



GNUS.AI

# WHITEPAPER

Version 1.1

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# Abstract

Historically, access to high-performance computer systems was reserved for large companies with human, technical and financial resources to own and manage them. Developers are looking for new tools and methods to contain the data surge which has led to more complex computer problems, and new areas emerge that depend on advanced computing.

In response to this growing demand, companies such as Amazon EC2 and Google Compute Engine have recently introduced cloud-based cloud computing services for small and medium-sized developers who need IT resources to reach a wide range of applications. However, as developers and market demand evolve to high-level cloud computing, the existing centralized architecture is outdated as Distributed computing provides the solution to the problem of scalability: a global computer network is much more powerful than any supercomputer.

This global architecture does not solve the problem of mediation of transactions between users that compromise projects and the computer nodes that execute the work.

GNUS.AI is an infrastructure which serves as a distributed multi-purpose service with a cryptographic payment system that allocates computing resources to integrated user projects in real-world use cases, as described in this document which involves the use of the Genius tokens to quantify and reward work done on a computer. In particular, users who require computer power of any of our services must purchase the GENIUS tokens and attach them to their projects.

GENIUS tokens can then be exchanged directly for computing power from the network or traded for conventional currency on an exchange.

A system and method for distributed general-purpose computing with cryptotoken payment system provide a full system that integrates a slow Blockchain Cryptotoken with a fast Directed Acyclic Graph Blockchain Cryptotoken. The instant invention provides:

- (1) a hybrid Cryptocurrency/Cryptotoken system that allows for high-speed transactions to happen decoupled from the slow operations of normal Cryptocurrencies
- (2) a mechanism to verify the processing of data and payments to the End User's wallet for the processing of data used for In-App purchases or in-game purchases of items and
- (3) mechanisms for the transfer of unprocessed and processed data to the client or customer.

# 1. Background

Considering the exponential growth data in our era, industry, academia, and entertainment realize that they need to make a fundamental transformation in the way operations and innovations are carried out. This transformation requires a gradual change of thought and openness that may never have been before. Due to the convergence of several technologies, including ubiquitous wireless communication, real-time scanning, and machine learning, and integrated systems, computational robotics is inevitable. Cloud computing has already become a demanding service or utility due to the advantages of high computing power, low cost of services, high performance, scalability, accessibility, and availability. International Data Corporation (IDC) predicts that the high-performance sector (HPC) experience a compound annual growth rate (CAGR) of 8%, which raises the total market to \$ 31.4 billion by 2019. (IaaS increased by 36.8% in USD to reach \$ 34.6 billion in 2017).

## Video and image processing:

The rendering and visualization software grows from a compound annual growth rate (CAGR) of 30.03% from 2016 to 2020 based on statistics. 3D visualization devices, virtual and augmented reality and high-end video games fuels this growth.

## Big data and business analysis

BDA's worldwide revenues reached \$150.8 billion in 2017, an increase of 12.4% compared to 2016. The commercial purchase of BDA hardware, software and services are expected to maintain the CAGR of 11.9% by 2020, when the turnover exceeds 210 billion dollars.

Examples of intensive computer science: research and science, technology, engineering and mathematics (STEM)

For example, the market for neural network software is expected to increase from \$7.17 billion in 2016 to \$ 22.55 billion by . Encouraged by unclassified and recently digitized data, neural networks are classifying machines with intensive use of computers.



## Advanced risk analysis

The risk analysis has a (CAGR of 15.3%), which increases the market from \$17.60 in 2017 to \$35.92 in 2022. New technologies, such as artificial intelligence, allow institutions to improve underwriting decisions and increase revenues while reducing risk costs.

Computer and Block Desktop grids can potentially interrupt all clouds, large data, and HPC economics.

Currently, there are some solutions for high-speed processing of transactions via a Blockchain Cryptotoken. Some of these solutions attempt to use different techniques to speed up the verification of transactions, but these solutions fail to meet the needs of the industry because the current systems' verification of transactions takes several seconds to several minutes. Other solutions attempt to solve this issue by using Directed Acyclic Graph Blockchain Cryptotokens, but still, fall short as decentralized applications are not integrated.



## 2. Blueprint for distributed general-purpose computing with cryptotoken payment system

GNUS.AI aims at providing a system and method for distributed general-purpose computing with crypto token payment system which offers a full system that integrates a slow Blockchain Cryptotoken with a fast Directed Acyclic Graph Blockchain Cryptotoken. This technology is based on smart contracts "Genius Tokens" from Ethereum and allows the creation of a virtual cloud infrastructure that provides high-performance computing services on demand. (See section 6.0)

GNUS.AI seeks to implement a scalable, high-performance, secure and manageable infrastructure side chain that promotes a new form of distributed management, including key leaders in the computing, large data, and cloud industries.

We believe in the future of decentralized infrastructures and market networks, where Big Data and HPC applications, high-value data sets and computing resources (storage, processors, GPU) are monetized on the blockchain with the highest level of transparency, resistance and security, and Genius Venture as a critical platform for the future.

We are building a highly-scalable hybrid blockchain for every computing needs and solution.

**Be a part of this revolution!**

## 3. Market Challenges and Opportunities

### 3.1. Current Limitations

#### 3.1.1. Blockchain Computing Challenges

Blockchains like Ethereum offer a new approach to the work of decentralized applications (also called DApps). Ethereum allows developers to write smart contracts, code that runs in a virtual machine. This represents a potential revolution in the design and implementation of services such as investments, finance, corporate financing, Internet, insurance, forecasting markets, gambling, distributed data processing and more.

Despite the unique promise, blockchains offer minimal computing capabilities to run distributed applications: several kilobytes of storage, a very inefficient virtual machine, and a high-latency protocol. In the end, blockchain technology will be developed to solve some of these problems, but it is increasingly necessary to provide additional functions to all applications, except the simplest ones.

#### 3.1.2. Traditional Computing Infrastructure Challenges

Existing clouds cannot meet the DApp requirements that require an utterly decentralized infrastructure for their execution. At the same time, industry and scientific communities are increasingly demanding computing power to deploy large-scale applications and manage large amounts of data.

The power of a computer to run large data applications is provided by cloud computing and HPC's high performance which means that small, innovative companies often lack the resources and experience to acquire and manage HPC platforms, while traditional cloud service providers, such as Amazon AWS, remain very expensive for demanding applications, graphics processor, and others.

Also, data centers spend a lot of energy running servers and cooling systems. Not only is it expensive, but it can also have a significant negative impact on the environment. We need a new form of decentralized cloud that can use blockchain computing and reduce the cost of using the infrastructure.



