



## EVOLUTION IN TRADING

### A MULTI-STRATEGY CRYPTO INVESTMENT ECOSYSTEM

Last updated July 17, 2018

KRONOS will revolutionize the hedge fund industry through the development of a multi-strategy, transparent, and democratized trading and asset management ecosystem to facilitate investments into cryptocurrency and other digital assets. KRONOS provides a technological bridge between two wanting parties: cryptocurrency investors, and portfolio managers (or traders). Investors hold cryptocurrency and other digital assets and seek a diverse set of returns; traders have the ability to manage such assets but lack the resources to obtain and administer it.

For subscribers to the platform, KRONOS provides democratized access to sophisticated strategies normally reserved for the elite. Subscribers are able to allocate capital across strategies ranging from quantitative to discretionary, and from short-term “alpha-based market making” to long-term “smart beta”. They are also provided deep guidance on the correlation between investments – a crucial aspect which investors otherwise overlook.

KRONOS is able to recruit top-notch traders by streamlining the trading process. The KRONOS solution reduces the inefficiencies associated with paper-driven processes and fund raising and allows traders and asset managers to focus on their performance by standardizing how strategies are allocated and evaluated. Portfolio managers are compensated according to a flexible formula which has roots in agile trading firms, incentivizing the most stable and highest performing strategies.

KRONOS is built on a distinct two-token model. First, we begin by issuing a utility token for the core trading entity which provides access to the platform and certain governing functions through smart contracts. Secondly, security tokens which represent tokenized units of each mature strategy will be issued to subsequent investors. This structure gives KRONOS flexibility in its initial technological and community development, whilst appealing uniquely across specific investor types and targeted jurisdictions.

## CONTENTS

1. Introduction
2. What is KRONOS?
  - a. KRONOS as a digital asset management solution
  - b. Dual token structure
3. The KRONOS platform
  - a. Token dynamics
  - b. Building a diverse set of strategies
  - c. Decentralized fund management ecosystem
4. KRONOS child strategies
  - a. What is a child strategy token?
  - b. Why a security token?
5. Token economics
  - a. Why does KRONOS need a utility token?
6. Initial strategies
7. Alpha-based algorithmic market making
  - a. How does it work?
  - b. Price prediction
  - c. Execution & trading
  - d. Risk management
8. Interaction between strategies
9. Evolution towards decentralization
10. Roadmap
11. Competition & industry comparisons
12. Team
13. Disclaimer

## 1. INTRODUCTION

The crypto ecosystem has grown tremendously over the past decade, but its potential as an asset class for investment is still in early stages. Most crypto investors follow a relatively simple buy-and-hold strategy, and despite the recent rise of ICOs, investors – and their portfolios – largely rise and fall together.

This is problematic for the industry's long-term outlook. While bull markets attract widespread attention and media coverage, down markets coincide with a rapid loss of interest as all investors are uniformly impacted. Volatility increases as investors chase the same set of returns and opportunities. More importantly, this type of marketplace dampens new investments and productivity: as popular interest ebbs, fund raising, recruiting, and regulatory progress all become much more difficult. Uncertainty discourages new investors, entrepreneurs, and employees from committing capital and labor into the blockchain economy.

As a strong contrast, we can compare cryptocurrencies against the mature equities market. Quantitative long-short funds, market neutral strategies, and multi-directional leveraged instruments ensure that there are ways for investors to profit in any market environment. While equities are still exposed to business cycles, the availability of more complex products means that investors are able to price in macroeconomic factors more efficiently. This moderates instability, increases economic predictability, and promotes business growth.

In order to strengthen the cryptocurrency ecosystem, we need to usher in a world with more sophisticated investment options. Investors are demanding ways to take a more diverse set of risks, and they need trustworthy options to do so.

We introduce KRONOS, a multi-strategy investment vehicle which will herald the industry's maturation as an asset class. We intend for KRONOS to become an accepted way of investing in the space and a gateway for attracting the best talent into analyzing and trading blockchain assets.

Eventually, we anticipate KRONOS to move past cryptocurrencies towards disrupting the traditional investment management space as well. Through a decentralized approach to asset allocation and fund management, we can address some of the industry's core deficiencies.

## 2. WHAT IS KRONOS?

KRONOS is a platform and multi-strategy ecosystem for the asset management industry.

The KRONOS platform is powered by two types of tokens: an ERC20 utility token for the **core KRONOS platform**, and security tokens to be minted and issued for each of the **child strategies** implemented on the platform.

### 2.a. KRONOS as a digital asset management solution

KRONOS is built to support and employ traditional multi-strategy hedge fund strategies in a blockchain-friendly way. All assets are held securely by the core KRONOS entity, but individual portfolio managers dictate how investments are made through our trading infrastructure. Portfolio managers are allocated small amounts of capital to start, and are given more as they demonstrate performance.

Recruiting, or partnering with, capable portfolio managers is the most important function of KRONOS. KRONOS needs to be able to attract high-quality talent, identify the managers with the strongest potential, and retain its most successful managers over time. KRONOS accomplishes this through a reputation protocol, quality support functions, a reliance on data-driven analytics, and an open and fair compensation system.

Support from the KRONOS entity is a major benefit to portfolio managers, as it performs functions which are tangential, but essential, to trading. Dedicated KRONOS personnel handle operational duties relating to tax, accounting, marketing, and trade reconciliation. KRONOS also aggregates the costs of maintaining high-quality market data, establishing connectivity to exchanges, the development of research infrastructure, and the recruiting of new team members. KRONOS gives portfolio managers the autonomy of managing a hedge fund within a structure that is much easier and cheaper than if they were to create and run one on their own.

We are steadfast in our adherence to regulations. Our platform will be registered and licensed as an asset and fund management company in a well-regarded jurisdiction. More details on this will follow as we develop and share our regulatory roadmap.

