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Menlo One

The Framework for Scaling Decentralized Applications

Whitepaper

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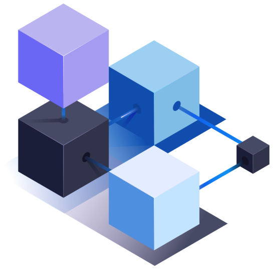
Whitepaper version: 6.0.0
November 1, 2018



Abstract

Menlo One is a framework, an open source set of tools and protocols, that allows developers to build applications that have the speed, ease of use and cost effectiveness of centralized applications. Our framework leverages multiple decentralized technologies including the Ethereum Network [26], IPFS [25] and is forward compatible with other decentralized networks. We use them in a synergistic way, off-setting their weaknesses and leveraging their strengths to create a user experience competitive with one that users have grown used to in the centralized web. Our decentralized database and Proof-of-Reputation incentive system enable the next generation of marketplaces, social media platforms, and other apps to be as fast and performant as their centralized predecessors.

Three Key Technologies Proposed by Menlo One:

1. A desktop native app which runs light nodes of networks including Ethereum and IPFS which can automate pre-approved transactions. This app communicates via an open port to dApps in the web browser.

2. A Proof-of-Reputation algorithm which leverages a Token-Curated Registry design pattern to incentivize virtuous contributions and promote network growth.

3. A decentralized database network which caches data from decentralized networks to provide users with the speed and experience of a traditional webapp, without compromising the security guarantees of a distributed blockchain.

Three Types of Participants Described in this Document:

1. Sellers: Menlo One is an attention economy. A Seller is a person or business seeking the attention of someone else to sell or promote a product, service, or brand. Sellers have Profiles of the thing they want attention for. This could include a restaurant seeking the attention of a hungry customers in the case of a restaurant review site, a business who's recruiting seeking the attention of a potential candidate in the case of a jobs site, or someone selling a used car on a car listing site.

2. Content Nodes: Serve an app which pulls data from IPFS and Ethereum including the Seller Profile and caches in a database on a performance machine hosted in the cloud.

3. Users: Someone who gets paid for viewing the Profile of a Seller. Payment comes from the Sellers Listing smart contract.

High Level Overview of Token Economics

In the spirit of Bitcoin and Ethereum, users have to pay something to support the network. Since most use cases on the web revolve around capturing someone's attention to sell them something, this model presents a problem as it's not ideal to charge potential customers to walk into your showroom. To solve this, the ecosystem is entirely supported by Sellers. Sellers put Menlo Tokens in a smart contract to pay Content Nodes to quickly serve their Profile or Product Page to Users. Menlo Tokens are used to pay for data, services, and attention.

Note: For the sake of exploring all of the features within our framework, an ICO marketplace makes for a great use case as that industry is already on-chain. While we refer to an ICO marketplace often in this paper, but there are of course, many other use cases for our framework.

Mission

The mission of Menlo One is to disintermediate the exchange of value. We're making tools that will spur mass adoption of decentralized applications by making them simple to use, inexpensive, and fast so that they are able to compete with their centralized forefathers. Doing so will lead to a world that is more prosperous and equitable. Our framework, a first in the space, will help spur what we hope will be the catalyst the blockchain community needs to create the decentralized application that gets used as often as Facebook or YouTube. Frameworks have always served as a catalyst for rapid development of virtually every web technology. We think Menlo One can do the same.

Not An Offer For Investment

This document outlines our product vision. We highlight the problems we aim to solve, and how as a company we plan to go about solving them. At the time of writing, we are planning on launching a sale of Menlo Token (ONE) which is a critical part of how our TownHall software works. The purchase of ONE is not an investment in the development of the products described below. ONE is sold as a product which is needed for TownHall to properly function. We present this document to outline our long term product vision.

Business Problems We Aim To Solve

Lowering The Cost of Building a dApp

Unlike other technologies, the decentralized application ecosystem is lacking of any robust framework that allows developers to implement commonly used features. By including an API for pre-permissioned transactions, our goal is to increase the speed of building decentralized applications, similar to the way that Rails increased the speed of building a centralized application on the Ruby programming language.

Making Decentralized Apps as fast for the User as Cloud Based

One of the inherent flaws in decentralized networks is that the speed of transacting simply cannot be as fast as transacting with a traditional performant web-stack. Our framework aims to increase the speed of reads and writes from multiple decentralized networks such that it as fast as interacting with a traditional performant web-stack.

Improving the User Experience of dApps

Many of the tools leveraged by the Ethereum ecosystem today were created a number of years ago and were intended for a technical audience. The experience of interacting with dApps using tools such as MetaMask, Parity and other Web 3.0 tools have an abrasive user experience because they ask users to approve transactions for things that could be as simple as liking a post.

Cost to Users & Developers of dApps

The cost of transacting on the Ethereum blockchain is currently a barrier to entry for dApps. While the philosophy inherited from Bitcoin that all users should each pay a little bit to support the network is fundamental to the concept of decentralization, the simple fact is that requiring users to transact is a barrier for mainstream dApp adoption. This poses a problem for any application that is trying to sell something because businesses cannot be charging users to “step into their showroom”. We believe that by offsetting the gas cost inherent to the Ethereum network with a fungible token (ONE), we can overcome this barrier to entry.

Potential Use Cases for Menlo One

Marketplaces for Security Tokens and other Financial Products

Many financial instruments and services could be made vastly more efficient by disintermediating. For example, equity crowdfunding is a space which required new laws to be passed in order to regulate the platforms upon which these securities are being offered. Someone could build a completely transparent decentralized crowdfunding marketplace like WeFunder or AngelList where regulation would not be necessary to ensure that some offerings are not being promoted over others. This would include ICO’s, Security Tokens and other types of crypto transactions, even completely decentralized system to make OTC crypto transactions much more secure. Our framework would make marketplaces with a user-experience as friendly as shopping on Amazon possible.

Peer to Peer Share Economy Sites

Using the Menlo One framework, it would be possible to build a completely decentralized Airbnb, Uber or other share site. These sites take a considerable percentage of a transaction which could be passed onto sellers and users.

Marketplaces for the Next Generation of ICO's

There have been many proposals for improvements on the existing ICO model [16]. Most notably the DAICO [17] and Interactive Coin Offering [18] proposed by Vitalik Buterin, the safe token sale mechanism proposed by Vlad Zamfir [19] and various continuous token models proposed by Simon de la Rouviere [20]. Most of these promise investor protection, transparency and trustlessness. These new models involve social relationships and complex interfaces beyond a standard wallets capabilities for them to be usable. It's unknown which models might catch on with the ICO market, however the features of Menlo One make it the most ideal environment to support such models, and our system is designed to be forward compatible with them.

Original Content and Media

In recent years we have seen a rise of content companies such as Spotify, Youtube and other media sites which lack transparency into creator revenue and into the mechanisms by which content creators are paid. Menlo One provides a framework where middle men are cut out and transparency and value are provided back to the users and content creators.

User Generated Content that Pays Users for Creating Quality Content

The Web 2.0 is built on intermediaries, profiting from advertising on sites where users are encouraged to share their content for "free" without providing them equal value in return. Examples include: Facebook, Google, Yelp, YouTube, etc. Menlo One can be used to build a system where users and contributors are rewarded for the value or content they provide.

Traditional Web Models that Wish to Move to the Web 3.0

Our Framework can be used to replace traditional web stacks on existing centralized social media sites, e-commerce, career networking sites, news outlets and other traditional models. While these systems could be built with a framework such as Rails, Menlo One instead leverages blockchain technology in order to enable users to monetize their attention. Leveraging traditional payment systems including Visa would normally be cost prohibitive for small to micro-transactions common to crypto.