## 4. The GNUS.ai Solution

### 4.1. Technical Overview

GNUS.ai supports the emerging class of blockchain-based distributed applications and enables cost-effective high-performance computing by building a decentralized cloud infrastructure which uses the Directed Acyclic Graph Blockchain Cryptotokens integrated with decentralized applications.

Our System is unique when compared with other known systems and solutions as it provides a full system that integrates a slow Blockchain Cryptotoken with a fast Directed Acyclic Graph Blockchain Cryptotoken. Similarly, the software disclosed is unique when compared with other known solutions as it provides a unique way for applications and games to utilize unused cycles from computing devices to earn Cryptotokens by processing real data, such as Artificial Intelligence or Machine Learning data.

Typically, other Cryptocurrencies and Cryptotokens are earned by what is known as mining. Mining uses the computing devices to solve complex mathematical problems to verify a block on the blockchain. This mining does not process real data and is only used as a competition to see who wins the mining payments.

A blockchain-based decentralized cloud connected with a hybrid cryptocurrency/cryptotoken payment system allows on-demand, secure and low-cost access to the most competitive computing infrastructures. DApps relies on GNUS.AI to automatically search, find, provision, use, and release all the computing resources they need: applications, datasets, and servers.

We envision a new ecosystem of companies offering storage, computer farms, data providers, web hosting, and SaaS applications, all conducting business with each other through GNUS.AI. The localized cloud can open new markets for aggressive use of existing computing infrastructures.

### 4.2. Core Value Proposition

At GNUS.AI, we aim to address the needs of all the decentralized businesses as outlined

below;

1. DApp providers can perform off-chain computations on demand.
2. Application suppliers lower the computing prices of their decentralized applications by employing a safe, reliable and robust infrastructure.
3. The customer can select A.I. or Machine learning algorithms through a customer portal and data can be uploaded or on customers secure servers
4. Stand-alone applications, embedded systems or games with the SDK integrated can run the processing
5. Server suppliers decriminalize underused computing resources and increase the come back on investment on their existing infrastructure, by seeking higher profits in providing their servers.
6. The hybrid Cryptotoken system uses a fast internal Directed Acyclic Graph (DAG) based blockchain that executes transactions in microseconds.
7. Development of the SDK is targeted for Mobile devices first and uses the computer devices on any system.
8. Code and SDK works on all devices, including Windows, OSX, iOS, Android, Linux,

#### 4.3. Decentralized applications or cloud infrastructure users

GNUS.AI can offer computing resources to decentralized applications at a far lower value than traditional blockchain computing resources, helping them drive more value for their customers. The transparency of resource suppliers can reward reliable suppliers, with integrated Quality-of-Service controls providing the required level of computing resources. Support for various resource suppliers and full visibility into partial contributions from every supplier contributes to transparency.

#### 4.4. Genius Token Blockchain

Utilizing unused cycles of Compute Devices on computers, mobile devices, and IOT devices, the system processes Artificial Intelligence and Machine Learning data on an end-user device. The end-user gets paid in Genius Cryptotokens that can be reused

for In-App purchases or converted back to other currencies. The entire system easily integrates into a computer, mobile games, and applications..

## 06 PAYMENTS

Once the process is complete the blockchain contract then maps the and distributes 70% of the Genius tokens to all the individual nodes wallets. The publisher of the app or game will then receive 20% with Genius Ventures receiving 10% The users can convert the tokens to regular currencies or use for in-app purchases.

## 02 DATA TRANSFER

The data to be processed is uploaded to a encrypted area in a distributed file systems. As part of the transaction, the costs of storage are charged against the deposit. If the customer has storage for their own data, the system then references this data through secure SSL transactions with the individual customers own SSL public key

## 01 TRANSACTION

Customers request processing of data for Artificial Intelligence or Machine Learning and pay into an account that converts the currency into Genius Tokens. The transaction happens via a distributed web interface and payment/cryptocurrency conversion system. The customer then uploads or references data to be processed.

## GENIUS TOKENS BLOCKCHAIN WORKFLOW

## 04 VALIDATE AND ADD

After processing all nodes report back results to a fast blockchain that aggregates the results data and verifies that nodes aren't cheating the system. The data is verified with a parity verification node and encryption verification. The data is then stored in the distributed files system or returned to the customers data storage area.

## 05 COMPLETE

After the data has been validated a transaction complete is sent to the main blockchain. The blockchain moves the payment in Genius tokens out of escrow ready to be distributed to the individual nodes that process the data

## 03 A.I. PROCESSING

Using a distributed networking system, similar to what peer-to-peer games use, the transaction is communicated to participants that have games and or apps installed that can process the A.I. Data. The workload is divided and distributed to individual nodes for processing either in a standalone app or while running a game.

## 5. Market Overview – Opportunities

### 5.1. The Perfect Timing

The convergence of several trends has created an optimal business environment for a decentralized cloud infrastructure.

1. In addition to the traditional users of cloud computing, the new generation of distributed applications (DApps) is becoming important, changing titles and has excellent potential for the future.
2. Proof-of-work tokens have led to the creation of large groups of optimized computer resources to seek the highest return on investment (ROI), thus providing significant resources on the supply side.
3. Smart Contracts have reached a point where they can include all the complexity of the market of decentralized computing resources, which significantly simplifies the infrastructure.