## 2.b. Dual token structure

The configuration above has been executed successfully in a similar fashion across many of today's top multi-strategy hedge funds. However, these elite funds are generally closed to the investing public, and participating in them as an investor carries many requirements and restrictions.

KRONOS builds upon and disrupts this structure through a **blockchain-based two-token system**. The *parent token* is a utility token which provides access to the KRONOS technological platform which, over time, nurtures and oversees fund managers. The *child token* represents a unit within a tokenized and redeemable interest in the asset pool and performance of an individual strategy. It is a security token that will be issued by the strategies and fund managers of the KRONOS platform.

The utility token provides significant usage functions within the KRONOS ecosystem, a few of which are as follows:

- (a) It is an ERC20 token and allows for programmable interaction with our open-source smart contracts
- (b) Compatibility with Ethereum wallets
- (c) Medium of exchange within the KRONOS ecosystem for discounts on management and performance fees
- (d) Access to governance and voting procedures for the direction of the ecosystem and its strategies
- (e) Staking mechanics towards asset allocation decisions and our reputation protocol
- (f) Payment and petitioning for strategy specific benefits, such as market-making services
- (g) Rewards and loyalty benefits, such as certain priorities during the issuances of new strategies' security tokens
- (h) Access to data analytics and reports

Together, our parent token and subsequent strategy-specific security tokens work with our blockchain-based smart contracts towards our vision of a democratized multi-strategy hedge fund.

### **3. THE KRONOS PLATFORM**

The KRONOS platform is the entity tasked with custody of all contributed assets, the management of new and existing strategies, and the marketing and development of the platform.

KRONOS is capitalized through the issuance of its parent utility tokens, called *KRON*. *KRON* provides access to the KRONOS platform: its holders are able to access voting functions relating to certain governance decisions for the protocol. While *KRON* token holders do not retain ownership or equity interest in the KRONOS platform, its intellectual property, or other capital assets or shares, they will be able to affect its long-term direction through their collective choices.

Custody is an essential part of our design, as we desire to provide strong guarantees that our assets are held securely both against external and internal risks. To that end, all assets are held by the main KRONOS entity which is located in a reputable jurisdiction with strong laws (we are evaluating a few candidates and will announce our choice soon). Assets, investments, and returns will be audited by a top-four accounting firm, and results will be carefully disseminated. As mentioned, traders and asset managers can direct investment decisions, but are never in a position to withdraw capital.

The KRONOS platform earns revenue by taking transaction fees from strategies listed on it. These fees will differ based on the performance of the strategies, but are directed in a way such that fund managers are compensated competitively against traditional finance funds which may compete to employ them.

#### **3.a. Token dynamics**

The KRONOS platform will establish a continuous cancellation system in relation to the *KRON* ERC-20 utility token. The KRONOS platform will proceed to cancel and destroy tokens in a transparent and defined process. Destroyed tokens will come from our treasury or the secondary markets. The governance of this process, such as how often or how many tokens are destroyed, will be governed by token holders.

### 3.b. Building a diverse set of strategies

A core function of KRONOS is the incubation of new fund managers. When novel strategies are first introduced, KRONOS takes on the risk of seeding the initial capital outlay and covering inaugural costs. This is partly because most strategies require little capital at the onset, but also such that the nascent strategy can establish an auditable track record of performance.

Identifying the best fund managers is paramount. We focus on a few different aspects when evaluating fund managers:

- **Strong background in the crypto or traditional finance world.** We look for individuals and teams who have verifiable track records, a robust reputation or pedigree, and strong knowledge of what they've done and are looking to do.
- **Diversification.** We want to add fund managers who are sufficiently different from each other so that token holders have an opportunity to choose from different types of risk. This includes risk across asset class, type of strategy, sharpe ratio, capital usage requirements, etc.
- **Teams over individuals.** We recognize that handling a fund is hard work and it can be easier with others to bounce ideas off of. We prefer small groups with preexisting familiarity and diverse skillsets.
- **Stability over capital usage, at least initially.** We are primarily interested in higher sharpe strategies to begin with, as they require less capital and it is quicker to establish statistical significance that they are working as intended. As we expand and grow, we imagine that we will start searching for higher capacity but lower sharpe strategies.

### 3.c. Decentralized fund management

One of the strengths of KRONOS is our emphasis on decentralization and democratization. While there are certain aspects which we reserve for future iterations (see section 9, "evolution towards decentralization"), we want to build some elements immediately which allow token holders to access certain decision making processes which affect the future of KRONOS:

- **Voting on adding new traders.** After new portfolio managers are evaluated professionally, smart contracts will allow token holders to approve or deny their final inclusion.
- **Voting for significant changes in asset allocation.** Trading teams solely under the core KRONOS entity will be given initial capital allocations by the professional staff, but significant increases or decreases will require approval by the token holding populace. This is also true for removing unsuccessful trading teams (i.e. setting their capital allocation to zero).
- **Voting for new or changes in priorities.** Significant deviations in fund direction will be put up for approval as well, such as changes in management personnel, the entrance into new asset classes, and key decisions around jurisdiction and compliance requirements.

#### **4. KRONOS CHILD STRATEGIES**

As a strategy matures and can begin to invest additional capital, it is opened for funding to external investors through the minting and creation of a strategy-specific *child token*. Each strategy has its own child token. Qualified investors will be able to deploy capital – ETH to start, but other cryptocurrencies and even fiat later on -- through the platform towards specific strategies by purchasing their token.

##### **4.a. What is a child strategy token?**

The child token for a strategy represents an interest or specific share in that individual fund strategy, and can be redeemed for the current value of its share from the strategy's assets during redemption periods. While strategies may have restrictions on when and how their redemption periods occur, participants are free to trade these tokens on the open market at any time.

