

Official Whitepaper for Aether Games Pty Ltd

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About Us

We're a team of technology professionals, successful business leaders, serial start-up entrepreneurs and marketing specialists with a wealth of experiences geographically cut across the regions, from North America to APAC. We're passionate about blockchain and what it will bring to the business enterprises and people at large, and strong believers in making blockchain a religion among our team members and associates.

Equipped a deep background in bringing new products to market, developing channel-to-market plans, plus years of practical experience in developing solutions and R&D on the Ethereum blockchain network – Aether isn't about talk and theory; ***we plan, create, and deliver real solutions.***

We believe that decentralised blockchain technology offers unlimited business opportunities with global market reach. Blockchain revolutionises how governments, business enterprises and people will interact and conduct business through transparency, transaction immutability and enhanced security.

Blockchain can radically transform many industry verticals from gaming & entertainment, fintech & stock trading, telehealth & wellness, non-profits & charity fundraising, and more. It's clear to the Aether team that blockchain is a powerful platform, an underlying force that will propel digital transformation and innovations along with big data, artificial intelligence, clouding computing, IoT and more.

Our Vision

- To be an active contributor in the eco-system that drives digital transformation forward using Blockchain as the underlying technology.
- To be a socially responsible organisation that delivers sustainable and innovative solutions which are disruptive with direct impact to people and businesses.

Our Mission

- Ramp-up quickly to deliver a disruptive Blockchain-based mobile gaming and entertainment platform with a fully integrated service solution targeting business partners globally as the 1st entry to the Blockchain eco-system.
- To engage the investors community with attractive investment opportunities to take part in the Blockchain revolution based on specific committed development products and services programs and roadmap.

To prove that our team at Aether can deliver and that blockchain works, our 1st foray has been into the gaming and entertainment sector – and we've developed solutions that leverage the power of blockchain and other cutting-edge technologies to help industry players go-to and disrupt the market in a big, unprecedented way.

Of course, Aether is committed to an innovative development program to extend our coverage to other verticals such as fintech, telehealth & wellness, supply-chain and beyond as we continue to build trust in the untrusted world of blockchain.

We are actively seeking opportunities and partnerships to develop and apply blockchain solutions across different verticals and enterprises – if you're ready to face the future, [contact us](#) and let's talk.

Aether Games' Blockchain Entertainment Platform

We have developed a complete, vertically integrated platform for blockchain lottery with a purpose-built administration manager that provides OAM capabilities and all the business management and business intelligence feature functionalities you need. All supported by additional solutions such as:

- a cryptocurrency gateway, **Aether Gateway**
- a secure platform wallet, **Aether Wallet**
- a unique random number generator, **Aether RAENDOM**

Our mobile-first solution can be played by anyone, anywhere, anytime and supports B2B, B2C and B2B2C business models.



- ✓ Secured
- ✓ Reliable & Scalable
- ✓ Fair & transparent to the players / end-users / customers
- ✓ Players controlled wallets on wager and winning directly without purchasing tokens / chips
- ✓ Seamless & consistent UX / UI on different mobile apps (OS) and webapps
- ✓ Supportable with a purpose built AMS Aether Management System for OAM
- ✓ Fully autonomous and manipulation-proof gaming experience
- ✓ Compliant to the licensing authorities

In this whitepaper, we will provide some insights into the innovative solutions that take advantage blockchain's special characteristics and properties which we've been hard at work developing for the gaming and entertainment sector.

Table of Contents

About Us	1
Aether Games' Blockchain Entertainment Platform	2
1. Aether Blockchain.....	4
2. Unified Wallet.....	4
3. Aether Gateway.....	4
4. Lottery Mobile App.....	5
5. Lottery Webapp.....	5
6. Administration Webapp	6
7. User management	6
8. Aether API.....	6
9. Blockchain API	6
10. Aether Wallet API	7
11. Aether RAENDOM.....	7
12. Schedule Services	7
13. Blockchain Indexer	7
14. Database.....	8
15. Reseller system.....	8
16. Future new games.....	9
17. Wallet integration with third-party online games.....	9
Aether Games' Assurance	10
a) Performance	10
b) Availability	10
c) Scalability.....	10
d) Security	11
e) Logging and monitoring.....	11

1. Aether Blockchain

The Aether Blockchain is an Ethereum (ETH) private sidechain. It provides a secure environment for games and wallets we've developed to reside next to the Ethereum main network (Mainnet). It also provides the security and transparency of deposit and withdrawal transactions of wallets, as well as all smart contracts of games, while the Aether Gateway facilitates the deposit and withdrawal transactions.

