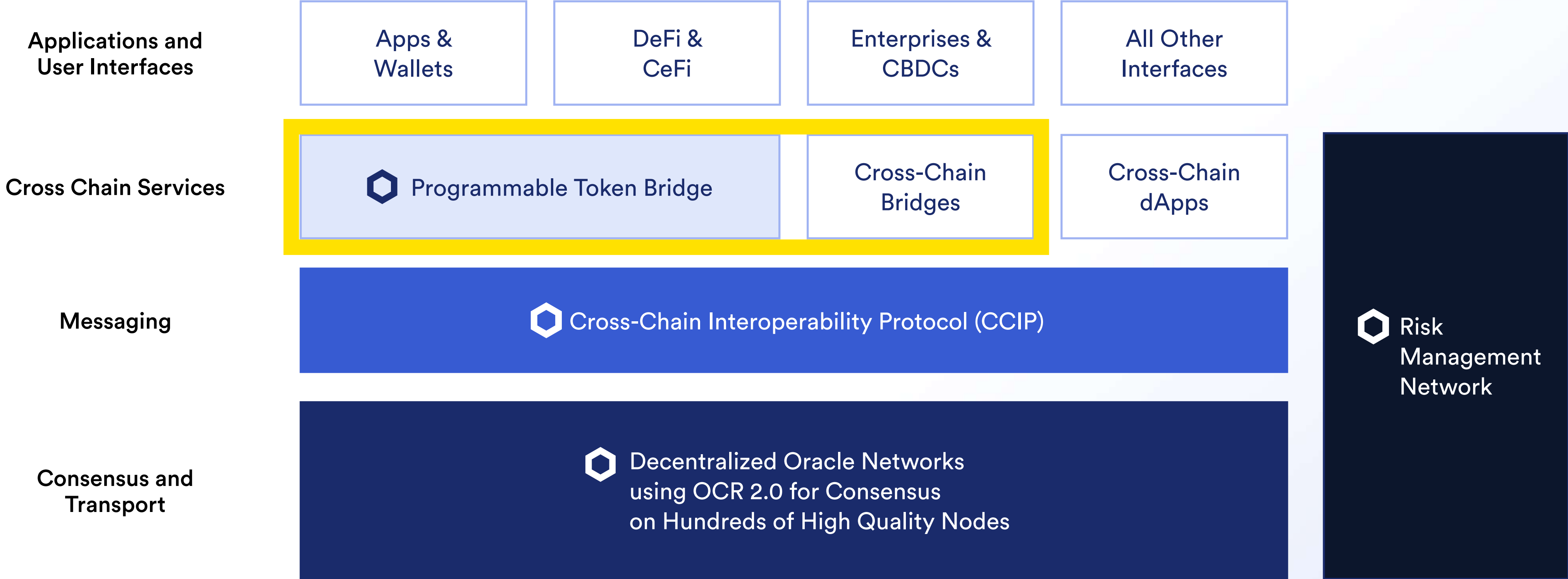


- Enables Cross-chain Smart Contracts
- A Standard for Blockchain Interoperability
- Usable by Various Bridges for Messaging

CCIP: A Messaging Protocol For Public and Private Chains



The Cross Chain Stack

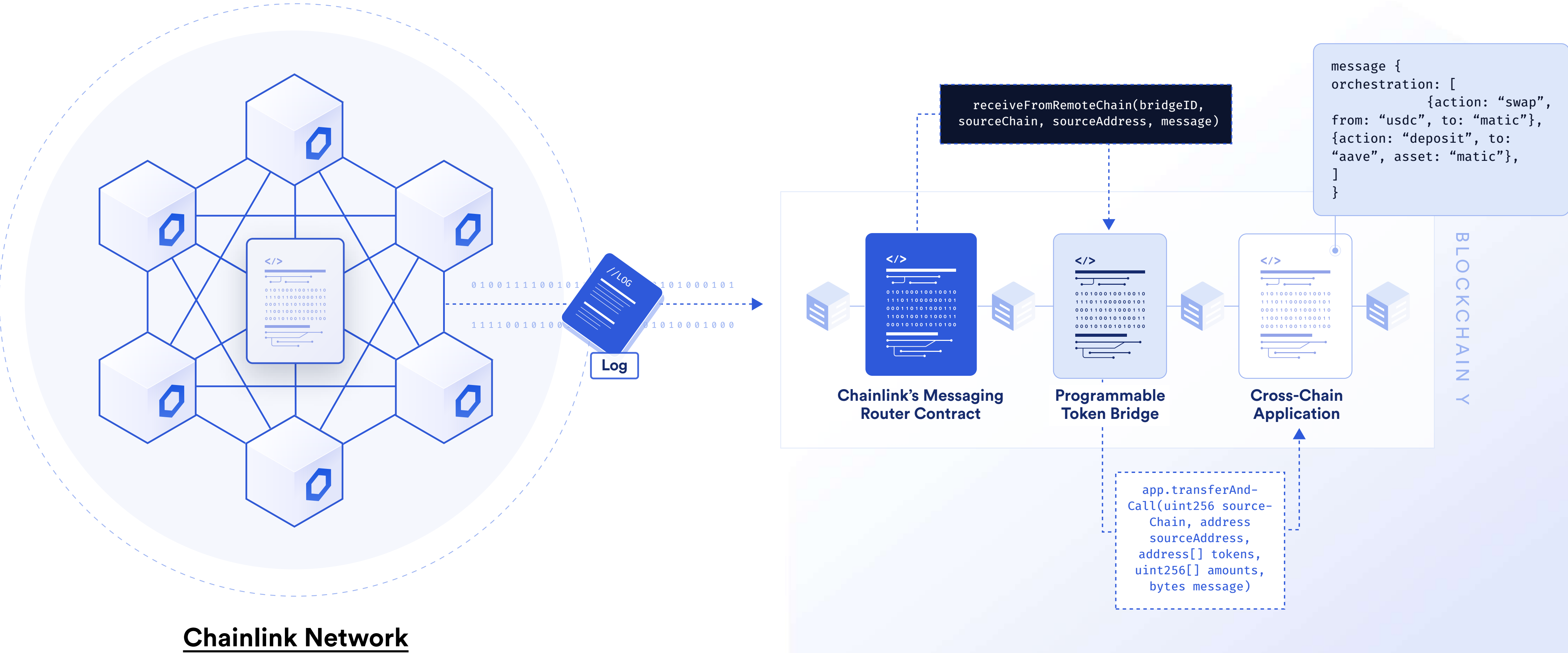


Chainlink Programmable Bridge Reference Implementation

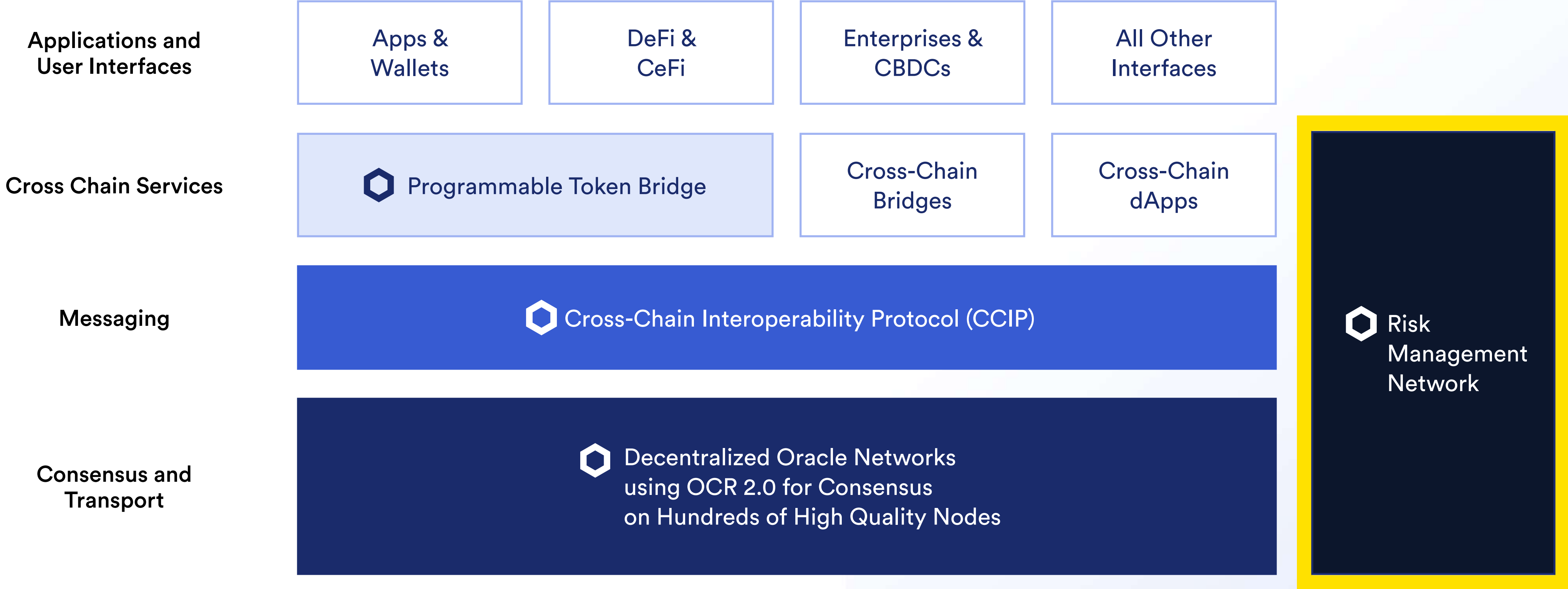


- Decentralized and Secure Bridges
- Send Tokens to Various Chains
- Send Commands about Tokens
- Utilize DeFi on Various Chains
- Build your own Bridge using CCIP

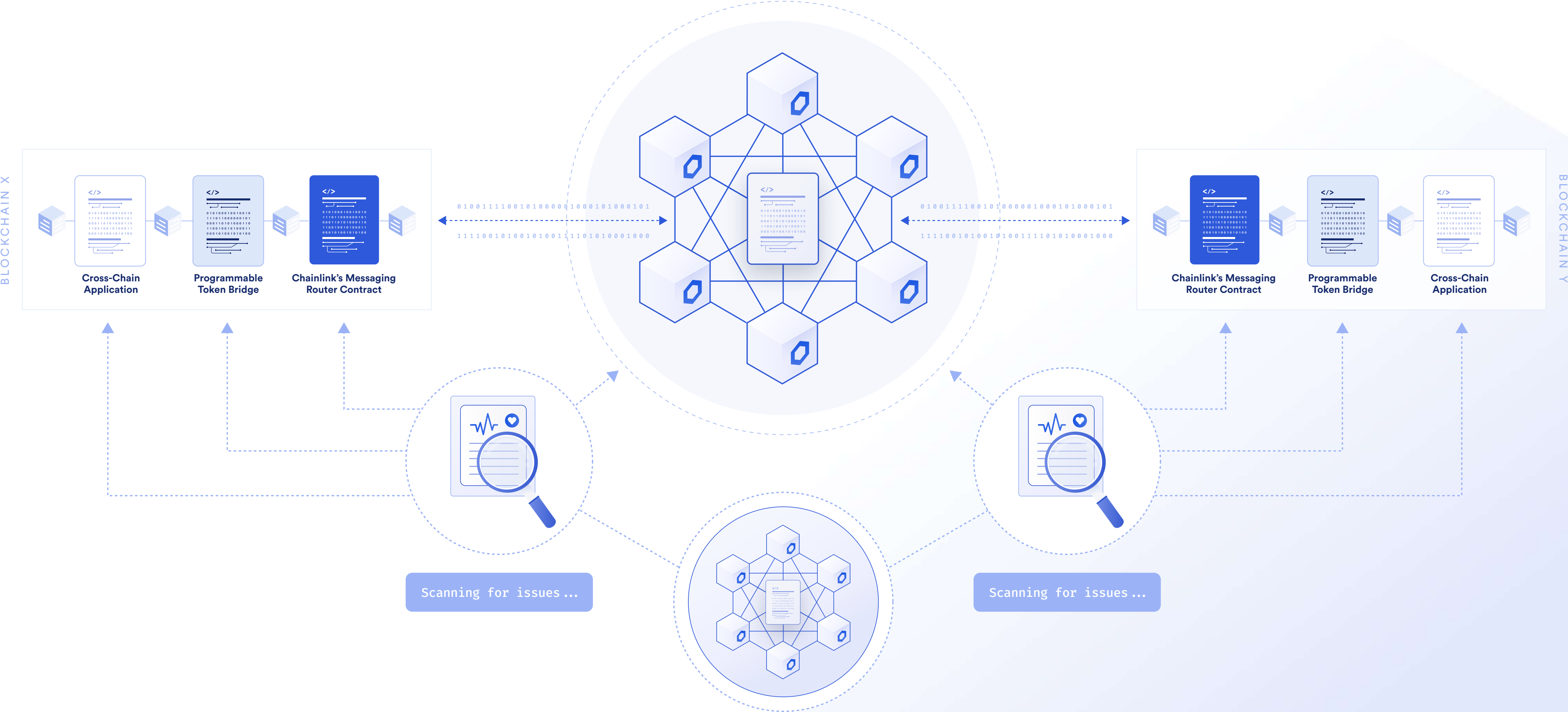
Chainlink Programmable Token Bridge Built On CCIP



