The Digital Assets Power Play Whitepaper

Technology building blocks for digital assets trading automation

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This Whitepaper outlines the Digital Assets Power Play platform structure and building blocks. We will outline the design and architecture, with a high level overview of the platform including the backend, frontend, solution and blockchain technologies used. The Whitepaper should give the reader a better overview of how the platform will be designed, how will it include third party building blocks and enable a distributed economy.

Abstract

The Digital Assets Power Play (hereinafter: DA Power Play) platform provides the required building blocks and services to enable digital assets trading automation. The DA Power Play platform is organised around different stakeholders, wallets and distributed computer nodes aiming to provide a balanced trade-off between availability, transparency and efficient (quick) algorithm execution and digital asset management. The DA Power Play platform enables a new distributed economy allowing stakeholders to seize algorithmic trading and investment opportunities in an optimally secure and distributed fashion. As we are building the distributed economy ecosystem, the DA Power Play Platform will be designed as a combination of the Blockchain and the distributed systems architecture. We believe that such a solution offers the right balance of transparency, system availability and I/O throughput.

- *The Blockchain building component will be based upon Ethereum smart contracts – wallets, tokens themselves and a web 3.0 stack (swarm, ens/eth, bzz).*
- *The distributed system components will be based upon hybrid cloud, legacy databases, Node,js, C language, messaging/communication protocols such as WebRTC, Whisper and IPC but also different data streams where applicable.*

Within the Whitepaper, we will outline the building blocks of the DA Power Play Platform.

I. The Introduction

When we started with crypto investment strategies and developing KIP's Eye System more than 2 years ago, there were only a handful of crypto currencies and exchanges, with relatively small daily trading volumes. At the time, it was possible to trade and manage these assets manually. However, early on, we have started to realize that volumes, the number of digital assets and exchanges are going to increase, requiring us to automate our trading. As such, we have begun to design our KIP's Eye system to address these issues and automate our trading. Our current trading strategies have led us to design our own Neural Networks and Artificial Intelligence agents enabling us to predict future token/coin price movements with a great certainty and accuracy.

At the time of writing (August 2017) the number of digital assets has exploded, increasing to over 850 and it will continue to expand to well over 2000 within the next two years. With such rapid growth, collecting market data (trades, order books) has become a complex task in itself, requiring fast data collection and storage running in TBs of data per month. Additionally, data needs to be parsed, processed, analysed and used for trading, and all trades and digital assets need to be accounted for, with correct risk controls in place. We believe that designing and developing such a system from scratch represents a great obstacle for most stakeholders, and once fully developed, difficult to replicate. Such data collection and platform service offers should be done on an industrial scale and presented to other market participants as a distributed economy where all stakeholders will benefit.

In the meantime, the number of exchanges has increased to over 100 and continues to rise. Exchanges are facing issues of downtime due to maintenance, attacks, or even regulatory issues locking out trading during exchange downtime and resulting in unavailability of digital assets and potential losses. We also believe that the platform should address these exchange downtimes by offering a single API multi-exchange access. By having multi exchange access we will be able to address exchange downtime, liquidity issues and digital asset lockdowns. Additionally, due to distributed system architecture, the platform itself should be resistant to attacks, offering greater availability and uptime for all stakeholders.

Currently, investing into top performing or portfolio-optimal digital asset strategies is a very complex process, and more often than not it's hard to find an easy route into such an investment. By providing the building blocks for strategy design and trading automation, and by making the results of these strategies visible, investors will have an easier route into making a decision and invest into digital assets. This will allow investors to excel in their overall portfolio structure and returns. Smart contracts – wallets will represent a bond of trust between investors and strategy owners/digital assets managers.

We also believe that one type or set of services is not "one size fits all", and as such will open building blocks to developers and third party providers, allowing them to design these additional building blocks and integrate them with the platform as a service. By enabling third party building blocks we believe that the platform will become truly scalable, allowing for numerous trading strategies and platform features.

Current market solutions provide DIY services where the user is only a stakeholder using the service to create, run, and invest in strategies. There's a need for a new distributed socioeconomic platform backed by new technologies and smart asset allocation. We recognise this need for establishing different wallet types addressing stakeholder's needs, but also for creating different combinable building blocks by following Unix philosophy.

