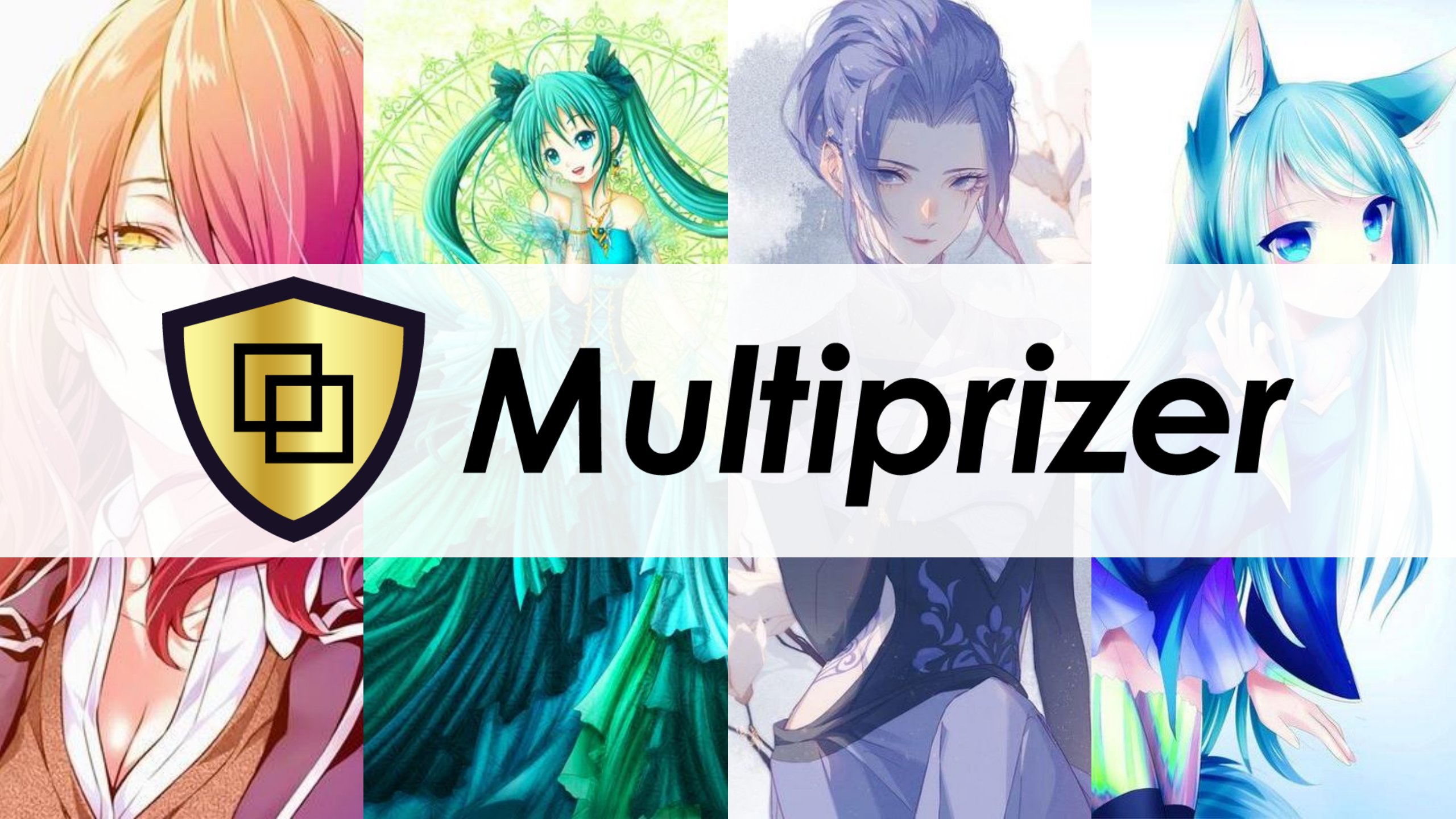

Multiprizer

INTRODUCTION

Multiprizer is a blockchain based strategy game DAPP in which a player can choose from multiple gameboards of different gameplay, to play their tokens intelligently. The rounds are time-bound, hence after the timer runs out, one player is chosen using the most powerful ‘provable random’ in blockchain history - Ledger based random of Oraclize, with on-chain proof verification. The winner gets all the tokens played in that game round, after edge.

It also implements the most secure and trust-less gameplay platform using best-in-class smart contract design methodology which cannot be tampered with or influenced by malicious players, rogue miners, hardware downtimes or Act of God.

What makes Multiprizer unique is, it incorporates complete decentralization that blockchain and peer-to-peer networks imbibe, which means the games cannot be influenced by any entity and will run perpetually in the Blockchain based world computer.

