



CONDENSATE

The Future of Environmental Awareness

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Introduction

RAIN

RAIN is the currency that was minted to serve the translation layer of the Condensate Blockchain.

As a species, humans have evolved through necessity, with each step leaving its mark on the Earth. In many ways, these advances have revolutionised human behaviour. We no longer concern ourselves with long journeys due to vehicles. Scarcity of food is becoming a thing of the past due to intelligent crop systems. Heating and electricity are more abundant across the world than they have ever been due to fossil fuels and the harnessing of renewable energies. With each step forward in technological innovation it becomes more necessary to adapt our behaviour in order to continue this progress.

Condensate began as a concept to continue this progress through environmental awareness, in order to monitor and reduce the marks technology leaves. It brings this dream into fruition through the incorporation of the Blockchain in a beautiful and seamless blend of technology and nature.

Bitcoin has spawned the creation of altcoins (cryptocurrencies built from bitcoin's underlying code), customized to provide a number of services, products, and devices with real-world use. Open ledgers provide a transparent system in which anyone can see another's activity, without divulging one's personal identity. This model can be replicated to protect both the environment and those who wish to speak out against environmental destruction.

Condensate uses a peer-to-peer network, which can be concentrated into a nexus of IoT-devices operating amongst one another to check for valid blocks and checkpoints. RAIN is transmitted between devices, with a primary 'node' monitoring transactions and outputting this data at given intervals.

Along with RAIN being transmitted through the network, we are actively integrating water quality metric tracking into the Data Layer of the Condensate Blockchain. With these metrics tracked and recorded across Condensate Blockchain, we enable environmental watchdogs and scientists to monitor technological impact on our planet, and help fund research in the field, in real time.

Abstract

A transparent, unregulated, distributed P2P system utilizing proof-of-work and proof-of-stake as of block 200,000. Multiple hashing algorithms, stealth addresses, and encrypted messaging encapsulate a secure network from which transactions can be made privately, and information can be released anonymously.

Target Audience

Being pioneers in this space, it's natural for us to engage with both science and technology in order to better understand and predict the world around us. The goal of RAIN is to fund innovation in the IoT world - one which combines technology and nature - to better understand the world around us and protect the environment from human negligence. By empowering our audience with our simple and incentivising technology, anyone can contribute to this cause.

RAIN Devices

The original IOT concept envisages RAIN meter devices as water gauges (pluviometers) capable of assessing both rain precipitation rates and water quality, through data collection retrieved by environmental sensors. As a starting point, the most important parameters to monitor will be precipitation rates, pH levels (acidity), temperature, and electrical conductivity (as indirect measure of mineral content). However, modules with additional functionalities such as atmospheric pressure, geographical localization, and underwater/underground data retrieval, will be added as necessary, according to a community-based voting system.

The development team heavily encourages do-it-yourself (DIY) and open source initiatives. This means that anyone can step forward and contribute to improving RAIN devices. In this sense, the RAIN meter DIY guide will be open to the community, in order to allow for evolutionary variants of the IOT meter. Ultimately, users living around the globe will be able to follow the guide, adapt it to his/hers particular needs, and even submit new guideline proposals. This will be achieved via social networks and collaborative work platforms. The official DIY RAIN Meter Guide for urban or suburban sceneries will soon be officially released, as well as an off-grid version for those tracking wilderness or jungle terrains.

Nodes

RAIN meters will be configured as masternodes to send information throughout a live-stream data network based on the blockchain technology. Data will be used for scientific analysis, promotion of environmental awareness, and to level up our responsibility in how we interact with Planet Earth. An incentivised system will be adopted, ensuring network stability, as well as global metering consistency. Our ultimate goal with this technology is to ensure a healthier environment across the globe, providing incentive to those who commit to cleaner environmental standards, and potentially highlighting ambiental violations in real time.

Hardware

The standard template we will base the DIY RAIN Meter Guide on is a Raspberry Pi, as it is lightweight, affordable, yet extensible. We will partner with an official supplier (Roadmap, 2018) of waterproof sensory devices for pH level, temperature and electrical conductivity. As stated previously, these are the first metrics we wish to track, and will ensure that any

additions wished by the community or RAIN Meter Masternode Holders can be easily adapted onto the device.

