iExec, The Cloud Computing Solution For Blockchain Developers

Tuesday 12 December, 2017

iExec is an innovative French startup which aims to ‘decentralize the cloud’, by creating a global cloud computing marketplace where anyone can rent out their processing power for profit.

What does that mean? What are the challenges of this decentralization?

‘Decentralizing the cloud’ means to move power from the giant companies (Amazon, Google, and alike) which control the cloud computing market today, to a network of smaller companies and everyday users.

It is not easy to explain what is going on behind the scenes, but let’s say that today’s centralized cloud model is slowing down the development of technologies whose demand is increasingly strong: smart cities, Internet of Things, artificial intelligence, virtual/augmented reality, etc.

The ‘cloud’ is basically a service, enabling you to buy computing power and storage over the Internet. Instead of buying the hardware yourself, you onlypay for using the hardware. The appeal of cloud computing solves the problem of companies having to buy a set of servers, but not using them to their fullest potential.

iExec, the decentralized cloud

iExec is short for ‘I Execute’, because iExec lets you execute your task in the cloud with competitive speed. Our approach to cloud computing is radically different to how things are done today. There are several reasons detailed below that explain why the model offered by iExec is safer, smarter, greener, and generally more optimized in every way than existing cloud solutions.

A marketplace for computing resources

A marketplace is a place where people can buy and sell things, and there are many different marketplaces on the Internet. By the Spring of 2018, iExec will have set up an online marketplace service which will allow anyone to offer their computing resources and interact directly with buyers. This enables users to trade with each other freely, which was not possible before.

On the provider side: servers and data centers can make their unused computing resources available in return for a fee in iExec’s internal cryptocurrency ‘RLC’. Alternatively, on the buyer side: applications and developers pay in the cryptocurrency RLC to access these resources. The price is negotiated between users: iExec does not intervene and does not receive any commission on these transactions.

RLC, the internal currency of iExec

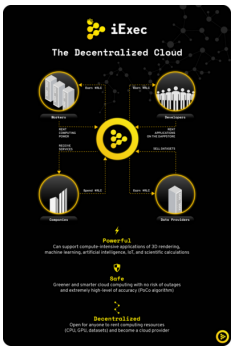
The cryptocurrency RLC gives access to the computing power of the network. RLC is an acronym for ‘Runs on Lots of Computers’. RLC is iExec’s native currency, and functions as a ‘utility token’ — a monetary transfer medium with a single purpose: buying and selling computing power on the iExec network.RLC is running on the Ethereum blockchain; if you are not familiar with blockchains or ethereum, I invite you to read this article which introduces Ethereum and also this one which explains what is called a ‘token’.

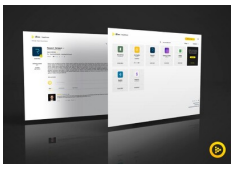
RLC launched on Ethereum on 19th April 2017 with 87 million RLCs in circulation. There will never be any new RLC created, meaning that the price of RLC will rise if more people buy and use it. RLC was created and distributed as part of a crowdsale iExec conducted in April to fund project development. During this crowdsale, iExec collected 2,761 Bitcoins and 173,886 Ethers: the equivalent of 12 million euros at the time. The price of RLC varies greatly in the global market, as you can see on Coinmarketcap . The valuation of RLC is an integral part of our business model.

If you would like to invest in RLC because you think the future of cloud computing will be decentralized, or just expect RLC to grow in value, you can read about how to do this in this blog post.

What is the benefit for users?

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To give a simple example, some websites use 3D animations that mobilise a lot of computational resources. Most of the time the calculations are done in data centers very far away from the user. The result is then sent to the user and the 3D animation is displayed. It all happens in a split second.

However, if the administrator of the website in question uses iExec, the end-user will ultimately get the same result, except that the whole package is more optimised, more reliable (i.e. fewer breakdowns) and less expensive to calculate. Therefore, it is potentially benefiting the end-user in cost savings and utilising a smarter and greener system.

The strengths of iExec

The project is based on the research work of Gilles Fedak, Haiwu He and Oleg Lodygensky. These three are all accredited researchers at INRIA, CNRS and the Chinese Academy of Sciences. They have been active for a long time in researching grid-computing, the technology which enables to decentralize computing. However, until now, their software has been reserved only to a small community of skilled scientists. It makes a lot of sense to open up this technology for everyone to use.

Infrastructures such as Amazon Elastic Cloud (EC2), for example, have the merit of already being huge today, but are complicated to use as well as expensive. Therefore, they are inaccessible to most people. By contrast, iExec allows everyone to utilize their own resources.

On the other hand, data centers consume a lot of electricity and generate massive amounts of heat, which costs extra energy to dissipate. The current model is simply not viable on the long run. We have a partnership with a French company, Stimergy, whose objective is to smartly distribute servers throughout cities. The servers are used as radiators, water heaters, and alike. Imagine using an application on your phone while its data is processed in your neighbour's heating system!

We know that there will be more than 50 billion connected devices in 2022. We also know that in this era, centralized structures (data centers) cannot keep pace. Processing and storing data near one's location is a key element and iExec supports this trend.

Finally, iExec is a Franco-Chinese project and we are very proud to be accompanied in the accelerator of Tsinghua University in Beijing (the Chinese equivalent of the MIT). iExec was also among the six startups selected this year by the French Ministry of Foreign Affairs to participate in the NETVA Program in San Francisco in October 2017, in particular to adjust our approach to the US market and meet different potential partners.

Dapps: a new generation of applications

The decentralized cloud opens the way to a whole new generation of applications based on the Ethereum blockchain called 'dapps' for 'decentralized applications'. By design, the capacity of the Ethereum blockchain is limited to applications with very low computation requirements; iExec increases the computing capacity for all these new decentralized applications. iExec successfully released its SDK v1.0 named 'The Wanderer' at Devcon3 2017. It enables developers to deploy and execute complex applications for off-chain execution. In addition, RLC tokens can be earned by renting applications on the blockchain.

What's next?

The release of the first version was carried out successfully and the first decentralized applications are currently being written to run on iExec.

On the journey of becoming a cutting-edge cloud network, iExec will launch the first-ever App Store for decentralized applications in mid-December. The targeted sectors are applications focused on AI, big data, IoT, fintech, and green IT.

SDK v2.0 will be released as the next iExec milestone in May 2018. At this point, users will be able to rent their computational power to the iExec ecosystem applications and earn revenue.

In order to boost the development of applications on the blockchain, iExec announced that it has reserved a prize pool of $150K to be distributed among different dapp projects. Doors are open to dapp project proposals, and the team is ready to fund and support the most promising ones. Ethereum developers can learn more about this challenge on its dedicated blog post.

These are exciting times for blockchain development and decentralization enthusiasts, and iExec is

already writing the first chapters of this story.

- Github: https://github.com/iExecBlockchainComputing
- Katacoda: https://www.katacoda.com/sulliwane/scenarios/hello-world
- Slack: https://iexec-team.slack.com/
- Reddit: https://www.reddit.com/r/iexec/
- Twitter: https://twitter.com/iEx_ec
- Facebook: https://www.facebook.com/pg/iexecteam/
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