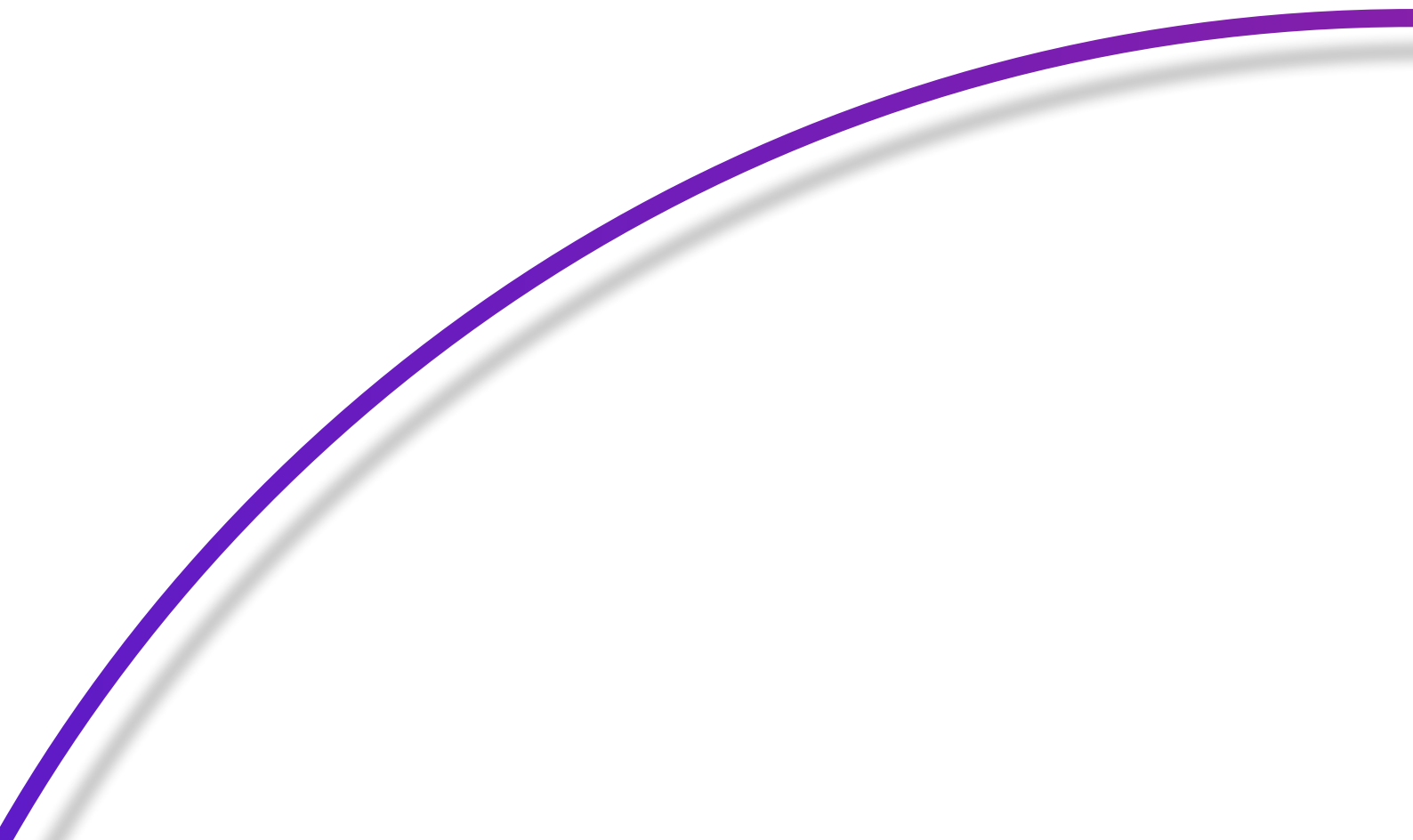# denet

Technology of sharing
resources for data storage

Blockchain technology means decentralization. First it worked with financial systems and payments. Then decentralized applications and blockchain programs appeared. Now the technology is applies in the field of information storage.