Basically, this game can be played from anywhere around the Earth, with complete privacy and anonymity (pseudonymity) and confidence of security and get back your tokens multiplied on victory!

DAPP SCREENSHOT

DAPP PROPERTIES

	Mainnet	Ropsten
Site URL	https://ethereum.multiprizer.io	https://ropsten.multiprizer.io
Multiprizer Contract	0x4E0C7a80dBf4aCdD6F020c3dD796Ef5b97D26Ed0	0x44cd9Cf21c589ac9D92a18782771485aF02250F9
Multiprizer Oraclize Contract	0x8E19A78146c50810da3FA93C3Adf237f8de70306	0xCb061C64c6Cfa3DC923a6a620A6E7BEFf0A0D16d
Gas Limit for DirectPlay of Game	234567	234567
Gas Limit for DirectPlay Withdraw	65432	65432
Value to send for DirectPlay Withdraw	0.00023456 eth	0.00023456 eth

A PAGE ON BLOCKCHAIN

Blockchain was invented by a person (or group of people) using the name Satoshi Nakamoto in 2008 to serve as the public transaction ledger of the cryptocurrency bitcoin. The identity of Satoshi Nakamoto is unknown. The invention of the blockchain for bitcoin made it the first digital currency to solve the double-spending problem without the need of a trusted authority or central server.

Like other blockchains, **Ethereum** has a native cryptocurrency called Ether (ETH). ETH is digital money, and can be sent to anyone anywhere in the world instantly. But unlike other blockchains, Ethereum can do much more. Ethereum is programmable, which means that developers can use it to build new kinds of applications.

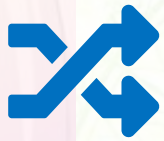
Bitcoin, like ETH, uses peer-to-peer technology to operate with no central authority or banks; managing transactions and the issuing of bitcoins is carried out collectively by the network. Bitcoin is also open-source; its design is public, nobody owns or controls Bitcoin and everyone can take part.

A **DApp** is a service that enables direct interaction between end users and providers, having their own suite of associated contracts on the blockchain which they use to encode business logic and allow persistent storage of their consensus-critical state. Ethereum dapps typically interface users via an HTML/Javascript web application using a Javascript API to communicate with the blockchain.

A pertinent tech underlying blockchain is **Cryptography**, which is the method of disguising and revealing info through complex math. The method involves taking unencrypted data, such as a piece of text, and encrypting it using a mathematical algorithm, known as a cipher. Hashing Algorithms and Public-key cryptography are core to blockchain's functioning.

A **smart contract** is a computer protocol intended to digitally facilitate, verify, or enforce the negotiation or performance of a contract, without third parties. They help you exchange money, property, shares, or anything of value in a transparent, conflict-free way while avoiding the services of a middleman.

FEATURES



Most Powerful ‘Provable Random’ in Blockchain History

Multiprizer uses the most sophisticated Provable Random Number currently known, to generate winner - **Ledger based random of Oraclize, with on-chain proof verification**. This creates purest ‘random’ to select winners from the strategic lot. impossible.

Fairness of Gameplay implementing ‘Undo’ of token purchase

The game tokens, once purchased, can be undone by the **‘revert’ feature in which all the player’s purchased tokens are cancelled, and the token value refunded to the player**. This is applicable at any point in time as long as the timer for that round has not expired.

Highest Level of Decentralization for robust and tamper-proof Gameplay

This DApp is built with game parameters such as **DirectPlay** and a **fixed significant house edge**, which make sure that the game cannot be controlled or manipulated by any party – neither malicious players, nor rogue miners, not even the admin or creator of this game.

Play without visiting the site using ‘DirectPlay’ mode

Players don’t even have to visit the DApp site to play. One can send a token value multiple of a specific game, from their Ethereum Wallet to the Contract Address, and the player participation gets auto-confirmed.

FEATURES

Emphasis on Strategy rather than ‘Random’ based outcome

Games are designed such that there is a **lot of leverage on how you play, rather than dependence on chance**, to maximizes your outcome of victory. The per token win probability itself is extremely high, teamed with option to purchase and revert at will, brings strategy as key to victory.

Immaculately secure Smart Contract code providing uncompromising gameplay

The Smart Contract follows **best-in-class secure methodology derived from various top safety standards** such as Consensys, OpenZeppelin etc. which prevents attacks such as re-entrancy, overflow/underflow etc. The contract is also publicly verified, providing full transparency of game algorithm.

MegaPrize category to pick a lucky winner from historical participants

The MegaPrize uses part of admin’s edge to create **a lucky draw for participants who have played any Game Board at least once, without reverting**. The winner is again chosen using provable random like game rounds & MegaPrize amount automatically credited.