High Level List of Possible Use Cases

- The first ever truly decentralized ICO/Security Token/Membership Token marketplace.
- The first ever DAICO marketplace and management system.
- A version of Yelp in which users get paid for writing restaurant reviews and where restaurants give coupons to pre-qualified customers.
- A decentralized Amazon or eBay which does not take a fee from the Seller.
- A decentralized Airbnb, Uber or other share site which provides more transparency to Sellers and does not take a fee.
- A marketplace for in game products.
- A job marketplace with small bounty-sized tasks.
- A monetized version of Stack Overflow which rewards users to solve complex software problems.
- A monetized version of Quora where high value contributors are rewarded for providing expert advice.
- An online community like Reddit where users with the best posts are rewarded.
- A task management system like Trello where users race to complete tasks for a payout.
- An online logo design community where a customer puts up a bounty for a logo, and the best logo gets a payout.
- A decentralized group or **guild** who are incentivised by startups to review their product.

Who Are We and Why Are We Building Menlo One?

We are serial entrepreneurs and technologists with deep experience and understanding in building successful consumer-facing web products and have been in the blockchain space since its inception. We’ve paid close attention to the pain points while using and developing blockchain technologies. We are simply building the product we know needs to exist.

Legal Considerations

Important Considerations for Prospective Menlo Token Purchasers?

Anyone contemplating purchasing Menlo Tokens should read and understand the important considerations set forth below before purchasing Menlo Tokens.

Development Failure or Abortion

Due to the technological complexity and difficulties that may be uncertain, unforeseeable and/or insurmountable, the development of the Menlo One protocol or certain components of the protocol could fail or abort at any time for any reason (including insufficiency of funds). Depending on when the development failure or abortion may occur, these events could result in an inability to use some or all of Menlo One which could have an adverse impact on the utility of ONE

Limited Information Disclosure

Various technical specifications and parameters of the Menlo One may be updated and changed both before and after the sale of ONE. While this Whitepaper contains key information regarding Menlo One and Menlo, Inc, it is subject to any adjustments or updates as deemed necessary in Menlo, Inc.'s sole discretion. Menlo, Inc. is not obliged to regularly update the Whitepaper regarding the development of the Menlo One (including its progress and meeting expected milestones) and has no obligation to provide timely and full access to all information relating to Menlo One that may be generated by Menlo, Inc. from time to time.

Changing Regulatory Environment

Cryptographic tokens similar to ONE are being, or may be, scrutinized by the regulatory authorities of various jurisdictions. Menlo, Inc. may receive queries, notices, warnings, requests or rulings from one or more regulatory authorities from time to time, or may even be ordered to suspend or discontinue any action in connection with Menlo One or the ONE. The development, marketing, promotion, use or otherwise of the Menlo One or ONE may be seriously affected, hindered or terminated as a result. Since regulatory policies in any particular jurisdiction are subject to change, any favorable regulatory position regarding Menlo One and ONE in any jurisdiction may be revoked or altered at any time. ONE could be defined from time to time as virtual commodities, digital assets or securities or currency in various jurisdictions and therefore could be prohibited from being traded or held in certain jurisdictions pursuant to local regulatory requirements.

Intended Use of Menlo Tokens; Not Marketed or Sold as Securities

ONE are not intended to hold value outside of their use within the TownHall software. Purchasers of ONE do not receive any ownership interest, voting rights, management rights, property interest, or any interest in revenue or profit sharing. The intended use of ONE is to incentivize participation in the TownHall ecosystem, encourage users to make positive value-add contributions to the ecosystem, and to support the token curated registry system. Because we do not believe Menlo Tokens are securities, Menlo Tokens have not been registered for sale pursuant to the Securities Act of 1933 or under the securities laws of any state. Neither the Securities and Exchange Commission nor any state securities regulator has reviewed the terms of the ONE sale. It is possible that either a federal or state securities regulator might determine that the sale of ONE is subject to the securities laws, despite our view that ONE are not securities. Purchasers of ONE tokens may be adversely affected by any such determination that ONE are securities and subject to compliance with securities laws.

Advances in Cryptography

Advances in cryptography, such as code cracking or technical advances such as the development of quantum computers, could present risks to all cryptography-based systems, including the Ethereum Virtual Machine and Menlo One. This could result in the theft, loss, disappearance, destruction or devaluation of ONE. It is impossible to predict the future of cryptography or the future of security innovations that could offset the risks posed from such advances.

Open Source Seller

Menlo One is an open source project initiated by Menlo, Inc. and intended to be supported by the community interested in improving trust the transparency and security of the token sale process. Although Menlo, Inc. may be influential in any community that develops around the Menlo One, it cannot fully control the development, marketing, operation or otherwise of Menlo One. Anybody may develop a patch or upgrade the source code of the Menlo One without obtaining prior authorization of any person. As a result, Menlo One could be influenced by third parties that do not have the best interests of ONE purchasers in mind. Alternatively, little or no community could develop around Menlo One, in which case, Menlo One would not benefit from the advantages other open source projects enjoy.

Flaws in Source Code

Menlo, Inc. cannot guarantee that the source code of Menlo One is or will remain without flaws. At any point in time, the source code for Menlo One may contain flaws, errors, defects, vulnerabilities and bugs (collectively, “**Flaws**”), which may disable some functionality for Users, expose Users’ information or otherwise adversely impact Menlo One. Such Flaws could compromise the usability and/or security of Menlo One and consequently adversely impact the value of ONE. Open source codes rely on transparency to promote community-sourced identification and solution of problems within the code. Menlo, Inc. shall work closely and continuously with the community supporting Menlo One to improve, optimize and perfect the source code of Menlo One, but Menlo, Inc. provides no assurances that any such community will develop or that Menlo, Inc. will be able to address identified Flaws in Menlo One source code in a manner sufficient to mitigate such Flaws.

Update of Source Code

The source code of Menlo One will be updated, amended, altered or modified from time to time by Menlo, Inc. and/or the community using Menlo One. Menlo, Inc. is unable to foresee or guarantee the precise result of any such updates, amendments, alterations or modifications. As a result, any update, amendment, alteration or modification could lead to an unexpected or unintended outcome that adversely affects Menlo One’s operation or the utility of the ONE.

Private Keys

The loss or destruction of a private key required to access ONE may be irreversible. Only the possessor of both the unique public and private keys can control the ONE through a local or online wallet. Purchasers are responsible for safeguarding the private keys contained in Purchasers’ wallets. To the extent such private key of Purchaser is lost, missing, divulged, destroyed or otherwise compromised, neither Menlo, Inc. nor anyone else will be able to help Purchaser access or retrieve the related ONE.

Popularity

The value of ONE hinges heavily on the popular adoption by users of Menlo One. Menlo One is not expected to be popular, prevalent or widely used immediately following the sale of ONE. For a variety of reasons, Menlo One may never develop a significant place in the token sale community in the United States or elsewhere. Further, despite the efforts of Menlo, Inc. to promote the purchase and use of ONE for the purpose of developing Menlo One, a significant number of ONE may wind up being held by speculators, which may artificially increase the price of ONE. The lack of users and commercial utilization may result in increasing volatility of ONE price and consequently compromise Menlo One’s long-term development.