The device will run headless with the wallet activated for staking and syncing the blockchain, as well as with the Condensator application as a middleware between the sensory data inputs and the Blockchain.

Condensator

The Condensator is an open source application that “condensates” live water readings from the sensory inputs. The metrics streamed through the Condensator will be parsed and organized into usable data points to insert into the Condensate Data Layer of the blockchain. This data is then available across all devices on the node. In 2018 and 2019 we plan to build web and mobile interfaces for accessing this data in real time. This application will be called "The Umbrella".

Umbrella

The Umbrella application will be built to communicate with the P2P Condensate network, in order to provide data interface to end users, as well as analyze data in real time. Using machine learning and AI algorithms, we aim to implement an alert system for environmental infractions even before they happen. With the alerts and data distribution, we can obtain a comprehensive overview of global environmental health.

Use Cases

The main use of RAIN meters will be as pluviometers that can assess water acidity, temperature and conductivity. These parameters are useful to determine environmental/air pollution, global warming, and metal contamination. Sensors can also be placed near water sources for monitoring a stream potentially polluted by industrial or agricultural runoffs. Multiple meters can be chained simply by placing a control device upstream, and a few nodes downstream. Installing RAIN devices at different points will allow monitoring of parameter fluctuations, thus facilitating detection of the source of the issue.

On the opposite side of the spectrum, cooperation with industrial companies could be a crucial feature. In this reality, the RAIN ecosystem may be used as a means of monitoring liquid transportation through pipelines. RAIN nodes can be placed on the pipeline at a set distance apart, each node transferring RAIN to the next at a set point in time. This transfer would coincide with the flow of chemical compounds, and any fluctuations or halting of transactions can point to a leak at a specific location, allowing for quick repair and mitigating environmental damage.

The blockchain model that Condensate uses allows for transparent and reliable data distribution, which in turn can be used to incentivise environmentally friendly agricultural or corporate practices, or to pinpoint potential offenders of environmental legislation.

Technical Blockchain Specifications

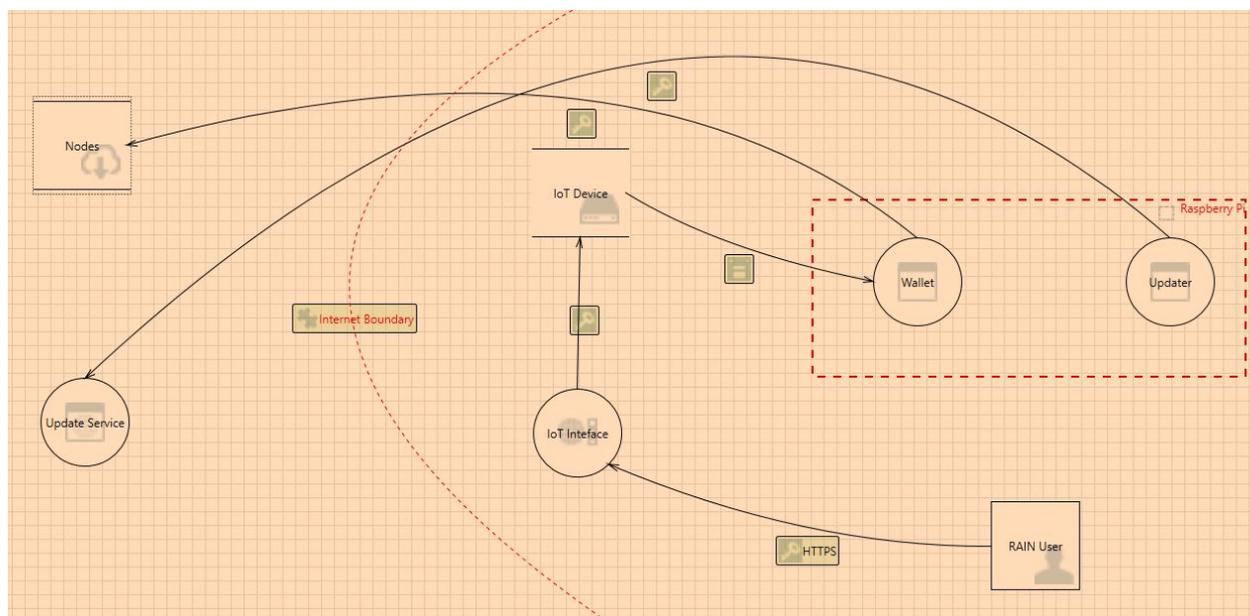
As of block 200,000 proof-of-work ceased. RAIN now operates solely on a proof-of-stake system, where rewards are generated to those holding RAIN on a single node.