DeNet, Storj, Sia, Filecoin, Substratum and other projects compete for this market's share. The idea of decentralized storage lets people rent idle capacities of a hard drive in a peer-to-peer network. Different platforms work differently. But regardless of the approach, decentralized storage is a rapidly growing industry and the future looks promising for any project that can improve the technology.

Cloud storage market volume grows by almost 30 % per year and will approach about USD 100 billion by 2022. But today the market is monopolized by several major players, like Dropbox, Google, Yandex and Mail.ru.

If a decentralized storage can capture even a small percentage of this market, it will be a big industry.

> That's why development of the best decentralized solution
> for data storage is that competitive and perspective.

We at DeNet have analyzed pros and cons of existing projects and taken them into account while developing our solution.

None of the listed projects can provide hot data storage at the moment. They all have limitations that DeNet doesn't have. For example, Storj is centralized; Filecoin still does not have implementation; Sia is very slow at work, while Substratum blockchain has poor development due to architecture.

Nevertheless, decentralized storage can be faster, cheaper and safer for broad implementation. Development of the technology will eventually benefit from severe competition. Developers make every effort for improvement and differentiation of their solutions. If speed, cost and scalability are improved, these solutions will be able to compete with Amazon and Google in the near future.

Cloud storage market grows

Cloud storage market volume grows by almost 30 % per year and will approach about USD 100 billion by 2022. Several major players, such as Dropbox, Google, Microsoft, Box, Amazon, Apple; and Yandex and Mail.ru in Russia, own the market now.

Construction of data centers endangers ecology

Within 5 years world amount of information stored in data centers will reach an enormous size of 1.3 ZB. It will require construction on new infrastructure and will entail significant growth of energy consumption and CO_2 emissions in atmosphere.

Meanwhile, today data centers are already comparable with aircraft industry by scale of air pollution with carbon dioxide

Most of personal computers have excess capacity

The world amount of excess computer capacities may comprise over 500 Exabyte and can be used for data storage.

For comparison, the amount of information stored in Dropbox as of June 2018 comprises 1 Exabyte.

According to data from publicly available sources, there are some 4 billion computers in the world today. In the last 5 years alone 1.4 billion computers were sold. By today these computers have not lost their relevance in computing power.

Most of them have excess capacity.

According to Steam:

48% PC	1 TB	26% PC	500–1000 GB
16% PC	250-500 GB	8% PC	до 249 GB

Thereby, 48 % of those have from 100 up to 500 GB of free space. Up to 750 GB capacity stays idle in 13 % of these computers..

DeNet vision

DeNet changes a habitual view on data storage and creates an alternative to traditional cloud services within a concept of sharing economy that has already proved its necessity in many fields of life.

Millions of people all over the world use Airbnb service to lease or rent lodging, BlaBlaCar app for search of fellow travellers, Uber taxi reservation service (which was recognized the most valuable startup in the world that testifies the fact that investors acknowledge the economy of collaborative consumption as one of the main economic sectors of the future), eBay online auction and other products.

Online platforms,

that let people and companies share resources belonging to them, have already created the world market

$ 15 bln

and with growth prospect of up to

$ 335 bln
by 2025*.

Ideas of sharing economy have rapidly penetrated almost in all fields of life. A Chinese startup Sharing E Umbrella rents umbrellas per minutes; Storemate suggests sharing free home or garage space for storing your stuff, while a JustPark app helps drivers find or rent free parking spots.

70%

of respondents of survey, carried out by Nielsen marketing agency, have declared that:

excessive consumption endangers the planet and the society. And though they do not want to reject the pleasures of life, they want to consume in a more sophisticated way.

How DeNet technology works

DeNet develops a technology that will let mobilize and efficiently use excess capacities of existing IT-infrastructure on a global scale: millions of personal computers their owners use rarely or do not use to the full capacity.