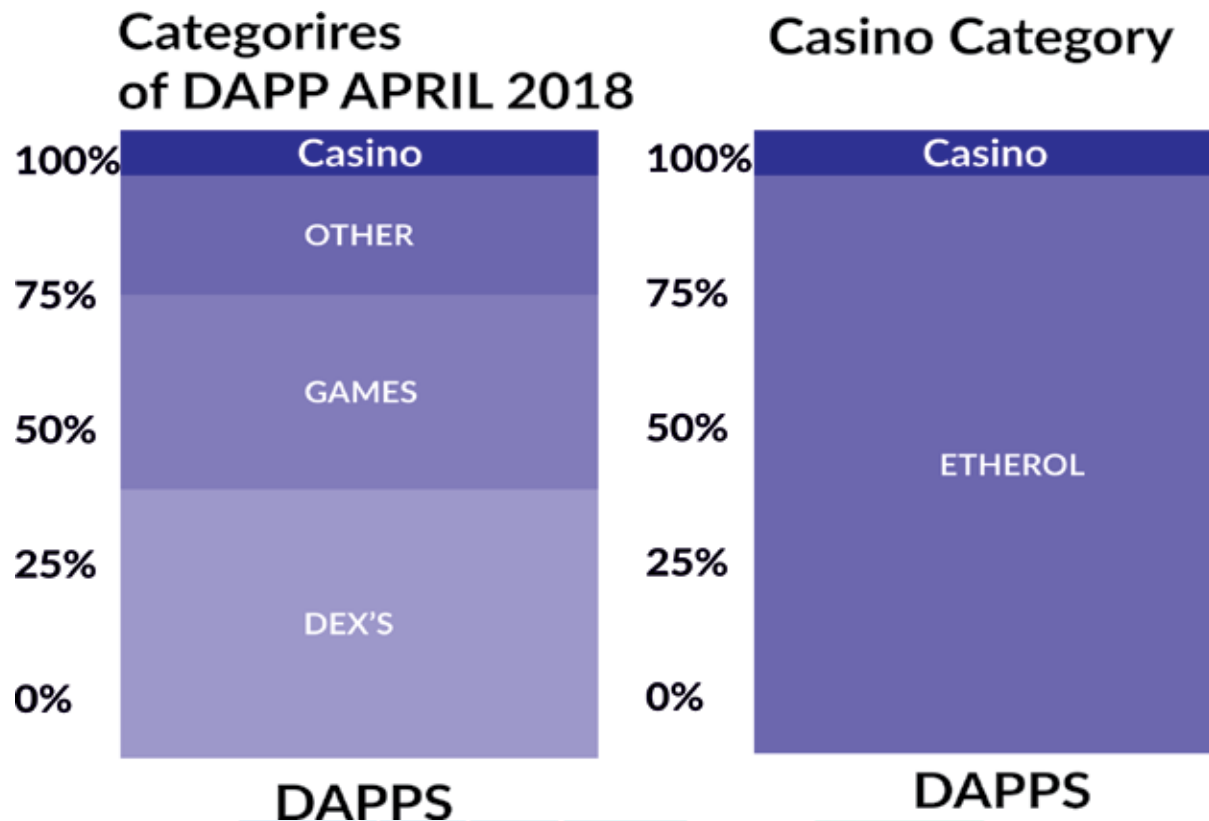
The sum of these trends justifies a particular market to launch cloud computing initiatives in the cloud and be prepared to face the growing demand for computing resources in the cloud in the coming years.

### 5.2. The DApps Market

According to a research carried out by Chris Mccann in 2018, he carefully analyzed, scrutinized and categorized the 312 DApps built on top of the Ethereum blockchain – the largest decentralized application platform.

These DApps were categorized into four main broad categories which are;

- Games.
- Pyramid schemes.
- Decentralized exchanges.



The Keynote of his research focuses on the fact that the top DApps in the categories listed above is minimal in comparison to the traditional web and mobile applications existing.

It is possible to conclude in terms of adoption that we are farther away from consumer adoption of dapps, as no specific designated app or trending app has been developed besides tokens and trading. McCann further established the fact that any seemingly large dapp (e.g., IDEX) has low usage overall.

In McCann research conclusion, he stated that "As an ecosystem, we need to build better tools and infrastructure, if we need to attain global adoption of DApps."

GNUS.AI positions itself as one of the engineering tools, by allowing DApps to have secure, scalable and straightforward access to computing resources.

We believe that these resources and innovations ensure computational support for a wide superfluity of CPU or GPU-intensive dapps, in the fields of artificial intelligence, gaming, cryptography, 3D rendering or scientific computing.

We have chosen to focus on dapps integrated into a hybrid cryptocurrency/cryptotoken



system as the first step of its adoption strategy, and envisions a crypto sphere of more valuable and diversified applications that make use of the unique properties of the blockchain and grow throughout their journeys to compete with traditional consumer web applications

### 5.3. The Edge and Fog Computing Market

Fog computing is a parallel, system-level architecture that distributes computing, storage, control, and networking functions closer to the users along a cloud-to-thing continuum. (Source: <https://www.slideshare.net/professorbanafa/iot-and-blockchain-convergence>)

According to research by OpenFog, it established that the global fog computing market has the potential to reach more than \$18 billion worldwide by 2022.

The Internet of things is rapidly increasing its potential to transform everyday life with homes, cities, farms and smart manufacturing facilities. The prospects for growth in the market are enormous, and Gartner expects that 20.4 billion related articles are used worldwide by 2020.

The development of an Internet-based solution requires cooperation, coordination, and connectivity without compromises for each part of the system and the entire system. All devices must work together and integrate with all other devices, and all devices must interact and communicate with connected systems and infrastructure transparently and securely. This is a possible achievement, but it can be costly, time-consuming and

## 6. System Architecture Overview

### 6.1. The Genius Venture Invention - GNUS.ai

The Genius Venture invention is a system and method for distributed general-purpose computing with cryptotoken payment system provides a full system that integrates a slow Blockchain Cryptotoken with a fast Directed Acyclic Graph Blockchain Cryptotoken. The instant invention provides:

- (1) A hybrid Cryptocurrency/Cryptotoken system that allows for high-speed transactions to happen decoupled from the slow transactions of normal Cryptocurrencies
- (2) It provides for a mechanism to verify the processing of data and payments to the End User's wallet for the processing of that data that can, in turn, be used for In-App purchases or in-game purchases of items and
- (3) It provides mechanisms for the transfer of unprocessed and processed data to the client or customer.

Similarly, the associated software is unique in that it incorporates interfaces that allow for applications and games to use unused cycles of one or more devices to process real data and to receive and utilize payments for the processing of data.

### 6.2. Our Computer Process

#### 6.2.1. Components

The system is made up of the following components:

- Generic Blockchain Cryptotoken component
- Directed Acyclic Graph Blockchain Cryptotoken component
- Payment System component
- Proof of Work component
- Decentralized File System component

- Data Delivery/Storage component
- Processing component
- Communications component
- Software Development Kit component
- Cryptocurrency Wallet component
- Compute Devices

The associated computer process is made up of the following executable steps, all of which are required in all versions:

1. A customer pays currency into a converter system that converts into a Cryptotoken and sends the transaction to the Generic Blockchain Cryptotoken component which holds the payment as a deposit. The customer then sends the data that is processed to the Decentralized File System component and stored in the Delivery/Storage component.
2. The customer then initiates a processing request with the Decentralized File System components location and the Generic Blockchain Cryptotoken deposit account. The Generic Blockchain Cryptotoken component calculates out the cost of the processing and puts that amount of Cryptotoken on hold for processing.
3. The Generic Blockchain Cryptotoken component then deposits into the Directed Acyclic Graph Blockchain component equivalent amounts of the Directed Acyclic Graph Blockchain Cryptotoken into the Directed Acyclic Blockchain.
4. The Directed Acyclic Graph Blockchain Cryptotoken component then sends the processing request to the Communication component that distributes the work to a multitude of End User Devices for processing through the Software Development Kit.
5. The Software Development Kit component then sends the request to the Processing component.
6. The processing component then communicates with Compute Devices to process the data.