Portfolio managers are responsible for trading decisions for their strategy's specific assets, but the core KRONOS entity always retains full custody of all assets in the system. Portfolio managers can exchange their assets into other crypto tokens or even traditional assets (equities, bonds, etc.) at their discretion. The core KRONOS entity will handle the valuation and execution requirements, and is located in a stable and legally agreeable jurisdiction to investors.

The beauty of the parent / child dichotomy is that children strategies receive many technical benefits from the structure as well. For example, KRONOS provides an interface for fund managers to be allocated capital from the investing public. Similar to the platform of retail brokers, the interface gives investors standardized information about funds, their managers, historical performance, future risks, and other data. This makes it easy for the public to evaluate and contribute to strategies.

##### **4.b. Why a security token?**

*Security tokens* represent an interest in a real world asset or investment scheme. In our case, child strategy tokens represent an explicit share of the assets of the individual strategy adopted and implemented on the KRONOS platform. They carry certain regulatory and reporting requirements, and provide investors with rights and obligations in the securities they are purchasing.

We expect to launch child strategy tokens 9-12 months after the launch of the KRON utility token.

KRONOS will incubate all new strategies internally, and only sufficiently mature strategies will be promoted to have their own child token. We expect it to take a few months to properly develop and vet new strategies, especially early on in our company's history when we are only beginning to put together our market data, technology, and risk infrastructure. The issuance of strategy-specific security tokens will also coincide with a need for increased capital in the individual strategies.



A significant secondary reason is that the ecosystem around security tokens is only beginning to develop. The regulatory requirements around the issuance of security tokens are still difficult and unclear in most jurisdictions, and many crypto exchanges will not list security tokens due to perceived legal risks.

Despite these problems, we believe that developing a protocol infrastructure for the issuance of security tokens is prudent and necessary. Many analysts predict that the majority of the world's financial products will eventually be traded on the blockchain as security tokens. To some degree, many regulators in the USA have been saying that the majority of issued utility tokens are in fact security tokens anyway. We can envision a future where security tokens are predominant and ubiquitous; we want to be positioned as an early mover in that world.

The benefits of issuing security tokens are numerous:

- Security tokens carry additional reporting and compliance requirements which are ultimately beneficial to the end investor. Cryptocurrency scams are widespread partly because of a lack of transparency and regulatory oversight; a deeper focus of regulatory compliance will make due diligence on the part of investors much easier.
- Security tokens will expand the cryptocurrency investor base. There are still many institutions and individuals who are watching from the sidelines because of their discomfort in investing in utility tokens. By offering security tokens, we can target a much larger set of investors and cryptocurrency adopters.
- Understanding the regulatory risks around the issuance and handling of security tokens hedges us against regulatory action classifying KRON as a security token.
- We may also become a “white-label” solution for other asset managers who are interested in issuing security tokens to represent their own strategies.

## 5. TOKEN ECONOMICS

### 5.a. Why does KRONOS need a token?

The token dynamics within the KRONOS platform represent a significant disruption of the asset management industry:

- The use of a token allows an open marketplace for the entry into unique strategies. This is an important point particularly for strategies which are capital-constrained: the managers for these funds may not be able to handle large amounts of capital, even if they wanted to. Many of the best capital constrained strategies at elite trading funds are open only to the fund manager or their close friends and family. Our token allows for an accurate pricing of the supply-demand imbalance as if the funds were offered openly, and an open access point for the determined token holder.
- The use of a token, particularly for our child security token, allows the ability for token holders to trade or liquidate their investment in advance of redemption periods within the KRONOS ecosystem. Redemption periods can be problematic for fund managers since they need to liquidate their holdings at a cost when redemptions occur; to investors, redemption periods are commonly regarded as infrequent or inconvenient. Allowing token holders to sell unwanted interests to one another is an equivalent result which works out better for both parties.

The KRON parent token, a utility token, has specific functions which give it added benefits within the KRONOS platform:

- It allows the *programmatically democratization* of many conventional actions – increasing efficiency and creating a more decentralized operation compared to traditional off-chain fund management structures. Voting for management resolutions, asset allocation decisions, and contributing to special projects (a subset of token holders may choose to sponsor a new trading team, for instance) are just a few examples of how the fund can self-govern. Many hedge funds are possible only because of the guidance of a superstar fund manager, and the fund may suffer if that individual retires or departs; an emphasis on decentralized continuity from the beginning will benefit the longevity of the fund.
- It represents a *subscription discount* towards the payment of fees in child strategies for qualified token holders. While we are still working out the details, we expect that discounts will increase as more tokens are held or tokens are held for longer periods of time.
- It allows *membership benefits* towards more exclusive offerings. If a capital constrained strategy desires to issue a limited number of new security tokens but the issuance is oversubscribed, utility token holders who stake a larger number or longer held tokens would be given precedence.
- It will allow the *payment and petitioning of strategy specific benefits*. If we have a market making service that is in demand by many participants, we may require potential clients to stake utility tokens as payment.

- As we build out our platform and influence, we intend for our utility token to be the *gateway for other loyalty rewards*. For instance, we may offer access to exclusive research reports, trading competitions, or joint perks with partner exchanges or projects.

KRONOS's dual class of tokens succeeds because both token types demonstrate clear value in specific ways. Contributors seeking to participate in the growth of a decentralized asset management network and the usage benefits of being a KRON stakeholder will choose the KRON utility token; investors looking for a stake with defined volatility and strong custody requirements will opt for the child strategy security tokens. Through strong but separate appeals, we have the ability to accommodate a diverse purchaser base and offer distinct benefits and attributes.

There is also an argument to be made that KRON utility tokens will exhibit long-term, non-speculative value. Most utility tokens don't provide convincing reasons for token holders to hold them, so they demonstrate rampant volatility and low intrinsic value. Through defined token metrics, the programmatic democratization of fund actions, and exclusive loyalty benefits, we provide a strong rationale for token holders to both use and keep our tokens as KRON grows as an ecosystem.