Consistency of Win Probability and Uninterrupted Game Perpetuity maintained

The **games cannot be obstructed in any manner** while the round is still on. The game locks can only be implemented by admin on completion of game rounds, so does contract kill. Also, to maintain consistent win probability, new game boards are added instead of increasing total tokens for a specific game.

TECHNICAL SPECIFICATIONS

- *Smart Contract tech providing secure, tamper-proof gameplay algorithm*
- *Pure, uncompromised 'Random Number' generated by Oraclize using Ledger Random with on-chain proof verification*
- *Fast render of components with virtual DOM using React, for instantaneous page re-rendering*
- *Continuous Block and Account Polling using Drizzle for instantaneous updating of Blockchain values*
- *Fully Responsive web layout of DApp sites, makes it convenient to play in any viewport , any screen size, any device*
- *Quick Log Notifications passed from Blockchain using Drizzle for split-second event updating*

SECURITY

- Δ Multiprizer DApp has been created using the state-of-the-art blockchain secure design principles, and by integrating best practices formulated by several top sources such as Consensys and OpenZeppelin. The 'Provable Random' which is used to decide on the winner is derived from the most powerful and credible method of random number generation currently possible in blockchain – Ledger based Random with on-chain proof verification, of Oraclize.
- Δ This means that we are implementing random created by Ledger hardware devices and also deriving hardware & software based proof certificates, which is then verified inside the Smart Contract code itself! This makes sure that an insecure random cannot be generated or influenced by any of the party in blockchain, be it malicious player, or a rogue miner(s), or even the admin/creator of the game.
- Δ It is even possible for anyone to manually verify the proofs if they want to. This would require subscribing to the event generated by the Multiprizer Oraclize contract:
- Δ Ethereum Mainnet: 0x8E19A78146c50810da3FA93C3Adf237f8de70306
- Δ Ethereum Ropsten (testnet): 0xCb061C64c6Cfa3DC923a6a620A6E7BEFf0A0D16d
- Δ One could analyze the event arguments of the event object emitted from the above mentioned Multiprizer Oraclize Contract, and verify the Oraclize Proof manually as described in the article here.

- Δ The complete event object is:

OraclizeValues(Oraclize_ID, isProofValid, Oraclize_Proof, bytes(RandomValue))

Event Variable Name	Variable Description
OraclizeValues:	Name of the Event Log
Oraclize_ID:	Oraclize ID generated by Oraclize API
isProofValid:	true (1) if positively validated, false (0) otherwise
Oraclize_Proof:	The proof data created by Ledger Hardware
bytes (RandomValue):	The string with random value - 'RandomValue', converted in bytes format

TECHNOLOGY TOOLS USED

Amazon Web Services

Chai

CSS3

Drizzle

ESLint

EtherScan

Ganache

GitHub

HTML5

Javascript

Jekyll

Material-UI

Metamask

Mocha

Node.JS

NPM

React

Remix

RubyGems

Solidity

Truffle

Trust Wallet

Visual Studio Code

Web3.JS

Webpack

DECENTRALIZATION

This DApp has been created after carefully considering the decentralized nature a Blockchain based DApp is supposed to be. This means that the DApp should be designed in such a way that there is no central point of control for any facet, and in extension, no point of complete or partial failure in gameplay and no chance of liability for players in any scenario. And that's exactly what Multiprizer delivers.

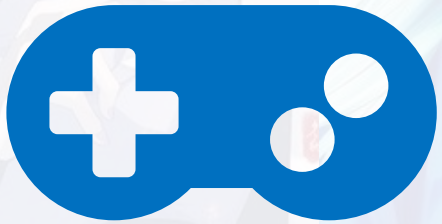
Even though there are specific points which still requires proprietary model, such as the timekeeper bot which runs in a Cloud instance perpetually, managing timers of various Game Boards and completing rounds when timer expires.

But the DApp is designed in such a way that the player's liability is zero, which means that even if in a highly improbable and hypothetical scenario that the timekeeper bot starts malfunctioning or gets influenced, there is no liability to the players because the players can choose to 'Revert' their tokens until the round completion routine is called for a specific Game Board.

Also, consider the scenario that the website itself is housed in a hosting space which is not necessarily decentralized. In a hypothetical and improbable scenario that the website itself is attacked by malicious actors, such as a DDoS attack, even if the site goes down, the player's liability is zero, since there would still be option to play the games using DirectPlay option, which doesn't require visiting the site, and can trigger direct participation using sending tokens directly from your Ethereum wallets. Thus, the design of the DApp is consistent with implementing decentralization of gameplay and reducing player liability to zero.