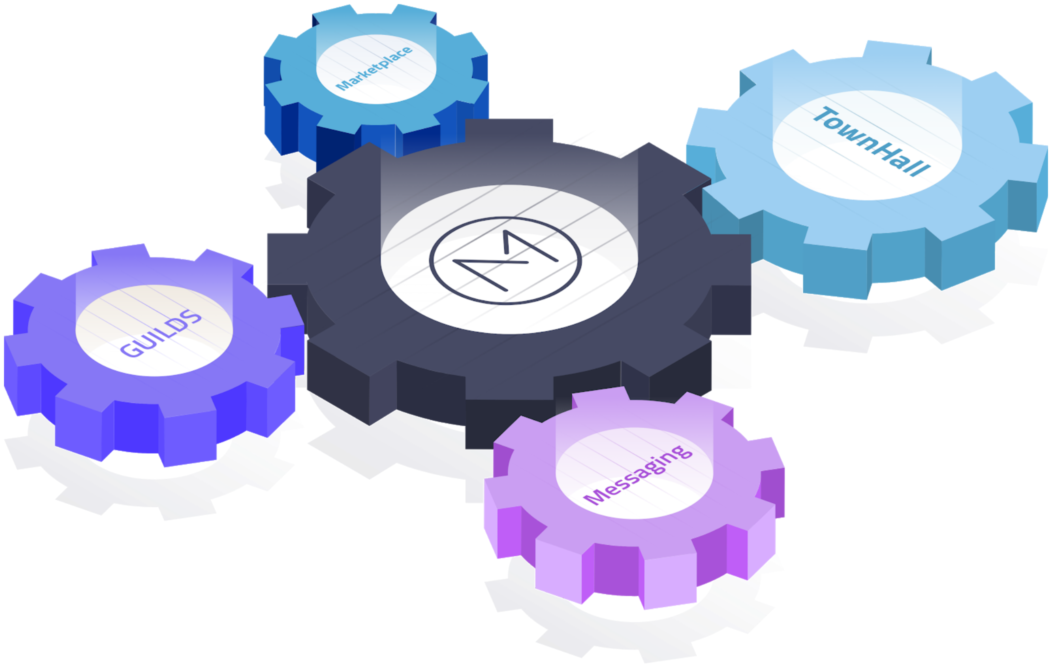
Liquidity

ONE are not a currency issued by any individual, entity, central bank or national, supra-national or quasi-national organization, nor is it backed by any hard assets or other credit. The circulation and trading of ONE on the market depends on the consensus on its value between relevant market participants. Neither Menlo, Inc. nor any other person is obliged to redeem or purchase any ONE from a purchaser or any other ONE holder. Menlo, Inc. does not guarantee the liquidity or market price of ONE to any extent. Purchasers of ONE who wish to sell their ONE must locate one (1) or more willing buyers to purchase at a mutually agreed price, which process could be costly and time-consuming. At any given time, no crypto-currency exchange or other public market may have ONE listed thereon for trading. Menlo, Inc. does not intend to take any steps to cause ONE to be listed on any crypto-currency or other exchange.

Competition

Menlo One is based on open-source computer software such that nobody claims copyright of the source code. As a result, anyone can legally copy, replicate, reproduce, engineer, modify, upgrade, improve, recode, reprogram or otherwise utilize the source code and/or the underlying platform of Menlo One in an attempt to develop a competing platform or software. Such circumstances are out of Menlo, Inc.'s control and may consequently compromise the utility of Menlo One and the ONE. In addition, third parties, some of whom may have substantially greater resources than Menlo, Inc., may develop separate and unrelated competing protocols. Menlo, Inc. will in no case be capable of eliminating, preventing, restricting or minimizing such competing efforts that aim to compete with Menlo One.

Menlo One Components



Menlo Token - The Cornerstone Of Our Software

Menlo Token (ONE) is an open source ERC20 [7] compatible token on the Ethereum public blockchain. ONE is a critical piece of software designed to work flawlessly with our software and is sold so that developers have a fully functional product with which to build on. The ERC20 design enables users to freely transfer ONE between one another without authority from an intermediary, which is a critical attribute for our system to be completely decentralized.

Use of ONE as a Currency for Data

In order to ensure Menlo One can provide users with an experience as fast and responsive as users are accustomed to from centralized applications (such as Facebook or YouTube), the data on Menlo One has to be served from high performance Content Nodes, which we envision will be hosted on AWS. Running such a system of course has a cost, and Content Node Hosts will be incentivised with ONE.

Use of ONE as a Currency for Attention

Menlo One, at its core, is an attention economy. A seller or someone interested in capturing the attention of a potential customers pays both a Content Node to deliver their Profile Page to a prospective customer, and to the customer for their attention. Sharing revenue with a User for their monetized attention is also famously used by the Brave Browser [8], who give users a percentage of the ad revenue from their in-browser ad network.

Use of ONE as a Virtuous Incentive Mechanism

Token Driven Database for a Token Driven Economy

Given the relatively low price for a standard display ad, the revenue a single user might generate for themselves using the Brave Browser or similar service is not likely to be life changing. Another benefit to having all previous transactions on an immutable ledger means it is easy to qualify the customer, and quantify the value of their attention. An impression from an experienced and relevant buyer could have a market value of millions of times more than what would be currently paid for a regular display ad. Common sense dictates that many users will go out of their way for the opportunity to share in that ad revenue, perhaps even trying a new online community. However, without a mechanism to prevent bad actors such as bots from abusing the system, advertisers might lose confidence that the impressions are authentic, devaluing the network. While validating financial history is traditionally a good way to qualify a customer, it's far from sybil resistant.

Proof-of-Reputation

To solve these problems we would like to propose a Proof-of-Reputation algorithm ("PoR"). Reputation is a token-curated score, granted by smart contracts which take signals from events in the ecosystem. This score is used to weigh how much a user stands to make from an impression or other monetizable event, with the payout of a fungible token like ONE, being relative to the amount of non-fungible Reputation user holds. Examples of Reputation building actions a user could take include contributing comments, posts or reviews, the value of which is determined by community upvotes. Upvoting itself is an action worthy of earning Reputation to incentivize participation.

PoR is contrasted against popular consensus algorithms such Proof-of-Stake in that one's reputation cannot be bought or sold (both conceptually and in this instance technically). The ironic flaw with the Proof-of-Work algorithm used by Bitcoin is that the challenge to solve quantitative math problems led only to an arms race between elite groups for specialized hardware and access to cheap power. PoR presents a low risk for centralized control, is environmentally friendly, and relatively fast to use. Although Menlo One is currently primarily based on Ethereum, it's theoretically possible to migrate the entire network to another blockchain so long as the new network can agree to migrate Reputation balances.

There have been multiple projects which use a public blockchain to establish social reputation. Userfeeds which leverage a similar architecture to determine relevance for data [28]. The most notable is Backfeed which proposed using reputation tokens to establish a users contribution to a community [10]. There have been several identity staked Proof-of-Authority systems proposed which share some similarities to PoR, including one from Ethereum co-founder Gavin Wood [29]. Menlo One builds upon these projects to implement a system which incentivises virtuous behavior, provides resistance against bad actors and is fast enough for a modern web experience.

Give Before You Get Token Incentives

On Menlo One, usually as in life, you have to give before you can receive. Since Reputation transactions are based on Ethereum, a new user will have to spend money on gas for each Reputation earning contribution. The incentive of course is for the user to build enough Reputation to recoup the cost, and ideally earn considerable ONE. Content Nodes have a much higher Reputation threshold before they can begin monetizing because Content Nodes should be invested in delivering correct and reliable information. In this sense participants have to stake ETH to join the network, and hope they can provide value to the ecosystem. All participants are incentivized to not cheat the system. If for instance a Content Node is caught serving anything other than valid data, they lose their Reputation and are immediately demonetized.

Background on Token-Curated Registries

Token-Curated Registries (TCR) are an emerging crypto-economic design pattern in which participants have stake-based incentives to curate lists. As described by TCR inventor Mike Goldin, "*A token-curated registry uses an intrinsic token to assign curation rights proportional to the relative token weight of entities holding the token. So long as there are parties which would desire to be curated into a given list, a market can exist in which the incentives of rational, self-interested token holders are aligned towards curating a list which is high quality. Token-curated registries are decentrally-curated lists with intrinsic economic incentives for token holders to curate the list's contents judiciously.*" [9]. In Menlo One, TCR's are used in many parts of the ecosystem to incentivize users for positive, value-add contributions.

Menlo TownHall - The Communication Layer

Menlo TownHall is a protocol to facilitate a decentralized, token incentivized communication system. This system is built with a matrix of smart contracts and rewards participants who provide high value information to an online conversation or discussion in ONE. Each participant contributes ONE to the system. The community then signals which messages have the highest value or are most relevant. Those who have the highest value contribution are rewarded with a ONE payout from the system.