The native ETH on Aether Blockchain is an asset backed in-game currency (IGC) which is guaranteed by the game Operator. By default, it has a pegged value of 1-to-1 between the IGC and ETH on the Ethereum Mainnet. The IGC branding can be modified to suit to each Operator's needs.

The Aether Blockchain provides functions that allow for setting up the games, operations of the games, facilitating the purchases of lottery tickets and the payment of prizes if won. It also provides a blockchain explorer that can be opened to the public to allow for more transparency or be kept private only for the purpose of internal audits by Operators.



2. Unified Wallet



The purpose of the Unified Wallet is to deliver a transparent and seamless experience to the Player, using a mnemonic for both environments; the Ethereum Mainnet and Aether Blockchain.

Players will be able to see the balances of their wallet in the two environments, manage deposits and withdraws to and from their wallets, and have full control over their balances and expenditure in games.

Together with the Aether Gateway, all transactions between the Operator and Player can be approved, validated, transmitted, and recorded securely.

3. Aether Gateway

The Aether Gateway provides the ability and backend functionality to enable deposits and withdrawals of ETH of a wallet between the Ethereum Mainnet and the Aether Blockchain.

It is assumed that the Player would have an existing wallet on the Ethereum Mainnet and can export its mnemonic. The mnemonic is then imported into the Unified Wallet on the Aether gaming platform.



The Aether Gateway works in-tandem with the Unified Wallet to facilitate deposits and withdrawals of Ethereum-based ERC20 crypto and major fiat currencies. Operator compliance officers can set withdrawal thresholds for improved pay-out approval management while the Aether Gateway ensures records maintained and transactions are performed with the highest integrity.

Payment gateway integrations are supported, with integrated digital wallet deposits and withdrawals for select providers – such as GCash for the Philippines. Additionally, debit and credit cards are supported by default – plus in-country bank transfer options for Indonesia, Malaysia, Vietnam, Thailand, Philippines with more to come and integration with crypto exchanges to support more fiat and cryptocurrencies included in the future roadmap.



4. Lottery Mobile App



The Lottery Mobile App is the mobile application packages customized, compiled, and made available to Operator's customers on Android and iOS devices.

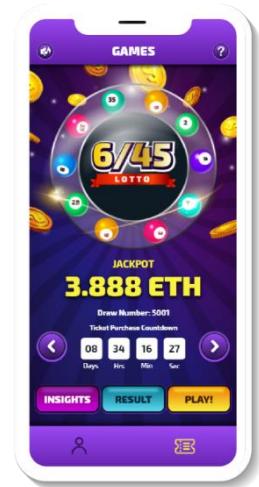
For Android users, installation packaged file known as APKs can be downloaded via Operator websites, or links made available to customers. Downloaded APKs can be installed directly on the Android phones.

An Operator can also register the Android APK with Google Play, and upon completion of the vetting process, customers will then be able to download, update and install directly from Google Play.

For iOS users, operator will be required to register with Apple App Store and complete the vetting process. Upon completion vetting process, the mobile app will be available on App Store and Players will be able to download, update and install directly.

Users that complete registration after installation will gain access to a standard array of account functionality, including but not limited to:

- User Profiles
- My Wallets
- My Tickets
- Notifications
- Referral Rewards
- Settings



From there, users can interact with the game catalogue through intuitive controls, check draw histories, game statistics and more on-platform information to fuel engagement.

5. Lottery Webapp

The Lottery WebApp is the mobile-first, web-accessible version of our Mobile Lottery application. Our Lottery Webapp is designed to look and feel as close to the mobile application, but on larger viewing devices.



Our Lottery Webapp supports the most popular web-browsers including Chrome, Firefox, Internet Explorer, and Safari.

Aether strives to ensure excellent User Experiences across all platforms and has optimized the Lottery Webapp for larger form devices including:

- Desktop / Laptop computers
- Tablets / iPads
- Large screen devices, e.g. - iPhone 13 Pro Max, Samsung Fold, etc.