The Cross Chain Stack

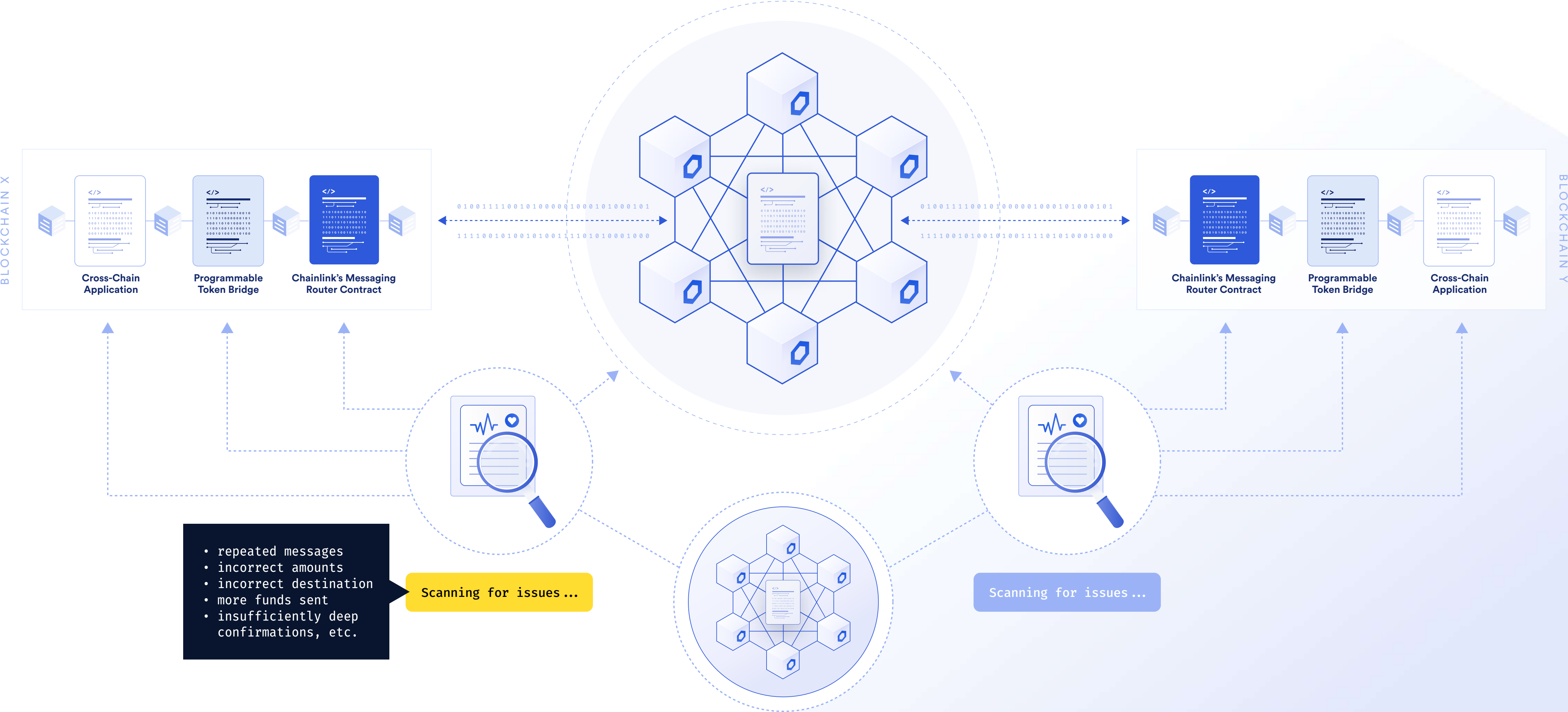


Risk Management Network: Decentralized Risk Management



Risk Management Network

Risk Management Network: Scanning for Risks and Approving



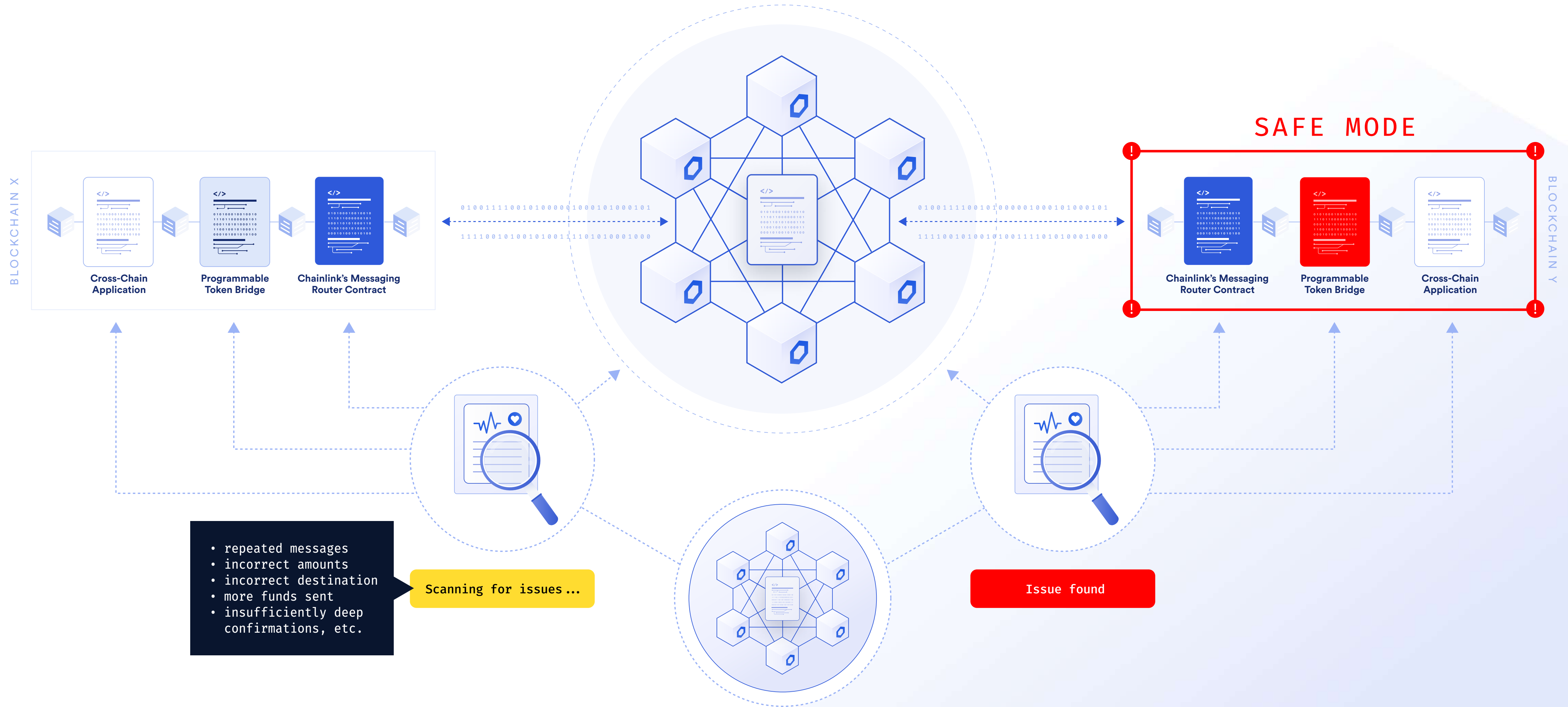
- repeated messages
- incorrect amounts
- incorrect destination
- more funds sent
- insufficiently deep confirmations, etc.

Scanning for issues...

Scanning for issues...

Risk Management Network

Risk Management Network: Reducing Risk Through Safe Mode



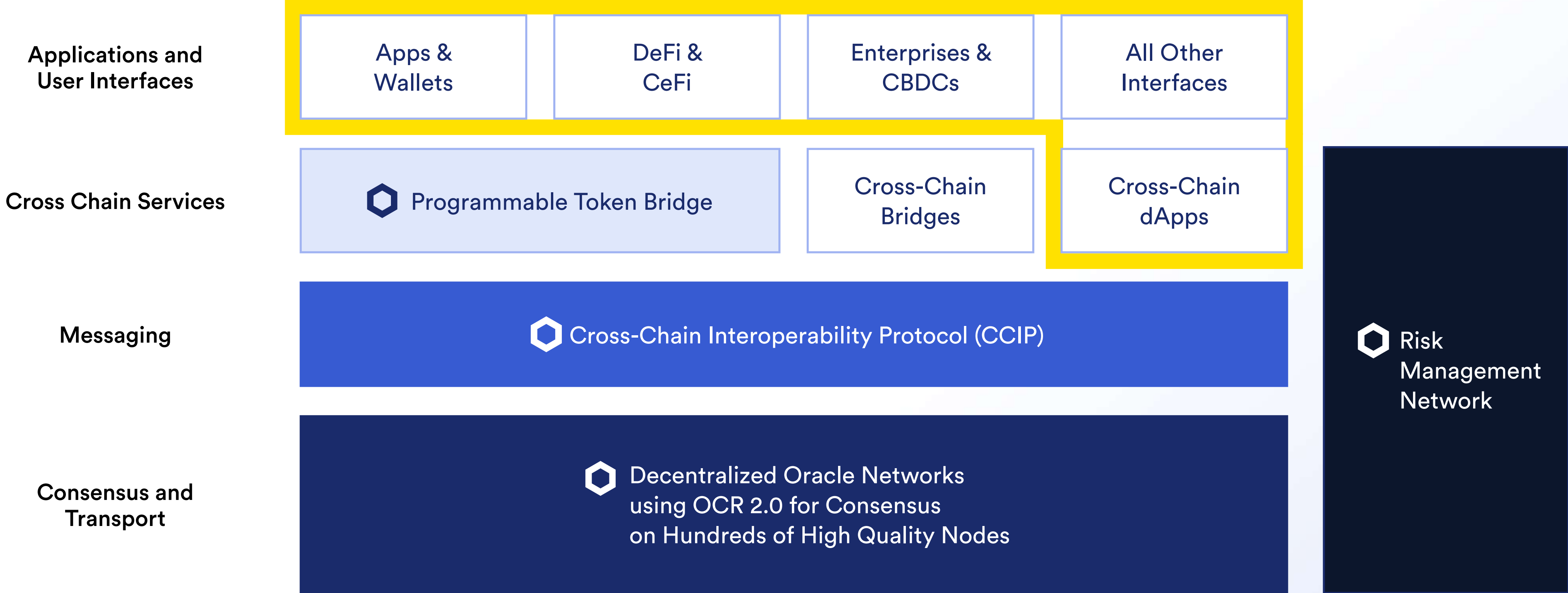
- repeated messages
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Scanning for issues...

