

TOKENLAB™

Token and Initial Coin Offering (ICO) as a Service

Project Contributors



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Building a Decentralized ICO Management Platform on the Expanse Platform



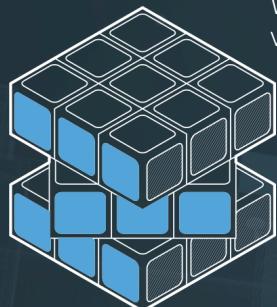
ABSTRACT

Tokenlab is an ICO- and smart-contract-management platform that aims to simplify the lifecycle of an ICO. Tokenlab makes it easy for anyone to participate, either as an investor or an issuer, while providing unique technology that makes ICOs safer and more flexible for those running and participating in them. The purpose of this paper is to go over the inspiration for Tokenlab, what problems it solves and why it is being developed. The paper also delves into sufficient technical details to provide a high level understanding of the various technology choices made.



INTRODUCTION

Problem



With the rise in the popularity of blockchain and the great potential it has, many startups, visionaries, and existing companies have been creating blockchain-based ICOs to share their concepts and visions with the world. The problem is this takes a great deal of technical expertise and there are many risks associated with security, coding smart contracts, collecting funds, storing funds and dealing with legal compliance. All of this leads to a very risky environment for both those creating such ICOs and those participating in them. Many have lost funds, been hacked, or had bugs that led to great losses in confidence--not only in the ICOs but in the very companies that started them.

Solution



The solution provided by Tokenlab is to provide a safe and easy-to-use platform that will simply and effectively limit risk by design. Tokenlab will allow you start your own campaign by providing a few simple pieces of information and will assist in marketing, legal, and technical support. The framework will not only allow projects to launch as an ICO, it will also let individuals and institutional investors invest in other ICOs and provide feedback that will serve as crowdsourced data resulting in a unique rating level. This process will separate the herd from the crowd and let future investors make better decisions, without worrying about the major problems encountered by earlier ICOs.



GOALS

Technology Choices

The technology choices for Tokenlab were made keeping the best possible user experience in mind along with providing a powerful and secure platform. Even though there are a lot of low level details for each of these components, here is a high level picture of the technologies used:

{ RESTful +
GRPC }

Communication
Between Services



Socket.io: Real-time
Client Side Updates



OAuth2: Social
Media Login



MD5 Salt Hash:
Password hashing



2FA Security



Node Server



React Client Side



Solidity Smart
Contract Dev.



Expanse
Blockchain Platform



FEATURES

The LAB Token

Tokenlab has its own transferable ERC644 Token with the ticker LAB. LAB represents an ownership stake in the Tokenlab product, and token holders are rewarded with buybacks using the revenue generated from Tokenlab. The total supply of the LAB token is set to 100 million, all of which will be distributed to investors through a crowdsale assuming all will be sold. Those unsold will be burned/destroyed and not part of the overall supply. The LAB token, and all subsequent tokens issued on Tokenlab, are listed on the Gander blockchain explorer with corresponding market value, price and ownership statistics.

Gander Integration

Similar to etherscan.io, gander.tech is the official blockchain explorer for Expanse. It's built using Reactjs with a Nodejs server tier and mqtt for real time communication. Gander provides various informational stats related to the Tokens issued on Tokenlab along with the ability to peek into the contract to view more details. Currently the list of tokens are listed here: <http://www.gander.tech/token>. Stats include market information as well ownership stats. Ownership stats provide critical information to investors such as distribution of tokens. This provides much greater transparency for Tokenlab ICOs over many in the past, giving greater value to all that use it.

ERC644 Token

The LAB Token will be based on a new improved version of the ERC20 Token standard known as ERC644 created by the Expanse team. The new standard is modularized and will allow separating business logic from data.

As it stands now, if any ERC20 tokens were to encounter any sort of fatal flaw, every balance on that token would be at

ERC644 Tech Specs

Root.sol

The root account is a special account that manages modules that are added and removed. The root account cannot manipulate the balances; only issuance modules can do that. So in the event that a root account wants to manipulate the data stored in the contract, it has to enable a "central bank" module that gives root the permission to make those changes.