## 6. INITIAL STRATEGIES

The KRONOS platform will begin with a few strategies developed by the founding team.

- **Cryptocurrency alpha-based algorithmic market making**

This strategy seeks to apply traditional alpha-based market making strategies on the lit crypto markets, primarily on large cap coins, but also as a service to exchanges or projects. Its average holding time is measured in hours.

- **Cryptocurrency diversified fundamental**

This strategy aims to make long-only medium horizon bets on cryptocurrencies, with an emphasis on large and medium cap coins. Its average holding time is measured in months.

- **Cryptocurrency emerging markets, discretionary**

This strategy looks to invest in small cap coins and pre-ICOs. Its holding time is usually measured in months, but can also take discretionary positions measured in days.

In the following sections, we elaborate on how some of these strategies work (more will come in succeeding drafts).

## 7. ALPHA-BASED ALGORITHMIC MARKET MAKING

### 7.a. How does it work?

Our alpha-based market making platform is a proprietary trading strategy and liquidity provision service with an emphasis on predictive intelligence and risk management.

Market making strategies typically make money in three different ways:

- Capturing the half-spread
- Rebates from exchanges or projects
- Inventory and risk management

Market makers are willing to buy or sell at any time, but in exchange for availability, will offer to sell at a slightly higher price than they believe an asset is fairly worth, and will offer to buy at a slightly lower price. The difference between these prices is called the *spread*; by design, market makers capture a sure profit of at least a *half-spread* in every trade relative to the fair price of the asset they are buying or selling. Since market makers participate in trades at bulk, these small profits can add up quickly.

Exchanges often incentivize liquidity by offering *rebates* to market makers. Rebates can be in the form of per-trade bonuses whenever a trade is made, discounts to existing fees, or lump sum payments.

In the crypto world, there is an increasing trend of market makers being hired by projects to provide liquidity for their tokens on existing exchanges. These market makers are generally seeded with capital, given profit sharing agreements, and/or paid a monthly fee. We intend on making our market maker available as a service as well. As experienced market makers are in short supply, we believe that we can build strong demand highlighting our professional and experienced team.

Market makers need to exercise careful inventory and risk management. When prices are moving in one direction, market makers are by definition taking offsetting positions, making their activities particularly precarious. To combat this, market makers utilize predictive signals called *alphas* to predict how markets will behave. Market makers with strong inventory management will know when to take, hold, and exit positions in a way which maximizes expected returns.

From an architectural standpoint, market makers need to excel at few different layers: price prediction, execution logic, and risk management. These pieces are all important in their own ways, but require different skillsets and capabilities to do correctly. Many traditional trading firms will actually split their staff to specialize in one layer or another, with only a few senior individuals understanding the entire

system. Perhaps the greatest strength of our team is that we understand how all these phases fit together.

### **7.b. Price prediction models**

Price prediction models make forecasts for the future return of an asset unconditional on our trading behavior. Market makers will typically forecast short-term returns, which look forward one to thirty minutes. As you try to predict returns longer in time, signals typically become less predictive and contain more noise; if you try to predict too short a horizon, it becomes difficult and impractical to trade. Short-term signals strike a good balance between predictability and utility.

While there are many important pieces to a market making strategy, alphas are typically seen by many as the most significant competitive advantage, and are tightly guarded secrets as a result.

Alphas encapsulate replicable market phenomena. Generating them requires creativity, market intuition, mathematical prowess – and in many cases, a lot of trial and error. Alphas also need to work over a broad swath of market data, across time and business cycles, and with some basis in economics or market microstructure principles.

### **7.c. Execution & trading**

Execution models and strategies represent the middle layer in our architecture: they utilize forecasts to express and realize our views in the marketplace. While price prediction is concerned with modeling theoretical returns, execution deals with the reality of sending and executing orders.

There are many aspects to consider here. The pricing, sizing, and timing of orders being sent, as well as how and when to cancel them, are all of utmost importance and are often carefully calibrated.

Market makers need to pay extra attention to inventory management, as taking offsetting positions from momentum-based moves will often put them in significant danger. Market makers will often back off from market conditions which seem especially hazardous, and may need to liquidate or hedge positions if necessary. As always, the devil is in the details.

Simulation is a great way to evaluate the potential future performance of a strategy. If done accurately, it can establish statistical significance much faster than any live trial. Building a strong simulation engine requires that it can accurately replicate live trading and all the nuances of connecting and working with a myriad of exchanges. An experienced development team is also necessary for making sure that the simulator runs quickly; a fast simulator will allow researchers to try many different types of strategies at once.

#### **7.d. Risk management**

The last layer -- which is actually more of an all-embracing overlay -- is risk management. Risk represents a measured response to uncertain events, and is perhaps the most important aspect of ensuring continuous operations. It deserves to be in forefront of any trading endeavor, especially a strategy so heavily response-driven like market making.

Risk management starts with fundamental risk controls. Basic restrictions regulate orders sized too large, priced too distant, or spaced in time too closely. The strategy will control its order placement rate, gauge if the market is reacting abnormally to its orders, and will measure gains or losses relative to historical or simulated norms.

The biggest risk to a market making strategy is rapidly repeating executions at marginally subpar prices: this is the easiest way to lose a lot of money. Failings can cause orders to send out too quickly, or executions to be reported too late. Safeguards need to be designed to handle not just demonstrated losses, but symptoms of potential losses.

A secondary aspect of risk management deals with correlation. Trading singular assets in isolation is an easy way to be exposed to systemic risks. Market makers will typically employ portfolio wide risk controls to ensure that they aren't taking too much of a risk in any particular risk factor.

## 8. INTERACTION BETWEEN STRATEGIES

Like the distribution of trading desks in traditional multi-strategy hedge funds, our strategies are designed to interact with one another in mutually beneficial ways. This is yet another benefit to strategies inside the KRONOS ecosystem which will allow them to perform in a superior way to strategies outside of it.