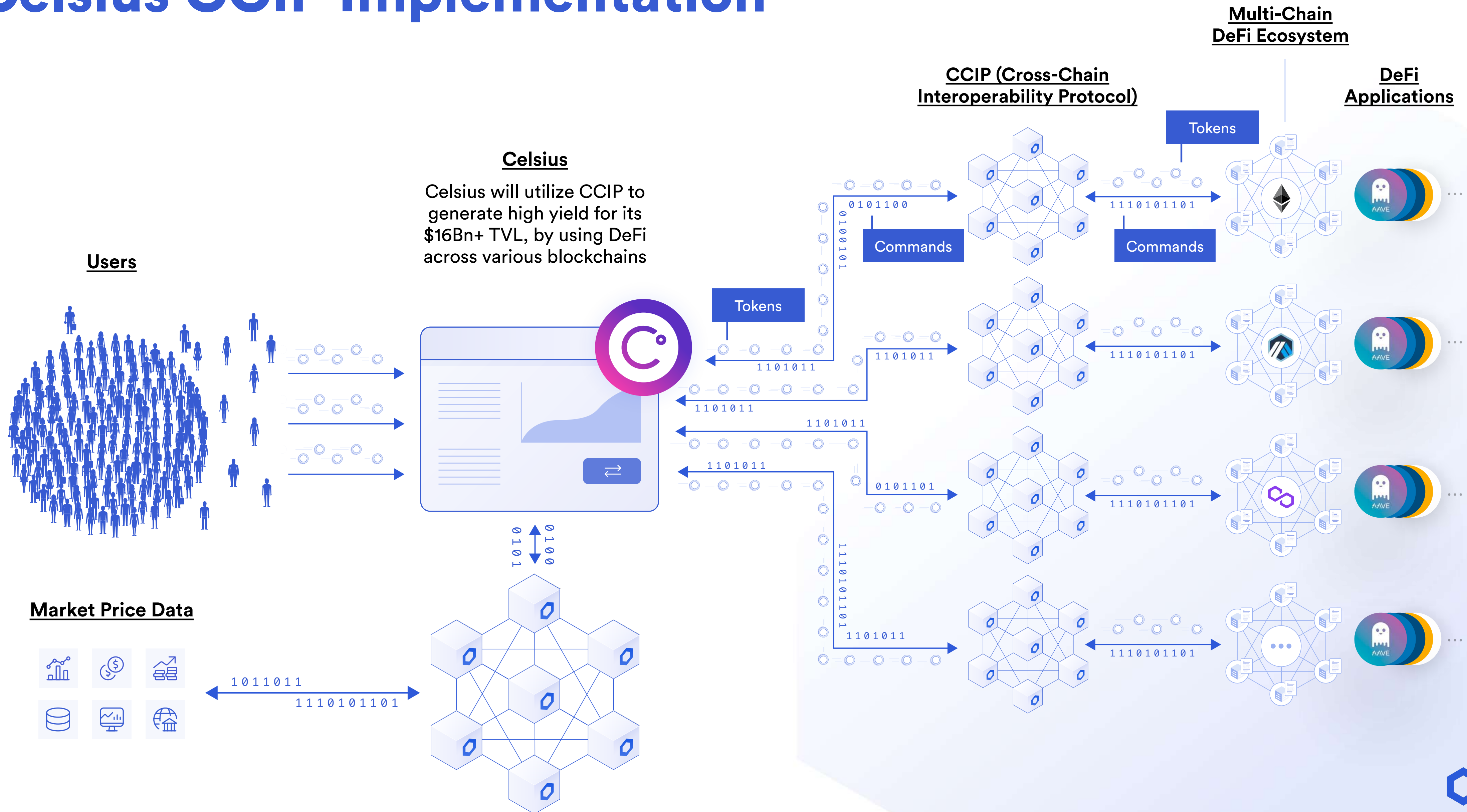
Issue found

Risk Management Network

The Cross Chain Stack

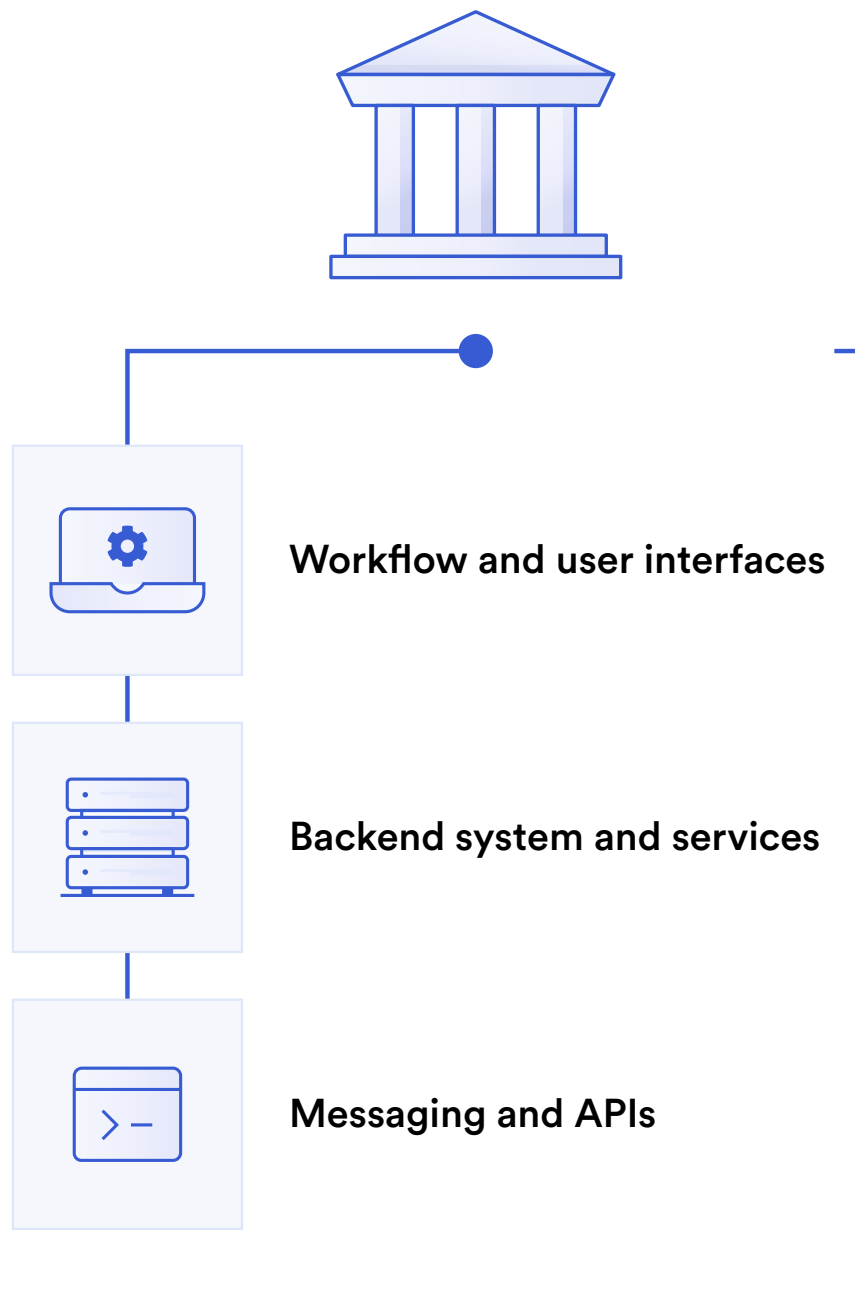


Celsius CCIP Implementation

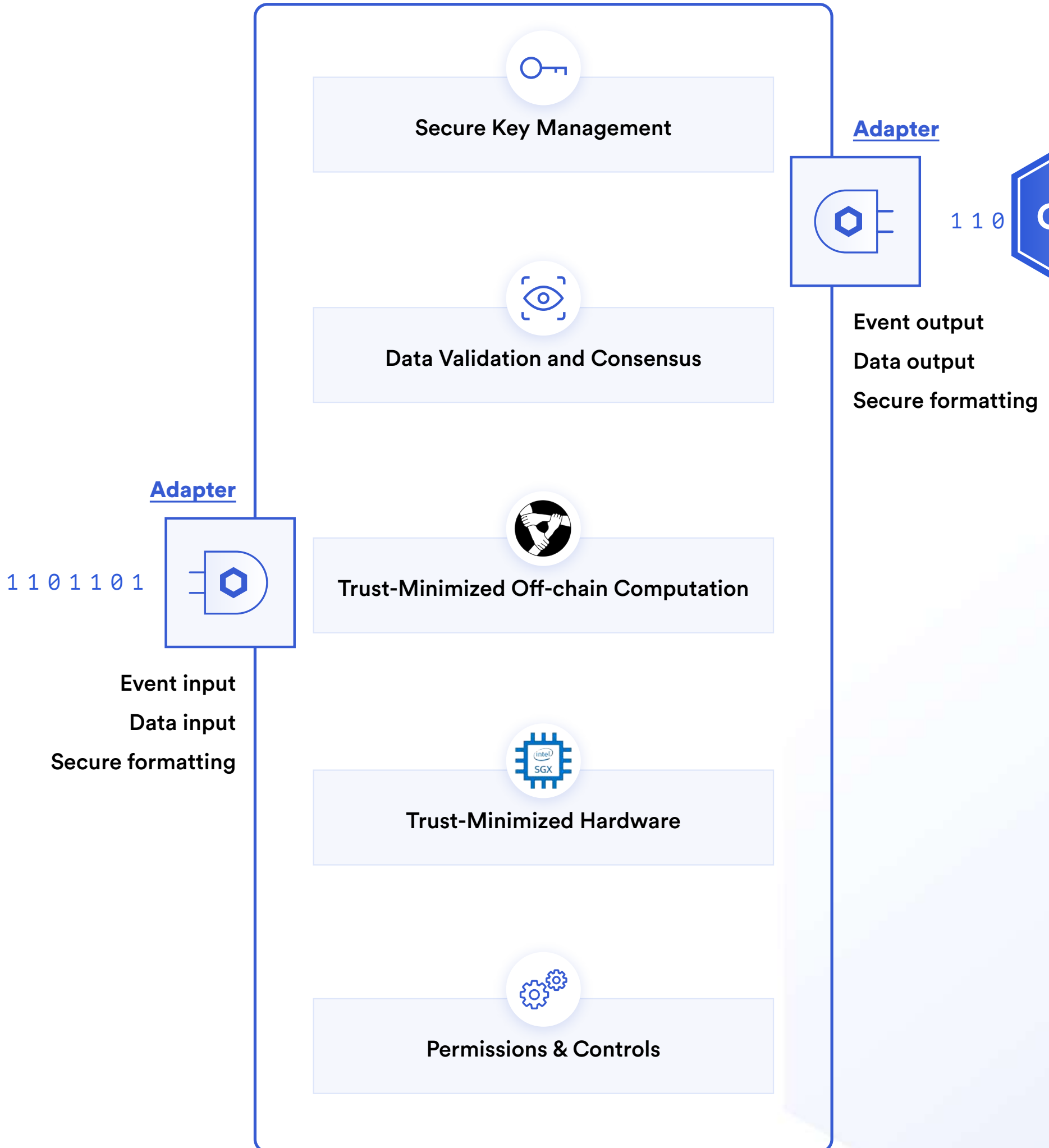


Accelerate Web, Fintech and Enterprise Blockchain Adoption

Web, Fintech and Enterprise Stack



Chainlink Abstraction Layer



Blockchain Networks

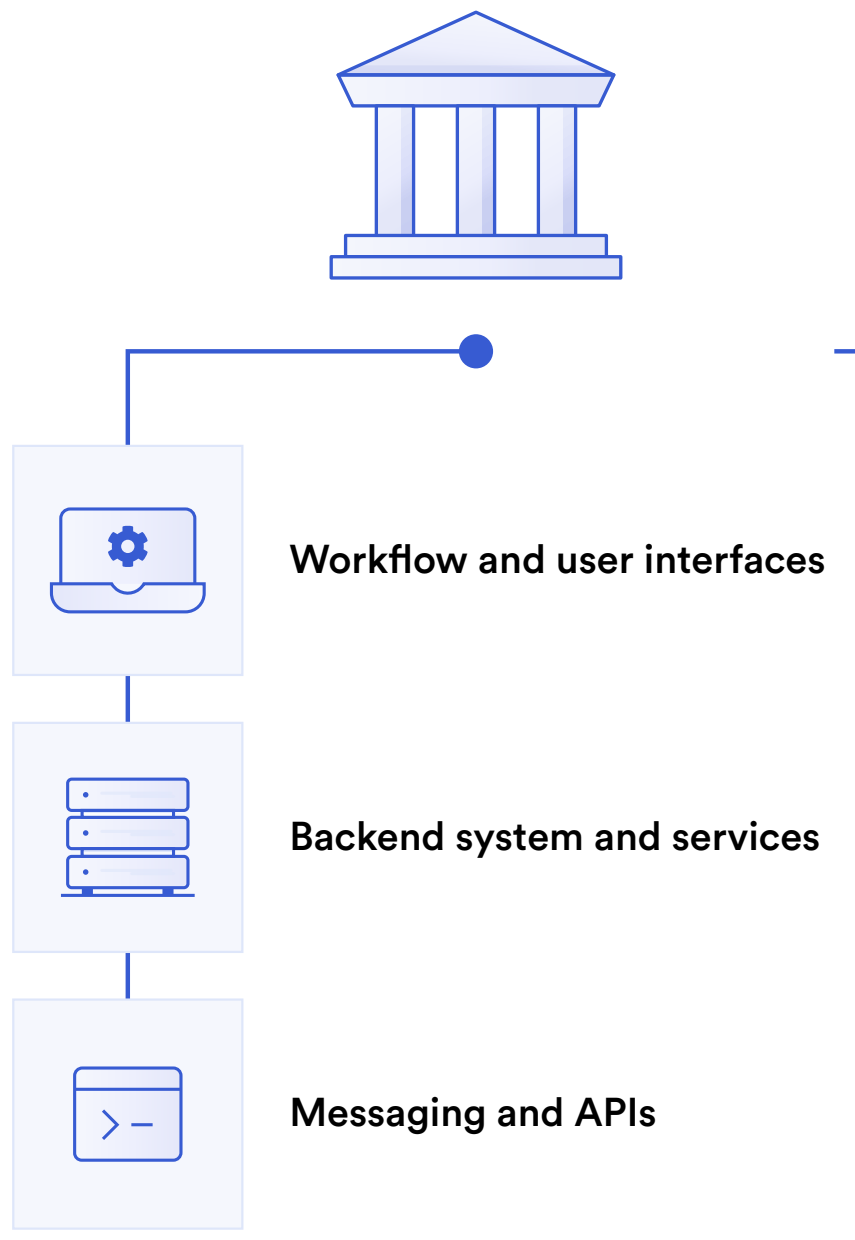


DeFi Applications

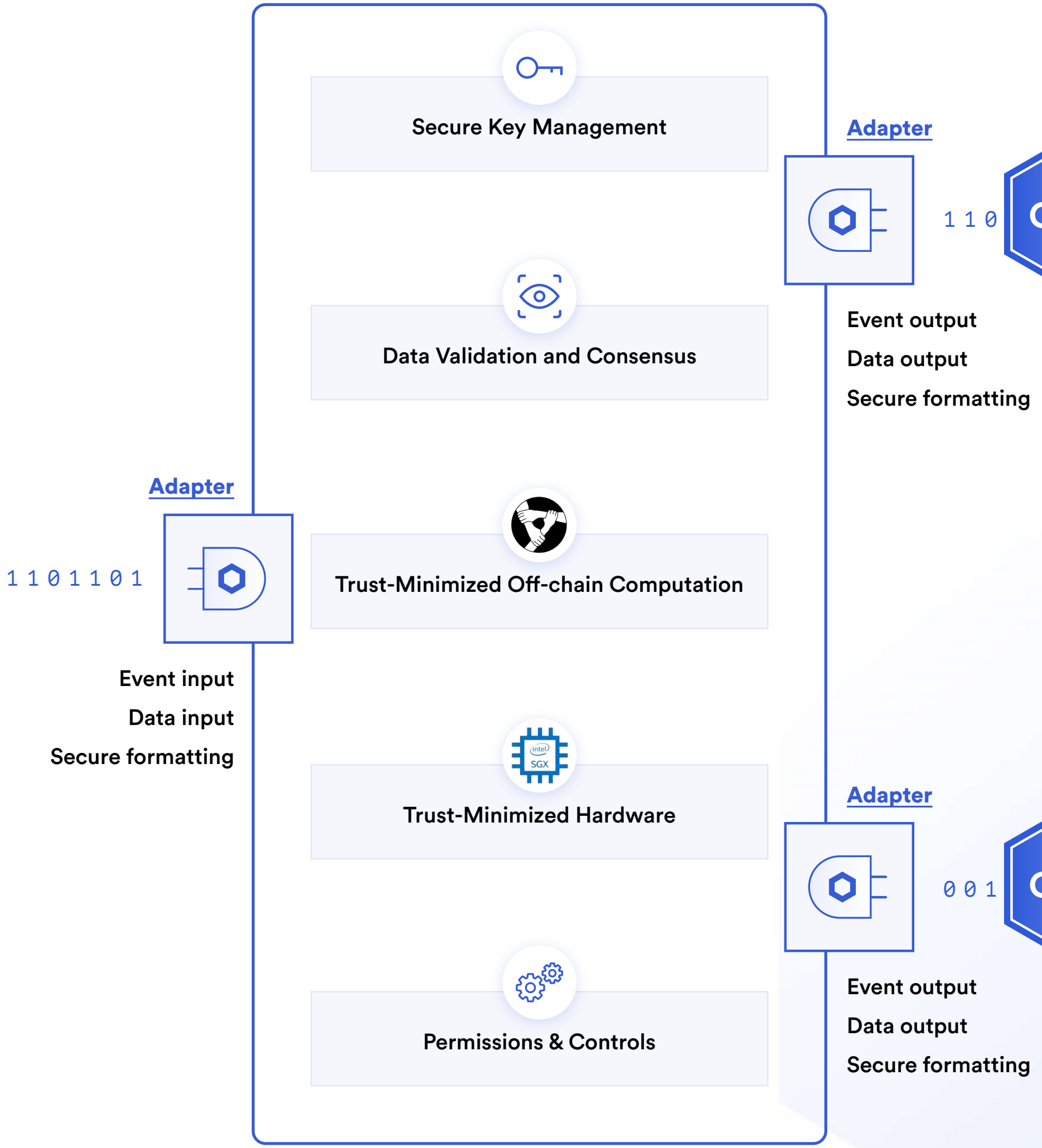


Accelerating Institutional Adoption of Smart Contracts

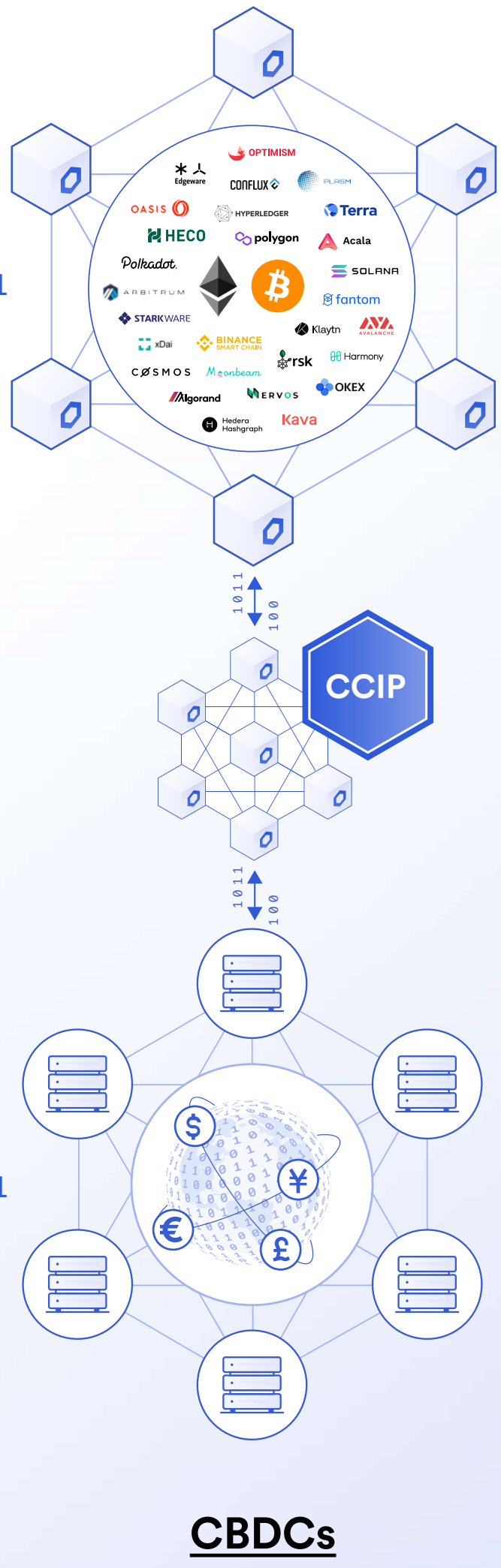
Web, Fintech and Enterprise Stack



Chainlink Abstraction Layer