We create a decentralized ecosystem using blockchain-technologies for data storage, websites and apps hosting and other computational tasks.

> The difference of DeNet technology from traditional cloud services lies in absence of a single data processing center.

Pieces of information are encrypted and allocated to multiple independent hubs. This is the basis of DeNet network. To provide integrity and security of data we use blockchain technology. No additional infrastructure and multimillion investments are needed for efficient use and scaling of the network – unlike with data centers, the growing capacities of which cause substantial harm to environment.

If needed, DeNet can localize the capacities within a separate enterprise or a country – for example, when it comes to legal requirements to store personal data of citizens on the territory of Russia.

*https://www.businessinsider.com/credit-suisse-sharing-economy-revenue-335-billion-by-2025-2015-11

Benefits of DeNet technology

1. Energy efficiency and reduction of IT-infrastructure costs;

2. Anonymity and revolutionary level of protection of commercial and personal information, reputation and personal data;

3. Increasing stability and working speed of software;

4. Scaling without creating additional infrastructure;

5. Possibility of using in different spheres (finance, healthcare, public sector, archives, telecom and more);

6. Creation of competitive environment (now the market is monopolized by huge corporations: Dropbox, Google, Microsoft, Box, Amazon, Apple; in Russia – Yandex and Mail.ru).

Like traditional cloud services, DeNet technology resolves the issue of storage of commercial and personal data of regular users, private companies, state authorities and organizations. However, centralized storage implies high costs and makes information vulnerable.

Benefits of services, based on DeNet technology, for users:

- simplicity and ease of use;

- privacy and confidentiality;

- availability;

- low cost.

Our solutions based on a concept of sharing economy will let millions of people all over the world not only rent idle capacities of their computers and earn on it, but become part of a global society, positively influencing the environmental health.

Why create new technologies?

We create our own technology, because there is still no decentralized / distributed platform that supports real hot data storage and executable services. For example, IPFS cannot be used for hot data; Etherium does not suit for hosting of sites etc.

Our platform consists of modules (Storage, CDN, Script, Hosting) based upon DeNet. Core. DeNet.Core is the major self-directed service determining the workflow of the whole system.

Why we do not use IPFS?

IPFS routing does not have optimizations for providing fast and reliable service of hot data, which implies a long delay and uncertain uptime. Furthermore, data in IPFS is accessible to all – if someone gets to know your address, he will be able to get all of your data. Besides, files cannot be deleted from IPFS; there are only functions "put" (save a file) and "get" (request a file).

On the other hand, IPFS does not have any economic model – everything is free of charge and there is no motivation for keeping data of other users.

We at DeNet want to build a more flexible and reasonable system.

Why master-nodes?

Our realization of the system presupposes implementation of master-nodes (or super nodes) as an interlayer between a user and a decentralized network. At first, master-nodes will be launched at our servers and at servers of our partners (GigaWatt, Daplie, Eggs etc.); later on each standard node can become a master-node if it has a good performance and a high rank for a long time. Master-nodes will also monitor the work of the system, distributing tasks for nodes, assigning jobs and checking their correctness.

It should be noted that master-nodes are not higher-ranking nodes of a network. They follow all the principles of decentralization. Practically each blockchain has master-nodes, e.g. there are mining pools in Bitcoin. In fact, mining pools are very powerful nodes, but in Bitcoin they exist for economic reasons.

In DeNet master-nodes are made for optimization of the work of the network.

Proof of storage

In order to ensure that a node is operating and stores data, we enter an algorithm of proof of storage. A node should provide hash of a file's part as proof of storage. Tuple (file, L, R) is a problem, where "file" is the name of the file that should be checked, "L" – the left margin of a hashed file, "R" – the right margin.

Nodes that do not provide proofs of storage will be penalized in accordance with a rating system and will not be rewarded for storage of this file.