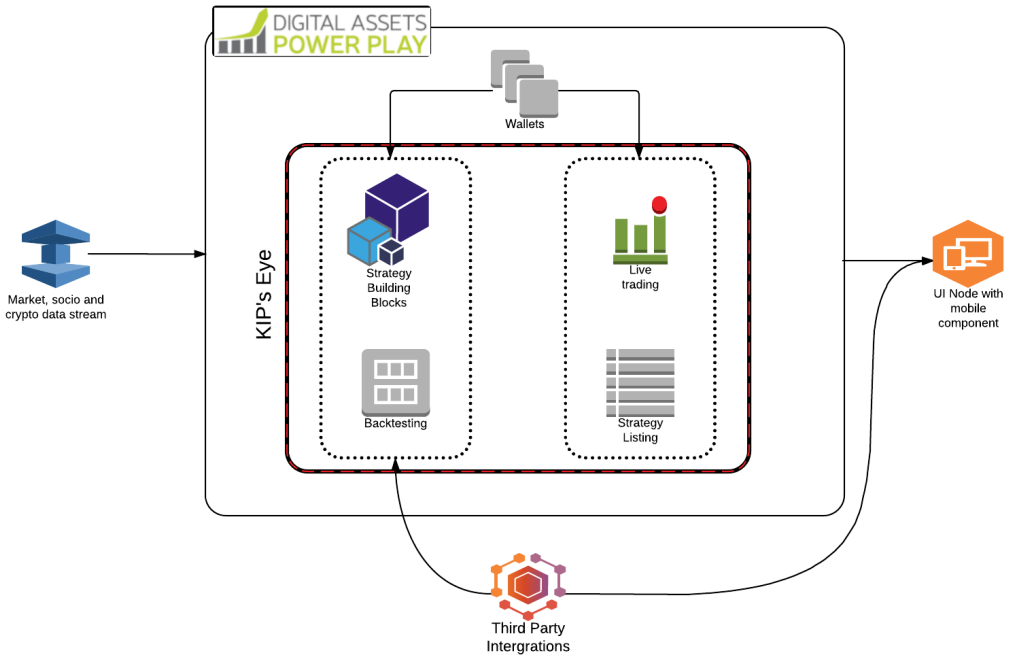

Figure 1: *General system architecture*

II. The Platform

As stated the DA Power Play platform will have to address all the obstacles mentioned above by utilising Blockchain technologies and legacy distributed technologies.

The general system architecture of the platform's building blocks and components are shown on Fig. 1.

The DA Power Play Platform is a distributed system in nature, having many building blocks and components working together, primarily Wallets, Kips Eye Platform Backend, strategy building blocks, an Ethereum-powered user interface node, and arbitrary amounts of additional building blocks built for the user interface or Kip's Eye Platform Backend. The DA Power Play Platform will also allow for third party building block integration and service offers on the platform.

i. Combining Blockchain and legacy technologies

Due to the limitations of Ethereum technology in block time execution (14 seconds, or 4 seconds on the Kovan test network, which we are following closely, but still not quickly enough for the transactional requirements), and challenges in communication from the Ethereum network with the outside world the DA Power Play platform will be a combination of blockchains designed to provide financial transparency with Kip's Eye Platform Backend and other building blocks to give the algorithms required processing power and tick speed in order to compete with other automated systems, all of this while enabling the platform user's nodes to collect and confirm market data and deploy new algorithms and building blocks. We are actively investigating multi-chain solutions and emerging inter-chain standards.

ii. Speed of execution

By carefully combining in-memory data processing and collection with geolocation system distribution, we will achieve optimal speed when accessing and processing market data. In-memory capacity for QPS (quotes per second) is expected to be at 1 million QPS and can be further scalable.

Efficient communication channels/protocols are employed on multiple levels (inter-process, inter-node) to allow for high-speed, real-time market and social data collection, optimisation, and analysis.

iii. Geo Distributed nodes

Developed automated trading strategies will be dockerised and deployed to the most geolocation-optimal server ensuring the shortest ping times for exchanges and users. Also, optimal network routes are prepared to have the shortest path between platform components and exchanges. Naturally, all these nodes will be geo redundant with a multi-site clustering relying on a hybrid cloud solution.

iv. Wallets

Wallets are Ethereum based smart contracts designed to hold and manage platform assets. The DA Power Play platform will provide the following wallets: Public Wallet, Strategy Wallet, Operational Wallet and Private Wallet. The minimum number of legally required KYC and AML procedures will be implemented.

iv.1 The Strategy Wallets

Strategy Wallet has the following functionalities:

- A deposit function to receive the funds for strategies and forward them to Kip's Eye.
- A constantly updated list of all strategy supporters with the amount supported
- Strategy information such as performance, assets under management, etc
- A withdrawal function for the returning of funds to the strategy supporters
- Definition of strategy owner's fees for supporting their strategy
- Domain "mystrategy.dapowerplay.eth"

iv.2 The Public Wallet

As the Public Wallet is designed to provide additional funding to strategy owners and to backing the best strategies, whilst reinvesting appreciation and provide liquidity. The Public Wallet will have similar functionalities as the Strategy Wallet but on a grander scale. The Public Wallet has the following functionalities:

- A deposit function to receive funds for strategies and forward them to Kips Eye,
- A constantly updated list of all strategy supported by Public Wallet with supported amount
- Strategy information for all backed strategies such as performance, assets under management
- A withdrawal function for returning funds to the Public Wallet
- Domain publicwallet.dapowerplay.eth

iv.3 The Private Wallet

The Private Wallet is designed to hold digital assets for investment in Strategy Wallets. As such, it is crucial to obtain fast exit and entry into other strategies as well as maintaining records of performance (for both single strategy investments and total investments). Private Wallets will need to have transparency and be very responsive. You will be able to withdraw and deposit from your Private Wallet whenever you wish - DA Power Play will only withdraw funds with your explicit approval, such as when supporting strategies. The Private Wallet has the following functionalities:

- Dual ownership, equally by Da Power Play and you.
- A deposit function to receive funds from others strategies and forward them to Private Wallet,
- Constantly updated list of all strategy supported with the supported amount
- Overall Wallet and single strategy informations
- A withdrawal function for returning funds to the Private Wallet
- Domain myprivatewallet.dapowerplay.eth

iv.4 The Operational Wallet

The Operational Wallet will be transparent meaning that it will be publicly visible information showing performance, assets under management, etc. Although transparent,the Operational Wallet will be designed to support the costs of the operations. The Operational Wallet will have basic functions that will provide transparency through a domain: operationalwallet.dapowerplay.eth.

v. Kip's Eye Platform Backend

In order to deploy automated investment strategies, one must obtain data, parse it and run analysis. To gather the required resources KIP's Eye © will function as a hybrid cloud that comprises of servers across the globe that will collect, analyse, and store data, and ultimately execute strategies. Another requirement is to maintain high data quality and to enable fast data access and execution.

The Kip's Eye © will perform in a distributed manner, so rather than creating a single monolith, the system architecture is divided in to several distributed modules. Every module represents different tasks in creating and executing fully automated strategies.

The Kip's Eye © modules are as follows:

v.1 The Collector

This module is used to collect data from the exchanges, hence it is known as the Collector. Due to the distributed geo locations of the exchange's servers, the aim is to provide the shortest and fastest route from exchanges to platform stakeholders, providing platform users with timely information about the state of digital assets across exchanges and alongside trades and order books. Additionally the Collector will analyse and parse data in order to achieve the highest data quality, ensuring high integrity of the data, as well as data uniformity. Data will be propagated through to the other modules of the system as well stored into a database where it will be used for further analysis and back testing.

v.2 The Calculator

The purpose of this second module is to calculate all required technical parameters that will be used in the decision making processes within every automated investment strategy. As with the