Balances.sol

Balances.sol is the data storage contract. It has two basic functionalities: 1) It stores the user balance/tx mappings and, 2) It dictates whether or not an issuance module can manipulate data stored in the contract's mappings. The Balances.sol contract abstracts the account balances from the business logic as a way to help protect the balances, making the business logic upgradeable and modular.

Balances.sol Methods

getBalances

Returns an account's token balance.

```
function getBalance(address _acct) returns(uint balance)
```

incBalance

Increases an account's token balance.

```
function incBalance(address _acct, uint _val) onlyModule  
returns(bool success)
```

decBalance

Decreases an account's token balance.

```
function decBalance(address _acct, uint _val) onlyModule  
returns(bool success)
```

getAllowance

Returns an accounts-allowed balance to be spent on behalf of owner.

```
function getAllowance(address _owner, address
```

risk and recovering from the flaw would be cumbersome at best. This ERC proposes a way to accomplish the tasks below by abstracting the user balances away from the business logic.

Makes tokens upgradeable
Allows for modular functionality
Creates a way to insulate user balances from exploitable code

Motivation

Protecting consumers from potential exploits.

Issuance Modules

Issuance modules are a collection of functionalities that have the ability to manipulate the datastores in the Balances.sol contract in a desirable way. Before an issuance module can manipulate the data in the balances.sol, the root account must first give the IM permission.

IMP (Issuance Module Proposal)

IMs can seek permission from root by creating an IMP (issuance module proposal) using the IMP template and submitting the IM proposal to the root account for deliberation. After the IM is submitted, the IM submitter can start lobbying the community for votes. In the event that the proposal is accepted and the new IM contract launched, the root account will then give the IM permission to manipulate the data in the balances contract. A modular approach provides the ability to update the tokens functionality while maintaining the token's data integrity.

Standard Token

The standard token issuance module is less of an issuing module and more of a general purpose module. The standard token for most users will be the entry point into the token and provide basic interfaces such as the ability to transfer tokens.

Standard Token Workflow

- Bob wants to send Alice 20 tokens
- Bob asks Alice for her Expanse address
- Bob tells the standard token contract to transfer 20 tokens to Alice
- The contract destroys 20 tokens from Bob's balance
- The contract issues 20 tokens to Alice's balance
- Alice now has 20 tokens and Bob has 20 less than before
- And everyone is happy

```
function getAllowance(address _owner, address _spender)
returns(uint remaining)
```

setApprove

Allows _spender to spend from _sender's account.
When the function is called it over writes the current allowance with _value`.

```
function setApprove(address _sender, address _spender,
uint256 _value) onlyModule returns(bool success)
```

decApprove

Decreases an accounts allowance amount by _value.

```
function decApprove(address _from, address _spender, uint
_value) onlyModule returns(bool success)
```

getModule

Returns if module _acct is active or not.

```
function getModule(address _acct) returns (bool success)
```

setModule

Sets module _acct to true or false.

```
function setModule(address _acct, bool _set) onlyRoot
returns(bool success)
```

getTotalSupply

Returns the total supply.

```
function getTotalSupply() returns(uint)
```

incTotalSupply

Increases the total supply.

```
function incTotalSupply(uint _val) onlyModule returns(bool
success)
```

decTotalSupply

Decreases the total supply.

```
function decTotalSupply(uint _val) onlyModule returns(bool
success)
```

transferRoot

Transfers to a new account.

```
function transferRoot(address _new) onlyRoot returns(bool
success)
```

Events

BalanceAdj

Triggered when balances are adjusted.

```
event BalanceAdj(address indexed Module, address indexed
Account, uint Amount, string Polarity);
```

ModuleSet

Triggered when modules are updated.

```
event ModuleSet(address indexed Module, bool indexed Set);
```

Faucet

The faucet IM drips a very small amount of tokens to new token users.

Central Bank

The central bank IM is exactly what it sounds like--an IM with central authority to manipulate account balances at will.