RAIN was originally built on the X11 algorithm with new blocks every. New blocks come every 60 seconds and there is a max supply of 500,000,000 RAIN. The yearly Proof of Stake Reward Percentage sits at 200%.

Security

Security of the Condensate device is paramount. IoT vendors in general have a bad reputation for spending zero time on ensuring the hardware and firmware cannot be trivially compromised and **we're going to up the game with RAIN**.

Therefore, we want to be transparent about our plan to secure both the device, the wallet and any code written to support the Condensate project. Protecting against buffer overflows, injection bugs or leaking of credentials or other secrets is the primary goal here. And the only way to be effective at doing so is thinking deeply and executing on specific security tasks that will actually mitigate these types of issues.



Code quality and security guidelines

- All new commits should be reviewed by at least one person other than the committer
- Any additions/removals/modifications where we consume user input, involve security features or store sensitive data must be heavily scrutinized

- Unit tests and security tests should be created for new code and ideally retroactively written for existing routines
- Input validation checks should be prevalent throughout the codebase, especially around externally tainted data (not data generated internally or constants)

Device security guidelines

- Communication must be encrypted where necessary and standardize on HTTPS
- Firmware updates must be checked for integrity to protect against tampering
- Web interface must be secure against OWASP Top 10 attacks
- RAIN users (aka RAIN Makers) must be able to protect their device with authentication
- All debugging interfaces must be locked down before device is released

Your trust is our priority. How many other projects even mention security in their whitepaper, other than buzzwords or empty promises? We have a plan and execution strategy.

Background

The RAIN project is less than a year old and has seen consistent and steady growth since its conception. The community is the backbone of everything we do, and from it comes a small core team tasked with managing the success and development of various aspects of the project. In spite of RAIN's relative infancy, the project has gained immense popularity as our supporters acknowledge not only the potential future of PoS authentication, but also our vision of a more environmentally responsible society.

Get Wet with RAIN Funding

Todo: Incentivising educational teams and environmental startups to use the RAIN network in their projects.

Educational Funding

Startup Financing

Masternode IoT Funding

Get Caught in the RAIN

Wallets

Wallets are currently available in: Windows, Mac OS, Linux, Source, and Bootstrap compatibilities. iOS and android wallets are currently under development.

Exchanges

Currently RAIN can be purchased with Litecoin (LTC), Bitcoin (BTC) and Doge coin (DOGE) on Cryptopia, NovaExchange, and CoinExchange.

The team is working hard on further developing our product and expect to increase RAIN's availability to trade on additional exchanges.

Development Roadmap

The development of RAIN is always changing and we often find additional abilities/technology we wish to add to our project. Below you will find the current roadmap we are following. However, Condensate is always looking to evolve and grow with new technologies, and so this will adapt as we add further items to our project.

2017

Q3

- [done] Rain Crafters Recruitment Drive
- [done] gathering basic requirements for IoT Rain Meters
- [done] Whitepaper drafting

Q4

- [done] Roadmap release
- [WIP] Prototyping of IoT Rain Meters
- [WIP] Whitepaper Editing and Release
- Organization of community management
- RAIN Reward Estimator Calculator
- Social media platform expansion
- Feature development roundtable TBA

2018

Q1

- Create "The Well" major feature upgrade

- Mobile wallet(s) wireframing
- Major visual updates to wallet

Q2

- Austin visit Mohan Allam and Dr. K. Padma in India.
- First “MVP” Rain Meter DIY guide released
- Major visual updates to wallet
- Beta release for mobile wallet(s) (Android, iOS)

The Future

As we progress we hope to partner with corporations and the scientific community in order to implement and encourage use of our RAIN meters.

Once happy with our progress in relation to water, we hope to incorporate this concept into devices targeted at monitoring soil and air pollution in order to raise awareness of, and protect from, dangerous materials in environments.