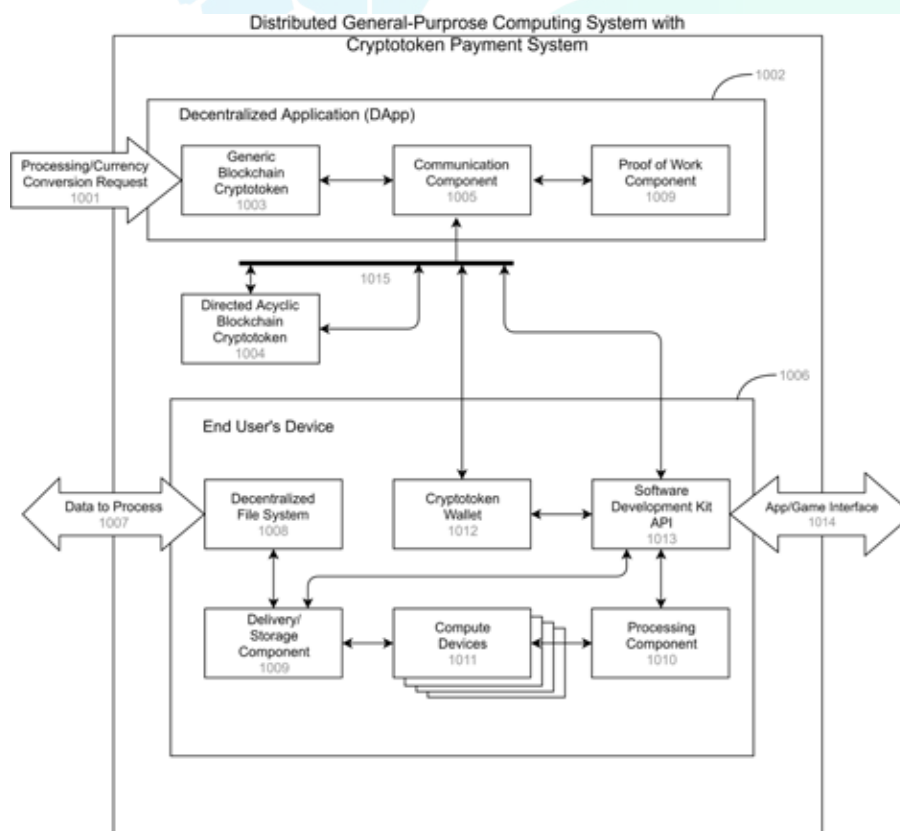
7. The Compute Devices processed the data and sent the processed data to the Delivery/Storage component and signals back to the Processing component the completion of the processing.
8. The processing component then signals back to the Software Development Kit component on process completion.
9. The Software Development Kit component then signals back to the Communication component process completion for one device.

All processing reports to the communication component send a signal back to the Proof of Work component that verifies the integrity of the processed data and then signals the Generic Blockchain Cryptotoken component to release the hold on the Generic Blockchain Cryptotoken. The Generic Cryptotoken then sends a signal to the Directed Acyclic Graph Blockchain token to release Cryptotokens to the End User's Cryptotoken Wallet.

## 6.3. Distributed General – purpose Computing System

### 6.3.1. With Crypto token payment system

FIG. 1 – as shown above is a schematic diagram that illustrates a Distributed General-



## Decentralized Application 1002

As shown in FIG. 1 above, the Distributed General-Purpose Computing System 1000 includes a Decentralized Application 1002, an End User's Device 1006 and a Directed Acyclic Graph Blockchain Cryptotoken Component 1004. The Decentralized Application 1002 is in communication with the End User's Device 1006 and the Directed Acyclic Graph Blockchain Cryptotoken 1004 through the Communication Component 1005 and via a network 1015. The network 1015 can be any network (e.g., a local area network (LAN), an extensive area network (WAN), a virtual network, a telecommunications network, a cellular network, a wireless LAN (WLAN), and others) configured to enable communication between the Decentralized Application 1002, the Directed Acyclic Graph Blockchain Cryptotoken component 1004 and the End User's Device 1006. The network 1015 can be implemented as a wired network and/or wireless network, or any other communication such as Bluetooth, NFC, and others.

The Decentralized Application 1002 contains three components, namely;

- Generic Blockchain Cryptotoken component 1003,
- Communication Component 1005
- Proof of Work component 1009

The End User's Device 1006 has six components, namely;

- Decentralized File System 1008,
- Cryptotoken Wallet 1012,
- Software Development Kit API 1013
- Delivery/Storage component 1009
- Processing component 1010.

The Directed Acyclic Graph Blockchain Cryptotoken 1004 is a stand-alone component.

(For more info on this subject, kindly refer to our technical paper on the website)