### *High frequency execution*

Larger funds like our diversified fundamental cryptocurrency strategy will excel at predicting longer term movements, but will not have intelligence over short term returns. As such, these are often the targets of predatory strategies which try to detect and get ahead of larger executions. This causes larger strategies to pay marginally more for each transaction.

We solve this by utilizing our market maker as a high frequency execution desk internally. With the right alpha and price impact models, an execution desk is able to distribute transactions through time in a way which minimizes overall cost.

### *Internal crossing*

We will be developing an internal crossing engine to further reduce transaction costs. This, too, is common in many of today's multi-strategy hedge funds.

As we have more and more strategies operating with different holding periods and risk profiles, they will naturally want to take offsetting positions within the same asset. One might wish to short BTC just when another wants to go long.

The internal crossing engine allows strategies within the same firm to trade with one another internally when desiring offsetting positions. By avoiding exchanges or OTC brokers and keeping these positional transfers "within the family", so to speak, these trades can be done for nearly free.

### *Sourcing early ICO deal flow*

By offering market making services to projects, our discretionary ICO fund will gain significant insights. A strong network will allow it to identify top early-stage companies, transact with preferential deal terms, and improve invested projects through introductions and advice.

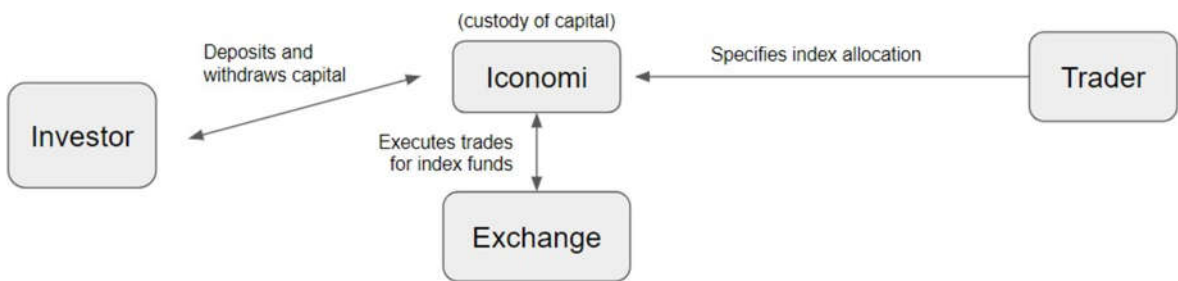


## 9. EVOLUTION TOWARDS DECENTRALIZATION

We are big proponents of decentralization, and plan to carefully but eventually rollout a more decentralized platform than what we describe in earlier sections of this whitepaper.

In order to show our proposed progression, it is illustrative to first describe a few alternatives which represent two extremes in their architecture.

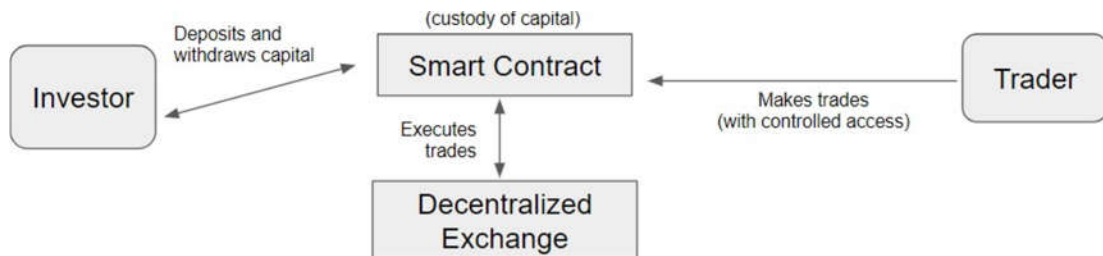
**Iconomi** is a centralized trading solution for index funds. Traders specify index allocations and Iconomi handles custody of capital and trading.



**Pros:** No need to implement a complex system to automate custody of funds

**Cons:** Centralized, traders don't have direct market access

**Melonport** is a completely decentralized trading ecosystem where custody of capital is held in smart contracts. However, traders can only trade on decentralized trading platforms, where liquidity is extremely low and technical sophistication is lacking.



**Pros:** Fully Decentralized

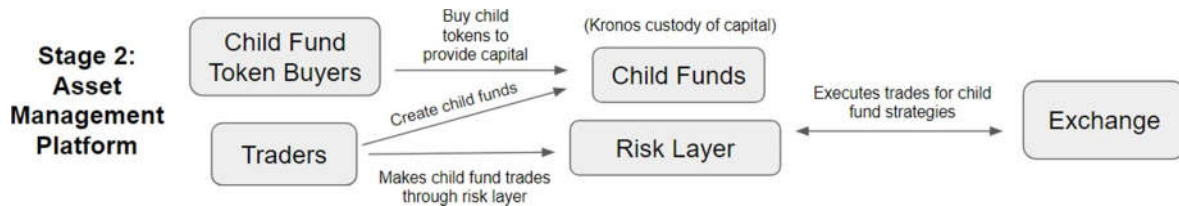
**Cons:** Technology has not matured enough to make this possible

Now, let's go over the three phases of our proposed decentralization rollout.

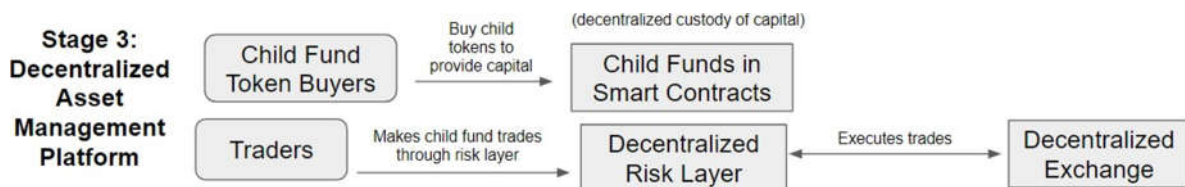
**Custody is held by KRONOS, and traders trade through the KRONOS platform** on centralized exchanges. Some governing functions take place on smart contracts.



