Vocal
A Token for Decentralized Advertisement

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***Abstract*—Vocal is building a decentralized exchange, liquidity provider mechanism, clearinghouse messaging network, and asset-backed blockchain gateway. Vocal is not owned by any single one party. Instead, it is an open distributed network of validators which enforce behavior of all participants. It uses the mechanism of a protocol token to create a proof-of-stake blockchain to enable enforcement of market activity amongst participants. This high-performant distributed network enforces exchange across asset classes, from fiat-backed issuers to fully decentralized blockchain tokens (ERC-20 style and native cryptocurrencies). Unlike nearly all other decentralized exchange platforms, this allows for decentralized exchange of other blockchains and between multiple blockchains directly without a trusted gateway token. Markets may be able to significantly reduce spreads and encourage market assurance via decentralizing custody and increased transparency of market activity. This is achieved using smart contracts, protocol tokens enforcing correct market behavior of orderbook matching, a new construction of Ethereum bonded external enforcement of clearinghouse activity, and commitments to historical exchange data for use with Ethereum smart contracts.**

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I. Introduction

Advertising has long been a unidirectional business; advertisers often force their ads/messaging upon end users in exchange for public awareness. This year (2017), the US Digital Advertising market will reach $83 billion in aggregate transactions - offering large growth opportunities for new and innovative advertisement offering platforms.

Vocal seeks to reverse that model by providing user with the power to control their advertising experience. In the Vocal app, users are able to control their advertising experiences by watching ads provided by a network of peers and sponsers. As users continue to watch advertisements, they begin to earn credit (Vocal) which can either be redeemed for their own marketing purposes or traded to other users. Vocal seeks to provide advertisers exposure in a new and creative way, and to, equally, create a marketplace where consumers can earn credit for their own use or investment purposes.

II. Scope of Use

Vocal is targeted at two main user groups: Consumers and Producers. In this section we will explain how each of these terms are defined in the Vocal model.

A. Producers and Consumers

1) Producers: Producers are the advertising partners and providers. Put anotehr way, these producers are the consumer goods entities (i.e. anyone in CVS) and companies in the crypto/blockchain space.

2) Consumers: The scope of consumers is designed to have limited barriers to entry. The consumers include anyone interested in generating passive value generation by watching and interacting with advertisements. Producers of ads can also be consumers - earning Vocal token as they watch and interact with advertisements provided by advertisers (other Producers).

III. Existing Work

Open trade is a fundamental aspect of Vocal token (and financial activity in general). There are many other efforts which seek to build advertising-focused currencies that are publicly tradeable.

Basic Attention Token (TODO: cite) is one example - with a main concept to track the user's attention span to ads by creating a custom browser, Brave, which can track user attentiveness when viewing advertisements.

Vocal's model is in some sense much simpler. Vocal provides a symbiotic relationship between advertising partners and consumers by providing an exchange of advertising content that benefits both parties.

IV. Vocal Token

The Vocal token is the main unit of exchange and credit in the Vocal exosystem; however, the utility of Vocal extends to these primary areas:

1) As a main unit of bookeeping for advertisement publishing and viewing.
2) As a store of value - the vocal token may be able to redeem more or less in the future.
3) As a unit of purchase - the vocal token can be redeemed for offers and services from public retailers.

V. Design

The Vocal token is an ERC20 based currency, which will have an initial public offering which buys a predefined amount of advertisement credit. Once the token has reached the required funding level, the Vocal market will open to public - enabling open trade and use of the token on the Ethereum blockchain.

As users view advertisements, the vocal token is recorded in the user's application and delivered every sunday night to the user's wallet in a single transaction. These records are proof of all Vocal token transfers and are stored publicly on the Vocal blockchain.

