THE WORLD HAS CHANGED

10 YEARS AGO

1. In 2008, 4 out of top-5 largest companies grew up from industrial economy: Exxon, GE, Microsoft, AT&T, P&G.

2. Centralized paradigm is the only option.

3. Internet is a free zone for the people of the world.

4. Open-key cryptography is a security standard. No reasons to believe that there is a real threat.

NOW

1. In 2018, top-5 largest companies are made for post-industrial society: Apple, Google, Microsoft, Amazon, Facebook.

2. Decentralization is a trend: every company from Fortune 500 has a blockchain department.

3. China sells their national firewall as a "franchise" to other countries to control the Internet.

4. NIST and NSA: post-quantum cryptography is a future standard. Quantum computer is not far off.

INTERNET 10 YEARS AHEAD

In case the world trends don't change, the Internet will be divided by enclaves with different principles, architecture types, protocols, and security standards.

We foresee a **demand for intercluster interaction protocols and value transfer**. Cellframe Network is built for it.
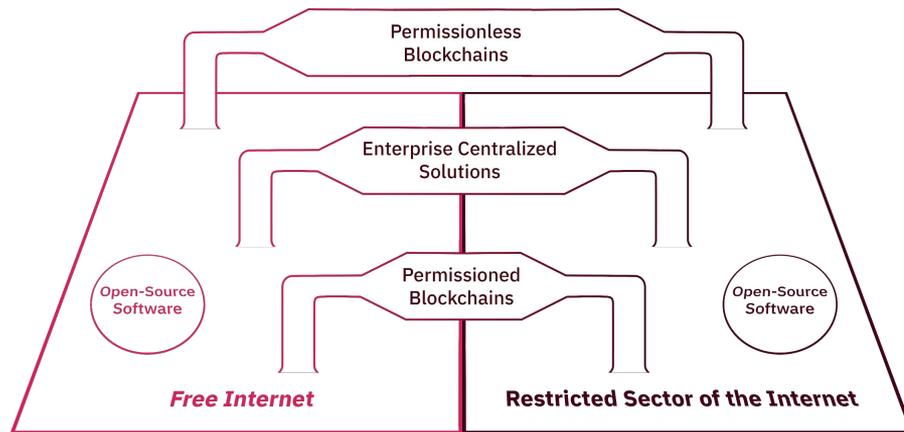
CELLFRAME FRAMEWORK

Cellframe is a framework for blockchain integration secured by post-quantum cryptography. It allows to achieve next features:

1. Connect **different blockchains in one system**;
2. Create systems with smart contracts from several blockchains;
3. Build a mesh-network of users to maintain privacy and freedom of the Internet;
4. Create isolated proprietary enterprise solutions with an access for private users;
5. The most advanced encryption to maintain the highest level of security throughout the whole network.

CELLFRAME ARCHITECTURE

Illustration of the underlying architecture of the Cellframe Network: a user can launch an interchain hub on the top of the ZeroChain and **connect 3rd party blockchains** to its fuel chain.

GRAM

ETH

EOS

Interchain hub (shard)

ZeroChain (base chain)
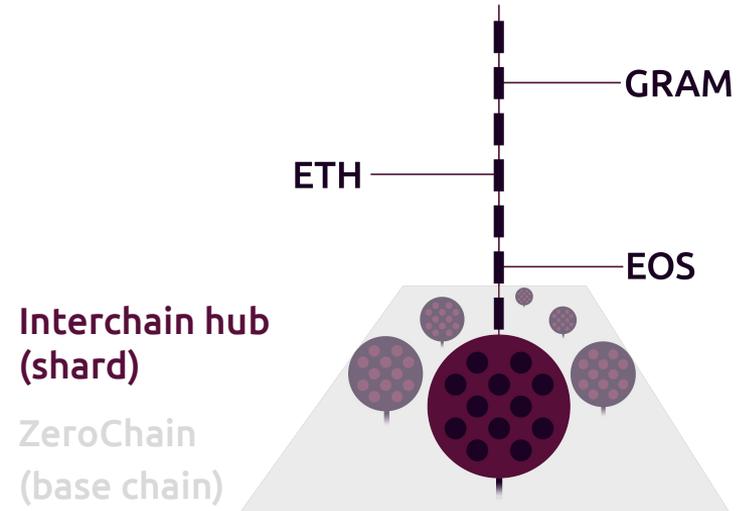
TECH STACK

Post-quantum cryptography by default: Picnic, Tesla, Crystal Dilithium, BLISS, Kyber;
Features: hybrid PoW/PoS consensus, P2P shards communication, zk-SNARKs, GUUID (global IDs for objects).

Advantages:
- Scalability. Original sharding implementation allows to achieve unlimited scale.
- Interoperability. P2P cross-chain operations between public, private blockchains and 3rd party web-services.
- High efficiency. Built in plain C, low-level interaction with hardware
- Quantum-safe
- Designed for building decentralized web services (e.g., VPN, CDN)

IMPLEMENTATION STRATEGY

To make our solution for Internet cluster interaction wide-spread, we've developed 2-stage plan:
Stage 1: Focus on Security Networking Infrastructure (VPN, CDN, Edge Computing, etc.) as a underlying layer for interoperability features.
Stage 2: Focus on Interoperability framework.

We've **already built** several product from Stage 1:

1. KELVPN: Network infrastructure based on distributed quantum safe VPN;
2. MIRROR CHAINS: Blockchain protection from terminal attacks;
3. Enterprise blockchain solutions.