6. Administration Webapp

The Operations, Administration & Monitoring platform is Aether's centralized platform for Operators to run and manage the mobile blockchain lottery game.

At the highest level, there are three-levels of access for Operators to the OA&M system:

- Operator / Administrator
- Game(s) Manager
- Compliance / Approver

An Operator/Administrator has full access to add or edit Game Managers and Compliance/Approver. Selected access to information, adding / removing / changing, functions are all defined by an Operator/Administrator.

When accessing the OA&M main menu, Operator personnel will be able to perform:

- the full scope of operations management relating to lottery games from ticket pricing to jackpot management, draw schedules and more
- financials management complete with profit loss, balance sheet, cash flow, and expense statements
- data analytics using customizable business intelligence dashboards to assess recent and historical performance
- platform settings and OA&M user access management

7. User management

This module of Aether Games' system is used to handle user and identity pools for authentication and authorization of Players and Admin Users. The user pools provide the user directory that power the sign-up and sign-in functionalities, while the identity pool is used to grant specific services. Most of the user access control is performed internally by the Aether API based on the user's role.

8. Aether API

This module provides the primary interface for all Game Apps and Administration Webapp into the Aether ecosystem; Blockchain API, wallet and any other integration with external party.

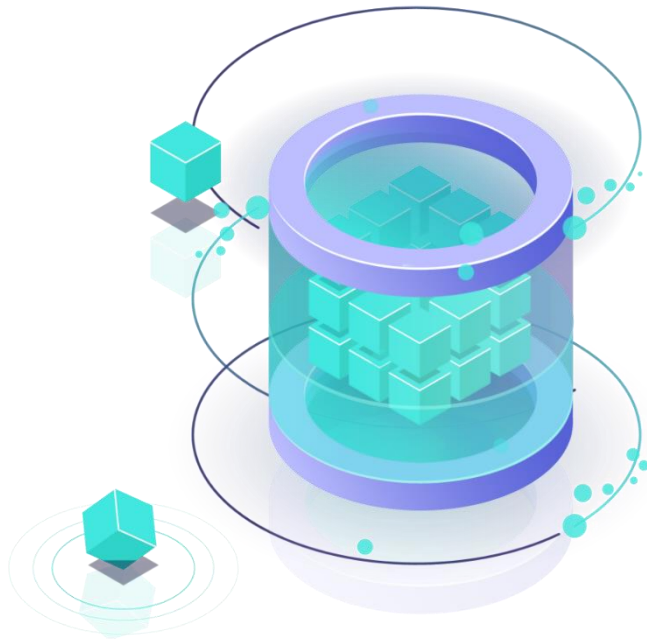
In addition, it provides an extensive business rules engine and creates a secure layer between Aether core database to fetch or update data according to the request.

9. Blockchain API

This module provides a secure connection between the Aether API and the Aether Blockchain, serving as the main interface between the two key components. The Blockchain API delivers all the key functionalities required to setup, configure, and operate the lottery games as well as some cryptographic and wallet related functions.

10. Aether Wallet API

Provides the ability for other 3rd party game developers to integrate into the Aether Games system and to enable their users to utilize the Unified Wallet as a form of payment using a wide variety of payment methods, especially accepting cryptocurrencies.



Key functions and features of the Aether Wallet API include:

- New developer registration
- Deposit and withdrawal API
- Wallet balance API
- Place Bet and Prize Pay-out APIs

Prize claim processes can be enhanced to support an Operator's requirements, such as:

- Automation of small prize pay-outs directly into Player wallets with thresholds set by the Operator
- Secure large prize claims with ticket validation and ID verification at designated Operator outlets

11. Aether RAENDOM

Aether RAENDOM is an industry-grade, cryptographically secure, random number generator that is based on Fortuna. The key feature of Aether RAENDOM is as follows:

- BMM Test Lab certified in accordance with the GLI-19: Interactive Gaming Systems Version 2.0 standards
- Compliant with the NIST SP 800-22 Revision 1a
- Cryptographically secure RNG based on Fortuna
- Entropy pool with quantum entropy extracted randomly for the NIST Randomness Beacon and a hardware-based entropy
- Generator function based on Keccak-256 cryptographic hash
- Server-client based on the WebSocket standard RFC6455



This module supports the blockchain lottery game and allows us to deliver gameplay experiences that are consistent with our product values –fair, transparent, and secured.

