MARKET Protocol: Digital tokens for any asset

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Abstract

MARKET Protocol is an open source and non-custodial framework for creating tokens that track the price of any crypto or traditional asset. Leveraging blockchain technology, these tokens can provide the benefits of modern finance to anyone anywhere by enabling global access to investment and risk management products. Custody of collateral, accounting, and settlement are decentralized, replacing the role of inefficient legacy infrastructure. Once created, position tokens are fully collateralized and tradable between any wallet or on any exchange supporting the ERC-20 token standard.
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Introduction

MARKET Protocol, an open and permissionless protocol built on the Ethereum blockchain, provides the framework needed to create position tokens representing the prices of either crypto or traditional assets. A position token is similar to a traditional derivative, which settles in the future based on the price of a reference asset. By leveraging the benefits of an open network to enable the exchange of asset prices, these tokens will provide access to investment opportunities and risk management products that were previously out of reach for most people around the world.

Derivatives are the largest financial asset class globally and are primarily used to manage price risk, such as when airlines hedge the price of jet fuel or banks hedge interest rates. Derivatives are also used by traders to speculate on the price of assets, playing a key role in the functioning of efficient markets. Further, derivatives can be used to create new products; for example, derivatives exist for shipping rates, weather, carbon credits, and payroll data.

We can use blockchain technology to create position tokens, which function similarly to derivatives by representing asset prices. This will allow traders, users, and organizations to hedge or limit the risk of holding crypto assets. Furthermore, this same mechanism can be used to create tokens representing traditional assets like stocks or commodities, removing access restrictions by making them tradeable on a blockchain. At creation, all position tokens are fully funded – eliminating margin calls, counterparty risk, and solvency risk.

Blockchain systems provide us with an opportunity to redefine the financial landscape. With this technology we can create a truly global market, removing centralized intermediaries and market inefficiencies, delivering value to anyone in the world. We have a chance to bring established trading relationships (stocks, commodities, etc) and new innovative products (like crypto baskets, housing indices, etc) to a worldwide market, while also making them safer and more transparent in the process.
The Problem

Primitive financial tools result in lost opportunities and unnecessary risks.

Modern finance provides many powerful tools, derivative products such as futures, options, and swaps. In their current form, these tools require centralized clearing and custody, roles provided by financial institutions. These tools have yet to leverage the benefits of blockchain technology, which promises to remove middlemen and reduce risk in financial applications.

At the same time, the blockchain space itself lacks these tools and will not mature without them. The derivative products that do exist are an extension of the traditional financial model, resulting in centralized systems. Frequent socialized losses, funding liquidations, and contract changes undermine the integrity of existing derivatives markets.

Lost Opportunities

Limited market access
Access to financial products, including investment products and risk management tools, is geographically and socioeconomically restricted. Where financial systems are developed, governments limit access to markets through rules and regulations. When access is available, it is often predicated on credit verification and large minimum account balances, providing the benefits of financial products only to privileged participants.

Across much of the world, financial systems are underdeveloped or unstable, and in these geographies local participation in global investment and risk management markets is unattainable. As a result, quality investment opportunities like the S&P 500, gold, or even reserve currencies such as the US dollar are out of reach of most people globally.

Limited products
As for-profit entities, financial institutions only offer products which they believe will be commercially successful. These gatekeepers have minimum market participation and open interest requirements for new products, in order to attract institutional clients. Further, many useful financial products that could exist do not, due to local restrictions imposed by governments. As a result, the pace of innovation is slow and many potential financial products never see the light of day, despite the benefits they could provide.

Unnecessary Risks

Volatility of crypto markets
Crypto is a rapidly growing asset class with many promising projects across a wide variety of use cases, however a serious challenge threatens the progress of this space. Due to
extreme price volatility, crypto assets are a poor store of value, medium of exchange, and unit of account. From their manic highs, the price of bitcoin fell 84% while the price of ether collapsed 94%. Currently crypto exchanges are focused on facilitating the exchange of assets at current prices (spot trading), so most holders of crypto assets, ERC-20 or otherwise, have no effective way to hedge their price exposure. As a result, crypto assets are currently poorly suited for anything but speculation.