## 6.4. Internal Components of the software development Kit API

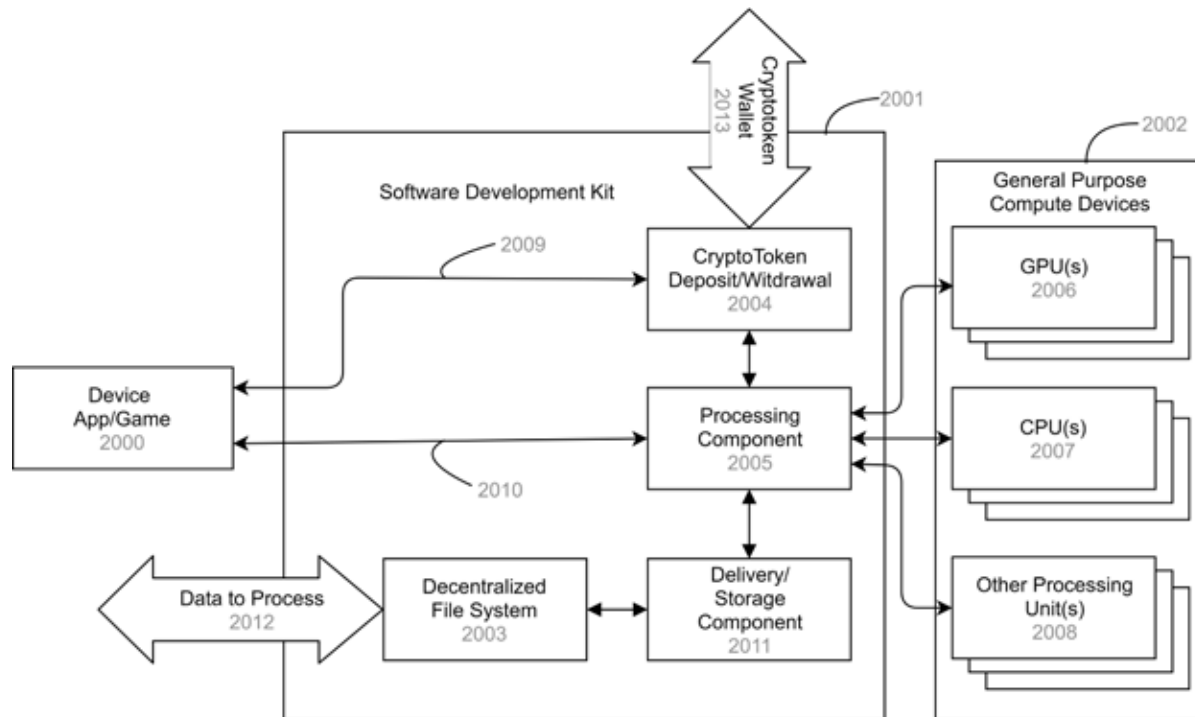


FIG. 2, as shown above, is a schematic diagram of the internal components of the Software Development Kit 2001 and the Software Development Kit API 1013. The General-Purpose Compute Devices 2002 is a representation of any computing device. These can include Graphics Processing Units (GPU(s)) 2006, Central Processing Units (CPU(s)) 2007 and other types Processing Units 2008. A Device App/Game 2000 connected to the Software Development Kit 2001 via an Application Programming Interface (API) 2009, 2010. For more details on how the internal components work, please refer to our technical paper.

## 6.5. Customer transaction

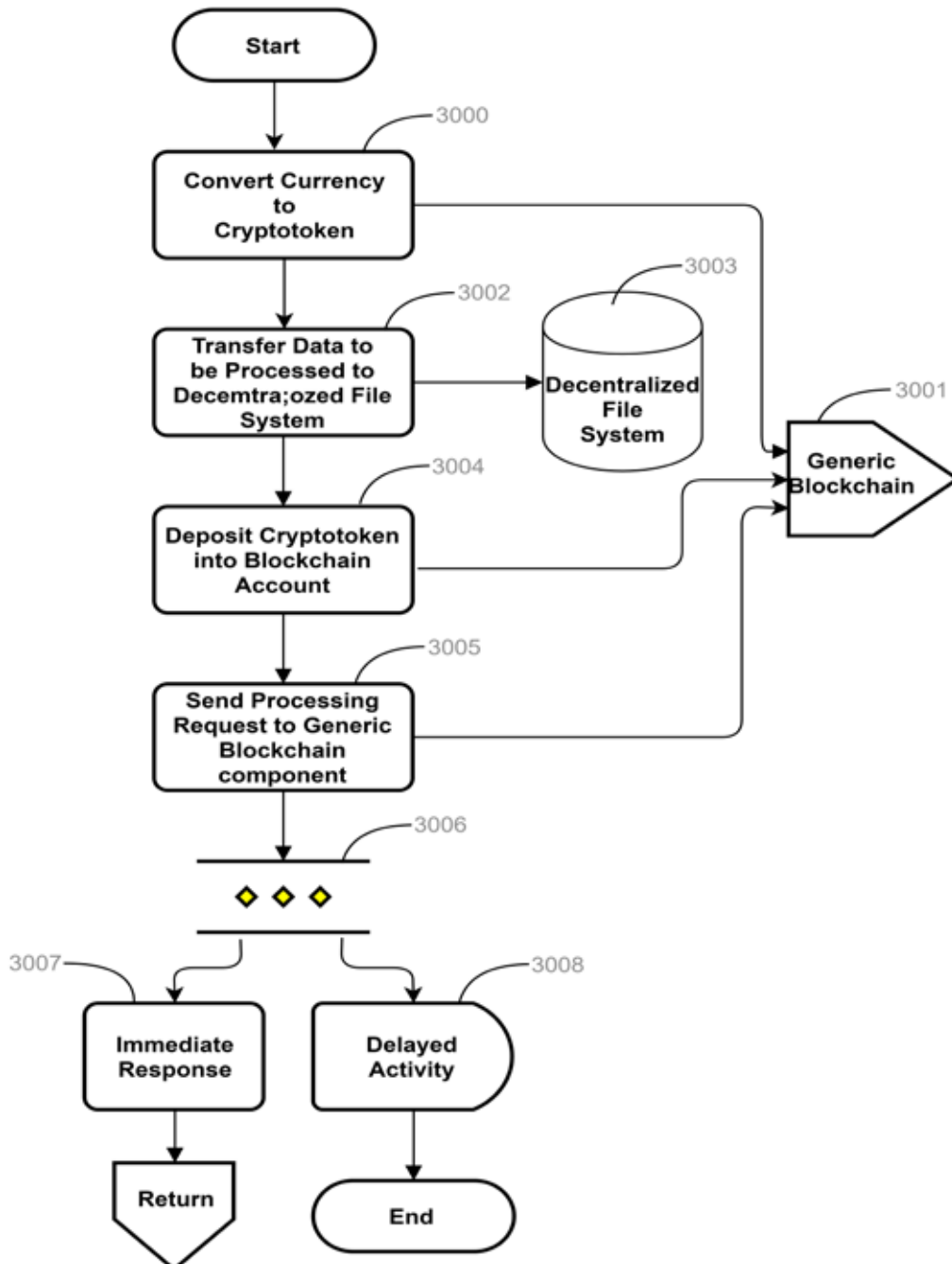


FIG. 3 is a flow diagram of a typical client or customer transaction. A customer or client converts any currency to a Cryptotoken 3000. This token is sent to the Generic Blockchain 3001.