Blockchain Networks

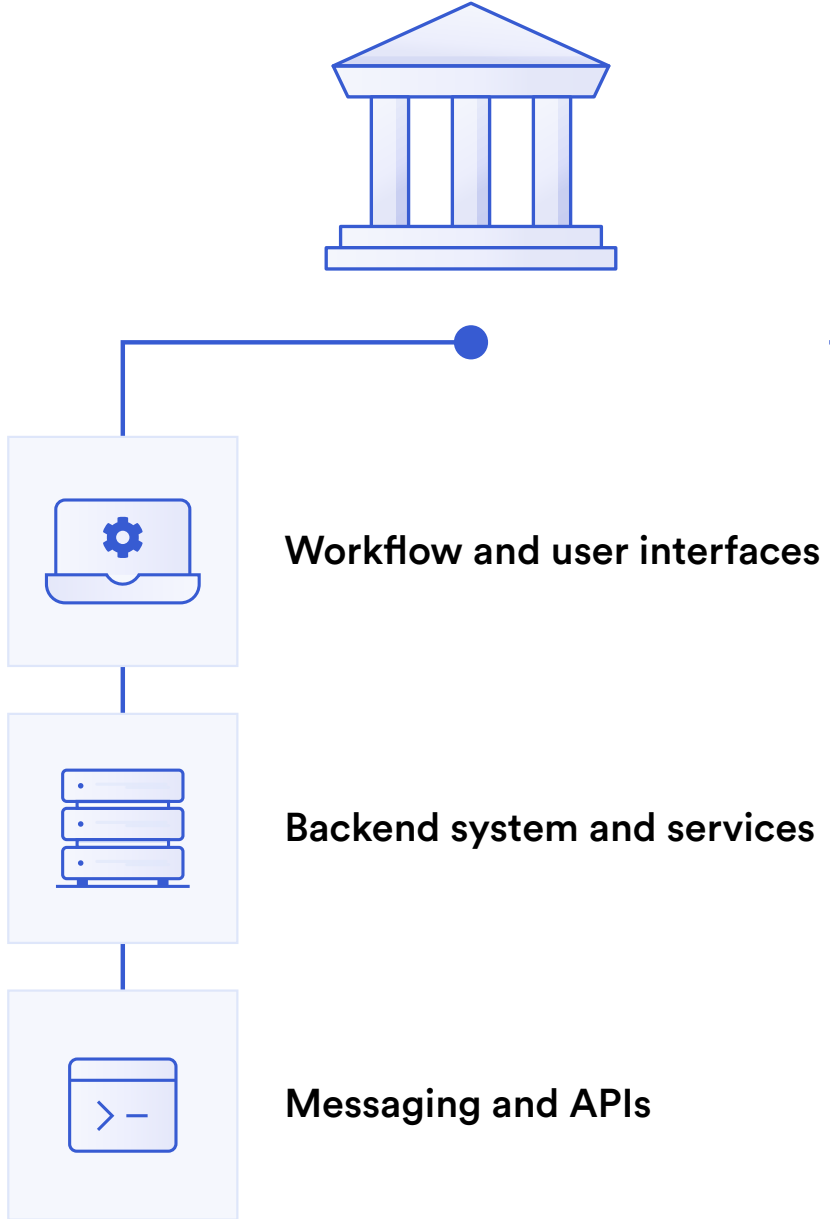


DeFi Applications

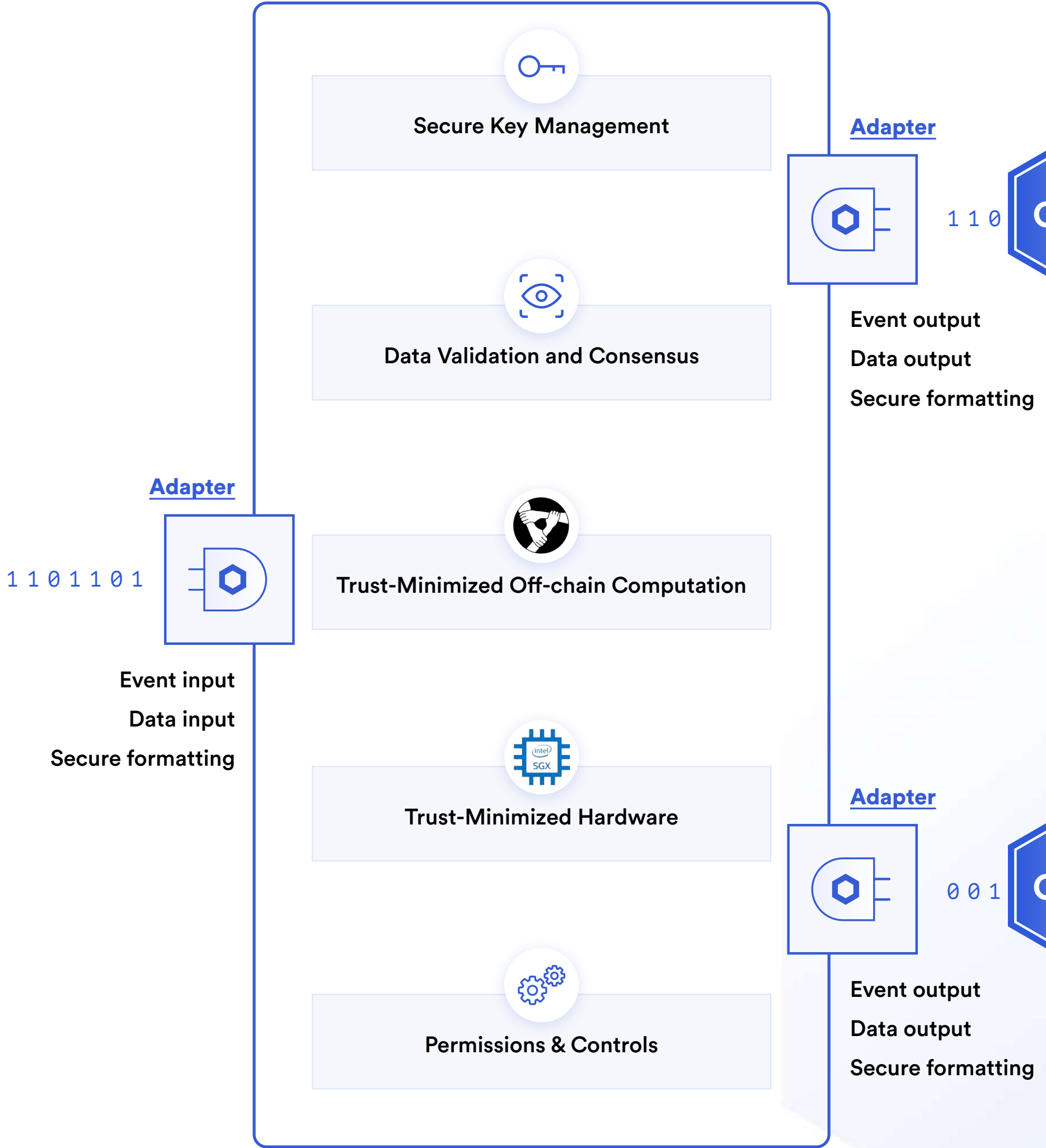


Accelerating Institutional Adoption of Smart Contracts

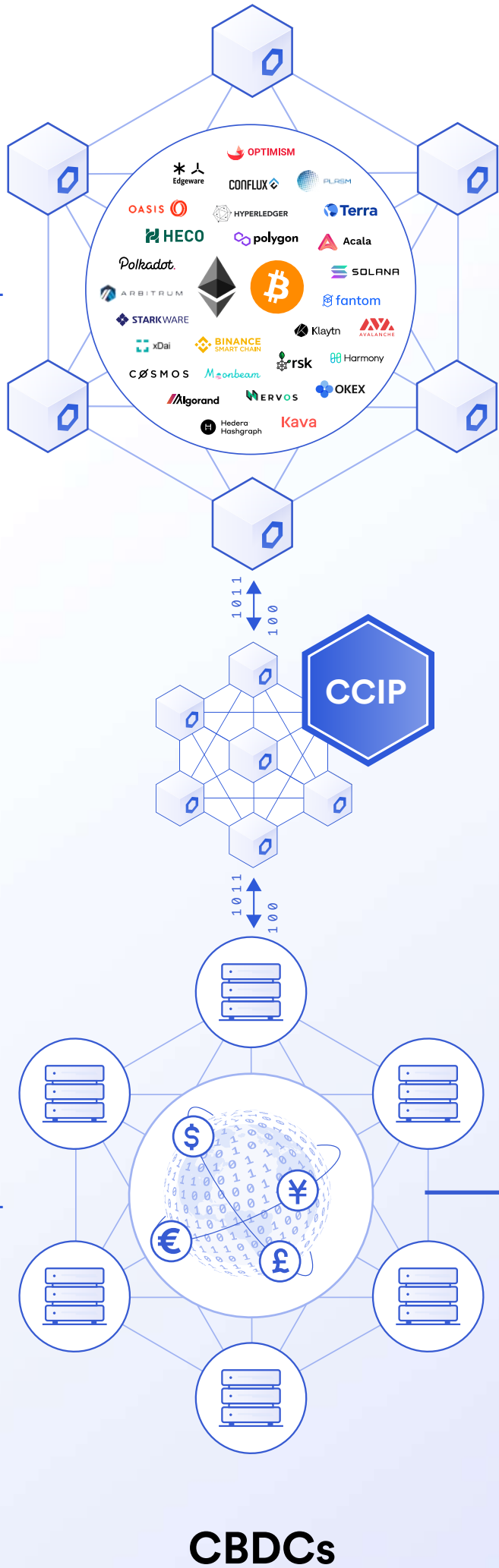
Web, Fintech and Enterprise Stack



Chainlink Abstraction Layer



Blockchain Networks



DeFi Applications



100X+ More in Smart Contracts & Blockchains

CBDCs

Services Building a World Powered by Cryptographic Truth

Highly Validated Data

Price and Market Data

Proof of Reserve Audits

All Off-Chain Data

Off-Chain Computation

Verifiable Randomness

Keepers / Automation

Expanded Computation

Cross-Chain