Online Chat

Most online ecosystems have some sort of public forum feature. By financially incentivising experts with deep domain knowledge to share their insight, Menlo One could be used to create ecosystems which have higher quality user generated content than their centralized forefathers. For example, this system could be used to pay a blockchain developer who's hourly billing rate is in the thousands of dollars to contribute to a discussion about the quality of a blockchain company offering a token.

HashMail: Private Paid Messaging

Most online ecosystems have private messaging. With blockchain technology, paid messaging such as LinkedIn's InMail, or Earn.com can be made considerably simpler. By leveraging symmetric encryption techniques with smart contracts, it’s possible to enable users to set a price to read an encrypted message.

Immutability

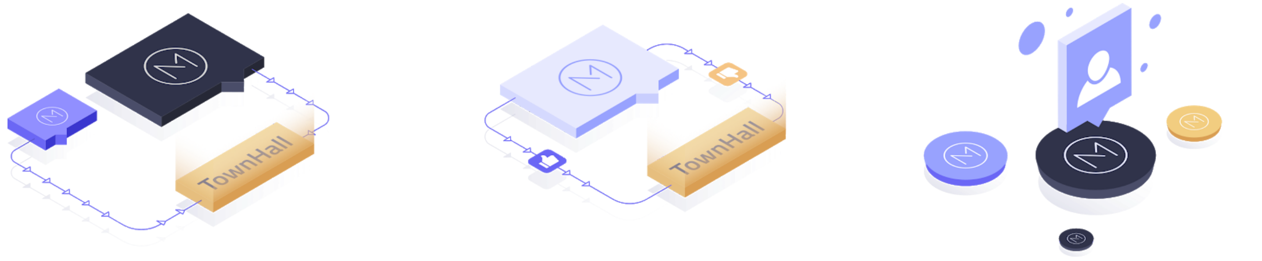
Many online marketplaces have faced allegations of censoring unflattering reviews or comments by those with administrative privileges. The consequences of such censorship are bad when someone is making a purchase decision about a product like a book or when picking a restaurant. This kind of censorship can be detrimental to investors when they are deciding on investing thousands or even millions of dollars in a business. An immutable forum is critical to ensure that a conversation has not been altered.

Reputation

User actions such as voting, opening a message, or winning a payout serve as signals of Reputation, and TownHall provides many opportunities to quantify a user’s level of Reputation in the network.

Token Economics Within TownHall

ONE is used by the ecosystem for posting, voting and rewards. Below is a diagram of the economic flow within the ecosystem.



Users pay MenloToken to comment. MenloToken goes into pool.

Users pay MenloToken to upvote/downvote. MenloToken goes into pool.

Users with most valued comment gets the MenloToken form the pool.

The TownHall Framework

It’s our intention to release most of our product as autonomous standalone products as we think it makes sense from an object oriented perspective to keep our project a s modular as possible. An autonomous standalone version of TownHall was released in April 2018 and is available at: https://github.com/MenloOne/townhall.

TownHall is written entirely in JavaScript (ECMAScript 6) and is designed to be run on the end users computer. It interacts with Ethereum via a web3 provider such as MetaMask and IPFS. To better understand how TownHall interacts with the other technologies, we could view the roles of each of these technologies from the perspective of the classic Model-View-Controller architecture. Our JavaScript application is the View layer. Both TownHallJS and the smart contracts on Ethereum serve as the Controller as they are are tightly coupled pieces of application logic which need one other to function. Both Ethereum and IPFS share the role of the Model. TownHall establishes a proprietary protocol for communicating between both networks.

The TownHallJS Application

TownHall is designed to be run on the end users computer. It heavily uses the React JS framework, webpack and dependencies including IPFS, web3, Truffle and others. The interface which is included in TownHall is intentionally designed to be "barebones", and it's our intention for it to be customized by end-user developers to fit their needs, with our expectation that many of the use cases we earlier presented can be created using the framework. It is required to deploy the included smart contracts to Ethereum in order to get the application running.

Once the application initializes, it reads messages, votes and other data stored on Ethereum at the address specified in the config file. A web3 provider and connection to IPFS is required at this step. Once the data is downloaded locally, it's displayed for the user in the GUI.

Authentication & User Data

End users essentially authenticate with their private key for any actions which require a write to the system such as posting, voting, commenting etc. All user data is associated with their key. This includes messages associations, vote count, messages payout etc. Of course payout in the Menlo One Token is also made to the users address.

This key pair authentication design pattern is becoming common place within decentralized systems, and while we think the pros outweigh the cons, it's not without its flaws. The clear advantage to this is the ability to authenticate without relying on an intermediary, the disadvantage is the end-user losing their private key or their private key being compromised. A major reason why the ERC20 standard makes sense for for Menlo Token (ONE) is how easy the token is to transfer. If a user suspects their key has been compromised, they can transfer their ONE to a fresh account. Many ERC20 compatible wallets also support the easy creation of an easy to backup mnemonic phrase. If handled responsibly, using a key pair for authentication makes a lot of sense. Though we recommend developers using Townhall to include information for their end-users on how to responsibly store and use their keys.

Data Model

Text based messages such as topics and comments follow the InterPlanetary Linked Data (IPLD) format which is then converted into Concise Binary Object Representation (CBOR) by IPFS. IPLD allows data on IPFS to treat all content-addressed data structures as subsets of one big information space, unifying all data models that link data with hashes as instances of IPLD [104].

An example of a message JSON object:

```
{
   "version": <hash>,
   "parent": <hash>,
   "body": <string>,
   "issuer": <pubkey>
}
```

Structure of a TownHall message object model:

- Root
- Messages

----Topics
----Comments

Core Features

TownHall comes with the following system features:

1. Create Topic
2. Comment on topic
3. Upvote topic
4. Downvote topic
5. Upvote comment
6. Downvote comment

The TownHall interface comes with the following features:

- View all messages
- Input box to submit a new message
- Buttons for upvote, downvote
- Button to “get paid for your messages”
- Text which says “this post earned X ONE” by that message

Key Components

Menlo Token (ONE)
Description: Menlo Token (ONE) is an open source ERC20 compatible token on the Ethereum public blockchain. The token serves several purposes in the system including: 1. Staking how strongly a user feels about a topic and 2. How users reward one another on TownHall.

ONE is a critical piece of software designed to work flawlessly with the TownHall framework and is sold so developers have a fully functional product with which to build on. TownHall and other Menlo One products have interoperability with other ERC20 tokens and ONE should not be purchased with the hope that future Menlo One products will use ONE exclusively.

TownHallJS
Description: An open source Javascript application. It interacts with and orchestrates the other following components. TownHallJS is responsible for interfacing with the user, formatting data for IPFS, sending data to IPFS and interfacing with Ethereum smart contracts.

Graph Smart Contract

Description: An open source smart contract which lives on the Ethereum public network which indexes data stored by TownHallJS. Menlo Token is required to store entries on or interact with this smart contract. The graph contract contains the links between message nodes. It creates and organizes the graph, linked list/tree of messages under topics. It contains a mapping of IPFS hash to in-contract index for message object. This graph is then used by clients to generate a view of the discussion board.

Voting and Payout Contract

Description: This contract to is used for voting on messages. If a user has one of the top 5 most upvoted message in a 24 hour period, this contract is used the pay the user from fees received from the Graph Contract. A method has to be called by the user to claim rewarded tokens. If a user does not claim the tokens within 24 hours, they are rolled back into the pool. Payout amounts calculations are triggered by first claimant in epoch.

All upvotes and downvotes must have tokens associated with them as tokens are used to stake how strongly the voter felt. All upserts related to forum messages are done with a JSON object which contains signatures and hashes. This payout structure will be used to reward the Top 5 Messages in a 24-hour period: 1st: 40%, 2nd: 25%, 3rd: 20%, 4th: 10%, 5th: 5%.