Over time, we expect to start **migrating traders onto a distributed trading platform**. This will break out the hiring of trading teams towards a decentralized structure, while the core KRONOS entity still provides custody and the necessary support functions. Whether traders will need to be legal employees will depend on the availability of the proper legal structures across traders' specific jurisdictions, but something we would explore as well.



Our ideal steady state is a **purely decentralized solution**, where traders, exchanges, and custody all exist on a distributed basis. This would require solutions to connect assets across disparate blockchains, sufficient liquidity on decentralized exchanges, and a sufficiently fast decentralized risk layer.



## 10. ROADMAP

We expect to move carefully but quickly.

### **June 2018:**

- Launch of the project & start of private presale for KRON token
- Assembly of initial team
- Purchase of market data and work on market making code
- Establish API connections to relevant exchanges
- Begin development of platform smart contracts

### **July 2018:**

- Launch of initial branding and website
- Launch of private presale
- Basic market-making engine begins to trade
- Development of market making execution engine and risk overlay

### **August 2018:**

- Development of price prediction alphas
- Beginning of deployment of platform smart contracts

### **September 2018:**

- KRON token public sale
- Token generation event for KRON token
- Discretionary cryptocurrency strategy begins to trade
- Complete backtests of alpha-based market making strategies

### **October 2018:**

- Alpha-based proprietary trading strategies begin to trade

### **November / December 2018:**

- Initial team ramped up to 15-20 full-time professionals
- Diversified fundamental cryptocurrency strategy begins to trade

### **Q1 2019:**

- Onboard first new trading teams

### **Q2 2019:**

- Initial issue of child strategy tokens

## 11. Competition & industry comparisons

### Digital Asset Management Ecosystem Competitors

**Iconomi** is a competitive platform which allows portfolio managers to create new strategies and connect with investors seeking high returns. The largest fund on their marketplace is currently managing more than \$10M. Similar to KRONOS, the Iconomi token will be burned over time as an alternative to providing dividends. However, Iconomi does not let traders do anything beyond choosing an allocation of existing tokens to split their strategy into, whereas KRONOS strategies may involve more dynamic strategies and less conventional cryptocurrencies. The ICN token sold 85% of their tokens at a price of \$0.11 in Aug 2016 and is now trading at \$0.96.

**Melonport** is an asset management platform with a focus on decentralization. It is a free and open source tool for creating cryptocurrency funds and letting others invest in them. Capital is held in a purely decentralized way; the founding entity holds no tokens. However, the Melonport team is still working through significant product development issues, only offers four tokens, and hasn't developed funds with investments beyond a few thousand USD. Many blame the fact that decentralized exchanges do not have enough liquidity. The project sold 67% of its tokens in Feb 2017 at a price of \$5.83 and is now trading at around \$46.

**Shapeshift Prism** is another platform for building new crypto funds with some marked differences from the approaches above. To start, the system does not have its own token. Investors instead choose a desired distribution of capital amongst several assets, and send ETH to a smart contract. The founding company will track the underlying assets in its own private way, and commits to providing the appropriate returns when investors wish to liquidate. As this methodology is widely derided as being far from decentralized and transparent -- and with entry fees up to 3-5% -- there are many questions regarding how effective the platform can be in the long term.

**Alpha Protocol** was a potential competitor designed around the interactions of investors and alpha traders in a joint ecosystem revolving around the exchange of their ALP tokens. Investors would purchase ALP tokens and entrust them to alpha traders. Alpha traders would use entrusted ALPs to borrow assets from a collective "Alpha Pool", which they would subsequently trade. The Alpha Pool would receive profits and distribute back to alpha traders and investors. Alpha Protocol raised funds with a token sale, but eventually returned them all to investors due to regulatory risks on March 31 2018.

In comparison to KRONOS, Alpha Protocol is more decentralized and set up in more competitive way. Strategists do not work together, and there is no central entity devoted to assisting traders and finding synergies between strategies. It is not clear whether the transaction costs and liquidity considerations with having a decentralized system can produce a competitively priced product at this time, but the project's suspension means we will never know.

### Digital Asset Fund Competitors

The **Crypto20 index fund** is one of the most popular crypto index funds and has reached \$51M in assets under management. The system was developed with an autonomous algorithm that keeps the portfolio distributed fairly between the top 20 cryptocurrencies. Fees for Crypto20 are a fixed 0.5% rate per year. The fund's ICO in December attempted to sell 87% of the total tokenized shares of the index, but only managed to sell half of that goal. The initial price of their tokenized asset was \$1, and is now trading at \$1.40. The Crypto20 smart contract allows for instant liquidation at \$1 to establish a price floor, and consequently it has never dipped below that amount.

The **Token Fund** is an example of a tokenized fund that lets users benefit from a proprietary trading strategy. This project launched with a token sale and now manages several million dollars of token holders' capital. Entry and exit fees of 5% each way are fairly steep.

The **Greyscale Bitcoin Investment Trust** is a more traditional version of a financial instrument with underlying crypto assets. The product being sold is openly marketed as a security, and was not started with a token sale.

## 12. KRONOS TEAM

### – Leadership –



**Mark Pimentel**

Quantitative Researcher & Trader

Mark is an experienced quantitative researcher, trader, and developer, with more than a decade of experience at high frequency trading firms. He specializes in writing alpha models, developing innovative trading strategies, and understanding market microstructure. He believes the key to successful trading is an incessant dedication to coming up with creative ideas.