Bridge & Messaging

Chainlink Network

+ hundreds more

DeFi Contracts + CeFi

Wrapped Assets

New Hybrid Smart Contracts

Gaming Contracts

DeFi Contracts + CeFi

New Hybrid Smart Contracts

DeFi Contracts + CeFi

+ hundreds of blockchains

Global Finance Industry

Thousands of Additional Use Cases

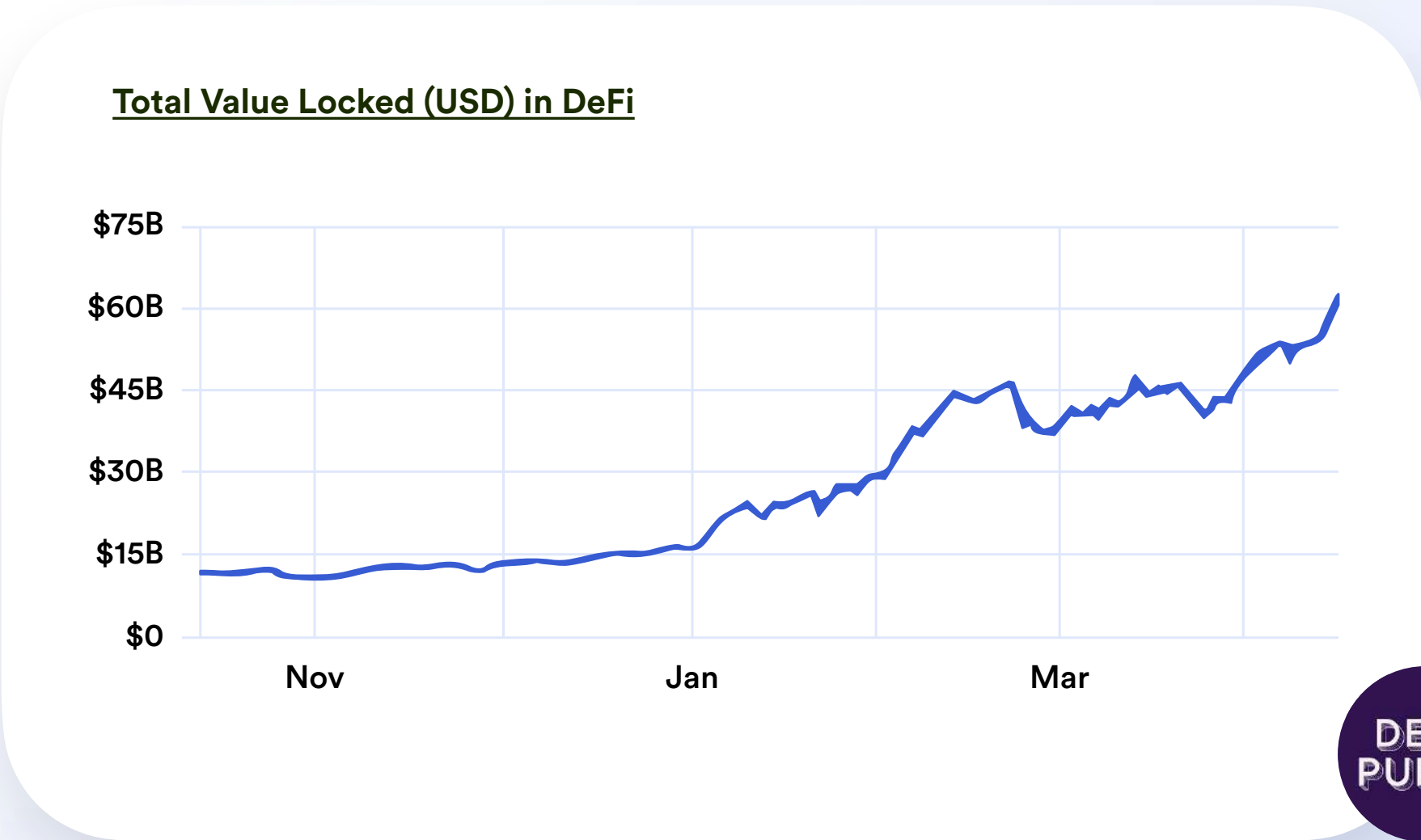
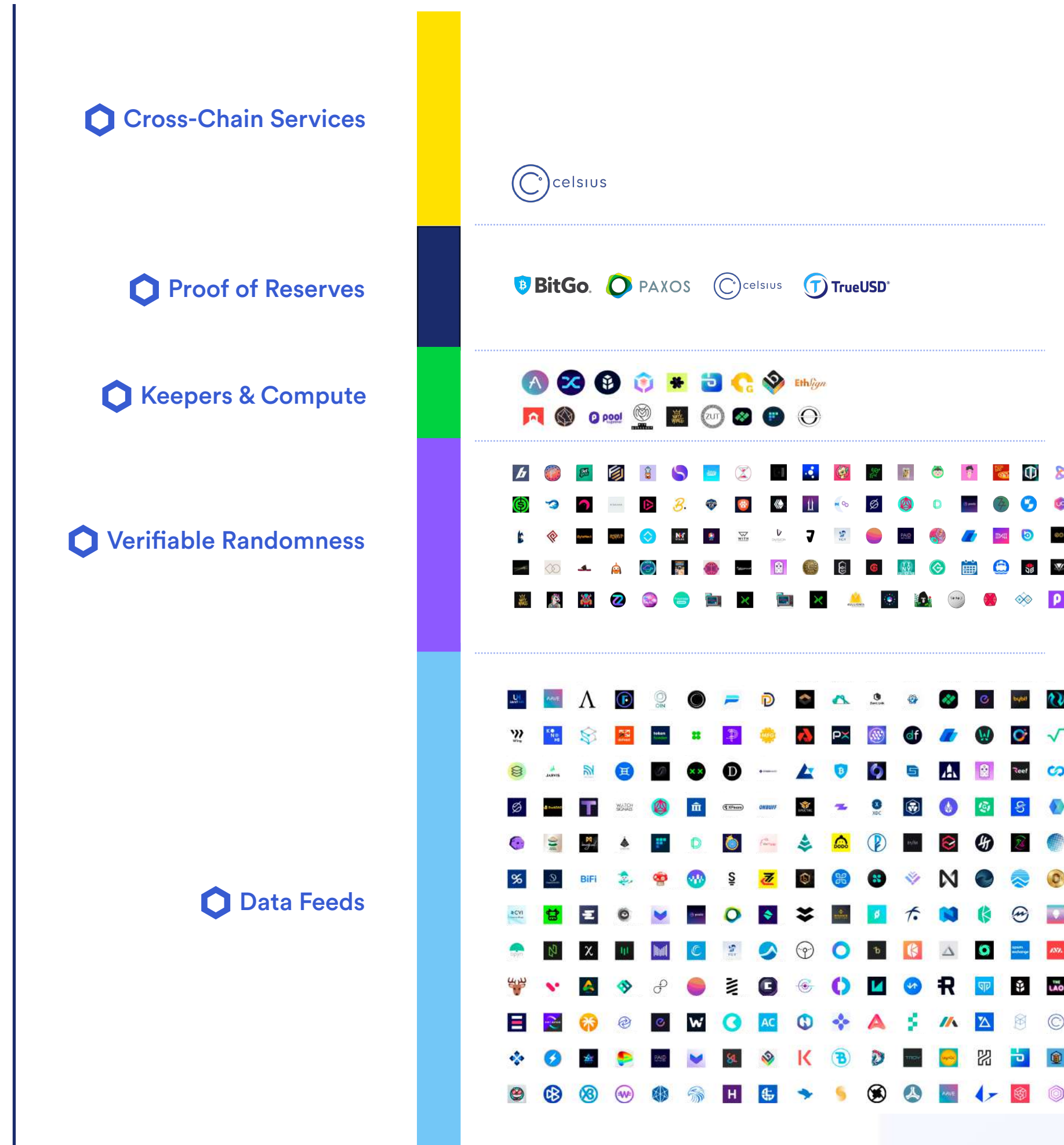
Global Demand for Off-Chain Computation

Cross-Chain Demand

More Smart Contracts Need More Decentralized Services

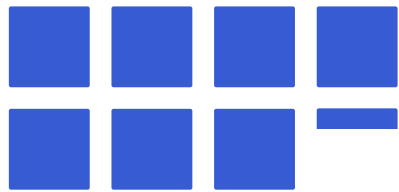
-  Cross-Chain Services
-  Keepers & Compute
-  Data Feeds
-  Proof of Reserves
-  Verifiable Randomness

