

ICO Review: Celer Network (CELR)

Off-Chain Internet-Scale Network Solution

June 29, 2018



What is Celer Network?

- Celer Network aims to be the first off-chain operating network to bring Internet-level scalability to blockchains. It can scale out to billions of trust-free, secure, and private off-chain transactions per second.
- Because transactions are processed off-chain by only those involved, the network's throughput can increase almost linearly even as more nodes and applications are added to the network.



Provably Scalable



Secure & Private



dApp-Aware



Rapidly Evolvable



Easy-to-use



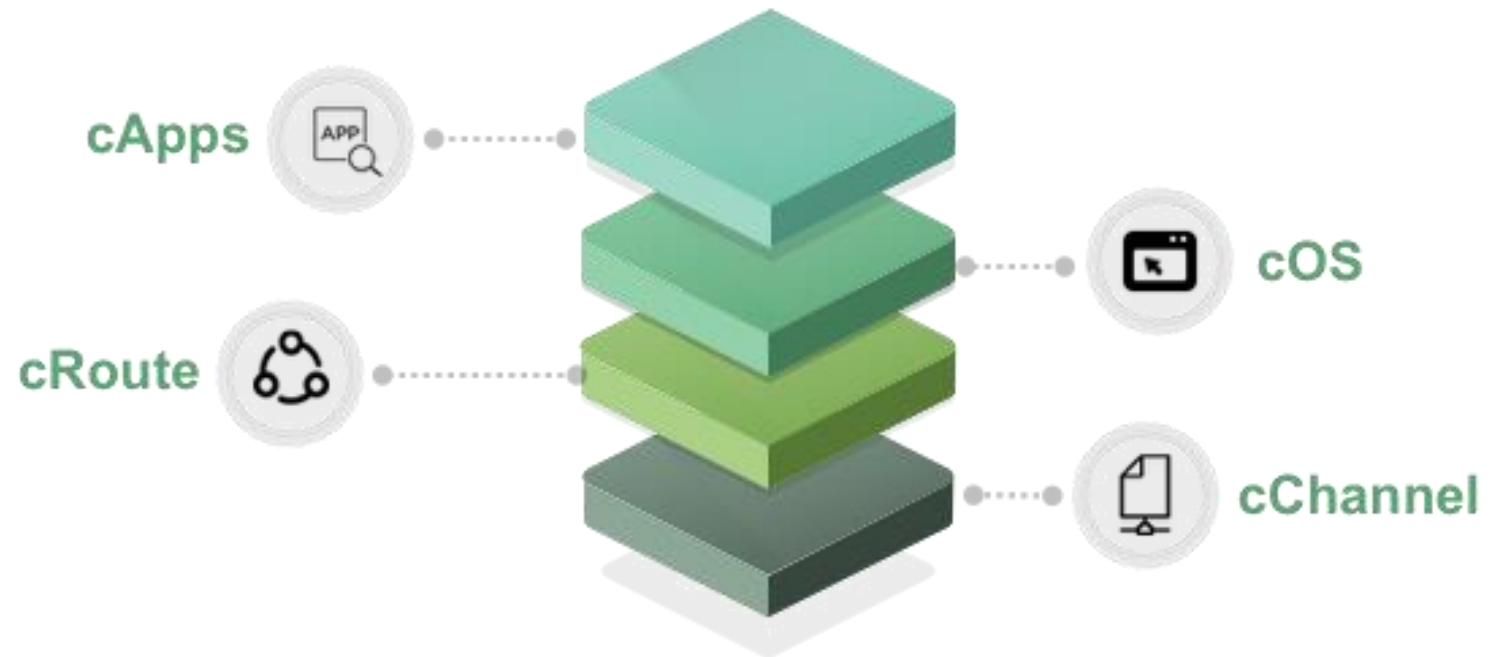
Incentive Compatible

Off-chain blockchain scalability

- The team stands behind their off-chain solution to blockchain scalability.
- On-chain consensus has its fundamental limitations, making it difficult to achieve Internet-level scalability (i.e. billions of transactions per second).
- Celer Network is being designed to serve as an entry point for scalable decentralized applications (dApps) with a simple, user-friendly interface.
- For users, connecting to Celer Network could potentially be as easy as connecting to the Internet. With Celer Network's proposed technology, blockchain applications could become more scalable and achieve mass adoption.

Technology architecture

- Celer Network's technology architecture is called the cStack, a four-layered architecture which is based on the design principles and architecture that made the Internet successful.



Technology architecture (continued)

- **cApps:** The network's application ecosystem, which is designed to be scalable and privacy-preserving. The team has already developed one working cApp.
- **cRoute:** A protocol used to route generalized states, such as conditional payments, in a trust-free manner between users.
- **cOS:** A development framework and runtime for scalable off-chain dApps that handles the operation, storage, tracking, and dispute of off-chain states.
- **cChannel:** A generalized state channel and sidechain suite that supports fast state transitions and maximizes liquidity utilization.