Mark started his career at Citadel Investment Group’s High Frequency Trading unit in 2006, which made \$892M in 2007 and \$1.15B in 2008. It was called “among the very top of high-frequency firms in the world, the top-of-the-top tier”<sup>1</sup>. He developed alpha models and ran several profitable European auction strategies. He later joined the Electronic Trading Group at Knight Capital, which operated the largest equity dark pool in the world in late 2008<sup>2</sup> and was the largest trader in US Equities with market share of around 17% in 2012. These two groups still dominate market making today.

Mark then went to work at several trading startups where he honed his craft in leadership roles. He was an early employee at Radix Trading Inc., a company founded by his previous manager and former head of Citadel’s HFT unit, and led their equity trading efforts. He later co-founded a proprietary trading group focused on active-only trades on E-Mini S&P 500 futures, the most liquid and arguably most competitive contract on the CME. While the results of these privately companies are confidential, he was either amongst the most profitable traders or researched high sharpe (>4-6) strategies.

Mark graduated with a Master’s and Bachelor’s Degree in Electrical & Computer Engineering, and a second major in Business Administration, all from Carnegie Mellon University in three and a half years. Mark is based in Chicago but is relocating to Taiwan in August to focus on crypto trading.

<sup>1</sup>Wall Street Journal: High-Frequency Gain: Citadel Unit’s \$1 Billion”, <https://www.wsj.com/articles/SB125444025346057763>

<sup>2</sup> Knight Link™ Ranked #1 Dark Pool By Share Volume, <https://www.virtu.com/news-perspectives/article/knight-linktm-ranked-the-1-dark-pool-by-share-volume-in-tabb-groups-liquidi>



**Jack Tan**

Investments & Business Development

Jack is a seasoned trader and blockchain advocate. He has a wide-reaching perspective throughout the crypto-landscape and is proficient at both identifying and making strong connections (and for others much more so than himself!). He spent ten years in finance as a trader and structurer before embarking on a blockchain career. He graduated with a degree in finance from Carnegie Mellon University.



**Ran Yi**

Cryptocurrency Trading Advisor

Ran is an expert in Chinese capital markets and modern cryptocurrency market making. He has started multiple businesses focused on quantitative trading and fund of funds. Ran graduated with a Bachelor's in finance from Carnegie Mellon University, and holds an MBA from China Europe International Business School.

– Quantitative Trading & Development –



**戴志洋 (Kaede)**

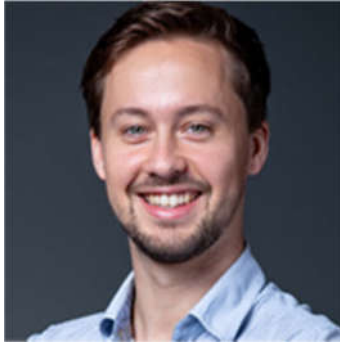
Lead Engineer, Systems Architect

Kaede is a technology leader, full stack engineer/architect, designer, and teacher. He is co-founder of the largest social media site in Taiwan, PTT BBS, and was a lead engineer at Yahoo!. Kaede graduated with a degree in Information Management from National Taiwan University.

Kaede has spent more than twenty years in startups and technology companies. He began programming at age of 15 and an avid contributor to the open source community. He started what became PTT at age 18 and grew it into the largest user-generated content site in Taiwan. He has since become a technology executive across multiple companies in the internet and telecommunication space. Kaede also has a strong interest in entrepreneurship, acting as a growth consultant to the Taitung Government and a mentor to several incubator projects.

Kaede is excited to bring his leadership abilities and network of top engineering talent to Kronos.





**Joe Scherping “十瓶酒”**

Quantitative Developer and Blockchain Engineer

Joe graduated from the University of Michigan with a Bachelor's degree in Computer Engineering and a Master's degree in Industrial Engineering. He worked for two years as a product engineer at IBM Watson, bringing several AI services to market, and became well versed in many machine learning techniques and applications. He left to pursue his own software projects, settled down in Taiwan, and is now pursuing a career in quantitative trading and blockchain technology.



**I-Ting Lin**

Quantitative Researcher & Trader

I-Ting is an experienced data scientist and an expert in deep learning. He graduated with a degree in physics from National Taiwan University, and spent several years working as a data analyst developing prediction models in the e-commerce and advertising field. He enjoys applying statistical techniques to new datasets, and is highly ranked on the machine learning competition site Kaggle.



**Andrew Tzu-Ming Kuo**

Quantitative Researcher & Trader

Andrew graduated from National Taiwan University with a Bachelor's in Physics and a Master's in Financial Engineering. He has a strong interest in astronomy, and conducted research at the Academia Sinica exploring the dust content of high-redshift galaxies. He later worked as a quantitative volatility trader at CTBC Bank and Win & Fun Capital, developing intraday strategies on equity index options.



**NAME WITHHELD**

Quantitative Researcher & Trader

This gentleman spent a decade at Citadel Investment Group and another large multi-strategy hedge fund, leading research and development teams in quantitative trading. He graduated with a degree in Computer Science from Stanford University, and has been involved and invested in Bitcoin since 2013. His name is confidential due to an exercised non-compete, but he will work full time starting November 2018. He will be building smart index and statistical arbitrage trading strategies.



**Kevin Zhou**

Portfolio Manager & Advisor

Kevin is Co-Founder and Chief Investment Officer at Goku Tech Inc., a leading multi-strategy asset management company in China, with over \$500M USD assets under management. He has over 20 years of experience in global financial markets, asset management, quantitative investment strategies, and risk management.

Kevin brings his talents to KRONOS initially as an advisor on long-term trading strategies, asset allocation, and risk management, but will also become a portfolio manager on the platform.

Kevin has considerable PM experience, and was formerly a portfolio manager at SAC Capital Advisors (over \$10B assets under management) and RCG Ardis Capital (a subsidiary of Ramius Capital Group with over US\$9 billion in assets under management).

Kevin earned dual Bachelor's Degrees in Computer Science and Finance from the Massachusetts Institute of Technology.