DIRECTPLAY

- As part of the decentralized nature of this App, this game can be played without even visiting the website/ DApp site. One can directly send a certain amount of crypto directly from one's Ethereum wallet (eg. MyEtherWallet, MyCrypto, Blockchain.info wallet etc.) to the contract address, with gas limit set as 234567, and Gas Price between 3Gwei to 20GWei, and the smart contract will automatically purchase tokens for the player and auto-confirm his/her participation. The Multiprizer Contracts are deployed in the following addresses:
- Ethereum Mainnet:
  0x4E0C7a80dBf4aCdD6F020c3dD796Ef5b97D26Ed0
- Ethereum Ropsten (testnet):
  0x44cd9Cf21c589ac9D92a18782771485aF02250F9
- The amount of ethers to send as total token value has to be exactly the total value of token(s) to purchase. The token value chart for three default gameBoards is shown in the table below.



Tokens to Buy	Total Value in Ethers for BountyBox (GameID: 102)
1	0.01
2	0.02
3	0.03
4	0.04
5	0.05
6	0.06
7	0.07
8	0.08
9	0.09
10	0.1

Δ If you want to purchase 2 tokens of Game Board called Bounty Box whose game ID is 102, the token value is 0.01 ether per token, and the total amount to send will be 0.02 ethers (0.01 * 2). Then you set the following parameters in your Ethereum wallet and send the ether amount:

Transaction Parameter	Parameter Value
From:	< Your Wallet Address >
To:	0x4E0C7a80dBf4aCdD6F020c3dD796Ef5b97D26Ed0
Exact amount to send:	0.02 ethers
Gas Limit:	234567
Gas Price:	3Gwei to 20GWei (depending on your priority)

Δ If you want to purchase 7 tokens of Game Board called Bounty Box whose game ID is 102, the token value is 0.01 ether per token, and the total amount to send will be 0.07 ethers (0.01 * 7). Then you set the following parameters in your Ethereum wallet and send the ether amount:

Transaction Parameter	Parameter Value
From:	< Your Wallet Address >
To:	0x4E0C7a80dBf4aCdD6F020c3dD796Ef5b97D26Ed0
Exact amount to send:	0.07 ethers
Gas Limit:	234567
Gas Price:	3Gwei to 20GWei (depending on your priority)

HOW TO PLAY

Multiprizer is quite easy to play!

1). First things first, make sure you have Metamask or Trust Wallet with sufficient Ethers:

This dApp requires Metamask Extension if you are playing from desktop / laptop, or Trust Wallet if you are playing from a mobile device. Once you have installed it, you need to create a new wallet (or use existing wallet) and get ethers (Ethereum Cryptocurrency).

2). Lets Go to the site and Play!

Visit one of sites below to play Multiprizer. Make sure you set your Metamask / Trust Wallet to whichever network you chose below (Ethereum Mainnet or Ropsten Testnet). Ethereum Mainnetcontains the production dApp where real ethers are used to play. In case you dont want to spend real ethers right now, you could choose to play in Ropsten Testnet after getting some test ethers (which have no intrinsic value). To get free test ethers, visit ***Metamask Faucet*** or ***Ropsten Faucet***.

3). Steps to play

Δ Analyse all the game boards that are present (Fig. 1) and check the game parameters – Total tokens, max tokens per player, round duration, bounty size, probability of winning etc. Then you choose one or more of the game boards and purchase one or more tokens. The more tokens you purchase, the more your weighted probability to win.

Δ To purchase the tokens, you need to select the number of tokens to buy from the 'Buy Tokens' textbox and press on 'PAY' button. This will open your wallet window where you can complete the transaction. You can choose to keep the Gas Price as low as 3Gwei or high as 20GWei for every transaction mentioned in this documentation. Please wait till the transaction is confirmed, which takes only a couple of seconds.

Δ After confirmation, the game board starts displaying the number of tokens purchased by you. You can subsequently, purchase more tokens or even revert all the tokens purchased yet, by pressing on 'Revert' button. On clicking on 'Revert', will open your wallet window where you can complete the transaction. Please wait till the transaction is confirmed, which takes only a couple of seconds.