Smart Contract Growth



DeFi is Still Only ~4.8% of All Value in Cryptocurrency

DeFi

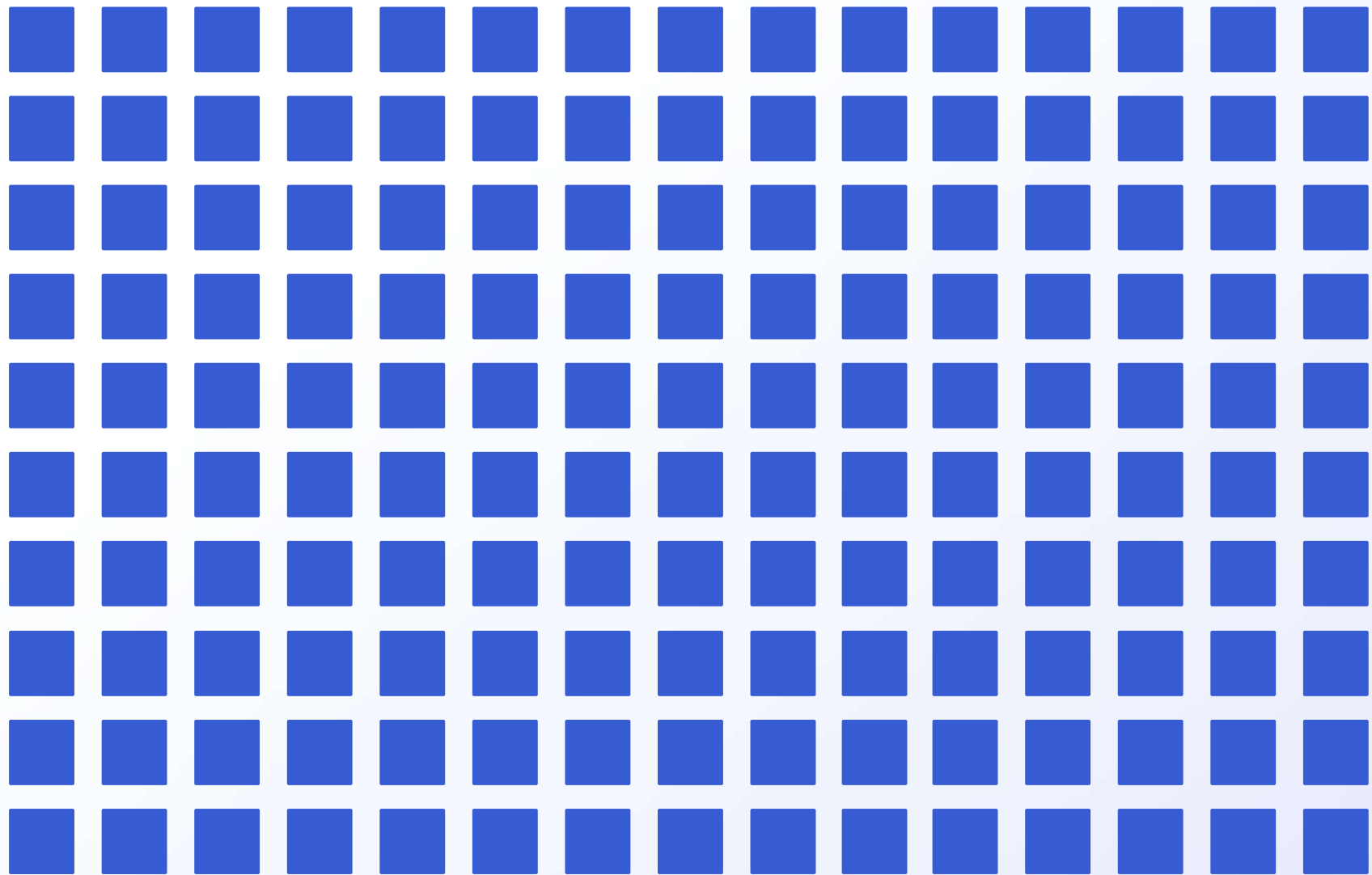


\$72 billion

High Interest Yields



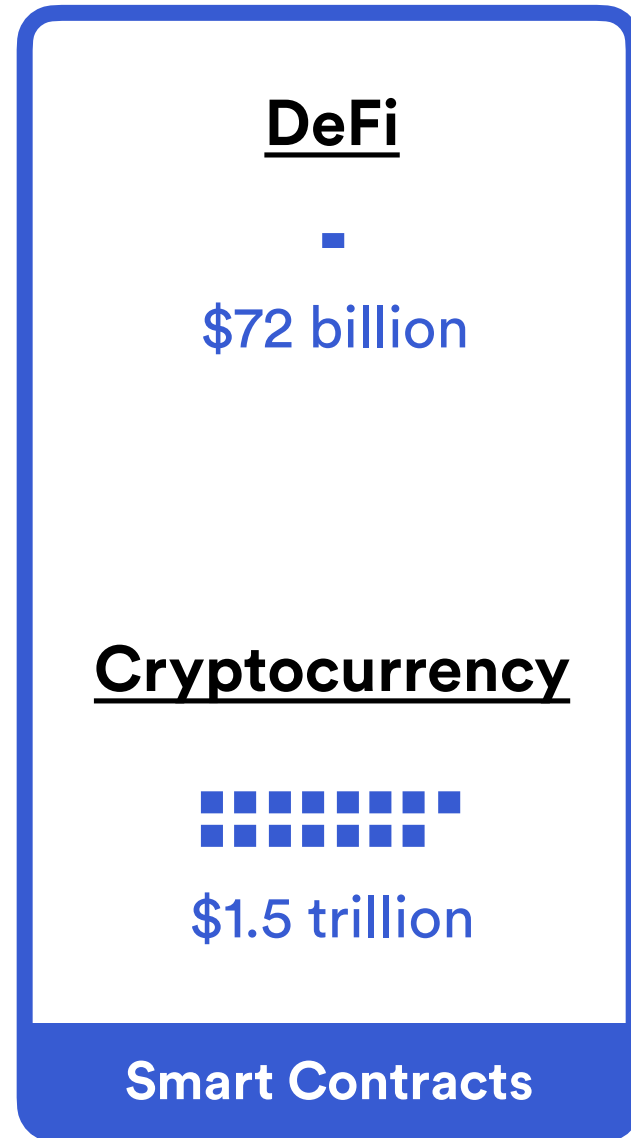
Cryptocurrency



\$1.5 trillion

■ \$10 Billion

The Remaining Market For Smart Contracts is Trillions



DeFi

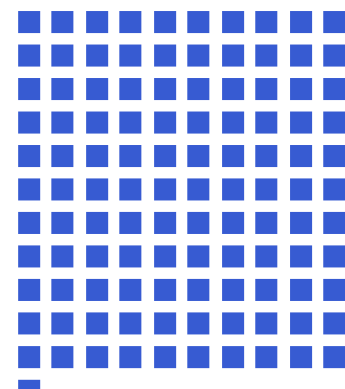
\$72 billion

Cryptocurrency

\$1.5 trillion

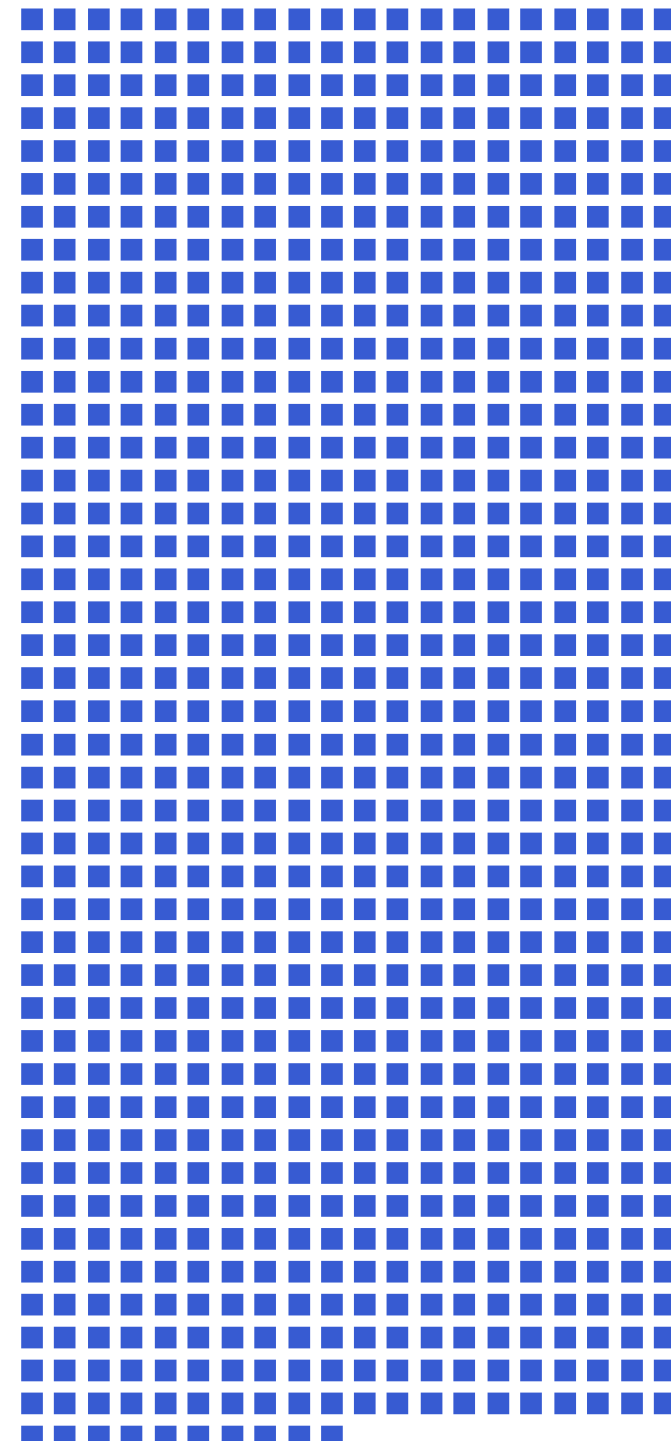
Smart Contracts

Gold