**Custody of funds**

Traditional investments rely on centralized custody which exposes users to bad actors and misaligned incentives. The largest breach of trust in recent times was the $2 billion Mann Financial violation of customer segregated funds, which resulted in 35,000 customer accounts frozen in bankruptcy.

In the crypto space, socialized losses, exchange hacks, and the community’s willingness to accept these outcomes are together evidence of an inefficient market dominated by a small number of firms. Crypto exchanges further abuse their market control by perpetuating practices such as margin calls and forced liquidations, resulting in unknown outcomes for traders, as well as other systemically dangerous scenarios.

**Our Solution**

Blockchain technology provides us with an opportunity to redefine financial markets by reinventing derivative contracts, tools that have long-existed within traditional finance. By improving these financial tools with blockchain technology, we can create digital tokens to track the value of any asset. This promises to enable valuable new investment and risk management opportunities globally by removing centralized intermediaries and market inefficiencies.

**Create New Opportunities**

**Democratize market access**

MARKET Protocol is a framework for creating tokens to track prices of traditional and crypto assets, providing financial access to anyone. Users previously unable to participate in financial markets due to financial or geographical restrictions will be able to effectively manage risk, invest, or otherwise speculate with only their smartphone. MARKET Protocol position tokens can be created for traditional assets such as commodities and equities, for example, gold, the S&P 500, or reserve currencies like the US dollar. This could allow a farmer in Eastern Europe to manage the price risk of their harvest or for an individual in China to invest in US equities.

**Create new products**

Beyond access to existing trading opportunities, MARKET Protocol can be used to create new products to deliver opportunities previously unavailable, for example an index of
crypto assets, a basket of financial products, or even a hashrate token. MARKET Protocol lowers the marginal cost of creating new financial tools, enabling new innovative products for every corner of the global economy.

Reduce Risk

Protect the value of investments
Businesses and individuals traditionally use financial tools to safely and efficiently manage price risk by transferring the risk of speculation to speculators. An airline’s management hedges the price of jet fuel so they can focus on operating their business instead of reacting to fuel prices. Derivatives are the clear next step as the crypto space matures; these financial instruments will provide the risk management tools necessary for this space to scale.

MARKET Protocol position tokens can be used to hedge the price risk of any crypto asset, whether on the Ethereum blockchain or otherwise. Holding a short position token allows businesses, traders, and investors to profit from a decline in the price of an asset, removing the price risk of holding the asset itself. For example, users can own and use tokens for their intended utility without inadvertently speculating on their price.

Use blockchain for asset custody
Decentralization allows us to address the problems of centralized decision makers and custody, so that we can create a safer trading environment. Position tokens are not tied to exchanges, but are instead administered transparently according to a defined set of rules executed on the Ethereum blockchain. All collateral is stored on-chain, while settlement and accounting is handled by smart contracts enforced by blockchain consensus.

MARKET Protocol position tokens allow traders to deploy capital efficiently and enter positions with a predefined maximum downside, preventing dangerous and disruptive market liquidations. All tokens are fully collateralized and bear no credit risk. Once tokens are stored in a user’s wallet they can be redeemed at settlement without interacting with an exchange. This allows investors who do not trust financial intermediaries to participate in financial markets.
MARKET Protocol

Overview

MARKET Protocol provides users with a trustless and secure framework for creating decentralized derivative position tokens, including the necessary collateral pool and position clearing infrastructure. Creating (or minting) positions results in ERC-20 tokens that function like derivatives by providing price exposure to a reference asset, either digital or traditional. Reference digital assets are not limited to ERC-20 tokens, allowing price exposure to cryptocurrencies like Bitcoin, Ripple, and Monero.