Network	DApp URL
Ethereum Mainnet	https://ethereum.multiprizer.io
Ropsten Testnet	https://ropsten.multiprizer.io

HOW TO PLAY

Game Details Button

Game ID for quick reference

Winning Chance Indicator

Max Tokens per Player

Game Board Name

Round Timer

Bounty Size Indicator

Round Duration Indicator

Token Inventory Indicator

Token Purchase Field

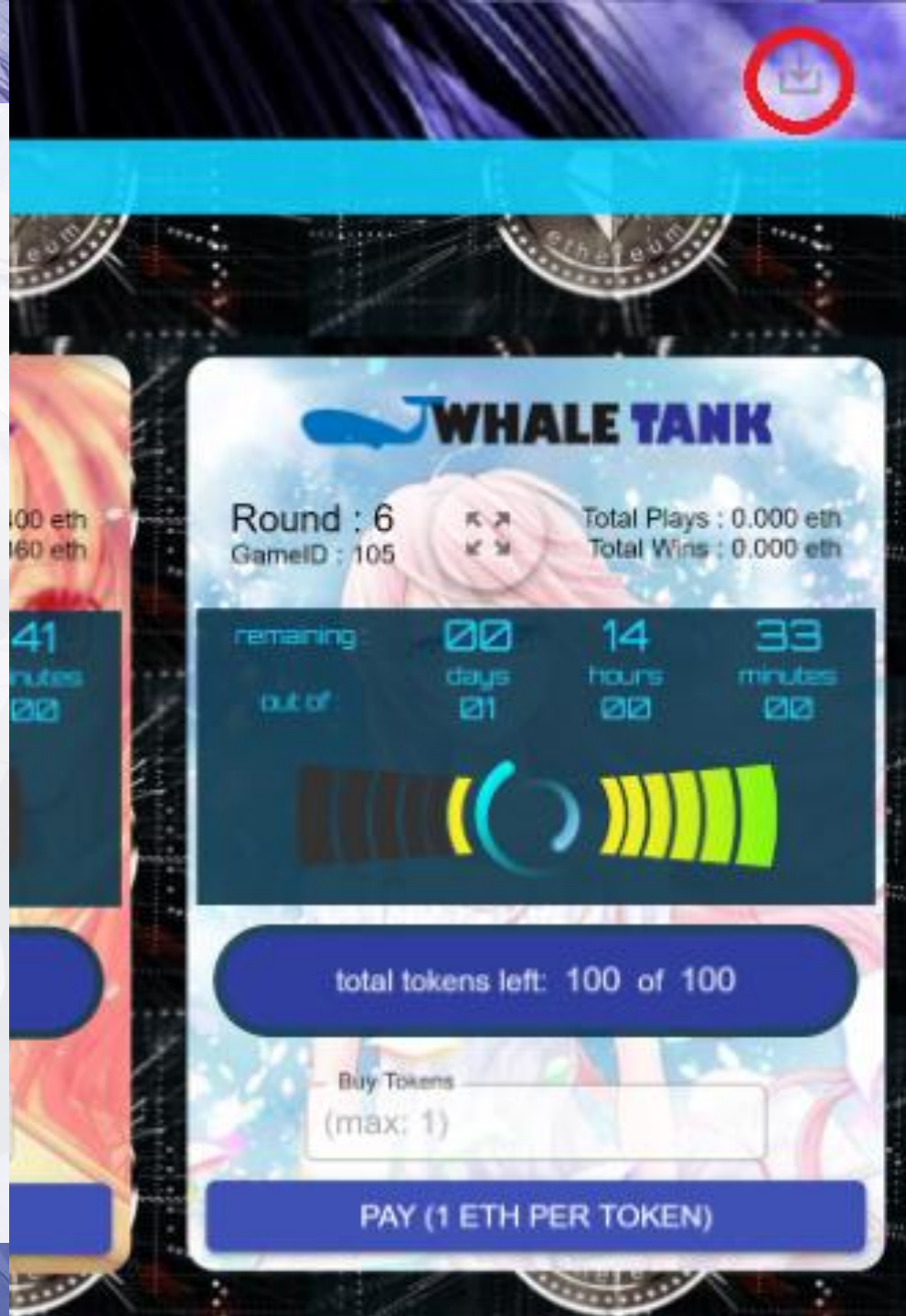
PAY Button

(Fig. 1)