Central bank workflow

- Central banks locate accounts that need updates on behalf of their users
- Central bank makes the change
- Changes are reflected in the balances contract

Token Conversion Oracle (ico)

Users are able to convert other crypto tokens into the new token by sending the other crypto to an exodus address or when sending Expanse or Ethereum to a smart contract designed to mint new tokens.

Conversion Method Workflow

- Users loads up conversion dapp with Expanse address
- Conversion dapp supplies users with an exodus address
- Conversion dapp maps users EXP address to their exodus address
- Users sends crypto to exodus address
- Conversion dapp consults the conversion rate
- Conversion oracle mints new tokens according to conversion rate
- Conversion oracle increases users balance by mint amount

Token Sharing Fund

Users who participate in this module will be able to receive a portion of new tokens created by others who produce tokens.

Online Wallet Integration

As part of the work on Tokenlab, the Expanse dev team is working on Expansejs, which is a javascript library that allows a browser to communicate with an Expanse node without the need for a locally running node on the client's machine. This library will use raw transactions to facilitate the communication between the node and the browser. This will greatly improve the experience for users planning to take part in the Tokenlab pre-sale and subsequent ICOs issued on the platform. Even though the online wallet requires the user to enter their private key, at no point does the private key leave the computer. With the online wallet integration, users only need to provide the amount of EXP they wish to contribute, and everything else will be prepopulated.

Home Page

The Tokenlab Home Page will be designed to allow maximum exposure to the current market trends. As seen in the wireframe, the idea will be to provide a list of running ICOs sorted by the most popular. Popularity can be based on the amount of funding, or it can be based on user interaction.

Alongside active ICOs there will be upcoming ICOs that are being planned or are in countdown stage. These upcoming ICOs will allow users to show interest, which will allow the system to gather important projections regarding popularity. This type of information will be very valuable to the issuers in determining how much interest their ICO is gathering.

The Home Page will be a ReactJS component, and real time updates will be communicated to the browser via the socket.io websocket library.

Sign-in/Authentication Options

In order to provide maximum flexibility and security to our users, Tokenlab will allow sign in using Google, Facebook and Twitter using the OAuth2 technology. We chose OAuth2 for the following reasons:

- OAuth2 allows better support for non browser based applications.
- OAuth2 doesn't force client applications to encrypt.
- Tokens are short lived, as opposed OAuth1 where tokens could be stored upto a year.
- Cleaner separation between OAuth requests and authorizations.

Tokenlab will also allow users who don't want to integrate with their social media accounts to sign in using a simple email and password. In the event the user decides to use a regular password, it will be encrypted using MD5 Salt Hashing.

Tokenlab Dashboard

When a user signs into Tokenlab, the dashboard will contain the following options:

- Create a Campaign
- My Campaigns
- My Investments
- Watchlist
- Upcoming ICOs

Create a Campaign

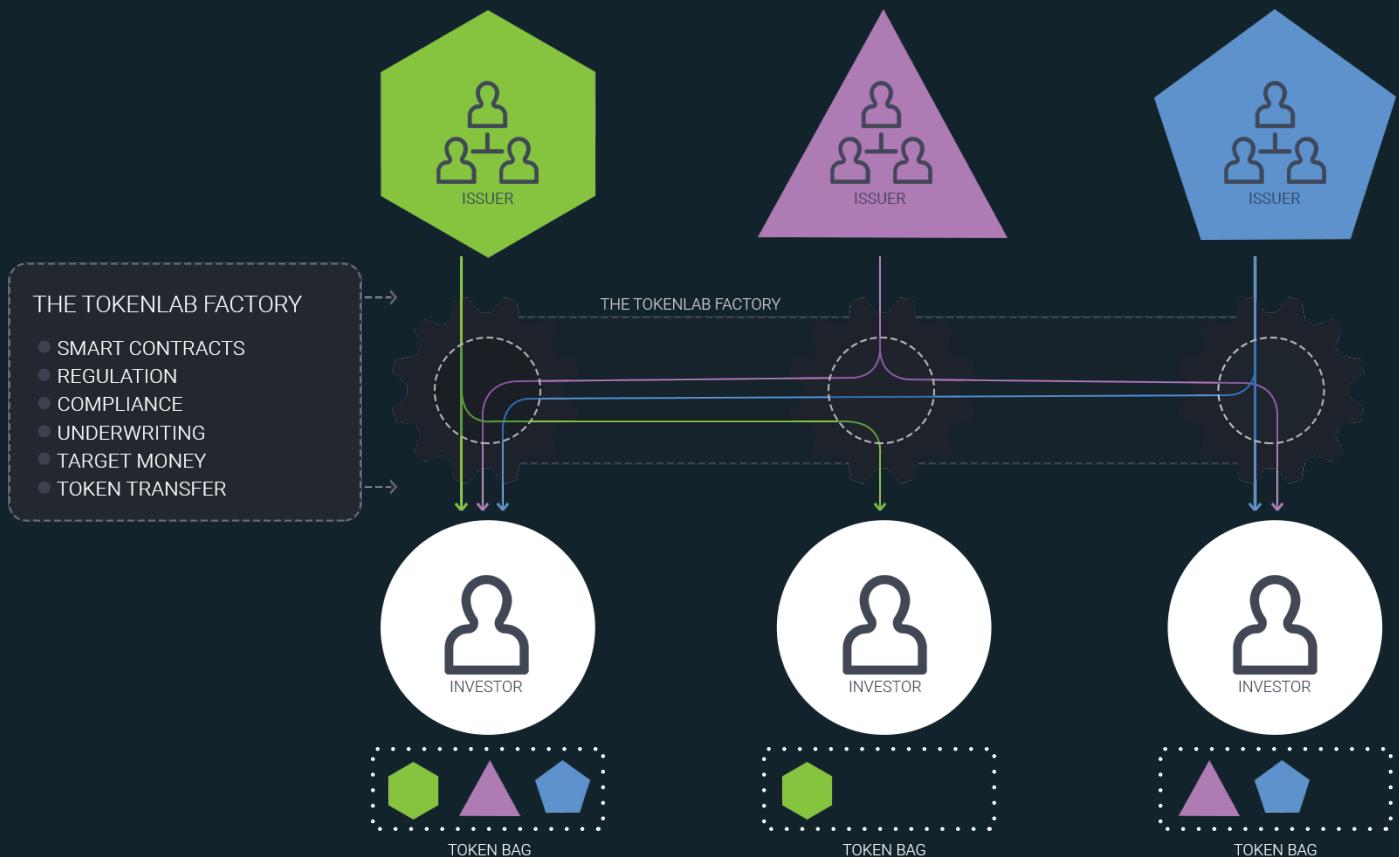
As the name suggests, this option will allow the user to start a new campaign. The campaign wizard will take the user through the creation process, allowing them to provide simple to understand values like start/end dates, price and target amount. The quantity to be issued will be determined based on the price and the target amount. Tokenlab will allow users to run staggered campaigns with different price points. In phase 1 the user will be allowed to run a pre-sale and a subsequent token sale. At the end of the sale, the issuer will be able to transfer his tokens to the investors. As soon as the Token is issued, Gander will show the contract details of the Token, including ownership distribution, price and market cap.

My Campaigns

Users who sign into Tokenlab will be able to view and manage their campaigns. Campaign management will include transfer of ownership to a different user or to multiple users, end a campaign and distribute tokens to investors when the campaign ends.

My Investments

Users of Tokenlab will also be able to invest in other ICOs by contributing to ongoing ICOs. Investors will be able to view documentation, white papers and teams to vet the future potential of the underlying project. Users will be able to rate the project and provide feedback so that the issuer can take appropriate action.



Watchlist

Users of Tokenlab will be able to maintain a list of ICOs that they are interested in but have not contributed to yet. Using the list they would be able to easily contribute to the ICO. Contributing to the ICO will move it to the “My Investments” section along with the amount of contribution.

Upcoming ICOs

Users will also be able to see upcoming ICOs, including the number of days remaining. The upcoming ICO list can be viewed in order of amount of days remaining or sorted according to user interest. Users can “like” ICOs to show interest. They can also enter the amount they wish to invest in the ICO, which can result in useful projection data that the issuer can see.