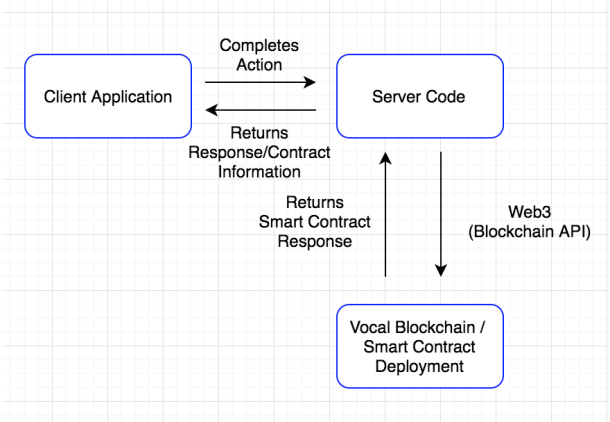

Figure 1. Basic Vocal Client/Server Architecture

A. Blockchain Overview

The above model for tracking and transacting Vocal token implies a large volume of activity (carrying a large amount of additional weight on the network). At the time of this writing, not all of this activity will be able to take place on the Ethereum main chain (due to known scaling limitations of the Ethereum blockchain).

These scaling concerns may be mitigated by the upcoming Ethereum blockchain improvements (TODO: cite these announcements here). However, we will plan to use a batched approach which provides both the benefit of reducing the cost of transacting for the end user on the main network and reduces the complexity of tracking public transactions.

Vocal is largely a token which will connect to other blockchains via public exchange - largely backed by the Ethereum token. Acitivity on other blockchains can interlink with this chain. The Vocal chain validates the activity of the behavior of all the participants on the main net (albeit if transactions are performed off the main chain these cannot be tracked, see LocalBitcoin as an example (TODO: cite this)).

The Vocal token itself is providing the computation and enforcement of the design via the smart contract protocol. Owning Vocal token grants the user the right to validate this chain through transaction fees, payment, interchange, trading, and clearinghouse use.

B. Holding Vocal Token

VI. Discussion

The Vocal architecture can be defined as a simple 3-tier system as illustrated in the below figure.

VII. Token Supply

Vocal token follows a fixed token distribution model as to be described in this section.

A. Total Cap

Vocal will be capped at a total circulating supply of $100,000,000,000$ tokens. Tokens will be earned by engaging with advertisements (either by watching, viewing, or opening advertisements). The token quantity earned for each action will vary according to the total number of supply still remaining. In this sense, viewing ads has become the notion of mining - rewarding users for participation on the network.

As more tokens are mined and held - the token quantity reward granted will diminish; however, the corresponding market or redeemable value of the token may correspondingly increase in value. This model lends itself similarly to Bitcoin. In that users will still be given roughly equivalent reward for the amount of work and early holders/participants will potentially be rewarded for their early entry point and involvement.

B. Distribution*

*section to be potentially removed before publish (distribution and release schedule of the token will be included on the FAQ).

The distribution of the coin will proceed as follows.

1) Vocal Launch (50%) Vocal is inherently a governance token that plays a critical role in the process of upgrading Vocal protocol. We are fully committed to formulating a functional and theoretically sound governance model and we plan to dedicate significant resources to Research and Development.
2) Retained by Vocaltoken (15%) The Vocaltoken core development team will be able to sustain itself for approximately five years using funds raised through the token launch. If Vocaltoken protocol proves to be as foundational a technology as we believe it to be, the retained Vocal tokens will allow the Vocaltoken core development team to sustain operations beyond the first 5 years.
3) Developer Fund (15%) The Developer Fund will be used to make targeted capital injections into high potential projects and teams that are attempting to grow the Vocaltoken ecosystem, strategic partnerships, hackathon prizes and community development activities.
4) Founding Team (10%) The founding team's allocation of Vocal will vest over a traditional 4 year vesting schedule with a one year cliff. We believe this should be standard practice for any team that is committed to making their project a long term success.
5) Early Backers and Advisors (10%) Our backers and advisors have provided capital, resources and guidance that have allowed us to fill out our team, setup a robust legal entity and build a fully functional product before launching a token. As a result, we have a proven track record and can offer a token that holds genuine utility.