User Journey 1: Creating a new message

1. A user wishes to create a new topic.
2. Their comment is given an IPFS content-addressable hash locally.
3. The hash is then sent with a fee and a parent message to the Graph Contract.
4. A fixed fee of Menlo Tokens and Ether(gas) is required by the Graph Smart Contract.
5. Once the user sees their message metadata in the Graph Contract, the user sends the message to Menlo’s IPFS instance. After IPFS acknowledges the message, it’s visible to other subscribers on Menlo Core.
6. Other users have the ability to "upvote" or "downvote" the message, which may be a topic or a post, based on how much value users feel it provides to the conversation.
7. Every 24 hours, the Top 5 messages of that day are determined. Users with popular messages can redeem their reward calling a method on the Voting and Payout Contract.

User Journey 2: Upvoting a message on the message board

1. A user sees a message they like, and call the upvote method.
2. A method in the Voting and Payout Contract is called. A small amount of ONE is required to call the method.

3. The ONE is held in the Voting and Payout Contract, and will go into the reward pool. The fees from downvotes also go into the reward pool.

User Journey 3: Redeeming ONE for a topic

1. A user wishes to collect the ONE owed to them for creating a popular message.
2. They see one of their messages is in Today's Top 5, then they call a method in the Voting and Payout Contract.
3. That method checks that the ETH address calling it is the same as the address of a poster in the Top 5, if so, it pays them accordingly.

Menlo Guilds - The Governance Layer

Design Considerations

When designing this network we examined many alternatives to traditional online reviews which are notoriously inaccurate.

Our goals were to;
1. Encourage those with expertise to share their insight.
2. Reduce corruption and bribery in online reviews.
3. Establish a system for ecosystem governance to identify potential bad actors.

We discovered numerous studies which showed financially incentivising people to give reviews was highly effective [11]. We also found that organizing reviewers into groups was effective in reducing opportunities for bribery. One study done at Stanford showed that organizing people into a decentralized social structures called "guilds" (a concept dating back to the middle ages)

was effective in reducing opportunities for corruption in reviews [12]. Given the similarities guilds have with smart-contract-inspired Decentralized Autonomous Organizations (DAOs) [13], organizing people in such a way seems like a natural fit for blockchain technology.
Being part of a guild encourages people to consider the Reputation of their peers as well as their own when adding to a discussion or providing feedback.

A Reputation Staked Token-Curated Registry

We propose Guilds, a system for people with domain expertise in a given field to create decentralized autonomous organizations, in which members create Token-Curated Registries (TCR) to provide marketplace users with expert opinions. As a practical example for a token marketplace: A group of highly respected engineers get together and form a Guild called “Developer Guild” to review ICOs. Together they review the technical merits of Sellers, and stake their Reputation on providing the community with quality reviews.

Sellers might submit a request to be reviewed and place an amount of ONE in escrow through a smart contract (a bounty). Any number of Guilds can review the Seller and the Seller cannot pick the reviewers. The ONE in the bounty is not distributed evenly to the Guilds, instead payout is relative to the amount of Reputation the guild has. The higher their Reputation, the greater the payout. A Guild has to provide high quality, insightful reviews over time in order to build enough Reputation to monetize their expertise, and Guilds can later lose Reputation by giving low quality reviews.

Quality Signaling Use to Filter Search Results

Scores are used to provide users with quality signals with which they can filter. Each Guild can set a threshold for what they consider “passing”, Guilds will then hold a TCR of Sellers which are on their “pass” list.

Guilds System Architecture

Guilds are a matrix of smart contracts. Guild memberships are stored in smart contracts. Membership to Guilds are confirmed by a vote which is also done through smart contracts. The results of questions Guilds vote on are stored at integers 0-99. A hash of the questions asked will be stored in the voting smart contract. Guilds will also be able to submit a written review which must be approved by the Guild with ⅔ consensus. The Guild can set a “passing grade” in which reviewed projects will be placed on a list of recommended projects.

An architecture such as this has been demonstrated to be a practical solution leveraging smart contracts as a tool to curate social membership and governance. DAOstack [14], for instance, has a very robust framework with similar architecture and functionality.

It will be possible for a Seller to “challenge” a review by staking a value of ONE. Challenging provides an opportunity for the Guild to consider missed information or mistakes.
If a Guild does not accept a challenge, it will damage their Reputation. Accepting a challenge is done by a vote on a proposal. If the challenge is resolved and an error is corrected, the project gets their tokens back. If the challenge does not require a change, the Seller’s ONE is sent to the community pool. A similar system has been implemented by Ad Chain [15].

There is a risk that one or more members of a Guild are caught accepting a paid bribe for a review. A small percent of the ONE paid to guild goes to a “scam pool”. A member of the community can stake ONE to challenge that a Guild accepted a bribe. If the community votes that this is true, the scam pool goes to the community pool, the whistleblower is returned their stake with a bump in Reputation, and the Guild loses all of their Reputation.

Menlo Pocketbook - The Transaction Layer

Menlo Smart Wallet

The heart of the transaction layer is an integrated Smart Wallet designed to improve the user experience of using dApps. The wallet has an integrated API which allows for automated transactions using our Early Bird Protocol, and supports transactions across multiple networks.

Pre-Permissioned Transactions

Most existing ERC20 wallets force users to enter a password for every transaction regardless of transaction size. We feel that this has stymied the mainstream adoption of dApps and decentralization. Menlo Wallet has an API for pre-permissioned transactions which allow the user to perform certain frequent actions (such as commenting, liking, etc.) without the need to authorize every transaction. To guarantee safety only addresses from within the Menlo One ecosystem are permitted to use this feature, and the user can rate limit these interactions by frequency and cost of transaction.

Auto-Buy

Auto-Buy feature lets users schedule a transaction for a time in the future. In the case of an ICO marketplace or festival-ticketing auction, this enables users to buy tokens asynchronously without having to be at the computer at the opening of a sale which is of course a bad user experience. The wallet has an API which interfaces with a smart contract which serves as a queue for the purchase event. It will help users beat the “fast fingered” style sales that sell out in minutes, and instead lets buyers get in gradually from the moment a sale is announced. By eliminating the need to use copy and paste for a smart contract address, this feature reduces risk presented by users mishandling a key or a malware attack.

1. From a users perspective, they could purchase something with a simple “buy now” button. It works by leveraging a pub/sub and sequencing system we call the “EarlyBird Protocol”. When a Seller enables Auto-Buy, an EarlyBird smart contract is deployed for users to submit buy orders with the amount of ETH they wish to spend. These pre-orders are prioritized by submission time and will be executed in this order.

2. The Buyer sets their Menlo Smart Wallet to listen to events from the EarlyBird contract such as the block number when the sale opens, and the address to transfer ETH to, which the wallet will automatically transfer to at the given block. Each user will be assigned a block number sequentially.

3. If the project is honoring the system, they will process orders as sequenced by the protocol. If they do honor the system, they will be rewarded with reputation as a result.

Cross-Chain Interoperability

Menlo One is designed to be forward compatible with smart contract blockchain networks other than Ethereum. At the time of writing, Ethereum is by far the most popular smart contract enabled networks, but there are currently several projects which could offer fierce competition such as EOS, Stellar or Hashgraph. Having to manage multiple wallets will only lead to a more fractured user experience. For that reason, Menlo Wallet will ease adoption of these systems by downloading a light copy of the other networks on the users machine and listing token sales in the interface.

From the user’s perspective, the experience of buying into a token sale on the Ethereum Network or another network like EOS will be virtually the same. The network that the project is hosted on will be shown on the interface, but the checkout experience will be nearly identical.