A new set of position tokens can be minted by first defining their rules and reference asset and then by depositing collateral. A single set of tokens is comprised of one long and one short position token, and the pair can be used to reclaim the collateral that backs these positions. At any point in time, the collateral in the pool fully covers the maximum gain and loss of both long and short positions, removing counterparty risk and replacing one of the core functions of traditional exchange platforms.

Once minted, MARKET Protocol positions are tradeable on any exchange, which means subsequent traders of a position token do not have to participate in the token creation process. Position tokens offer users continuous price exposure and automated future settlement. They can be stored off-exchange in users wallets and are tradable on both centralized and decentralized exchanges, allowing traders to easily enter long or short positions in any token.

A trader can close their position by selling it on an exchange, for example, by selling a long token in return for ether (ETH) or a stablecoin. Alternatively, a trader can close a long position by buying a corresponding short token and redeeming the set of tokens for a return of capital directly from the collateral pool. Finally, a trader can hold their position until expiration. In this case, oracle provides a settlement value, which is used to determine the trader’s profit or loss. Once the position token enters a settled state, the trader can use their token to call a function for a return of collateral.

Contract Definition

Each pair of long and short MARKET Protocol position tokens are administered according to a set of predefined terms outlined within their contract specification. MARKET Protocol uses these terms to automatically settle all MARKET Protocol position tokens. Each contract specification will include the following terms:

- Reference Asset: What asset is used for pricing? This can be digital or traditional.
- Price Floor and Cap: This defines the maximum gain or loss for participants.
- Expiration Date: This is the date at which the position token is settled.
- Settlement Mechanism: An oracle will provide a settlement price to be used in the position token’s final profit and loss calculations.
• Collateral Token: What will the base asset be for profit and loss settlement? This must be an ERC-20 token and is used to collateralize the position token.

Position Ranges

MARKET Protocol position tokens offer continuous profit and loss exposure derived from a reference asset up to the limits of the PRICE_CAP and PRICE_FLOOR defined in the contract specification. All prices between the PRICE_CAP and PRICE_FLOOR are tradeable, outcomes are not binary. Traders can replicate uncapped payoff structures by utilizing a series of tokens.

If the high or low of the range is breached, the token is settled with the participant on one side receiving their maximum gain and the other side receiving nothing (their maximum loss). It is possible that neither the PRICE_CAP nor PRICE_FLOOR is breached; in that case, the token expires at its expiration date. This process is one of the most important features of the contract framework underlying MARKET Protocol and is discussed below.

Leverage

Position tokens provide implicit leverage to their holders. For a trader acquiring a long token, the amount he trades for the token is the position’s maximum downside. This is always less than the notional value of the position (the current price of its reference asset) For example, a trader could post only $50 to gain price exposure to a $200 share of Tesla stock (TSLA), by buying a long position token with a PRICE_FLOOR of $150.

The amount of leverage depends on the width of the position range (the difference between the PRICE_CAP and PRICE_FLOOR) relative to the price of a reference asset. All else equal, a narrower range provides more leverage than a wider range. Furthermore, the specific amount of leverage afforded to an open position depends on the price of the position relative to its price range. For example, a trader who buys a long token near the bottom of its price range (PRICE_FLOOR) will have more leverage compared to buying near the top of its range (PRICE_CAP).

Leverage offered through MARKET Protocol differs from traditional leverage, which runs the risk of forced liquidations and unfunded positions. Instead, MARKET Protocol position tokens are fully backed by the collateral contributed during the token minting process. At any point in time, this collateral fully covers the maximum gain and loss of all tokens. A set of long and short tokens can be used to claim collateral from the pool, or a single token can be redeemed for collateral after it has expired and settled.

Expiration & Settlement

Price oracles will be used to determine if a contract’s price bands have been exceeded or if the contract has reached its expiration date. If either of these criteria are met, the contracts’ position tokens enter an expired state and the settlement process automatically begins, allocating profits and losses to position token holders.
Tokens can be settled to the price of any actively traded ERC-20 token, cryptocurrency, or other listed asset by calling an oracle. For example, the defined token settlement terms could specify the last traded price of a reference asset on Kraken at a predetermined point in time. Oracle frameworks such as Thomson Reuters’ BlockOne IQ or Chainlink can be used to bring external data on to the blockchain, or an oracle can be written specifically for a contract.