Rating system

We use a reputation system as heuristic to lower costs of check of files' consistency and reliability. Reputation should develop in accordance with statistics obtained during tests of DeNet.Storage.

Current figures

To prove the idea's operability, in the end of 2017 DeNet presented an alpha-version of a shared static hosting; and a pre-beta version of DeNetStorage data storage – in July 2018. The final versions will be released in 2019.

As of today the company has successfully concluded the next phase of a pilot introduction of DeNet software at "Polimatiz" JSC (a daughter company of "Nizhnekamskneftekhim" JSC, part of "TAIF" group).

A preliminary evaluation showed that a DeNet development would let five times on average reduce costs of computer park maintenance of "Polimatiz" JSC and would significantly increase the level of protection of information resources.

To prove resistance of DeNet decentralized services to cyber threats, we conduct a full audit of systems via a complex blockchain-based cybersecurity platform Naoris (https://naoris.com/).

Since 2017 valuation of DeNet company increased from USD 1.25 mln to USD 20 mln (by DCF method).

Future of DeNet

Apart from technologies, DeNet has a 5-year economic model for 10 major markets where we are going to launch and initiate scaling of DeNet network. Our main market is Asia. We have a 3-year detailed development plan. Our code is in a private repository up to now, but our ultimate objective is a decentralized platform with an open source. All the above-mentioned information can be shared in accordance with an NDA agreement.

By 2022 the company plans to obtain 1 % of the global cloud storage market, starting expansion from markets of Russia, South Korea, Japan and China.

DeNet is an international IT-company with headquarters in Hong Kong and development department in Kazan (Russia).

- Reliable and motivated team is our key to success.

Cofounders

Rafik Singatullin

Chief executive officer

A Kazan state technological university's graduate (engineer). Over 15 years of managerial and entrepreneurial activity. Has a broad experience in development and introduction of innovations in industrial production. The founder and leader of innovative startups in manufacturing and construction.

Denis Shelestov

Chief technology officer

At the age of 20 he became an author of break-through IT-startups and innovative projects. Launched his first IT-startup in the ninth year at school – developed a project for automation of applications' screening for "olympic" programmers, that has grew into WillDev – a rating for programmers from all over the world integrated with a job-seeking service. Winner of the President of the Russian Federation award (2016), diploma winner of the XIX competition of the Republic of Tatarstan "Young programmer" (for WillDev project).

Olga Belonozhko

Chief operating officer

Graduated from European school of business administration (Riga, Latvia). Worked as a marketer in commercial companies, in South Korean corporation "Nuga Best". From 2012 to 2016 – chief executive officer at "Ilanit" company, partner of "Nuga Best" in Belarus. In 2016 was a coordinator of an educational IT-project for children "High Five" in Tatarstan.

Team

Our core team may seem small.
But we can vouch for each member's experience and competence.

Maria Titova

Chief financial officer

Amir Malikov

Business development Asia

Fail Zaripov

Core Developer, backend, security

Danis Sabitov

Core Developer, backend, security

Anton Polikasov

Core Developer, devops, miner-apps

Adil Amirov

Core Developer, backend, security.

Iskander Nizamov

Project manager

Meret Danatarov

Front-end Developer

Ramazan Mardigallyamov

UX/UI Designer

Advisors

Our consultants are a group of global experts in the sphere of technological development, economic and business processes management. Representatives of Microsoft, Google, IBM, MIT Lab, and NASA are among our advisors. All our consultants are part of the team and are directly involved in teamwork and achievement of set goals.

Andrey Kulik
Google, Switzerland

Enrique Martinez
NASA, USA

Jim Blasko
Aspire, USA

Simon Cocking
Irish Tech News, Ireland

Dave Carlson
Microsoft, USA

Кирилл Николаев
VIP Bitcoin, Switzerland

David Hwang
IBM, South Korea

Vasily Sumanov
Cointelegraph, Russia

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