**Eugene Quan**

Alpha Research Advisor

Eugene is an experienced quantitative trader and researcher. He has spent the last year as a senior data scientist at Twitter where he analyzes large amounts of consumer sentiment data. Eugene looks to bring the latest data analysis techniques from Silicon Valley to the world of trading. Prior to this, he had a ten- year career leading teams in quantitative trading. He was a portfolio manager at Tower Research Capital where he designed his own signals and strategies and was the lead researcher in charge of execution at Headlands Technologies LLC. He spent the early part of his career at Citadel Investment Group's High Frequency Trading group. Eugene graduated with a degree in mathematics from Harvey Mudd College.

**Jilin Tan, Ph.D.**

Algorithms and Systems Advisor

Jilin (PhD) was a software architect for more than a decade at Cadence Design Systems, the leading electronic design automation software company in the world. He has been developing EDA software in the area of electromagnetic computation, circuit simulation, algorithm design and optimization numerical methods with C and C++. He has also worked at Intel and Qualcomm for digital signal integrity and power integrity. He holds a PhD degree in Electrical Engineering from the University of Wisconsin and a Master's degree in Theoretical Physics from Beijing Normal University of China.

– Investment & Eco-System Advisors –



**Richard Wang**

Venture Capital & China

Richard is a partner at early stage venture capital firm Draper Dragon, formerly known as DFJ DragonFund. Originally a joint venture between famed Silicon Valley venture capital firm Draper Fisher Jurvetson and the Chinese VC company DragonVenture, Draper Dragon has come into its own as a leading sector agnostic early stage fund which draws from talent across Silicon Valley and China.

Richard is based in Shanghai and explores deals in the blockchain and internet space. He has over 18 years of business development, technical marketing, and sales management experience in the high technology sector. He previously served as CEO of QunZhong E-Commerce, and founded OLEA Network, a company developing intelligent wireless ECG sensors. He has strong expertise in networking and wireless systems and holds a Master's in Electrical Engineering from National Chiao Tung University.



**Marc Hurley**

Cryptocurrency Ecosystem & Partnerships

Marc is a serial entrepreneur, blockchain researcher, and early-stage investor. Marc was dragged into the crypto rabbit hole with early investments of Bitcoin and Ethereum and is now an early investor in more than fifty ICO projects. He is an active member of the crypto community, regularly attending conferences around the world.



**Yoshimitsu Jimmy Homma**

Blockchain Technology

Jimmy is the CEO and Co-founder of United Bitcoiners Inc. which is focusing on developing the Lightning Network. Jimmy is also the president of the Japan Digital Money Association. Before blockchain, he worked as a researcher at Fujitsu Laboratories of America, Inc. Jimmy holds a B.S. in Mechanical Engineering from Kyoto University.



**Hiro Shinohara**

Blockchain Technologist & Serial Entrepreneur

Hiro is a blockchain entrepreneur and prominent evangelist. He is the CEO and co-founder of Hotaru Inc., a startup studio specializing in blockchain technology and asset management of cryptocurrencies. He is also COO and co-founder of SIVIRA, an IoT blockchain research company. Hiro is active in developing blockchain technology both locally in Japan and internationally and serves as an advisor to leading cryptocurrency companies such as GMO Internet Inc. and Genesis Mining. He lives a nomadic life, shuttling frequently between Tokyo, Asia, and the USA.



**Simon Li**

Founder of Chain Capital

Simon began studying the blockchain industry in 2013 with a focus on crypto mining and investment. He has since initiated and managed multiple blockchain investment funds with one of the top track records in the blockchain space. He is a graduate of Zhejiang University.

– Legal & Regulatory Advisors –



**Lee, Tsai & Partners Attorneys-at-Law**

Taiwan Law firm

Lee, Tsai & Partners is a leading Taiwan-based law firm with extensive government, intellectual property, and international investment experience. Co-founder Jaclyn Tsai (蔡玉玲) is a former Executive Yuan Minister Without Portfolio under the Ma Ying-jeou (馬英九) administration, and currently leads the Taiwan Blockchain Self-Regulatory Organization (SRO), which is tasked with studying and drafting legislation for ICOs, exchanges, and cryptocurrency across the country. Ms. Tsai was also elected and currently serves as the Executive Supervisor and Convener of the Legal Environment Committee of Taiwan Fintech Association and is one of the promoters of the Global ICO Transparency Alliance. Lee, Tsai & Partners is responsible for providing legal services with respect to the laws of Taiwan.





**Sherwin Lee**

Partner at TLB Law, Singapore

Sherwin is a partner of TLB law firm in Singapore and holds a Master's in Law (Distinction) in International Banking and Finance from The University College London. Sherwin focuses on advising companies within the financial and emerging technologies space and particularly on the application of distributed ledger technologies (DLT), token generating events / ICOs / ITOs, and set up and design of blockchain ecosystem players – cryptocurrency funds, collective investment schemes and cryptocurrency intermediaries such as centralized and decentralized exchanges.

### **13. DISCLAIMER**

The materials presented by KRONOS are strictly for information purposes only, and shall not, under any circumstances, be treated as an offer of or an invitation to participate in securities or any regulated investment schemes defined in any jurisdiction around the world.

None of the information contained herein is intended to form the basis of any advice or inducement to engage in any sort of investment activity, and no specific recommendations are intended.

The information contained herein shall not be construed as a commitment by KRONOS, and is subject to change and/or update without notice. Such change may pertain to the intended functionality of Kronos system, parent token, and child token in order to ensure compliance with any legal or regulatory obligations that apply to us, whether now or in the future. This white paper is a draft version, and is under ongoing editorial, technical, and legal review.

These materials are not composed in accordance with, and are not subject to, the laws or regulations of any jurisdiction. Please seek independent advice from your professional advisors, including lawyers, tax accountants and financial advisors, if you have any uncertainty or doubt as to any of the matters presented.