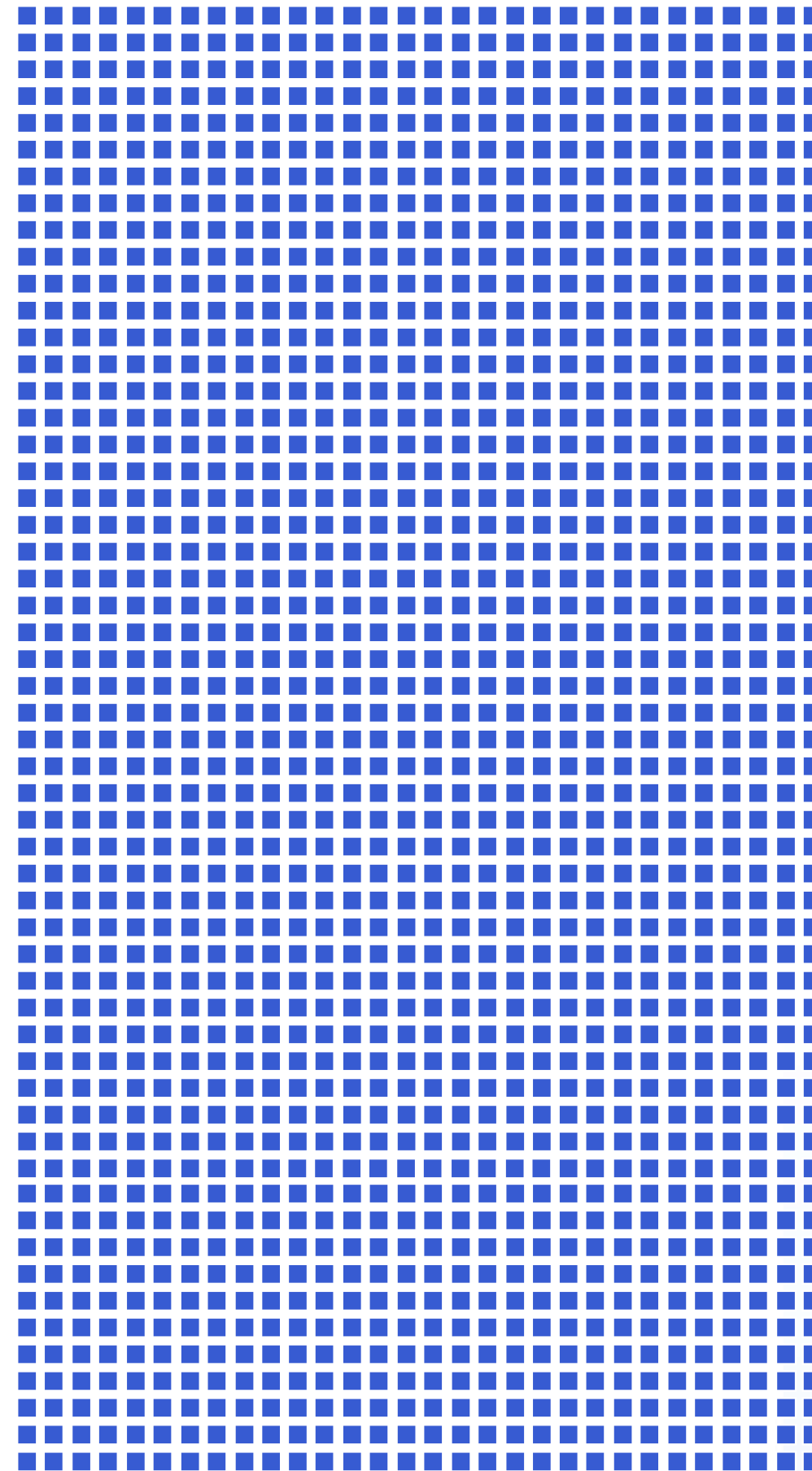
\$10.9 trillion

Stock Market



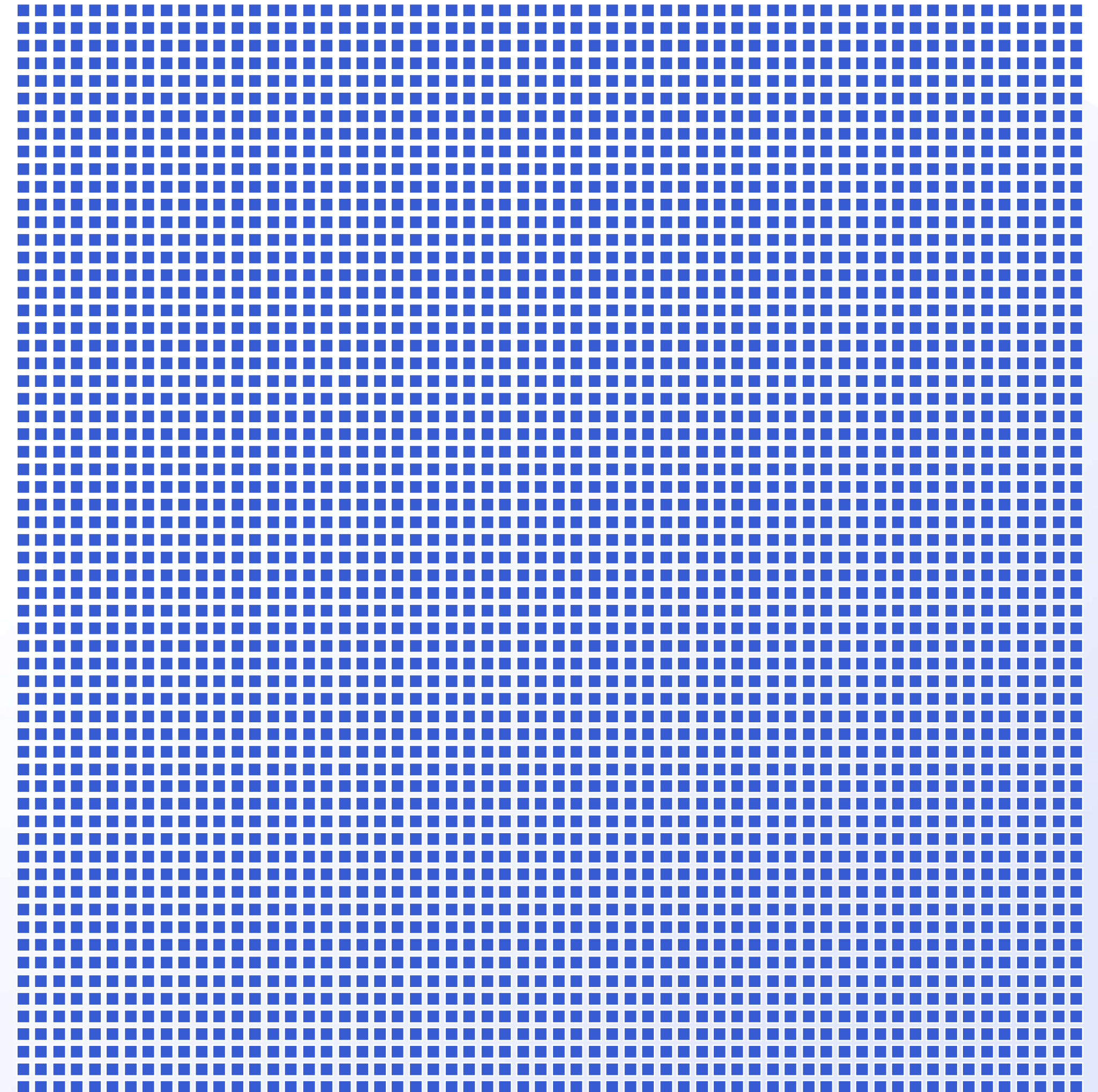
\$89.5 trillion

Global Real Estate



\$280.6 trillion

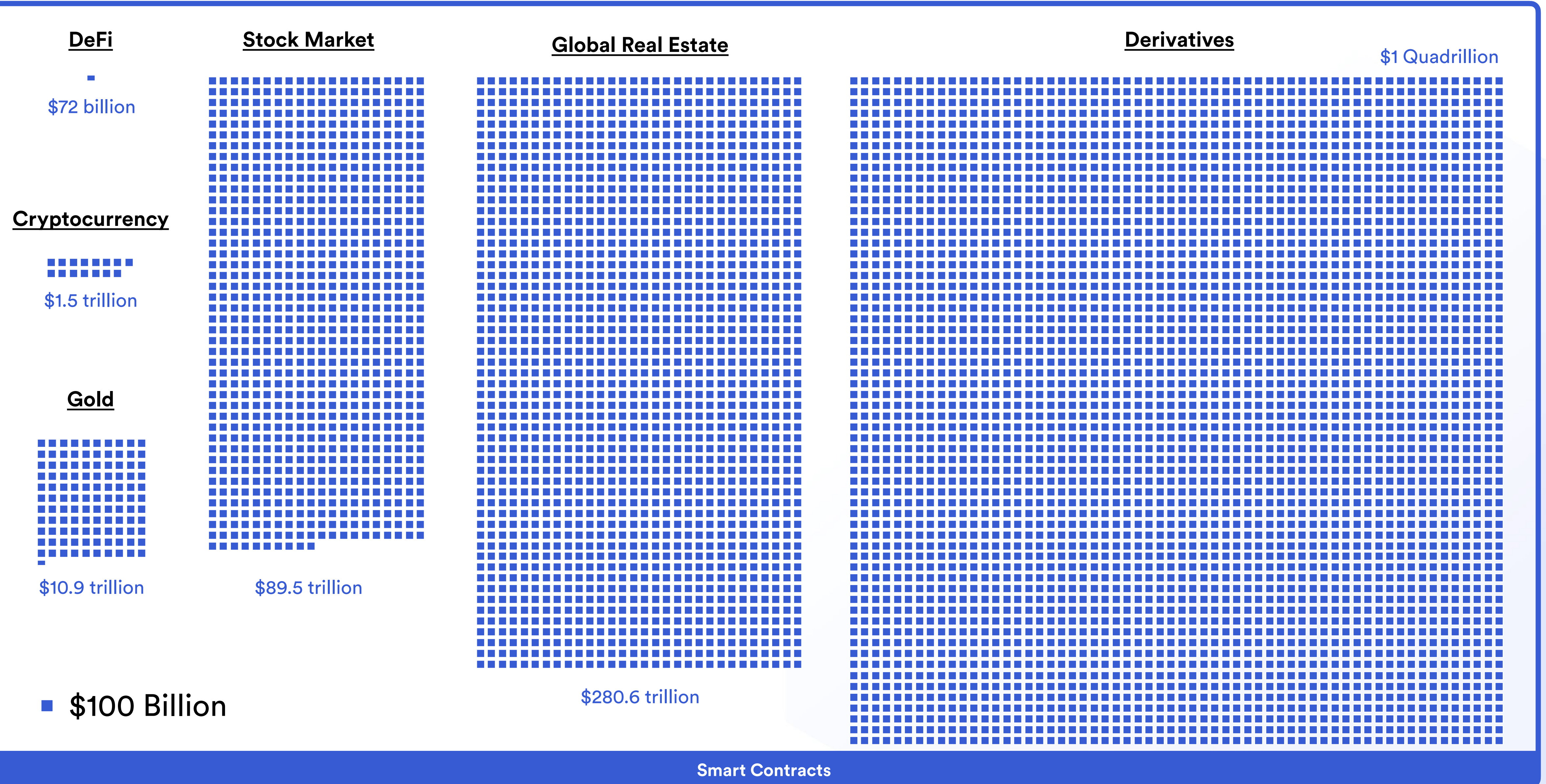
Derivatives



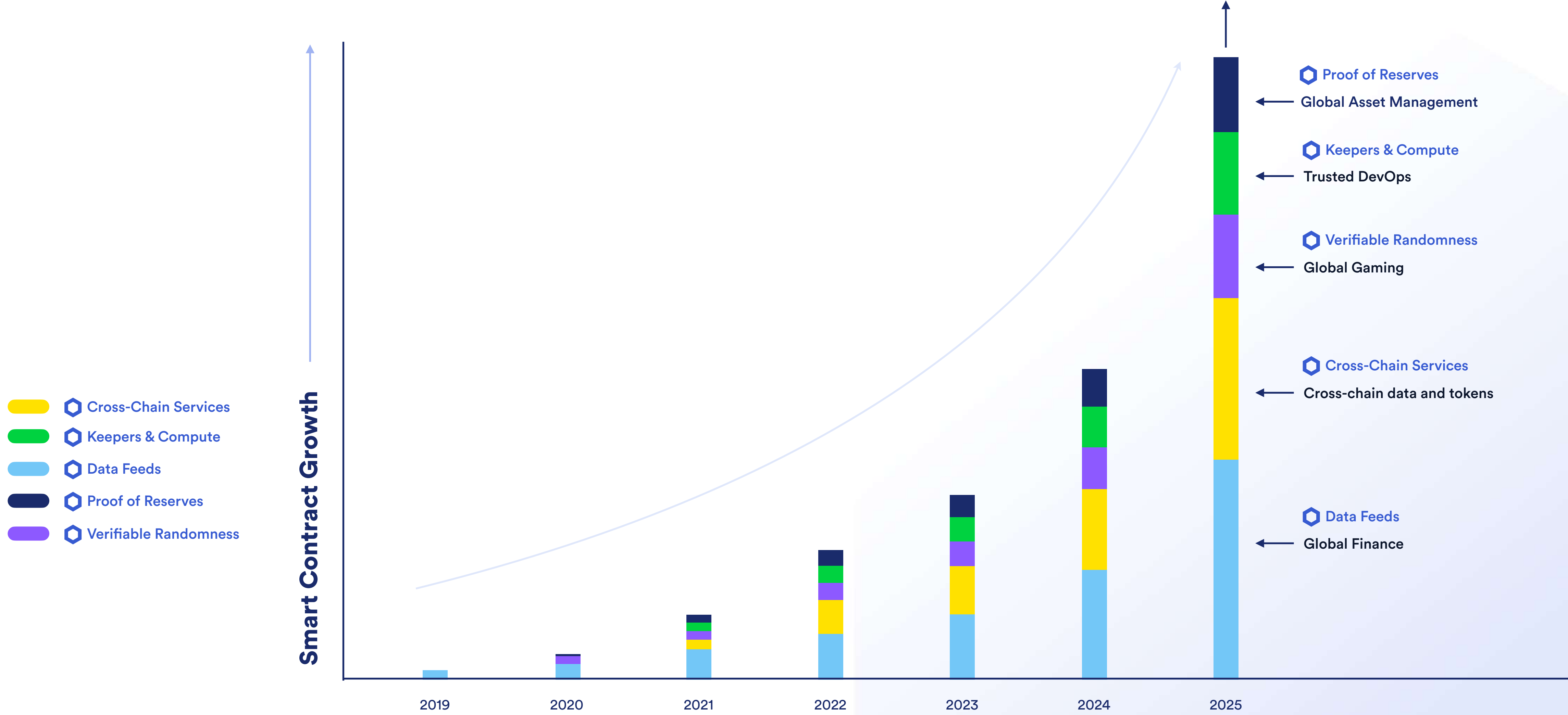
\$1 quadrillion

■ \$100 Billion

The Remaining Market For Smart Contracts is Trillions



More Smart Contracts Need More Decentralized Services



- Proof of Reserves
- Global Asset Management
- Keepers & Compute
- Trusted DevOps