Token Creation

Cost

In order to create a new token on Tokenlab, token creators must burn a variable amount of LAB tokens. The amount of LAB burned depends on the amount of new tokens distributed to LAB holders when the new token is initialized. The value of burned tokens cannot exceed \$5000 USD.

Example Pricing

1 LAB = \$0.25

Minimum burn = 200 LAB = 0% goes to token creator, 100% goes to lab holders.

Maximum burn = 20,000 LAB = 100% goes to token creator, 0% goes to lab holders.

Buybacks/Token sharing

LAB is the underlying token for Tokenlab. When a user holds Tokenlab, they hold equity in the project. Tokenlab will reward the holders by buying back revenue generated through Tokenlab, which issuers will pay when launching ICOs. Alternatively, issuers can choose to reward LAB holders by giving them a share of the generated token.

Crowdsourced Feedback

One of the key problems of ICOs today is that there is no process of vetting the project. In the world of IPOs, there is a vetted process through which investors can determine how likely a company is to provide shareholder value. When an IPO is issued it goes through a process of underwriting, which helps determine valuation. Tokenlab will bridge this gap with useful info gathered from its user base, and provide a confidence level for its investors. Over time, the info gathered from these metrics will lead to more controlled issuing. There will also be Expanse-sponsored ICOs that will have a higher rating than others. Other issuers on the platform, through continued participation, can achieve higher rating and will also be able to sponsor ICOs.

EXR Migration

As part of the work on Tokenlab, EXR tokens will be migrated to Tokenlab and will be converted to a tradeable ERC644 Token.

ICO Exchange

A decentralized ICO exchange will be introduced in phase 2 of Tokenlab. The exchange will be used to provide more validity to the ICO process. Not all ICOs will end up being on the exchange, and there will be a vetting process through which the listings occur.





ROADMAP

September 2017 - Presale

- Login page and basic account management
- Launch presale contracts on the expanse livenet
- Additional supported coins: EXP, BTC, LTC, ETH
- Contribution limit: 1m USD
- Bonus: 10%
- Presale countdown
- Presale event
- Presale funds used for marketing and further development

Aug 2017, Exclusive Sale

- Launch presale contract on livenet
- Supported Coins: EXP
- Contribution limit: 1m USD
- Detailed roadmap with master detail section
- Info graphics explaining tokenlab
- Videos and other supporting media

November 2017 - Limited Release

- Improved login with social media integration
- Open Tokenlab to run 10 ICOs simultaneously
- Accept contributions in Steemit and PivX
- Crowdsourced underwriting

October 2017 - Token Sale

- Launch beta product with LAB Token Sale
- Launch ICO's for selected partners
- Additional supported coins: EXP, BTC, LTC, ETH, PivX, SteemIt
- Contribution limit: 8m USD
- Improved dashboard and partner integration
- Token sale countdown
- Token sale
- Distribute LAB tokens
- Integrate with Gander
- Launch LAB on exchanges

Q1 2018 - ICO Exchange

- Exchange integration with Tokenlab
- Supported markets: EXP, ETH and BTC
- Basic order book analysis
- Basic charting and TA tools

December 2017 - Public Release

- December 2017 - Public Release
- Underwriting workflow improvements
- Increased vetting
- Performance metrics and charting around ICO performance



FREQUENTLY ASKED QUESTIONS

1. WHAT ENTITY IS SELLING TOKENLAB AS A PRODUCT?

Tokenlab (LAB) is by Borderless Corporation. Founded in 2016, Borderless Corp., Inc. is incorporated in Wyoming, USA. Its address is P.O. Box 2702, Washington, NC 27889. The phone number is 252-375-5230. The CEO is Christopher J. Franko. Expanse.tech and all related products are subsidiaries of the Borderless Corporation.

2. ARE THERE EXPECTATIONS OF PROFITS?

The Token for Tokenlab (LAB), is being sold solely as a Token to use on Tokenlab for using Tokenlab as utility, as a virtual token, and not a currency. There are no expectations of profits whatsoever and the value of LAB Tokens will be determined by whatever prices the market deems it to be worth. LAB is not to be considered an investment and merely as a means to use Tokenlab and create ICOs in a safe and secure way..