## 6.6. The internal workings of request processing

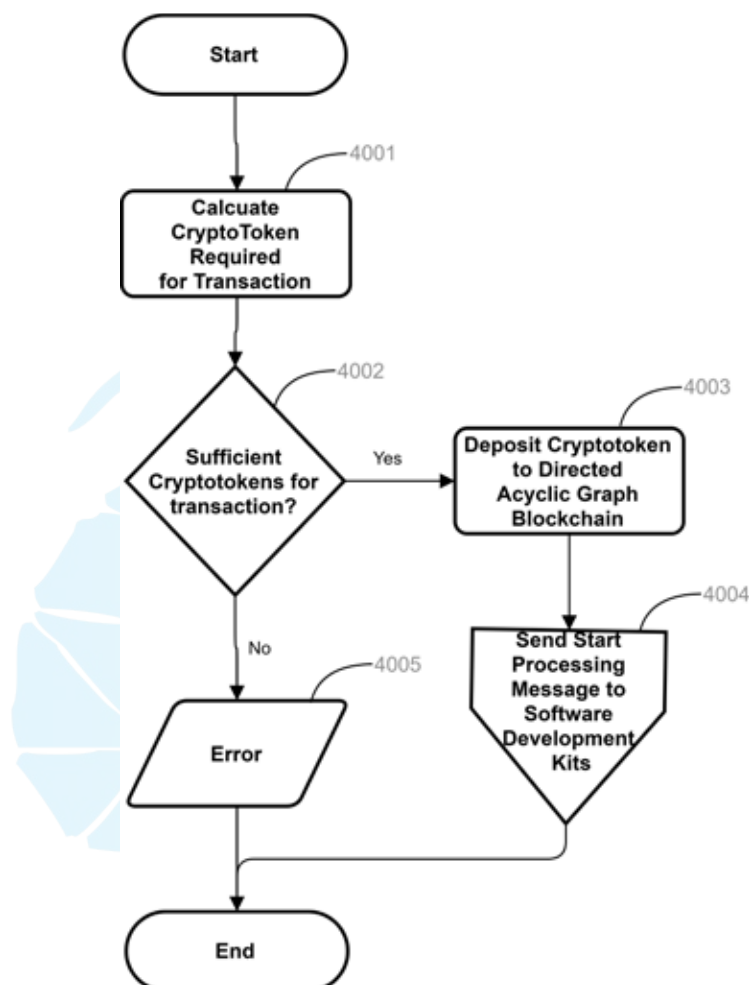


FIG. 4 is a flow diagram of the internal workings of the processing request inside the Decentralized App (DApp). The DApp calculates the amount of Cryptotokens required for this transaction 4001.

The calculation uses the amount of processing power needed and the size of the data to process in determining the amount if there is enough Cryptotoken on deposit to execute this transaction 4002 if there are sufficient Cryptotokens available, the Cryptotokens deposited into the Directed Acyclic Graph Blockchain 4003. The Dapp then sends the processing request to the Software Development Kit API 4004. If there are not enough Cryptotokens, the application aborts and returns an error message. 4005

## 6.7. The use of Cryptotokens for in-app or in-game purchases

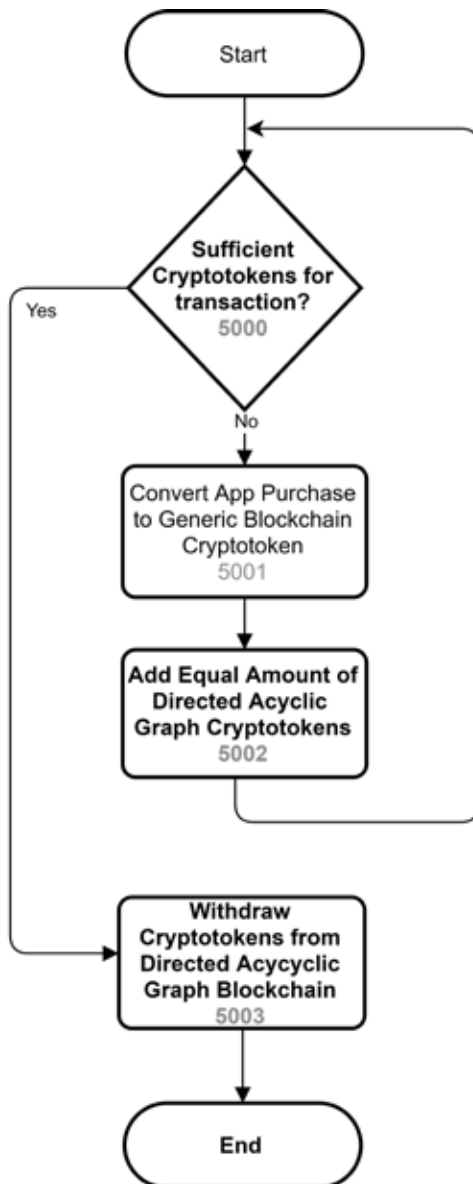
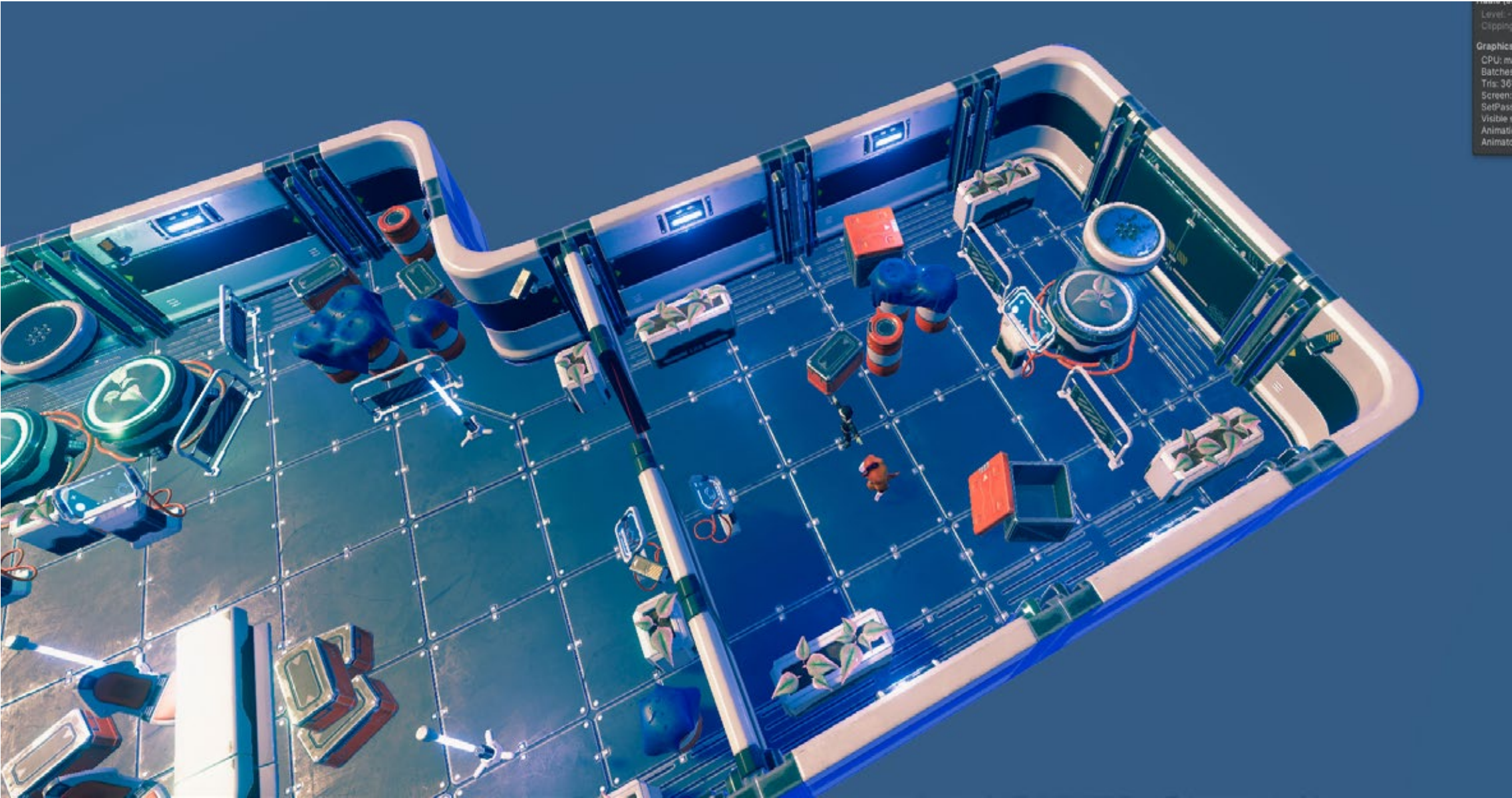