Development roadmap

Q3 2018

cChannel: generalized state channel contract release

cRoute: continued research and evaluation

cOS: SDK private beta release

cEconomy: PoLC testnet launch

Community: 400 cApp developers onboard

Q4 2018

cChannel: multi-blockchain support

cRoute: large-scale emulation and algorithm tuning

cOS: SDK public v1.0 release

cEconomy: PoLC mainnet launch

Community: first off-chain service provider launch

Q1 2019

cChannel: unified interface for state channel and sidechain

cRoute: implementation and test

cOS: SDK public v2.0 release

cEconomy: LiBA and SGN testnet launch

Community: more third-party cApps

Q2 2019

cChannel: continued blockchain expansion and integration

cRoute: test and deploy

cOS: SDK public v3.0 release

cEconomy: LiBA and SGN mainnet launch

Community: more off-chain service providers

H2 2019

cChannel: cross-chain interoperability

cRoute: production measurement and optimization

cOS: SDK public v4.0 release

Community: large-scale cApps ecosystem

Use of CELR tokens

- The CELR token is the network's native protocol token and will be used in various ways within Celer Network to bring value and provide network effect and stable liquidity.
- Other uses for the CELR token:
 - **Proof of Liquidity Commitment (PoLC):** The network features a virtual mining process that acquires liquidity for the off-chain ecosystem. Users will need to commit/lock their idle liquidity for a certain period of time and in exchange, will be rewarded with CELR tokens.
 - **Liquidity Backing Auction (LiBA):** This auction process enables off-chain service providers to solicit liquidity from lenders, For lenders, the more CELR tokens they stake, the higher their rank/priority.
 - **State Guardian Network (SGN):** To become a stake guardian, CELR token holders need to stake their tokens in order to earn guarding opportunities and service fees. The more tokens that are staked, the more service fees will be earned by the stake guardian.

Use of CELR tokens

- CELR tokens should appreciate in value as more users join and use the network. This is driven by numerous factors, including the number and type of applications available on the platform, ease of use, transaction speed, etc.
- Other uses of the CELR token (i.e. PoLC, LiBA and SGN) incentivizes users by providing various rewards and fees, which should also help increase the demand for the token and therefore, its value.

THE TEAM

Team and advisors



Dr. Mo Dong

Co-Founder

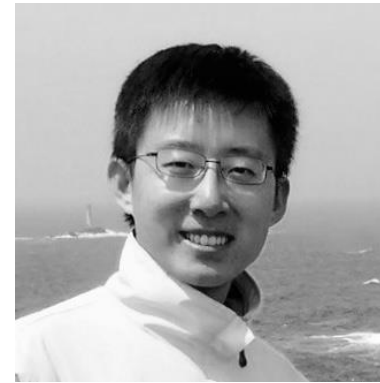
Background in learning-based networking protocol design, distributed systems, formal verification and game theory. Previously the engineering team lead and product manager at Veriflow. Obtained his Ph.D. in Computer Science from the University of Illinois at Urbana-Champaign in 2017.



Dr. Junda Liu

Co-Founder

Background in networking infrastructure with prior research in high performance and large-scale networks. Previously worked at Google for almost 7 years in various roles, including senior engineer and software engineer. Obtained his Ph.D. in Computer Networks from the University of California, Berkeley in 2011.



Dr. Xiaozhou Li

Co-Founder

Background in distributed systems, networking, storage, and data management. Previously worked for 2 years at Barefoot Networks as a software engineer and in various research assistant/intern positions with Princeton University, Microsoft, Intel Labs and the University of Pennsylvania. Obtained his Ph.D. in Computer Science from Princeton University in 2016.



Dr. Qingkai Liang

Co-Founder

Background in distributed systems and network control algorithms. Previously a research assistant at the MIT Laboratory for Information and Decision Systems where he worked for more than 4 years. He has also been in various intern roles with Google and Bell Labs. Obtained his Ph.D. in Computer Networks from MIT in 2018.

The opportunities

- Celer's generalized state channels are better and more efficient than other projects tackling the same problem. It has demonstrated to be 15x faster with a much higher channel utilization ratio because of the channel balancing mechanism.
- The founders have a very strong technical background, particularly in computer networking infrastructure, formal verification, etc., with prior experience working at major tech companies including Google, Intel, Microsoft, and Nokia Bell Labs.
- Celer Network is blockchain agnostic and can be integrated with any blockchain, therefore the risks of the project becoming obsolete due to the blockchain that it is integrated with have reduced substantially.
- The staking mechanism makes the network more efficient and provides good token utility.

Our concerns

- No business development or go-to-market strategy has been provided yet but this is a crucial factor in achieving and sustaining mass adoption.
- The project faces competition from other off-chain payment networks include Raiden, Lightning Network, Funfair, Perun Network, and others.

For flipping: **Neutral.**

- We are of the view that the hard cap and fully diluted market cap is on the high side, especially when ether price is hovering around \$420.
- Raiden, which is the most comparable project to Celer in our opinion, has a market cap (using circulating supply) of \$33 million. However, we note that Celer Network's scope is wider than just an off-chain payment solution..

Our views (continued)

For long-term holding: **Positive.**

- We really like the long-term prospect of the project. In fact, we believe Celer is one of the most technically advanced projects that we have looked at that is led by a capable team.
- We believe on-chain and off-chain scaling solutions are both needed to take decentralized applications to mainstream. No matter how robust on-chain scaling solutions become, the latency is still far higher than off-chain solutions. We believe end users care about user experience more than anything else.
- Celer, being blockchain agnostic, has a much higher chance to succeed than projects that are only compatible with a single blockchain. We also like how CELR tokens help the network to become more efficient. Therefore, we believe CELR tokens have a great long-term potential.

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