To avoid incorrect or inaccurate settlement prices, we will implement a time delay between the position token expiration and the time at which users may withdraw their funds. Initially, a small group of project supports and team members will be responsible for reviewing the values used for settlement. As crowd-based consensus mechanisms evolve, we will implement additional resolution mechanisms into MARKET Protocol.

Initially, MARKET Protocol has chosen to use an internally developed oracle service which allows for the team to get to launch the initial implementation.

**MKT Token**

Anyone can mint position tokens by depositing collateral and paying an origination fee. Users who pay this fee with MKT, MARKET Protocol’s native token, will receive a fee discount.

The MKT token implementation has the ability for an upgraded token to be issued to add new features and use cases in the future. When and if an upgraded token would be issued, holders of the token would be asked to call the on chain upgrade function that would burn the old token and issue the new token in equal amounts. No changes to the total supply would occur and token holders would be able to upgrade at any point.

**Short Selling**

Currently, there are limited and inefficient options available for short selling crypto assets. With MARKET Protocol, traders or investors who own short position tokens have short exposure and will profit from a decline in asset prices. Short exposure can be obtained by simply acquiring short tokens. There is no need for the short token holder to locate or borrow the reference asset.

**Hedging Utility Tokens**

The majority of decentralized application (dApp) tokens are designed to provide users with some benefit or utility, however these tokens are subject to considerable price volatility, making them unsuitable for their intended uses cases. MARKET Protocol gives owners of utility tokens a way to hedge their price exposure. By acquiring short tokens, users can offset the price movements of their utility tokens.

Consider an example utility token, UTL, used to access the functionality of a decentralized application. Alice is a daily user of this dApp, so she holds a balance of UTL tokens in her
wallet. She is not interested in speculating on the changing price of UTL, so she decides to hedge its price. Fortunately the exchange she uses to buy UTL also lists a MARKET Protocol short position token for UTL. Alice buys 5 UTL tokens for $20 each and 5 UTL short position tokens. Before Alice can use her UTL tokens, they fall in price by 25% to $15 per token, resulting in a loss of $25. However, her short position tokens have increased in value by a total of $25, completely offsetting her loss.

Technical Specification

Summary

The MARKET Protocol platform is build with best-of-breed software and technologies. Our development organization follows software development best practices that are iterative, allowing for the rapid delivery of functional value. The team is comprised of industry veterans from the financial, blockchain, and IT industries. As a collective group, we’ve delivered 100’s of releases of software within organizations ranging from startups to Fortune 500 companies.

Our platform is composed of the following functional layers:
**Decentralized Exchange (DEX):** The MARKET Protocol decentralized exchange, built as a 0x relayer. This includes wallet integration and the user interface for minting and redeeming tokens.

**Middleware:** An abstraction of technologies providing DEX access to smart contracts and backend services.

**Backend Services:** The core infrastructure of the MARKET Protocol platform. Services such as the order book, minting/redeeming tokens, and managing the collateral pool are housed here.

**Blockchain:** MARKET Protocol smart contracts are deployed to, and interact with, the Ethereum blockchain.

This modular architecture allows our technology to fast-follow any platforms that gain traction in the marketplace. We have made specific choices today to take advantage of the current market leading ecosystems, while also keeping our eye to the future.

The following token specification examples each assume the architecture above, as well as the use of 0x infrastructure for off-chain order book hosting, order management, relayer communication, and networked liquidity. In all examples we use the decentralized stablecoin DAI as the collateral token, although any USD token could be used, such as USD Coin or TrueUSD.
Example Specifications

Minting
A long and a short token are minted as a pair, each representing a claim on capital from the collateral pool. The collateral necessary to mint a set of tokens is equal to the difference between the PRICE_CAP and PRICE_FLOOR and deposited into the MARKET Protocol smart contract.