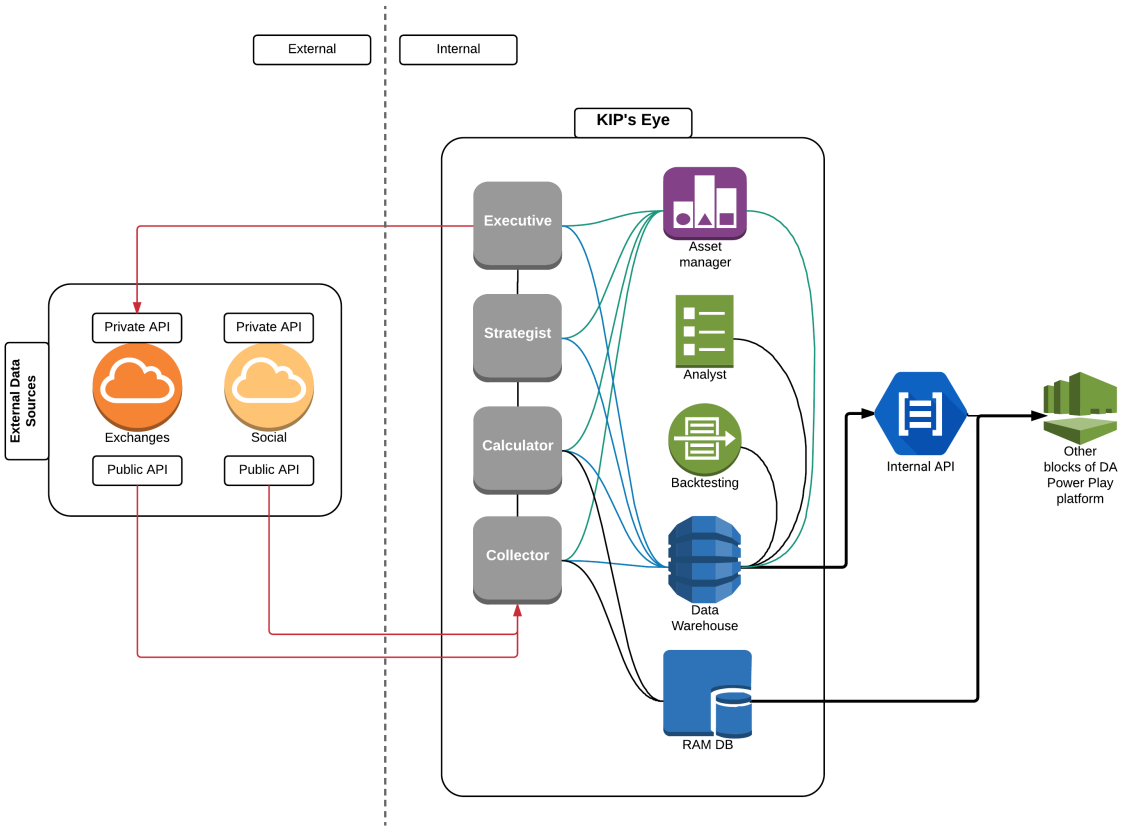

Figure 2: *Kip's Eye © software Architecture*

Collector, the Calculator will have functions that will send calculated data through other modules and also store calculated data in a database for future use.

v.3 The Strategist

This third module will store logic of automated trading strategies, and based on the calculated and raw information of the state of digital assets across exchanges, it will decide what action should be executed. Based on these decisions, information will be pushed into the next module and stored in the database.

v.4 The Executive

Since information regarding account access keys is most valuable, it's of the highest priority to protect this information with strong security measures. The fourth module will execute actions that were approved and validated by the Decision Maker module, hence it is called the Executive. Also, when actions are executed, this information will be stored in a database for backtracking and future analysis.

v.5 The Asset manager

This is a special module for surveillance and management that will provide end to end process stability and data integrity. Furthermore, it will provide risk control and it will be in charge of cancellation of tickets/actions that have already taken place, therefore optimising risk and system usage.

v.6 The Analyst

The Analyst will be in charge of reporting, back office and preparation of backtesting. This module will also provide strategy parameters (performance, assets under management, strategy owner's fees, etc).

v.7 The Backtesting

The DA Power Play Platform will provide strategy validation and backtesting for all developed strategies. Validation and debugging will be made available for drag'n'drop strategy building blocks.

Backtesting will be possible on available historical data per exchange. We will have several exchanges and historical data available, and will collect as much data for exchanges as required.

v.8 The User interface node

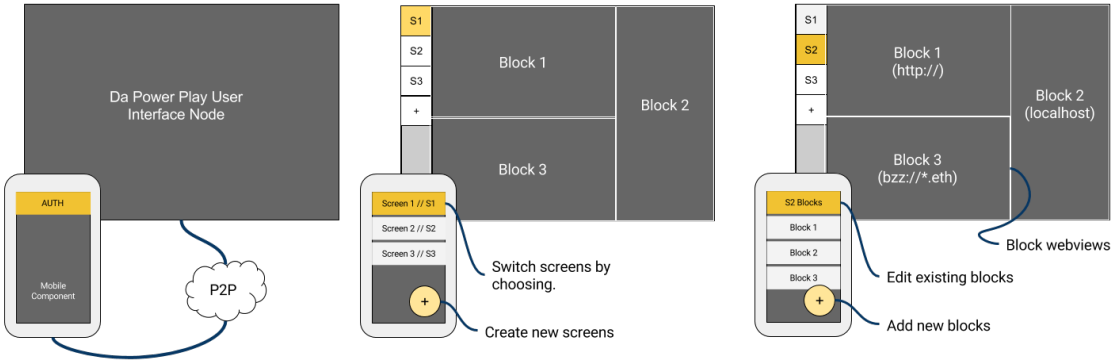

Figure 3: *Desktop app with tightly coupled mobile component*

This is the user's entry-point into the platform, featuring innovative modular UI, a code editor, node editor, and custom personal screens. Tight coupling between mobile and desktop versions allows for quick screen switching and creation without constantly having to use your computer, but also for secure user identification. The User Interface Node is fully web3 powered so you can create, browse and integrate favourite Dapps. The User Interface Node also features a drag'n'drop strategy editor.