FIG. 5 is a flow diagram of how an Application or Game (App/Game) might use the Cryptotokens for in-app or in-game purchases. The App/Game first checks the wallet of the user or play to see if there are sufficient Cryptotokens for the transaction 5000. If there are enough Cryptotokens, a withdrawal from the Wallet is made 5003. If there are not enough Cryptotokens the user can add Cryptotokens by making an in-app or in-game purchase that will deposit a certain percentage into the Generic Blockchain 5001 and then add equal amounts to the Directed Acyclic Cryptotokens 5002 via a Cryptotoken wallet and then rechecking the amount of Cryptotokens.



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## 6.9. Data Flow

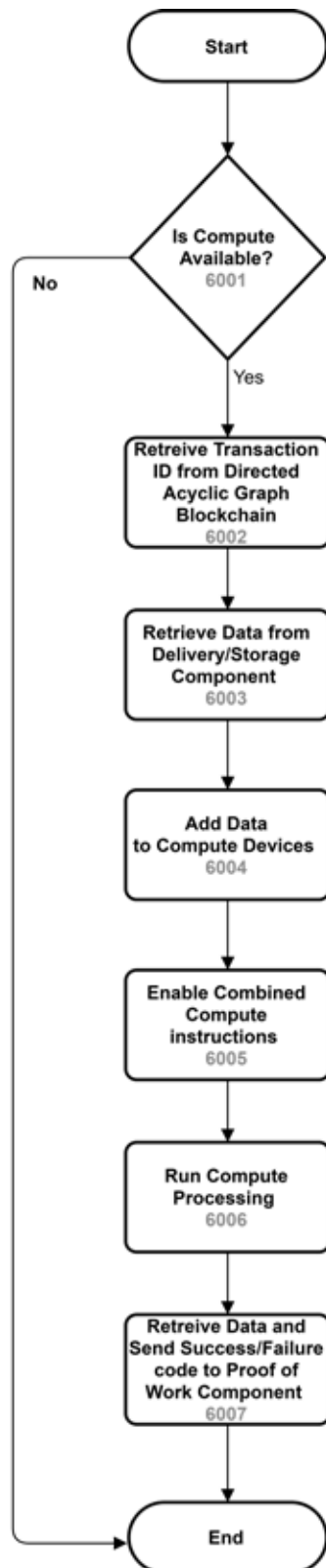


FIG. 6 is a flow diagram of the processing of data flow. The first check is to make sure the devices have compute devices available for processing of data. If not, the flow ends immediately. If it does the process retrieves the transaction ID from the Directed Acyclic Graph Blockchain system 6002. The process then retrieves the data from the Delivery/Storage Component 6003. The process then adds the data to the Compute Devices for processing 6004.

## 6.10. Verification – Data Processing (Proof-of-Work)

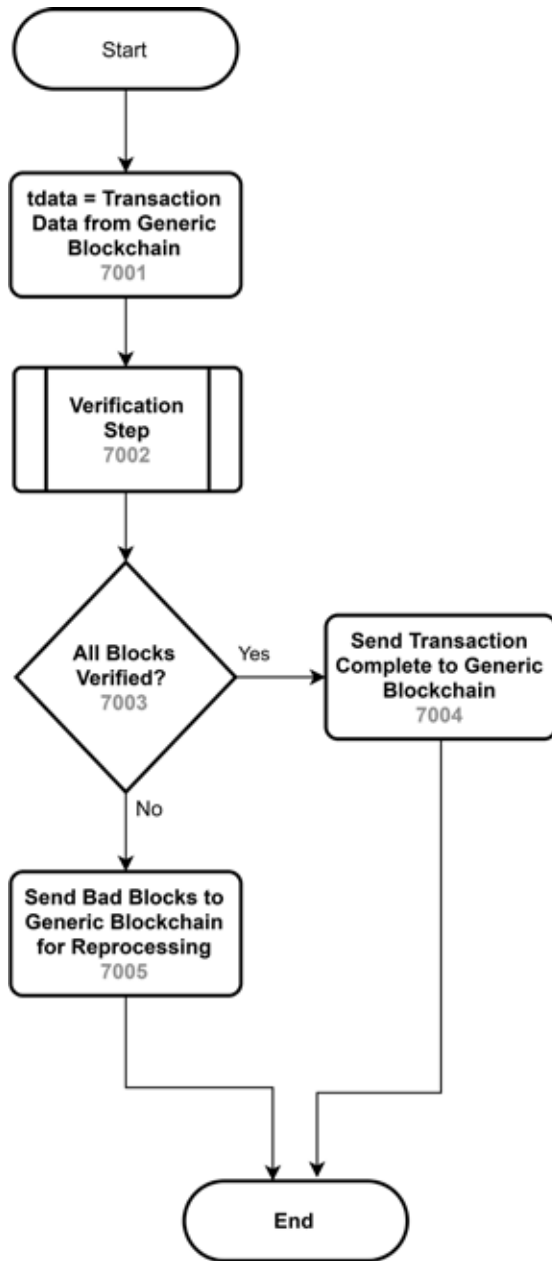


FIG 7 is a flow diagram of the verification step to ascertain the processing of all data. This is also known as “Real Proof of Work.” The process first grabs the Transaction data from the Generic Blockchain 7001 as tdata. It then sends tdata to the Verification Step 7002. If the Verification step returns that all blocks are verified 7003, it then sends a message to the Generic Blockchain that the transaction has completed successfully 7004. If all blocks have not been verified, the process then sends the bad blocks back to the Generic Blockchain for reprocessing 7005.