12. Schedule Services

A collection of scheduler programs that are designed to keep services running accordingly. The key services included are game cycle management, ticket purchase processing, ticket prize processing, and exchange rate updates.

13. Blockchain Indexer

Blockchain explorers, like Etherscan, index and keep records of the Ethereum Mainnet and some of the commonly used test networks. As the Aether Blockchain is essentially a private blockchain, these blockchain explorers can no longer be used.

The Aether Blockchain thus require some additional indexing mechanism to build up certain transaction data when retrieving certain information on the blockchain. The Blockchain Indexer is an indexing system is designed to fulfil this requirement.

This module facilitates:

- Blockchain data collection, of information such as
 - Block data
 - Transaction information
 - Events emitted from smart contracts
- Blockchain data processing, such as
 - Game information and history
 - Wallet accounts
 - Smart contract accounts
 - Individual transaction records



14. Database

The Database provides the use of flexible document schemas that meets our requirement for complex data structure that can be modelled and manipulated easily.



The Database provides a flexible data structure design as required in our fast-moving game development. It supports user profile and role-based access control for Players and Operator's admin users; provides data schematics to store game related information for fast access to purchase history, financial accounts, raw and processed blockchain data; and enables queue management of data such as batch processing of ticket purchase traffic during peak hours.

15. Reseller system

The reseller system provides support for reseller accounts and their related features such as:

- Wallet management
- Bulk purchases
- Current and historic sales and commissions reports

Additionally, this extends the OA&M platform functionality to support reseller management features including but not limited to:

- Reseller account registrations
- Reseller verifications
- Commission rate settings
 - Per game
 - Per reseller
- Current and historic sales and commissions reports
 - Consolidated view
 - Per reseller
- Withdrawal approval and disbursement process

16. Future new games

Discussions on future, new games will commence to define what will be implemented next. These new games supplied will be blockchain games and taking advantage of the Aether Games systems deployed.

The two key advantages of Aether Blockchain are:

- i. Blockchain based with Unique Value Proposition of fair gaming, transparent and trustworthiness
- ii. Totally integrated with the Aether Wallets for ease of transfer-in/out with fiat and open cryptocurrencies, and placing bet using Aether

The number of games to be developed will be discussed and decided based on the project timeline as agreed.

Several factors such as the game mechanics complexity and user experience vs development efforts will affect the games selection, subject to the Operator's business objectives and market demand.

The initial list of potential games that could be developed are:

- 3D or 4D Lotto
- Pick 3 or Pick 4
- 5 Card Cash
- Scratch card
- Dice
- Lucky wheel
- Keno
- Roulette
- Slot machine

The new games will be supplied based on a mutually agreed business model.

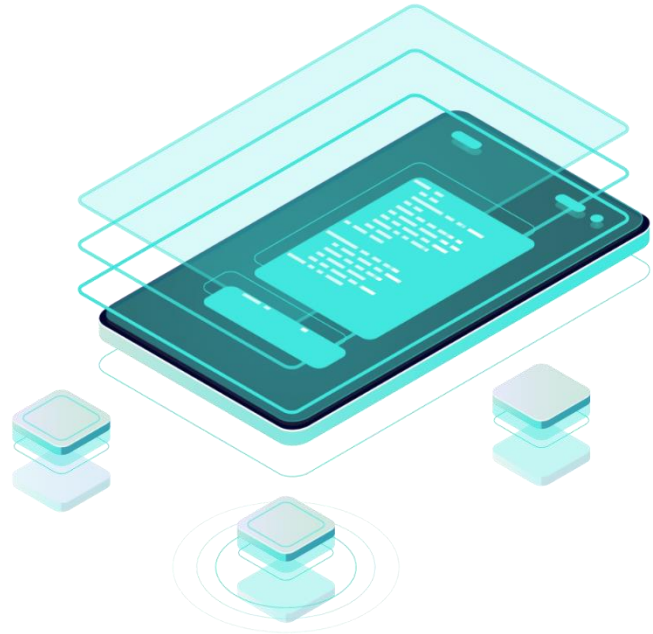
17. Wallet integration with third-party online games

A third-party online game can be identified to have the Aether Wallet integrated.