The DA Power Play Platform will utilise Electron Framework for the User Interface Node and webRTC for real-time comms between UI nodes. Electron is based on CSS, HTML5 and JavaScript , enabling customisation of UI screens based on stakeholder preferences.

v.9 The Plug-and-play building blocks store

The DA Power Play platform will be open to developers and third parties to develop and integrate their building blocks, enabling additional services on the platform. These building blocks can be deeply integrated with the platform, providing either API access for a programming language strategy designer or new building blocks for a drag'n'drop strategy designer.

Swarm will be used to store data, and where applicable, display open source code for these building blocks.

Code and libraries are developed and tested and thereafter packaged into containers with docker files. Once deployed, they will be available on the DA Power Play platform as a service. This enables the DA Power Play Platform to easily deploy and integrate third party building blocks with the platform.

We will partner with other industry services and providers in order to have the right building blocks that will empower users, providing them with a powerplay over the rest of the market.

The Ethereum Name Service and our own eth subdomains will be used for adding these building blocks, so for example, santiment.dapowerplay.eth is an example of a building block where payment for such services can be directly payable in DA Power Play tokens to this domain, rather than just a wallet address.

III. The solution deployment

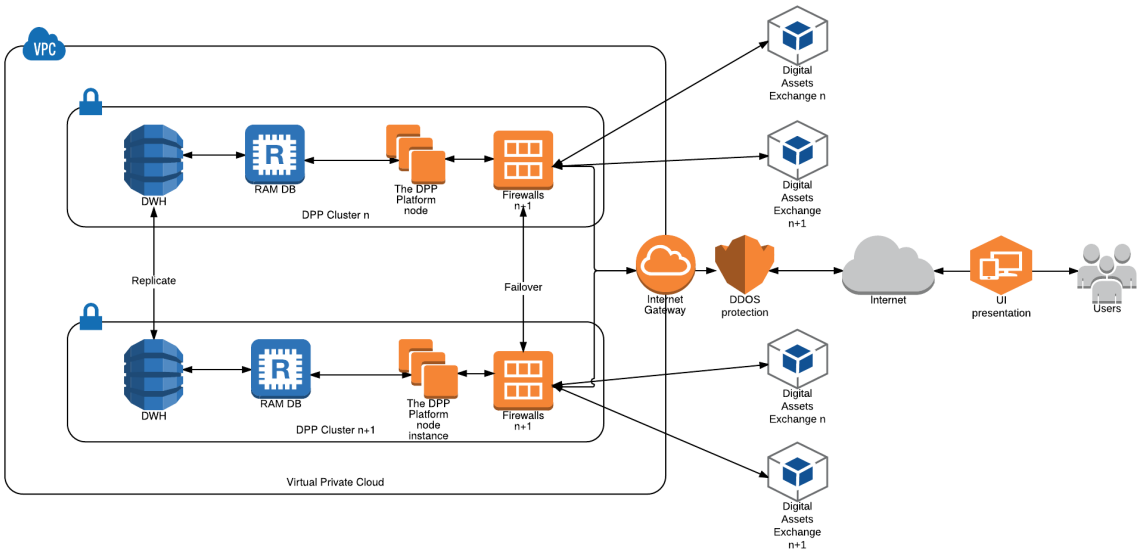

Figure 4: *Hybrid cloud architecture*

The DA Power Play Platform will be run on a hybrid cloud architecture that will be geo distributed, having redundant nodes and security. This hybrid cloud will be formed from custom hardware and public cloud services, providing a redundant failover mode, collocated at data centres, it will have implemented security and a firewall, DDOS protection, redundant networking through BGP, and wherever possible static tunnel (IPSec or VPN) routes to the exchanges. As the

DA Power Play Platform is utilised, the architecture is scalable to allow for a future growth.

IV. The conclusion

By combining a proven solution, expanding it with blockchain technology enabling, having a scalable system architecture, and third party access to building blocks for the DA Power Play platform, we will "democratise" algorithmic trading and be able to build our distributed economy based around our stakeholders.