HOW TO PLAY

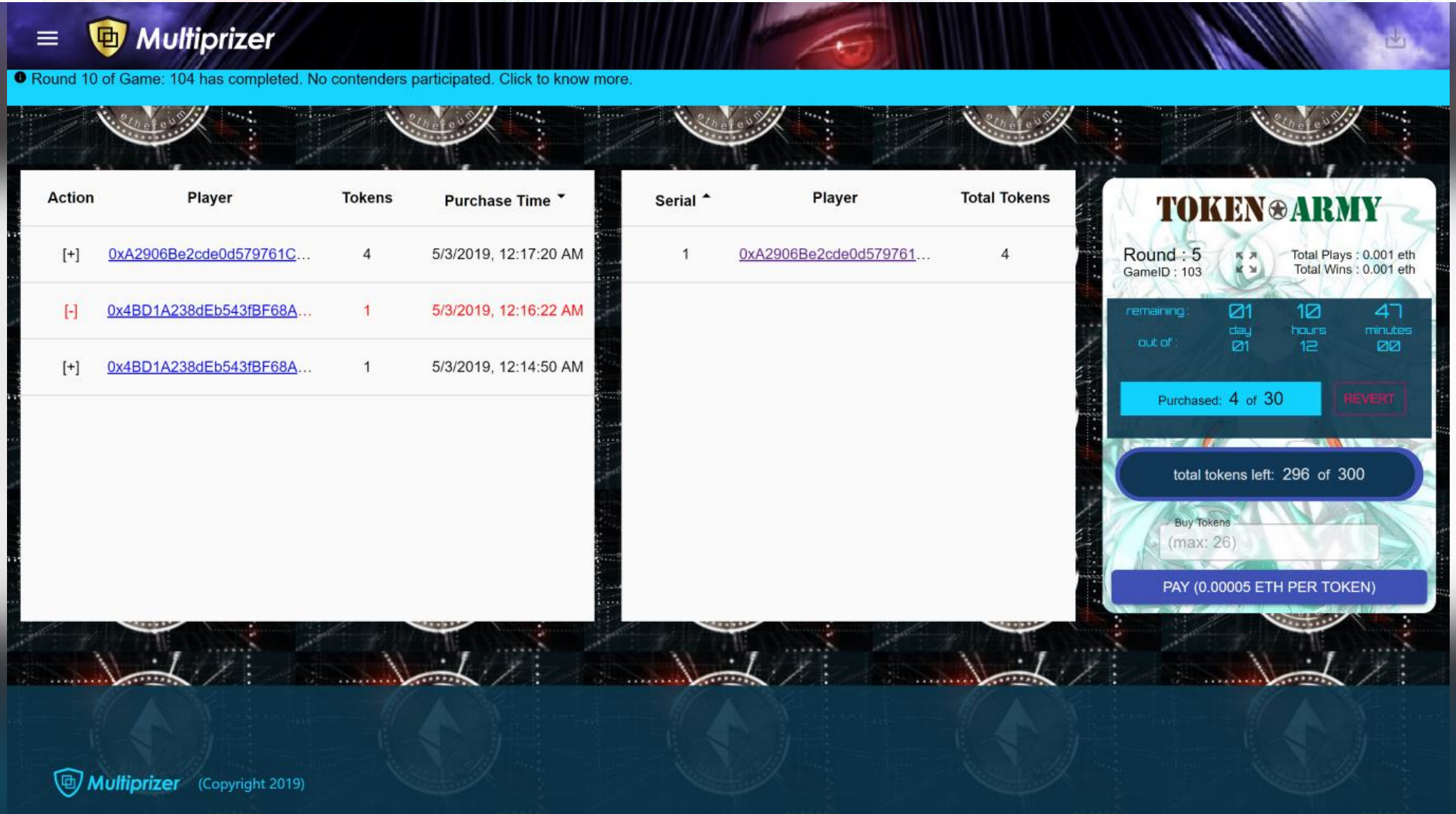
Δ Once the timer for the game board completes, a new round begins and automatically, and in a short while, a winner is chosen automatically using the most powerful provable random algorithm in blockchain space. The winner is announced in the light blue notification bar on top, and also in the Notifications page, and the total token amount for that round is automatically transferred to the winner's address.

Δ One can also manually withdraw their winnings by clicking on the 'Withdraw Winnings' button at the top right, which gets activated when direct transfer was unsuccessful due to winners keeping a fallback routine at their address. Once completed, please wait till the transaction is confirmed, which only takes a couple of seconds.