KYC Identification Management

Many Sellers which accept cryptocurrency as payment need to ask buyers for documents to satisfy KYC/AML regulations. Users can save their government-issued ID and other Personally Identifiable Information (PII) in their Menlo One wallet. We have partnered with a leading vendor for AML background checks, and the investor is screened by our partner. The data is encrypted and stored for when the User needs to send it to someone.

Menlo Core - The Data Layer

Blockchain protocols have enabled new ways of storing, distributing and verifying data in decentralized, trustless environments. Blockchains however, are by definition immutable, which has presented a design challenge to anyone interested in leveraging their security guarantees to build a modern web app. Furthermore, cloud based web apps provide users with the convenience of tasks such as queries without having to download all the data locally. We propose a set of systems and protocols that leverages the security guarantees of a blockchain network, the cost efficiency of distributed data storage, with the speed and reliability of a traditional web server. This is done by creating a market for Content Nodes to cache data pulled from these two networks and serve them to clients, using a Proof-of-Reputation algorithm to incentivize network growth and mitigate the risk of bad actors.

We use the InterPlanetary File System (IPFS) which is a protocol designed to create a permanent and decentralized method of storing and sharing files [21], for data storage, but cached on an array of user operated nodes to perform tasks like querying without burdening the end user. Sellers pay a bounty to users for their attention and pay Content Nodes for data availability. Rewards for both Content Nodes and users are based on a smart contract based Proof-of-Reputation algorithm where the size of the reward is relative to their Reputation. It's completely decentralized with no single point of failure, and delivers blockchain validated data with the speed of a traditional web host because Content Nodes will most likely be hosted on high performance web servers such as AWS.

System Architecture Considerations

The following principles are being taken into consideration when building Menlo Core.

Privacy Preserving
All participants should have the option of using the system pseudo-anonymously as users may be posting unpopular opinions or revealing unflattering information about a company or product.

Disintermediated
All participants must be able to contribute without intermediaries of any kind including administrators of permissioned systems. The system must be able to work without the efforts of a single central service provider.

Censorship Resistant
The system should be censorship resistant as users may be posting unpopular opinions or revealing unflattering information about a company or product. Filtering can be applied to messages which the community deems as inappropriate, but messages should remain permanent.

Elegant
The system must have an elegant design which is effective for communication, yet simple enough for users to deploy without the need for special hardware or having to recruit large groups of participants to ensure security.

Fast
The system has to be fast enough for asynchronous posting to forums, but does not have to have the speed of real time chat.

Affordable
The system should not have a cost most users find prohibitive, and should be accessible to users who can already afford the cost of an internet enabled device.

Open Source
In order to provide the security guarantees to achieve the other considerations, the entire system must be completely open source.

Key Terms

Sellers: A person or business seeking the attention of someone else to sell or promote a product, service, or brand. Sellers have Profiles of the thing the want attention for. They place ONE in an escrow smart contract to incentivize Content Nodes to serve their data, and to pay Users to view their profile.

Content Nodes: They host a web app which pulls data from IPFS and Ethereum including the Seller Profile and caches in a database on a performance machine.

User: Someone who gets paid for viewing the Profile of a Seller. Payment comes from the Publisher's Listing contract.

Reputation: Tokens used for a positive Reputation score. These tokens are not transferable outside of the system and not publicly listed anywhere. There are multiple types of Reputation that could be applied to a product, depending on the use case.

Negative Reputation: Tokens used for a Negative Reputation score.

Profile: A Seller's profile, essentially an advertisement for the Seller.

Admin Guild: A DAO like group of admins who are compensated for their effort.

Granter: A smart contract which grants Reputation and other system tokens.

Validator: A smart contract which validates transactions.

Authentication

All parties authenticate into the system with an Ethereum key. A Seller creating or updating a Profile does so with a key. A new user who wishes to join the network, does so by deploying a smart contract at signup (all handled automatically) which contains an address to the users profile, stored on IPFS and a balance of Reputation tokens. This key pair authentication design pattern is becoming common place within decentralized systems. Menlo Wallet also supports the creation of an easy to backup mnemonic phrase.

An Attention Economy

Menlo One is, at its core, a marketplace for attention. A real world analogy would be someone paying FedEx money to deliver a package, except the receiver also gets paid for opening it. In the specific use case for an ICO, an entity wishes to pay a Content Node to deliver their Profile to an investor with a history of buying tokens. In the case of an eBook store, an author who wishes to pay to have their book listing viewed by a user who reads a lot of books.

Ethereum Used To Validate Data Stored on IPFS

In order to achieve byzantine fault tolerance while affordably storing messages, the protocol leverages both the Ethereum network and the InterPlanetary File System (IPFS) [25], establishing communication between the two decentralized networks and offsetting the limitations of each. IPFS is extremely cost effective for the storage of the data, but lacks the security guarantees of a network like Ethereum. Furthermore, content on IPFS is only indexable by its hash. Most users expect to be able to search for content by name or another key in a marketplace. To offset one with the other, Menlo Core stores message data on IPFS, and the content hash on Ethereum. While the message itself is not saved to Ethereum, a record of it is.

Solution to Blockchain Stored Dynamic Content

Blockchains are by definition immutable, which has presented a design challenge to anyone interested in leveraging their security guarantees to build a modern web app. A basic web app must have dynamic content such as a user profile which is easily updatable. We solve this by keeping the reference to the projects content stored as a state variable in the project’s contract. When the project updates their profile, new content is stored as an entirely new file on IPFS and the reference is updated in the smart contract. Assuming nobody accesses the old data, it will be automatically removed by IPFS within 24 hours.

Augmenting Ethereum Performance By Caching On Content Nodes

We propose to address the challenges above by constructing an autonomous Ethereum and IPFS content-caching market. Ethereum serves as a public immutable ledger without any centralized mediator. The transaction records between the Content Node and user are jointly approved by the project's Granter smart contract, the content prefetching and delivering processes are done by the Content Node. The Granter also provides publicly accessible records about the demand and supply of contents in the network.

Proof-of-Reputation Incentives

The heart of the Menlo One ecosystem is a Token-Curated Registry which rewards those who have been good actors over a long period of time. Users are granted tokenized "Reputation", which is measured with non-transferrable Reputation tokens. There is a non-finite amount of Reputation tokens. The Menlo One ecosystem rewards users in ONE in several instances including commenting, being in a Guild and Content Nodes for providing data. ONE is transferable and is used as a currency. In the future it is possible that we have multiple types of Reputation for measuring specific metrics.

To safeguard against malicious actors, the Proof-of-Reputation algorithm ensures the amount of ONE the system rewards users is relative to the Reputation held at their address. For instance, a malicious bot with little Reputation will not receive a payout in ONE for Profile views. However a User who is active in TownHall, Guilds and other Reputation granting systems will receive a payout in ONE for viewing a Seller's Profile.

An Incentivised Network of Content Nodes

All data on Menlo One is stored on IPFS, with a hash of that data stored on Ethereum. In order to serve data to users with the same speed and experience of a traditional web app, we cache the data stored on IPFS in a traditional database and served by a web app on a Content Node. There are many Content Nodes in the system who compete to provide data. A Content Node earns ONE by serving a Profile to a User, and takes a percent of the Sellers payment for the service. Content Nodes can build Reputation for each successful transaction. Since there are multiple Content Nodes, there is not a single point of failure in the system.

When a user receives a Profile from a Content Node, the user also pulls the same data from IPFS to check its authenticity. Users with high Reputation can report a malicious Content Node to the Admin Guild. To ensure Content Nodes are using the web server code provided by the Menlo One community, the Content Node's file system must be open the public. Users can earn Reputation by scraping the Content Nodes code, and checking the hash against the copy in the repository.