C. Challenges and Limitations

Creating an advertising-based currency poses a few challenges. For example,

1) In order for advertisers to participate, the opportunity for them should be equal to or greater than current other opportunities and channels.
2) Is that true for participation in Vocal? For their participation, they would be both paying for Vocal and be

Table I
VOCAL TOKEN TIMELINE

Nov 2017	Finish token proposal and development.
Dec 2017	Finish Client facing token application.
Jan 2018	Vocal Token Presale.
Apr 2018	Mobile application released for Android.
Jul 2018	Tokens redeemable for goods and services.
Dec 2018	Obtain retail partnerships for addition offers.
2019	TBD: Ongoing security and product development.

willing to provide a good or service to a consumer in exchange for tokens. How is this better than distributing coupon's from a advertiser's point of view?

3) Why would an advertiser want tokens? What do they do with them thereafter?
4) The quality of the advertisement view is important to its value. For instance, if a user is watching ads continuously, the value of a single ad may not be necessarily very high. How does Vocal mitigate this? And how does this affect the go to market strategies for advertisers who wish to become involved with Vocal Token?

These are fundamental questions to be solved by our Roadmap below.

VIII. DEVELOPMENT ROADMAP

IX. CONCLUSION

Vocal is a token that has potential both as a store of advertising value and as an accounting system for advertisement engagement. Taking inspiration from both the Bitcoin and Ethereum mining models, one of Vocal's main goals is to create a token ecosystem whose rewards stay consistent over time (but with greater potential for individual growth with a more early the entry point). The token is designed to be easily accountable by transactions discoverable on the public ethereum (ERC20) blockchain.

Vocal token's initial offering will be done in early December 2017.

APPENDIX

A. Founding Team

Vocal was founded by Eric Asquith, Murch Ewings, and Chris Buonocore. Eric and Murch are Boston-area natives and bring a complimentary blend of professional experience to Vocal. Eric, an attorney and real estate broker, and Murch, formerly a consultant and CPA with a wealth of relevant experience, share a vision for how technology can fix the broken advertising model. Chris is a developer from silicon valley with over 8 years of development experience, holding expertise in creating and scaling cloud based software platforms.

B. Acknowledgements

We would like to express our gratitude to our mentors, advisors and to the many people in the Ethereum community that have been so welcoming and generous with their knowledge. In particular, we would like to thank the following folks for providing insight during the development and prototyping process And of course all the folks in the Boston Cryptocurrency and Ethereum developers meetup groups for their support and advice.

C. ERC20 Vocal Protocol

Vocal follows the ERC20 (ethereum-blockchain) protocol for recording transactions. ERC20 establishes a standard contract ABI for tokens on the Ethereum blockchain and has become the de facto representation for all types of digital assets. ERC20 tokens share the same contract interface, simplifying integration with external contracts. Core ERC20 functions include:

1) transfer(to, value)
2) balanceOf(owner)
3) approve(spender, value)
4) allowance(owner, spender)
5) transferFrom(from, to, value)

EIP101 includes a proposal to change ether to follow the ERC20 token standard. For now, a "wrapper" smart contract may be used as a proxy for ERC20 ether. For reference, see the Maker implementation or the Gnosis implementation.

1) Contract ABI: EIP50 proposes an extension to the contract ABI to support structs. This would allow the community to establish standard Order and Signature data structures, simplifying our contract interface and integrations with external contracts.

2) Ethereum Name Service: EIP137 or Ethereum Name Service (ENS) will be used to resolve human-readable names, such as "my- name.eth," into machine-readable identifiers that may represent Ethereum addresses, Swarm and/or IPFS content hashes or other identifiers. It can also be used to associate metadata with names, such as contract ABIs or whois information. ENS will be used by 0x protocol to create more intuitive message formats that optionally reference Makers, Takers and Relayers by name.