MARKET Protocol Position Token Specification:
- Reference Asset: AAPL stock
- Collateral Token: DAI
- PRICE_CAP: 220 DAI
- PRICE_FLOOR: 120 DAI
• Current Price of Reference Asset: 175 DAI
• Expiration: 14 days later

**Before minting:**
• Alice’s wallet: 500 DAI, 0 position tokens
• Collateral pool: 0 DAI
• Alice wants to mint five sets of position tokens

**After minting:**
• Alice’s wallet: 0 DAI, 5 long tokens and 5 short tokens
• Collateral pool: 500 DAI

**Minting Tokens:**
1. A request is generated to mint five sets of tokens from the MARKET Protocol smart contract.
2. 500 DAI is transferred into the collateral pool. The cost to mint a set of tokens is 5 * (220 - 120) = 500
3. 5 long position and 5 short position tokens are minted.
4. The newly minted tokens are deposited into the Alice’s wallet.

After minting, Alice has no net exposure to AAPL. Any potential gains in the long position (L) will be offset by losses in the short position (S). Note that the price of the reference asset isn’t important when minting, what matters is the difference between the PRICE_CAP and PRICE_FLOOR. Underlying price is relevant when trading and discussed in the following section.
Trading

If a minter sells either their long or short tokens, then they are left with the resulting exposure that they did not sell. For example, selling short tokens leaves the minter holding long tokens, providing long exposure. After minting, Alice wants to be long AAPL. Since she currently owns 5 long and 5 short tokens, she wants to sell her 5 short tokens so that she has only long exposure.

MARKET Protocol Position Token Specification:
- Reference Asset: AAPL stock
- Collateral Token: DAI
- PRICE_CAP: 220 DAI
- PRICE_FLOOR: 120 DAI
- Current Price of Reference Asset: 180 DAI
- Expiration: 22 days after trading
• Long Token Bid/Ask Midpoint: 60 DAI (CURRENT_PRICE - PRICE_FLOOR) or (180 - 120)
• Short Token Bid/Ask Midpoint: 40 DAI (PRICE_CAP - CURRENT_PRICE) or (220 - 180)

Prior to trading:
• Alice’s wallet: 0 DAI, 5 long tokens and 5 short tokens
• Collateral pool: 500 DAI

After trading:
• Alice’s wallet: 200 DAI, 5 long tokens and 0 short tokens
• Collateral pool: 500 DAI

Trade Life Cycle
1. Alice (a maker) wants to sell 5 AAPL short position tokens. Her order is created, signed and validated.
2. The order is published on an exchange (0x relayer). Bob (a taker) fills Alice’s order, and the 0x protocol transfers Alice’s short position tokens to Bob while also transferring Bob’s DAI to Alice.

Alice is left with 5 long tokens with a cost of 300 DAI. She originally spent 500 DAI to mint 5 long and 5 short tokens and then sold off her short tokens for 200 DAI. Her long tokens have a price of 60 DAI each (300 / 5).

\[
\text{PRICE_LONG_TOKEN} = \text{CURRENT_PRICE} - \text{PRICE_FLOOR} \\
\text{PRICE_SHORT_TOKEN} = \text{PRICE_CAP} - \text{CURRENT_PRICE}
\]

Using the above formula her long tokens are equivalent to a current price of 180 DAI each (60 = CURRENT_PRICE - 120). Alice is now long 5 tokens at $180 DAI each.
Expiration

Alice can exit her position in three different ways. First she could trade away her long tokens. Next, her long tokens could settle due to either position expiration or a band breach. Finally, she could purchase back short tokens and submit both her long and short tokens together for redemption of DAI directly from the collateral pool. In the example below, Alice holds her tokens until expiration, although the process is similar in the case of a band breach.