3. ARE THERE RESTRICTIONS ON BUYING LAB TOKENS BASED ON LOCATION?

There are no restriction on locations for buying LAB Tokens. Tokenlab is by Borderless Corporation in the USA and US sales will not be blocked by IP address. Borderless Corp will follow all rules and regulations and pay all applicable taxes. If you live in the USA or elsewhere you should be able to participate, however, please check your local laws and regulations of your state or country before purchasing.

4. WHAT IS TOKENLAB?

Tokenlab is an integrated system to create Tokens and assets on the Expanse.tech Blockchain. It includes the ability to start ICOs with smart contracts designed with time-locked distributions built in to protect investors from funds being dumped on the market. Tokenlab is also the first ICO of Tokenlab utilizing the LAB token that will be tradable and pay out a percentage of all new Tokens created by Tokenlab. For example, when Expanse creates the Votelock™ ICO on Tokenlab in the future, any holders of LAB would receive a percentage of Votelock tokens later. When anyone else creates an ICO using Tokenlab, a percentage also goes out to all holders of LAB.

5. WHAT IS THE PURPOSE OF THE LAB TOKEN?

The LAB Token will be the Token sold at the launch of Tokenlab and as the first crowdsale on Tokenlab. Tokenlab will be operational at this time, and after LAB Tokens are issued, new ICOs can start on Tokenlab. A fee of LAB is required to start any new ICO to prevent spam. This fee will be dynamic and based on levels of customization and change with market cap. LAB tokens will also function as a reward mechanism and a decentralized ownership stake in the Tokenlab project. Rewarding holders of LAB and LAB tokens will also be tradable on exchanges, to be announced, and as negotiated in the future.

6. WHO IS BUILDING TOKENLAB?

Tokenlab is the first official ICO of Expanse.Tech™ that is a subsidiary of Borderless Corp, and is being built by the Expanse.Tech Team. Additionally, some new people are joining for this project, and may become members of the permanent Expanse team. The information about the new members for this specific project is to be announced at a later date.

7. HOW MANY LAB TOKENS WILL BE AVAILABLE?

There will be 100 million LAB Tokens as a fixed supply, assuming all sell. LAB Tokens will be burned (destroyed on the blockchain) as each ICO is launched. It will be a fixed, decreasing supply. The cost will be a variable amount of LAB to launch an ICO based on levels of customization and special features for each ICO. This cost will help prevent spam ICOs with no value that waste review time, while also increasing the value of LAB Tokens. This dynamic cost and decreasing supply, by design, will be sufficient far into the future no matter how popular Tokenlab becomes.

8. WILL THE TOKENLAB TEAM ALSO RECEIVE LAB TOKENS?

No. It is commonplace these days for projects to raise lots of funding and also keep a very large premine at the same time, Tokenlab, however, will have a better distributed ICO with all LAB tokens going directly to buyers and none withheld for the team. We feel there is no legitimate reason to also keep ICO tokens, along with funding raised, as most projects have been doing. However, future projects using Tokenlab to build their own ICOs will have that option if they do have a reason or desire to do so.

9. WHAT ARE THE LIMITS OF THE SALE?

The sale will have no minimum limit of funds raised, and whatever is raised will be used as revenue at the sole discretion of the Tokenlab team. If only a small amount is raised, Tokenlab will still launch, just with minimal advertising. If a great deal is raised, then, at the discretion of Tokenlab, more will be used on promoting Tokenlab and bringing more quality ICOs into the system, generating more rewards for LAB holders.

10. WHAT PAYMENTS WILL BE ACCEPTED FOR THE TOKENLAB ICO?

Payment will be in Expanse (EXP) only for the exclusive sale, with 20% off. Expanse Ethereum, Bitcoin and Litecoin will be accepted for the Tokenlab presale and final sale. There will be a 10% discount for the pre-sale, and no discount for the final sale.