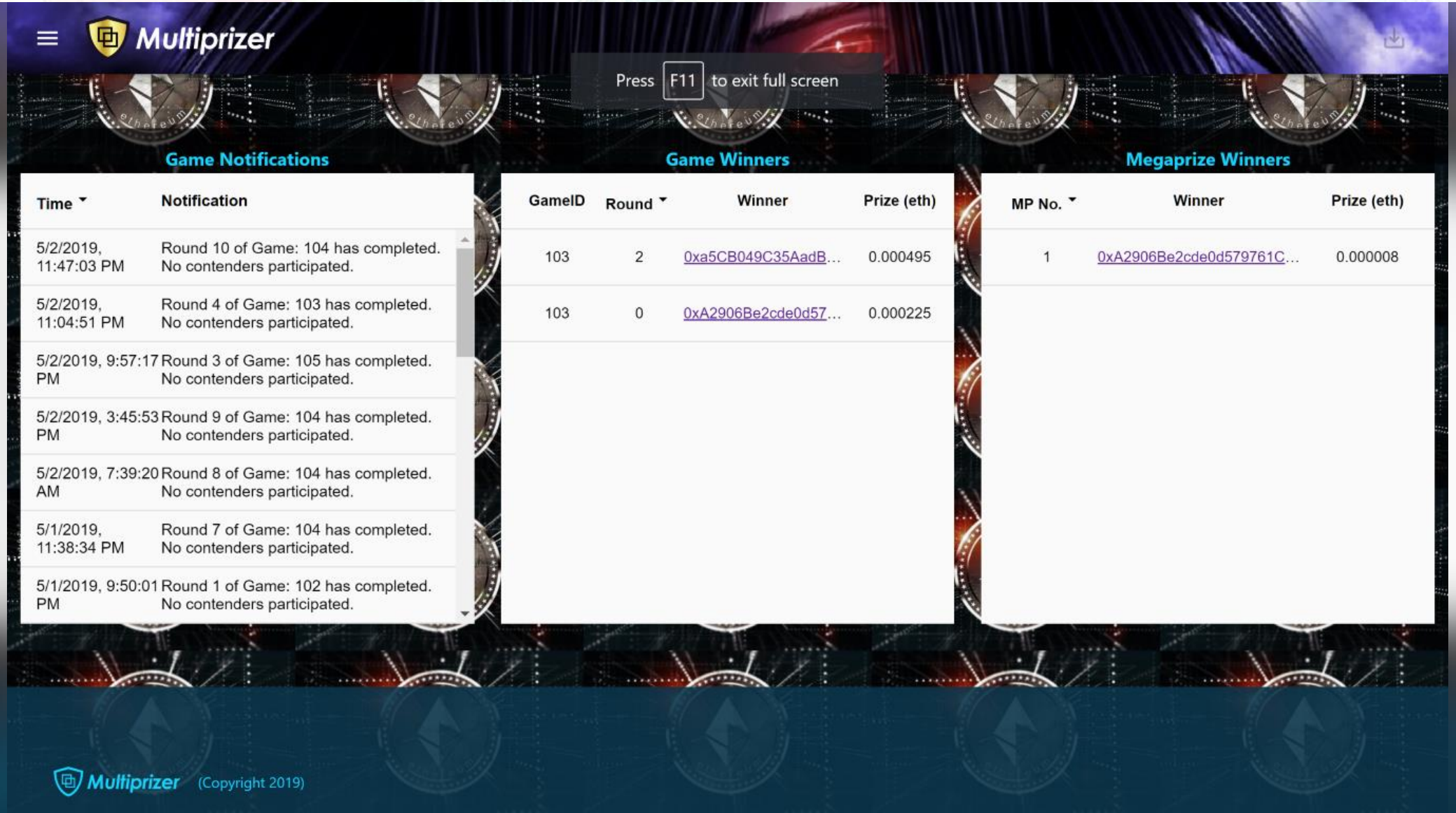
HOW TO PLAY

Δ To get the game details such as logs of token purchases and reverts by players or total tokens bought by various players for that round, one can click on ‘Game Details’ button.



HOW TO PLAY

Δ Also, on clicking the notification bar above, the notifications pane is accessible which provides complete details of all notifications, winners and mega prize winners.



MEGAPRIZE

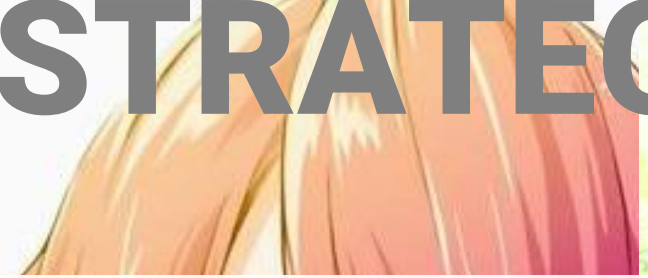



MegaPrize is a special bonus prize that is offered apart from the prize winnings of the various game rounds. To become eligible for the MegaPrize, a player should have played any one of the Game Boards at least once, without reverting. Thus, if you have played any of the games in Multiprizer DApp even once, you are automatically eligible for MegaPrize consideration.

The MegaPrize rounds are much longer in duration than the game rounds and can go on for a week or two. Once the MegaPrize round duration is finished, one of the participants is picked using the same popular ‘Provable Random’ we use for the game rounds.

There is no weightage for the number of games a player has played, or total tokens the player has purchased. The only criteria is to have played any game at least once throughout the duration of MegaPrize round, and every historical participant has equal probability to win. Once the MegaPrize round is over and a winner declared, a new round begins and the players will again have to satisfy the criteria of having played any one of the games at least once, without reverting.