KELVPN

Quantum-safe distributed VPN network and VPN marketplace operating on top of Cellframe. Every user of KELVPN can use the service for free without leaving any logs or traces.

Advantages for end-user:
- Open source code, no logs collected
- No single point of failure, cannot be blocked
- Real privacy: user cannot be identified either by traffic trace, neither by payment for the service with ZK transactions
- Simple user experience, as in regular centralized VPNs

ENTERPRISE BLOCKCHAIN

Cellframe allows any business to launch a quantum-safe distributed ledger from scratch.

Advantages for business
- Easy-to-launch enterprise quantum-safe DLT solution.
- Interaction with kernels of large-scale computer systems without translators because it "speaks" the same language — C.
- Allows to reduce cost of trust in fintech and healthtech and unlock new opportunities for business.
- Create systems with digital tokens representing real-world assets.

MIRROR CHAINS

We've created a MIRROR CHAINS solution that will secure public and private blockchains from modern terminal attacks without competing for their users.

Another MIRROR CHAINS use case is securing transactions on exchanges through post-quantum backup copying.
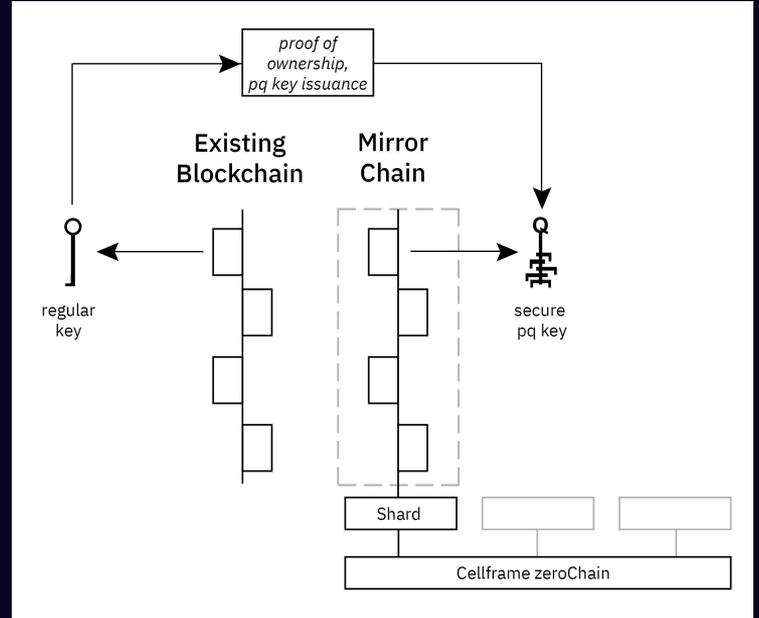
ROADMAP

WHAT WE'VE BUILT

1) Distributed VPN as an connectivity infrastructure layer for different parts of the Internet. Clients for Mac, Linux, Windows, Android, iOS.
2) Cellframe Network in private mode.

TARGETS FOR THE NEXT ROUND

1) Cellframe Network in public mode*
2) VPN user growth
3) DPI-resistance for KELVPN

*more info in Appendix 1: Documents

TEAM

Dmitry Gerasimov, CTO, Novosibirsk: network security, quantum geek, former CTO of 2 commercial VPNs.
Yaroslav Lunev, CEO, Seoul/Moscow: serial entrepreneur, founder of Merklion, consultant of 10+ tech startups.
Eugen Grishakov, COO, Moscow: founder of 3 franchise businesses incl. world biggest network of escape-rooms, Forbes contest winner.
Sergey Sevantsyan, CIO, Moscow: international keynote speaker, 25+ years of experience in ICT, partner of Ethereum.Moscow;
Vasily Sumanov, head of research, Berlin/Moscow: contributor to many industrial media, pre-PhD in materials science (author of 2 patents and 3 academic articles), worked over 10+ startups focused on distributed systems as a researcher
Alex Vesnin, IT architect, Moscow: self-educated IT expert, 25+ years of practice
Ilgiz Gimaltdinov, product manager, Moscow: fintech professional with 10+ years experience, PhD in Computer Science.
Dmitry Chirkin, legal partner, Moscow/Cyprus: cross-border projects lawyer, 13+ years of experience in finance, M&A, VC; PwC Legal, Chadbourne & Parke, Dentons and a number of global clients.
David Nayer, strategic advisor, Austin USA: lead or founding roles in 21 startups, advisor of 7 projects, former Director BD at Dell, leadership at Booz Allen, contributor to 680 inventions in various fields.

+2 lead developers (Kyiv, Penza), +2 cryptographers (Orel), +5 developers (Kazakhstan, Moldavia, Ukraine).

CONTACTS

E-mail: yardy@cellframe.net
Telegram: @yardy

APPENDIX 1: DOCUMENTS

- Cellframe Network Stage 2 architecture description:

  https://docs.google.com/document/d/1xA1GXKgYFQY0_Os_O4tURA2rLoDauHoqCoVl46m_aXo/edit?usp=sharing

- KELVPN pitch deck:

  https://docs.google.com/presentation/d/1ayXEqe9mCG0vcIyR7OgXbcGr9IAd_73k4I67ZXfsUm0/edit?usp=sharing

- Technical documentation: wiki.cellframe.net

- Cellframe website: cellframe.net

- KELVPN website: kelvpn.com