11. WHAT WILL BE THE COST PER TOKEN OF LAB?

LAB tokens will cost \$0.10 cents USD each. Any LAB tokens not sold will be burned/destroyed at the end of the final sale, increasing scarcity. So if all LAB tokens are sold, the total supply will be 100 million LAB. If only half are sold, the total would be 50 million LAB, and so on. No fiat will be accepted, but as multiple cryptocurrencies and tokens are being accepted, and prices change all the time, this is the easiest way to show potential costs in advance. Also, the EXP-only exclusive sale would price lab at \$0.08, and the presale will have LAB priced at \$0.09.

12. WILL THERE BE A PRE-SALE?

Yes, and you can sign up for it on the landing page here www.tokenlab.io. There will be a 20% discount for buying early (with Expanse only) in the Exclusive sale, 10% in the pre-sale later, and no discount in the final sale. Buying early means you are guaranteed to receive LAB tokens and a discount. No OTC trades will occur for this; all of this will be through the landing page system.

13. HOW WILL THE TOKENS BE DISTRIBUTED?

The Tokens will be distributed automatically by the Tokenlab smart contracts upon completion of the ICO to an Expanse address provided by the user. It is crucial users utilize a wallet that supports ERC20/ERC644 compliant tokens such as Mist, Parity, or MyEther-Wallet for managing this address. Users should not attempt to use an exchange address or any wallet they are not sure supports these token types, and doing such may result in unrecoverable tokens.

14. WHERE DO THE PROCEEDS FROM THE TOKENLAB SALE GO?

The proceeds of the sale will be considered revenue for the Tokenlab team to be used to develop the platform and to provide ongoing support. This will be held in smart contracts and used over years so the team is incentivized to continue developing and improving the platform, not as some payday or short term profits, but rather as legitimate funding for improving the Tokenlab ICO system and providing value and utility to users.

15. HOW DOES THE TOKENLAB TEAM PLAN TO USE THE PROCEEDS?

Proceeds will be used for continued developing and expanding the platform; hiring more people; for advertising and legal expenses; and as previously stated, as revenue to be used solely at the discretion of the Tokenlab team. This will be used over years for continued development and growth of the Tokenlab project into multiple blockchains. Tokenlab will not be only for Expanse, but will also launch ICOs on multiple platforms in the future – all EVM (Ethereum Virtual Machine) compatible platforms first, then beyond, all under Borderless Corp.

16. ARE THERE NETWORK FEES FOR TRANSFERRING LAB TOKENS?

Yes, there will be a small gas fee required for the LAB smart contract system to process the transaction. As such, users should ensure the address interacting with the contract has a small expanse balance to cover the gas costs of interacting with the smart contracts.

17. WHEN WILL I RECEIVE LAB TOKENS PURCHASED?

At the time of the sale, your LAB Tokens will be registered on the Blockchain and held in the private key and wallet that you control. Once exchanges launch with LAB, you will be able to trade your LAB tokens, hold them for future rewards, or use them to launch your own ICO on Tokenlab. Rewards from new ICOs could start shortly after the release of your LAB Tokens.

18. WHAT IF I CANNOT BUY OR DO NOT RECEIVE LAB TOKENS?

Every precaution will be taken by the team to make this as safe as possible, but this sale will be as is, at your own risk. The Tokenlab and Expanse team assumes no liability whatsoever for Tokens not received, bugs, problems, delays, or any unknown risks with Blockchain tech. To participate in the Tokenlab sale, and for creating sales on Tokenlab, you assume all risk. That said, it's important to understand that the developers and advisors overseeing this project are some of the most experienced out there, evoking a high level of trust.

19. HOW WILL TOKENLAB ADDRESS SCALABILITY CONCERNS?

Every campaign will go through the Tokenlab platform and will be coordinated for maximum efficiency and stability. As the platform grows, we will publish metrics around the performance and highlight how we continue to improve performance. Additionally, we will implement a queue that will make sure that we don't overload the network. The queue will allow for the maximum number of concurrent participants to ensure stability. Lastly, in the future, Tokenlab will be multi-blockchain, and the Expanse team will also implement technology to advance the transaction scalability of Expanse itself.

20. HOW CAN I PARTICIPATE IN THE LAB TOKEN DISTRIBUTION?

The Tokenlab Website is being built, but for now you can sign up for notifications at our new landing page for the Tokenlab ICO: www.tokenlab.io