STRATEGY over LUCK

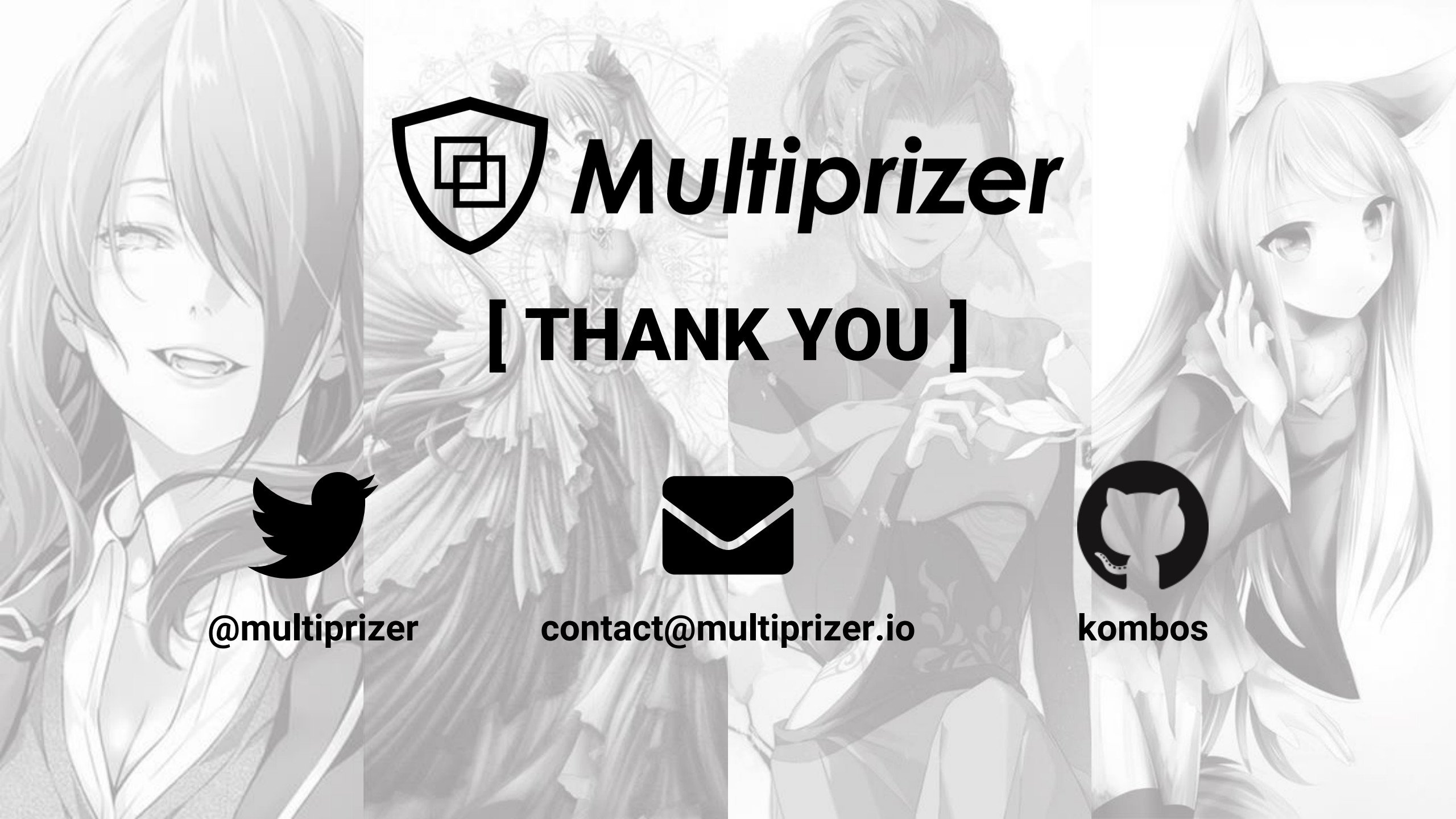



Multiprizer is more a Game of Strategy, and less a game of chance. Although we implement a powerful ‘provable random’ to create fair outcomes for the games, the probability of victory is majorly influenced by the gameplay leveraged by the players.

Unlike other pure chance-based games, or lotteries, the tokens can be reverted back at any point of time, giving the leverage for players to exit the game with their tokens, in case they sense a crowding strategy (a player purchases significant amount of tokens using multiple wallet addresses, thereby obtaining huge probability of victory) is being implemented by another player. This, teamed with the fact that the house edge is 10%, ensures that players cannot crowd the game by purchasing too many tokens, as they have to forfeit 10% of the purchase value in any gameplay.

Also, the probability of winning is significantly high as compared to pure chance-based games, sometimes reaching as high as 1/20, and since the game intervals are much shorter, and token values of some games are much smaller, makes for a much fairer, much healthy gameplay.



Multiprizer

[THANK YOU]

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kombos