- Verifiable Randomness
- Global Gaming
- Cross-Chain Services
- Cross-chain data and tokens
- Data Feeds
- Global Finance

Help Build a World Powered by Truth



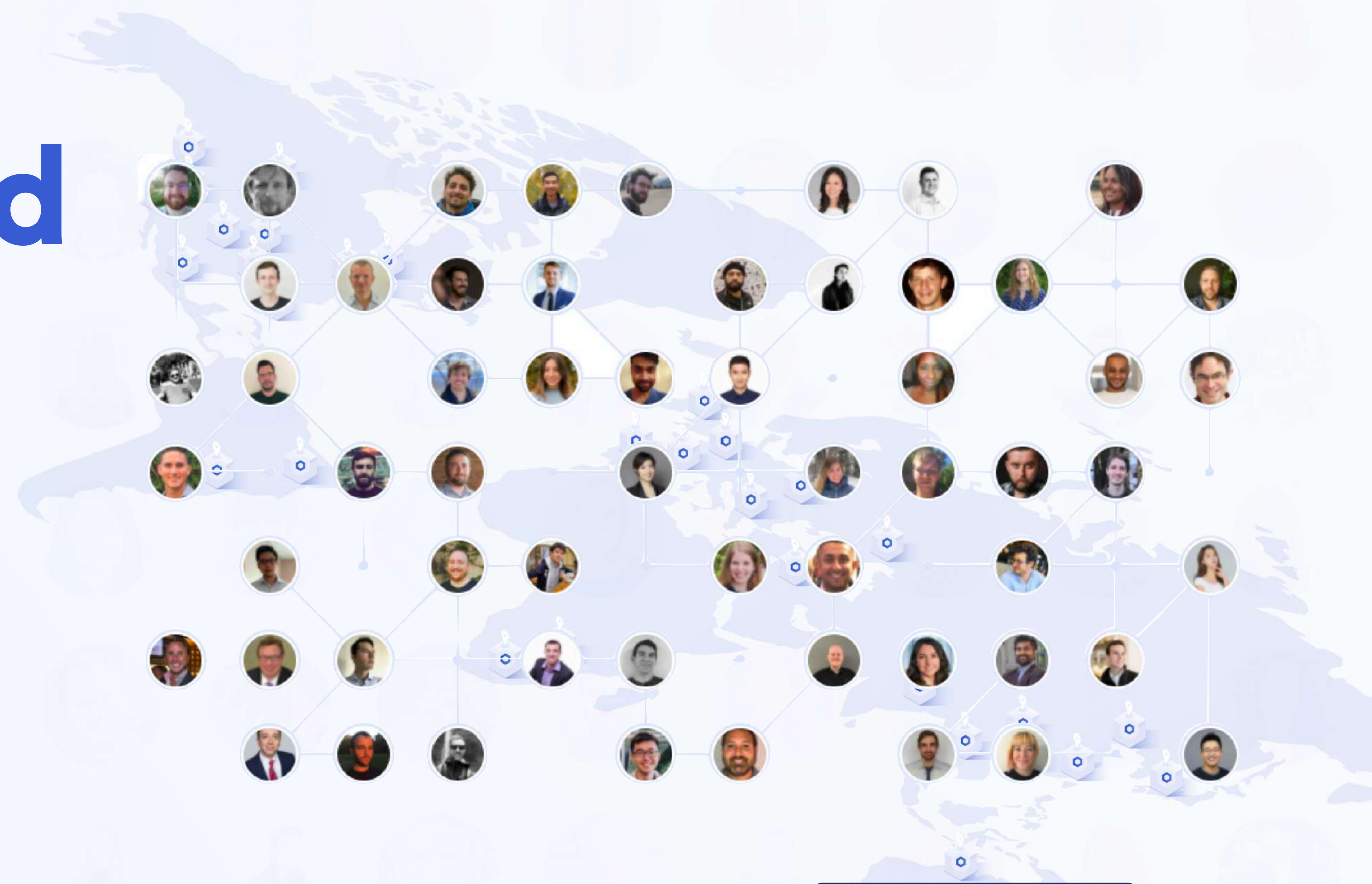
Build great open source software that enables the next generation of DeFi and many other smart contract types.



We're an idea meritocracy where the best ideas win.



We're a remote team working with great people all over the world.



WE ARE HIRING!

chainlinklabs.com/careers

Thank You