MARKET Protocol Position Token Specification

- Reference Asset: AAPL stock
- Collateral Token: DAI
- PRICE_CAP: 220 DAI
- PRICE_FLOOR: 120 DAI
- Settlement Price of Reference Asset: 200 DAI
- Expiration: Now

**Prior to expiration:**
- Alice’s wallet: 200 DAI, 5 long tokens and 0 short tokens
- Collateral pool: 500 DAI

**After expiration:**
- Alice’s wallet: 600 DAI, 0 long tokens and 0 short tokens
- Collateral pool: 100 DAI

**Redeeming Tokens:**
1. Alice presents 5 long position tokens for redemption due to expiration.
2. 400 DAI tokens are transferred from the collateral pool into Alice’s wallet (5 * (200 - 120) = 400). After redemption, 100 DAI remain in the collateral pool since the 5 short position tokens have not yet been redeemed (5 * (220 - 200) = 100 DAI).

To start, Alice has 200 DAI and 5 long tokens in her wallet, and the collateral pool holds 500 DAI. Alice’s long position tokens expire due to time with a settlement value of 200 DAI. This assigns the claim value for long tokens of 80 DAI per token (CURRENT_PRICE - PRICE_FLOOR).
Redemption
Along with minting, the redemption process is an important mechanism that encourages efficient market pricing. Anyone at anytime can mint a long and short token, or redeem a long and short token for a return of capital from the collateral pool.

MARKET Protocol Position Token Specification
- Reference Asset: AAPL stock
- Collateral Token: DAI
- PRICE_CAP: 220 DAI
- PRICE_FLOOR: 120 DAI
- Settlement Price of Reference Asset: 200 DAI
- Expiration: 10 days after redemption

Prior to redemption:
- Alice’s Wallet: 0 DAI, 5 long position tokens, 5 short position tokens
- Collateral pool: 500 DAI

**After redemption:**
- Alice’s wallet: 500 DAI, 0 long tokens and 0 short tokens.
- Collateral pool: 0 DAI

**Redemption process:**
1. Alice presents 5 long and 5 short tokens for redemption.
2. 500 \((5 \times 100)\) DAI are transferred from the collateral pool to Alice’s wallet. 1 long and 1 short token are redeemable for the difference between the PRICE_CAP and PRICE_FLOOR (220 - 120) or 100.

Anytime a trader can buy a long and short token for less than 100 DAI, they will do so and then immediately redeem the pair for 100 DAI from the collateral pool. The opposite also holds true, anytime a trader can sell a long and short token for more than 100 DAI, they will mint a set of long and short tokens for 100 DAI and then sell them.
Team

The MARKET Protocol team has a diverse technical and financial background with over 30 years of cumulative experience in electronic trading on global exchanges. Co-founders Seth Rubin and Collins Brown have worked together since 2011, managing market making and algorithmic trading desks. In 2015 they began trading cryptocurrencies and realized that blockchain technology could solve many of the problems inherent in both traditional and crypto exchange models. These insights catalyzed the development of MARKET Protocol, which will enable an open, trustless, and globally decentralized derivatives marketplace.

Seth Rubin  
Co-Founder  
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LinkedIn

Since starting his career as a derivatives trader in 2005, Seth has directed multiple algorithmic trading desks, operated as a registered market maker, and launched numerous products. In 2013 he co-founded the algorithmic trading group BRE Trading, where he focused on global short term interest rates, as well as a number of commodity and equity products. He was also responsible for building and maintaining the firm’s exchange relationships. In 2015 Seth began trading cryptocurrencies, and soon afterwards he and his partners successfully developed and implemented a number of arbitrage and relative-value crypto strategies. Seth has a deep understanding of centralized and decentralized trading and exchange infrastructures, and he now leverages this experience to develop and execute the practical strategies incorporated into MARKET Protocol.