## 6.11. Verification – Blocks of a transaction

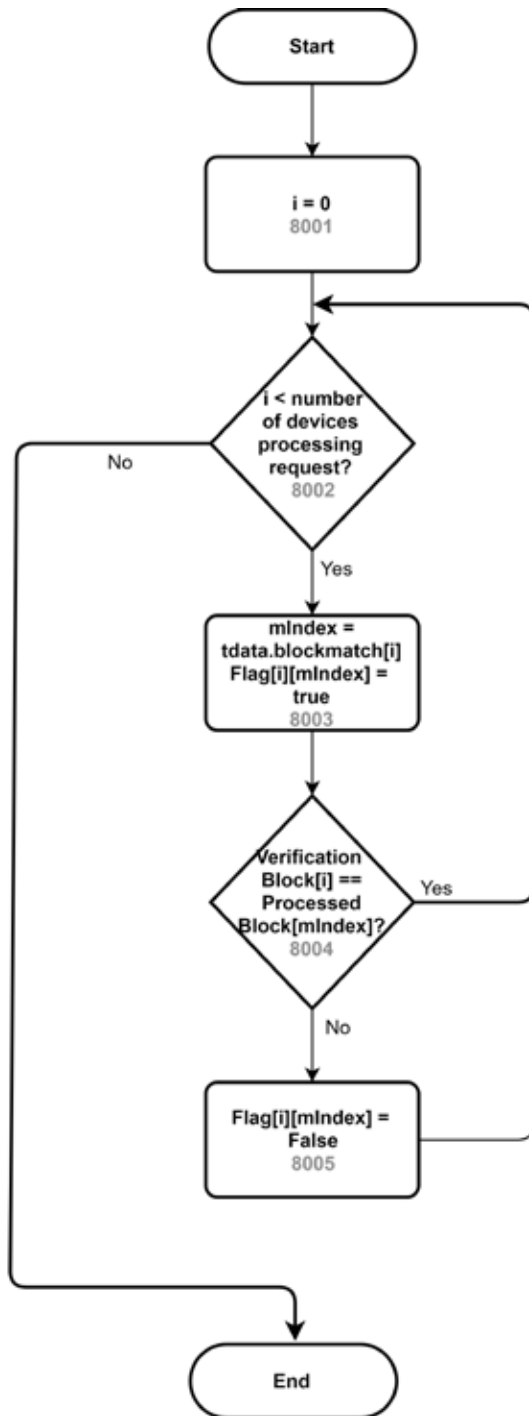


FIG 8 is a flow diagram of the verification step that verifies all blocks of a transaction request to process data. For each of the number of processing requests, a random block is checked from the verification device. A verification device is a random End User Device that receives a block from each of the other End User Devices and runs the processing of those blocks for verification. A counter 'i' is set to 0 as the first block index to check 8001. A check made for counter 'i' is less than the number of devices involved in the processing request. If yes, 'i' is used to index into a table of indexes that correspond to the random block that was chosen to verify of a device's processed data and that device is set to verified 8003. The checksum of the verification block is checked against the random block 8004. If the verification block checksum is equal to the system loops to check the next device that processed data. If the verification fails, a table index is marked as false for the failed device 8005. The process continues to verify all the devices random verification blocks. If all the devices have been checked, the return value is an array of device verification pass or failure flags.

## 7. ICO/LaunchPad/CEX

### ICO:

We started to use an Initial Coin Offering in 2021. Still, due to the COVID-19 pandemic and subsequent Ukrainian/Russian war, we pulled the ICO to focus on making a better product that could serve more vertical markets.

### LaunchPad:

This is a non-regulatory means of raising funds for a new company of cryptographic value. Start-up companies use the Launch Pads to bypass a rigorous and regulated capital increase process required by venture capitalists or banks.

### Centralized Exchanges (CEX):

Following the success of the Launchpad, GNUS.ai Tokens will start the listing process on traditional Centralized Exchanges (CEX).

## 8. The Team



### Kenneth Hurley

CEO

Kenneth has been in engineering management for more than 25 years. He has earned expertise in leading strategy for technology platforms, partnerships and external relationships. He has built and managed great technology teams and ensures high technical standards throughout the organization.

### Brent Arias

CTO

Brent is a software engineering leader, full-stack product developer, cloud architect, and hands-on technologies expert. He drives transformation & improvement across organizational and technical boundaries, over a breadth of industries: financial services, healthcare, IT security, retail, and telecom.



### Henrique Klein

SENIOR SOFTWARE ENGINEER/DIRECTOR OF SOFTWARE

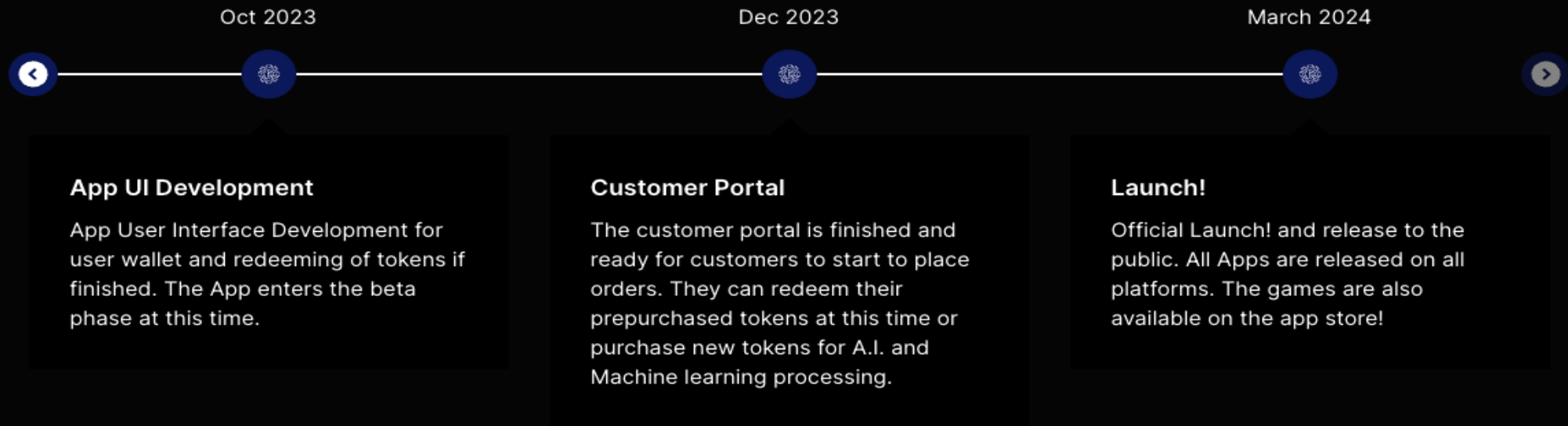
Henrique is a phenomenal C++ architect and software engineer and is our acting Director of Software. He has worked in many industries. His background in C++ and embedded systems brings a great degree of





# The Timeline

With help from our teams, contributors and investors these are the milestones we are looking forward to achieving.



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