Development efforts can be made to integrate the selected game to use the Aether Wallet to pay for bets and for winnings to be paid into for the Players. Features available on the Unified Wallet will be made available as part of the integration with the selected online game.

Further discussions are required with the developers of the selected third-party online game to coordinate on the integration efforts. Exchange of proprietary documentation including but not limited to design specification and API specification may be required, subject to signing of a mutual non-disclosure agreement between the involved parties.

Actual scope of integration may vary subject to future discussions and agreement.



Aether Games' Focus

We understand that support for non-functional system properties such as performance, availability, redundancy, scalability, and security are critical to all software solutions. That is why we focus on the following assurances for your peace of mind.

a) Performance

The Aether Gateway shall be able to handle 1,000,000 transactions per day, in any combinations of Deposits and Withdrawals.

However, the actual throughput depends heavily on the Ethereum Mainnet's traffic demand and average gas limit. As the traffic demand and average gas limit on the Ethereum Mainnet is dynamic, it is hard to predict the actual throughput though this may be increased if the Players are willing to pay a higher gas price when performing the transactions.

b) Availability

Aether Games' systems shall be available 24 x 7 to facilitate gaming, ticket purchases, Deposits and Withdrawals of ETH into the Players' Aether Wallets.

The system availability shall be no less than 95% of the time during a month.

Higher system availability can be made available upon request subject to adjustment in service pricing.

c) Scalability

Deposits and Withdrawals are effectively transactions on the Ethereum Mainnet and hence, the scalability is limited by the current version of the Ethereum Mainnet.

Ethereum 2.0 will address the issues of both performance and scalability of Ethereum and will happen in three phases.

Ethereum 2.0

Phase 0: The Beacon Chain

In this phase, the Beacon Chain brings staking to Ethereum and lays the groundwork for future upgrades.

The Beacon Chain will be used eventually to coordinate with the new system.

The Beacon Chain is now live.

Phase 1: The Merge

The Ethereum Mainnet will "merge" with the Beacon Chain as part of the move toward improved scalability, security, and sustainability.

This phase is estimated to take place in 2022.

Phase 2: Shard Chains

Ethereum's capacity to process transactions and store data will greatly be scaled with the introduction of Shard Chains.

This phase is estimated to be shipped some time in 2023.

d) Security

Aether Games' systems shall be compliant with top security recommendations against well-known and documented risks and vulnerabilities to ensure system integrity, prevent fraud, and protect our users.

Code injection

Aether Games' systems shall prevent code injection attempts by attackers that send invalid data to the gateway with the intention of making it perform something other than what the system is designed to do.

Interfaces that accept parameters as input can potentially be vulnerable to a code injection attack.

Broken authentication

Aether Games' systems shall prevent a broken authentication vulnerability that can potentially allow attackers to use manual and or automatic methods to try to gain control over any account they want in a system or to gain complete control over the system.

Broken authentication often refers to logic issues that occur on the application authentication's mechanism, like bad session management prone to username enumeration. A malicious actor may use brute-force techniques to either guess or confirm valid users in a system.

Sensitive data exposure

Aether Games' systems shall prevent potential exposures of sensitive data.

This vulnerability is one of the most widespread and it includes compromising data that should have been protected. Responsible sensitive data collection and handling is critical in ensuring users' sensitive data is always protected if being stored and/or transmitted between servers and clients.

Broken access control

Aether Games' systems shall ensure access controls are sufficiently protected.

Applications delivering the Unified Wallet functionality shall be adequately protected with email or mobile number and strong passwords, PIN numbers and/or fingerprints.

Insecure deserialization

Aether Games' systems shall prevent the possibility of attacks on interfaces relying on process of deserializations of byte strings to objects.

This vulnerability exposes the system to potential attack vector to change serialized data string in session information such as cookies to change the behaviour of the server such as tricking it into believing that the user has higher access rights to certain system resources or data.

Components with known vulnerabilities

Aether Games' systems shall not use open-source components with known vulnerabilities and have all open-source components sufficiently upgraded in a timely manner.

e) Logging and monitoring

Aether Games' systems shall capture and maintain sufficient system logs and perform monitoring.