Granter Smart Contract For Profile Views

Upon creating a profile on Menlo One, the profile data is stored on IPFS, the Seller's Menlo Wallet deployed an included Granter smart contract to Ethereum which contains the content addressable hash of the IPFS hosted Profile. The project also sends ONE to the Granter which is held as a bounty for profile views. There is no minimum requirement to the amount of ONE held in the Granter for the Profile to be available in the system. However the Content Node can charge as much they wish for supporting the "premium" features offered by the system such as auto-buy, and such features cost the Content Node compute time to operate. In effect this creates a dynamic open market for data availability.

The ceiling price the Granter is willing to pay is set by the Seller in the Granter. The Granter can be modified by the Seller in anytime to change their price as the market price is subject to fluctuation. Naturally the volume of traffic to a profile will determine the market price from the Content Nodes. The more popular a Sellers profile is, the more it will cost them for service.

Proof of Retrieval

Sellers incentivise the Content Node to deliver the Profile by offering a payout in ONE. This requires leveraging a Proof of Retrieval scheme in which both the Content Node and User have to sign the hash of the Profile with a digital signature, and submit that to the Granter. In order to incentivize the User to pay the gas required to in the transaction, we give the user a predetermined percent of the ONE payout.

Mitigating Attack Vectors with Incentivised Validators

1. A Malicious Content Node Has Tampered with the Data Delivered from IPFS.

By introducing an intermediary Content Node we create an opportunity to alter data. There have been multiple Proof-of-Retrieval-like systems designed to ensure data delivered from an outsourced provider has not been altered by using a 3rd party auditor [22] [28]. In our system the User checks the validity of the data with the Granter, as the User and Content Node must have both submitted a signed transaction for a payout, but there could be one or two minutes where the user believes that tampered data is authentic.

We mitigate this risk from being a common occurrence with a network of autonomous Validators. When a user receives a Profile from a Content Node, it hashes the Profile locally. Both the User and the Content Node submit digitally signed payloads to the Granter. If the content hash submitted by the User does not match the hash stored in the Granter by the Seller, an event is published to which Validators are subscribed. These Validators are nodes which can run a request against the Content Node in question.

If the Content Node returns tampered data, the Validators issue the Content Node Negative Reputation tokens. It is built directly into the Granter protocol to *not* payout ONE to the Content Nodes with negative Reputation. Building enough Reputation in the system could take weeks or months of work. There is an upfront cost to running a Content Node before it has any Reputation to monetize. The threat of demonetization serves as an incentive for the Content Nodes to not misbehave.

2. Content Node Tampering with Search Results

In order to provide users with speed, we do not require each to host a local copy of the database. One of the key features provided by the Content Nodes is the ability to quickly query data from their copy. The Menlo development community decide the algorithms and parameters behind search results to ensure fairness to everyone in the system. There is a risk that a Content Node might tamper with query results, perhaps to promote or censor a particular token sale over others.

Part of the rules of operating a Content Node is that the filesystem is always readable. The Menlo Wallet has a feature which scrapes the content from the filesystem and hashes it locally, which the User then compares with a hash of the codebase from the public repository. If the User discovers the Content Node code is in any way different from the repo, the user publishes an event to the Validators, and the Validators run a check as well. If they too confirm the Content Node is running unapproved code, they're issued Negative Reputation. Only

Validators have power to grant Negative Reputation and are incentivised to perform these tasks by being granted Reputation by a Validator Granter contract. Validators have to reach a 2/3 consensus for any Negative Reputation to be assigned to a potential bad actor.

System Architecture Components

Menlo Client App

This is a native desktop app which runs on the users machine. It includes the JavaScript interface app which is bundled inside Electron. It has several responsibilities.

- Pulling the most recent copy of the front-end code repo.
- Serving the front-end app.
- Discovering Content Nodes from the Content Node Listing Contract.
- Connecting clients directly to Content Node.
- Housing an Ethereum light node, which is used for all transactions: Transfering ETH to a smart contract when buying a tokens, and interacting with Menlo including; creating user profile, liking Seller Profiles, commenting with TownHall, etc.
- Pulling data from IPFS, validating that the data is the same as what the Content Node delivers.
- Authenticating Users for all interactions (via Ethereum key).
- Signing digital signature from a Content Node response to claim bounty for viewing a Publishers Profile.
- In the future, housing other blockchains such as EOS, Stellar, and Hashgraph.
- Holding Users' KYC identification (encrypted).

Menlo Node App

The Menlo Node App is a Node.js app with a RESTful API serving JSON. The Content Node scrapes app data from IPFS and stores it in a local database so a User can quickly access it. It provides the User features such as querying by keys other than the IPFS content addressable hash. Content Nodes must keep everything on their filesystem open and readable by anyone (except for files which contain keys and other sensitive data), so their file system can be audited by Users. A hash of most recent code on GitHub must match the hash on the Content Node. Content Nodes have to pay for their own server costs and a listing fee to participate in the network, earn ONE and build Reputation.

- There is a "Listing Contract" for Content Nodes to be discovered by Users.
- Every 24 hours Content Nodes have to pay a fee in ONE to stay listed. The fee goes to pay the cost of IPFS pinning.
- The Listing contract tells Users their IP address, Reputation, other metadata.

- Content Nodes must host the most recent webapp code from the repo.

Matrix of Smart Contracts

These smart contracts operate the system and serve as an Granter to reward Reputation.

- Listing: Lists available Content Nodes
- Profile Granter: Confirms Profile delivery and grants Reputation

Token Economics

Flow of ONE Within the System

1. Sellers put Menlo Tokens into a Listing Contract on Ethereum. The contract is included in the Menlo App.
2. When a User requests a profile from the Node, he includes his public key in the request. In the response the Content Node returns a digital signature. Both parties then submit their keys and data to the Sellers Listing Contract.
3. If successful, both parties are paid in ONE. The User is paid for their attention. The Content Node is paid for data availability.
4. The Sellers Listing Contract is also a Reputation Granter, and gives each actor Reputation tokens for a successful transaction.

Ways Users Earn Reputation

Users can earn Reputation a number of ways, including being a top rated commenter in TownHall, voting in TownHall, being part of a Guild and on-chain purchases via Menlo Wallet. Each of these systems are operated by smart contracts with Granter privileges to give Reputation. Content Nodes earn Reputation by reliably serving data over time.

Use Cases for Menlo Core

The system is ideally used when someone is willing to pay to ensure somebody sees something. For instance, when Alice is willing to pay Bob to ensure something is delivered to Charlie. A real world analogy would be someone paying FedEx money to deliver a package, except the receiver also gets paid for opening it.

There are several existing business models where this would be useful, such as online advertising. The Brave browser has been inspiration to this project by suggesting that the viewer of an ad also receive a portion of the ad revenue in exchange for their attention. However, Brave currently uses a trusted intermediary service to make the micro-payments required affordable. The trade off for complete decentralization is usually cost and speed. Menlo leverages Ethereum for BFT, but the cost in gas for a user to redeem their ad payout would be greater than the payout of the ad itself.

Similar systems which incentivize caching blockchain data servers has been suggested in other projects [23], however they have lacked several key components to make viable in a real world use case, such as a proper incentive structure which is offered by Menlo Core's Reputation system, and the poor user experience of most blockchain wallets. A tokenized marketplace such as Menlo One makes a lot of sense as Reputation and tooling around an exchange has been considered.

A token, ICO, or security token marketplace makes for a perfect use case for such a system. Companies have historically been known to spend hundreds, thousands or even millions of dollars to market their token sales to a relatively small number customers. They are willing to pay a lot of money to ensure customers (who could potentially spend millions of dollars) see their product. Additionally, end Users will be willing to pay the upfront gas costs to build Reputation as they will be well incentivised for it later.

Project History

- Summer 2016: Launch of Ether-Signal, a precursor to TownHall. It was developed for members of the Ethereum Foundation in the summer of 2016 to help the community vote on whether or not to fork after the DAO hack. https://github.com/MenloOne/ethersignal
- 2016: Early development of Vulcanize, a project started by Menlo One team members and is key to Menlo Core. https://github.com/vulcanize/VulcanizeDB
- 2017: Market research into the rapidly growing blockchain market. The need for a product like Menlo One became clear.