Collins Brown  
Co-Founder  
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LinkedIn

Collins has over 13 years of experience trading derivatives on exchanges around the world. He began trading U.S. government bonds, U.S. Treasury futures, Eurodollars, and international interest rates at Transmarket Group in 2005, eventually expanding into metals, soft commodities, and currencies in 2010. In 2013 he co-founded BRE Trading with a focus on automated and quantitative trading strategies. While trading full time at BRE, he led the firm’s development team, building flexible, low latency, proprietary trading systems to implement the firm’s strategies. As an experienced trader, Collins understands the complex demands of exchanges and traders, and he believes MARKET Protocol is the bright future of the global derivatives industry.
Lazar Jovanovic  
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As a crypto trader and enthusiast, Lazar has evaluated many new projects, pursuing the technical side of more successful ones. He has been involved with strategy development and community support for a number of blockchain based startups.

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Travis Mathis is a software developer from Burlington, VT. He has a web 2.0 development background and has owned and operated several startups. He has over 10 years experience in software engineering and has worked on numerous projects as a contractor, freelancer, and team member.

Dan Matthews  
Software Developer  
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LinkedIn

Dan is a digital nomad with a passion for transforming the way communication and money work. He has held lead engineering and management roles in startups focused on big data, finance, and communication for over 15 years. In his spare time he enjoys world schooling his two girls, traveling, restaurant hopping with his wife, Ana, and exploring new places with his dog, Kieran.
Advisors

Erik Voorhees
Founder and CEO, ShapeShift.io
LinkedIn

Erik is a successful serial crypto entrepreneur and also one of the most renowned advocates of crypto technology. He is currently the founder and CEO of ShapeShift an instant exchange for digital currency founder in 2013. Erik's long-term experience building successful crypto businesses and his deep industry knowledge will both be huge assets to MARKET Protocol. We are very excited to have him onboard as we leverage the benefits of blockchain technology to build a superior derivatives marketplace that is open to all traders.

Patrick Charles
Data Science and Analytics Pipeline Architect
LinkedIn

Patrick Charles has over twenty years of experience building software in a variety of industries including finance, education, health care, and computer security. He has worked as a technology leader, consultant, software architect, engineer, and researcher. Patrick is an open-source contributor, has authored a number of technical papers, is an inventor with two U.S. patents, and is co-author of the opening chapter in the soon to be published book titled *Frontiers of Cyberlearning*.

Josh Fraser
Co-Founder, Origin Protocol
LinkedIn

Josh started coding at the age of 10. Prior to Origin, he co-founded three other venture-backed companies: EventVue, Torbit (acquired by Walmart Labs), and Forage.
Casper Johansen  
Co-Founder, Spartan Group  
LinkedIn

Based in Asia since 2004, Casper has worked as an investment banker, tech entrepreneur, corporate executive, and private equity investor. He is currently a co-founder of Spartan Group, an investment management and advisory firm focusing on blockchain technology. Casper co-heads Spartan’s advisory business, which works with industry leaders in the blockchain and ICO space. Prior to Spartan, Casper spent 10 years in the Investment Banking Division at Goldman Sachs in their London, Hong Kong, Beijing, and Singapore offices. Casper has been an active tech angel investor for over a decade, and is an active blockchain and crypto investor.

Kevin Owoccki  
Founder, GitCoin  
LinkedIn

Kevin Owoccki, the founder of Gitcoin.co, is a software engineer interested in hacking, learning, and writing about the intersection of next-generation technologies, especially machine learning, computer vision, VR, AR, and plenoptic photography. He has a BS in Computer Science and also 10 years of engineering leadership experience in startups and open source software. Additionally, Kevin plays an active role in the Boulder, Colorado tech scene, co-organizing the Boulder Blockchain meetup.

Brent Traidman  
Chief Revenue Officer, Bread  
LinkedIn

Brent has over 15 years of experience leading high impact growth software companies, of which many have had successful exits. Brent is currently the Chief Revenue Officer at Bread (BRD), one of the world’s fastest growing crypto financial platforms. Bread is considered a thought leader in the world of crypto, with over one million users in over 140 countries. Prior to Bread, Brent worked in the Vista Equity Partners portfolio where he helped drive two exits. Brent builds revenue engines and helps develop growth strategies. When not at work, he helps advise a Silicon Valley venture capital firm on early stage investments and regularly speaks, mentors, and attends global accelerator conferences.