Senior Management Team

- **Matthew Nolan (CEO / Engineering) (LinkedIn)**
  Serial entrepreneur & full stack developer. Partner at Ark Advisors: an ICO consulting firm. Co-founder of Speek: acquired by Jive 2015. Former Senior Engineer at JP Morgan Chase. Former Senior Engineer at IBM. Built some of the largest online casinos at High 5 Games. Founder of Verona, one of Fast Company's "most innovative companies" for 2016. Globally recognized social entrepreneur featured by BBC, NBC, FOX, Vice and more. Webby Awards honoree, 2016. Speaker and Resident at TED.

- **David Dawson (CTO/Engineering) (LinkedIn)**
  David is a veteran of 15 years at Microsoft directing engineering organizations across product & software engineers. He delivered products that power Windows, Xbox & Office from scalable enterprise services to consumer mobile products. He also Co-founded Mast Mobile, and as CTO focused on business mobile focused communication services that sold to Hearsay Systems.

- **Tiaan Wolmarans (COO) (LinkedIn)**
  Tiaan is an entrepreneur who focuses on operations and product development. He has directly advised, written white papers for and developed products for multiple ICO's that have collectively raised $11 million in private and public sales, some with still-upcoming ICO's. He also worked on the product development and relaunch of Hempcoin as well as the relaunch, development and blockchain migration of Solaris.

Advisors

- **Richard Titus (Business) (LinkedIn)**
  Richard D. "Titus", a partner at Ark Advisors, is a globally experienced senior executive (CxO) with 20+ years in digital transformation. He has co-founded 11 firms including Prompt.ly and digital agency giants Razorfish (LA) & Schematic. He has also led business divisions for Samsung Electronics, DMGT (Associated Northcliffe Digital owner of the Daily Mail) and the BBC to award-winning levels of performance recognized by CES, GSMA, Techcrunch and the Wall Street Journal. He has advised numerous successful ICO's including: Adex, Hive Seller, Pillar, Po.et, Guardium, Omega One, Reveal.it, The Sun Exchange and Sn.ip raising +$200m in funding in 2017.

- **David Langer (Funding) (LinkedIn)**
  Venture Partner @ Pioneer Fund, Pledger @ Founders Pledge, Mentor @ Seedcamp, Founder/CEO @ Zesty Inc. David is a serial entrepreneur, active angel investor and startup advisor working with a growing portfolio of 20+ companies.

- **Mike Norman (Business/Crowdfunding) (LinkedIn)**
  Mike Norman is the cofounder of the crowd investing platform Wefunder.com. With over 6,000 funders and $16 million in startup funding. Mike helped craft the crowdfunding portion of the JOBS Act and watched Obama sign it into law at the White House. He holds an MBA from MIT Sloan School of Management.

- **Jill Richmond (Marketing) (LinkedIn)**
  Jill Richmond leads the Sparkchain team at Spark PR, one of the leading firms in the space with clients including Blockchain Capital, Civic, and Simple Token. She has over 15 years of experience focused on startups including co-founding two, and supporting global innovation within the private and public sector at the World Bank Group's Innovation Practice. Jill has curated and spoken at many conferences and panels and is currently a regular contributing writer for Forbes, BTC and Distributed Media. Her views on technology and innovation have been featured in The Washington Post, VentureBeat, The New York Times, BBC, Modern Luxury, BTC Media, Forbes and Spectator.

- **Marissa Kim (Legal) (LinkedIn)**
  Marissa, a partner at Ark Advisors, is a securities and capital markets lawyer focused on helping innovators in the blockchain and crypto ecosystem launch, raise capital and navigate and influence the regulatory landscape. Previously, she represented major financial institutions and Fortune 500 companies in all aspects of public and private company transactional practice, focusing on corporate finance, public and private offerings of stock, M&A and the formation of hedge and PE funds at Skadden, Arps,

Slate, Meagher & Flom, LLP in New York City.

- **Markus Ament (Strategy) (LinkedIn)**
  Serial FinTech entrepreneur, Markus Ament, or Maex as he is known, has led many companies from early stage startups to global leaders, loved by thousands worldwide. Maex currently sits as Chief Strategy Officer and Co-Founder of Taulia, and has transformed the company from an idea in 2009, to the market leading Financial Supply Chain company, connecting businesses to create a more efficient and profitable supply chain. With an enviable list of the of Fortune 500 clients and over 300 employees, Taulia has quickly become the recognized leader in the financial supply chain.

- **Elissa Shevinsky (Product) (LinkedIn)**
  Elissa is a serial entrepreneur, was previously Head of Product at Brave Browser, and CTO of Glimpse. She has written about cybersecurity policy and spoken at security events such as HOPE. Elissa is the author of "Lean Out".

- **Mike Hostetler (Engineering) (LinkedIn)**
  Mike is a serial entrepreneur, director of blockchain at Raise, CEO of Modern Web, CTO of SuperBetter, and Seller lead at jQuery.

- **Jake Baval (Community) (LinkedIn)**
  Jake Baval aka Korean Jew Trading is a veteran cryptocurrency entrepreneur, having built a grassroots community from scratch and making it his mission to help people navigate the space. As someone who is so experienced in growing and building communities but also experienced the difficulties of ICO investing, his insight is invaluable to the development of the Menlo One platform and all its user-friendly features.

Most Important Factor To Growth: Developer Community Support

The history of software development has shown us repeatedly that the key to a products success is the inherent network effects of open source. At the dawn of the rise of Linux, many traditionally minded people from the business world scoffed that a decentralized group of hobbyist programmers had a chance at making a product which could rival Microsoft who at the time dominated the cloud software industry. Not only did that open source project take off, but it's been estimated that over 75% of the internet now runs on Linux, replacing centralized monolith Microsoft. Indeed it is clear that community adoption gave this free software business advantage over what was at the time the world's most lucrative business.

The blockchain movement has seen an acceleration of these network effects. Bitcoin is the ultimate open source project as the founder of the technology still remains a mystery. Although there are many projects with fantastic teams and strong leadership promising a faster, cheaper version of Bitcoin, still Bitcoin reigns supreme in terms of market cap. The second largest cryptocurrency is Ethereum. At the time of Ethereum's inception there were multiple smart contract projects. In my opinion the primary reason Ethereum won is because their community building efforts were far better than the rest. They were hosting more meetups in more cities than the rest. The reason we're writing this white paper today is because some of the Menlo One team attended an Ethereum meetup in 2014.

Not only does the success of Menlo One not rest solely on the founding team, we will have relatively little to do with it. All we can do is spark the fire. Like the other successful open source projects, growth is dependent on developer adoption. We've structured this project to be completely decentralized in every way. Our goal is that if for some reason the Menlo One team stopped working on the project, it would go on without us. While a call to action for developer support is out of scope for this paper, we encourage everyone interested in Menlo One to participate in any way they can. Software is fundamentally a team sport.

Project Governance Structure

All our projects follow the "liberal" open source contribution model. Under a liberal contribution model, the people who do the most work are recognized as most influential, but this is based on current work and not historic contributions. Major project decisions are made based on a consensus seeking process (discuss major grievances) rather than pure vote, and strive to include as many community perspectives as possible. Other examples of projects that use a liberal contribution model include Node.js and Rust [24].

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Acknowledgments

Thank you Joshua Landau, Wendy Brawer, Tiaan Wolmarans, Marcie Grambeau, and Mike Hostetler for your thoughts and revisions on this Whitepaper. Thanks to DAOstack for a lot of inspiration on DAO architecture. Thanks to Rick Dudley for introducing me to Ethereum way back in 2014. Big, big thanks as always to the Menlo One team. And thanks to the Menlo One community for joining us on our mission to grow the token economy, and for creating a Telegram group with the best vibes in crypto.

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