Whitepaper

Bryllite Platform

Beyond the Game Boundaries

Bryllite Ltd.
labs@bryllite.com
www.bryllite.com

Contents

Introduction

Long-lasting Dispute: Property of Game Assets

Online game services, which has been around since the mid-90s, has become a hugely successful global game market. We have been paying attention to a long-standing single dispute. The question is whether ownership of game assets, including game items, should ultimately be vested in the developer (including all developers such as: distributors, service companies, and single developers). **"Game Assets"** include all tangible/intangible contents which a gamer may possess, such as accounts, personal information, ID/nicknames, equipment, items, character levels/abilities, cyber cash and membership services.

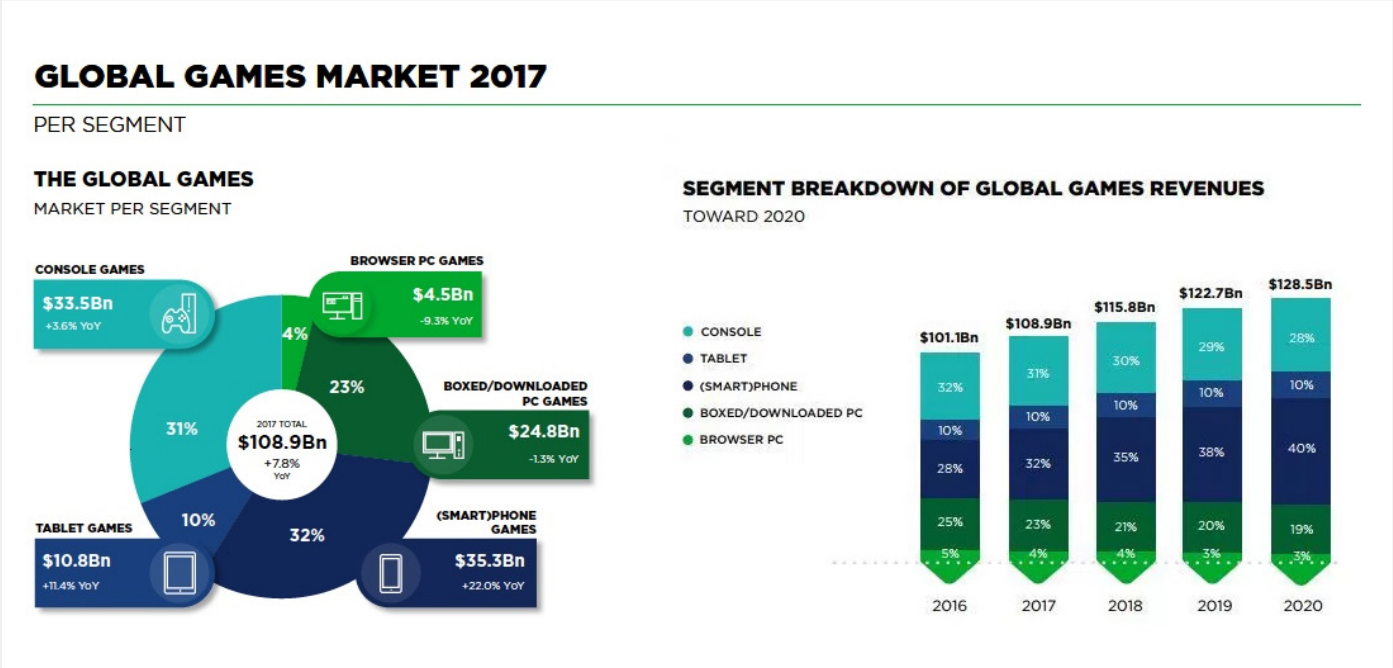
Many gamers are investing enormous amounts of time, effort and money to increase the value of their accounts/characters. And the developers maintain and develop the company based on profits from such dedication of gamers. In this regard, it should be understood that not only the contract has been established for the paid items purchased by gamers in cash, but also for the **"implied game asset sales contract"** between developers and gamers for all the game assets acquired through their time and efforts as mentioned above.

However, gamers are unable to receive any compensation for the costs (time + effort + money) they have invested when they quit the game. Even when data is lost due to the fault of developers or the game service is unilaterally terminated, it is difficult for gamers to receive reasonable compensation. This is because the ownership of the game assets is ultimately vested in the developer as per the unilateral and unfair terms and conditions proposed by the developer.

Based on the establishment of "implicit game asset sales contract", we insist that all game assets including items purchased in cash should ultimately be vested in gamers. In this regard, we would like to propose the **"Bryllite Platform"**, which aims to build a **"Hyper Connected Game Society"** ecosystem through the block-chain technology to safeguard gamers' assets and allow them to move or trade these assets across game boundaries.

Size of the Global Game Asset Market

Domestic cash market for transaction of game items has already grown to KRW 1 trillion a decade ago[1]. The overall size of the game market has risen steadily and now exceeds KRW 11 trillion[2]. According to the 2017 report by game market researcher NewZoo[3], the market size of the global game market is expected to reach $130 billion by 2020, far exceeding $100 billion, and further reach $150 billion by 2023.



[Diagram 1] Size of 2017 Global Game Market and Prospects to 2020, ©Newzoo | Global Games Market Report Light

We would like to return game assets far exceeding $100 billion worldwide to gamers. Of course, it will not be an easy challenge, and we acknowledge that it is not a task deemed feasible to be realized in a short period of time.

However, since this is a value that must be realized eventually and someone has to conduct once and for all, we are now initiating to take on this challenge through the Bryllite Platform.

Our View of the Block Chain Technology

In October 2008, Nakamoto Satoshi (an anonymous person or group) unveiled a P2P e-money system based on block chain in a thesis titled [Bitcoin: A Peer-to-Peer Electronic Cash System] [4]. Bitcoin (BTC) was proposed as a notion to reach a “cashless society” [5] which will surely be realized in the near future. It is evaluated that the system is approaching a cashless society with the distributed ledger system which solves problems such as “Double

Spending" [6] and is 'almost' impossible to be forged or falsified.

However, despite such advancements, Bitcoin is still exposed to numerous problems. Although some problems of slow transmission speed, insufficient processing capacity, and expensive commissions can be solved through complementary technologies, there still exists some serious problems which deter consistent advancements of Bitcoin networks, such as difficulty in reaching a consensus between centralized mining nodes and development camps, both of which move along with profits.

A more essential problem may be in a philosophy close to anarchism that denies the state's ability to issue a currency for the sake of deregulation and decentralization. It is not a question of right and wrong, but a question of whether it can realistically survive while denying the social maintenance function of the nation's economy and monetary policy. The defense logic for **"51% attack"** [7] is a defense logic on the premise of a malicious node, but there can be as many cases for bigger gains when the network is attacked by injecting more than 50% of the hash power. For instance, if a competitive crypto-currency like Bitcoin Cash wants to break down Bitcoin to take up the key currency position in the crypto-currency market, or if FRB, EU, individual countries or a federation of those countries maintain the value and the right of issue their own note, it may be more beneficial to disrupt the block-chained network of Bitcoin by injecting more than 50% of the hash power. Even without this cumbersome method incurring costs of operation, an attacker who is an individual country or a federation of these countries can easily break down the block-chain network via legal regulations or administrative measurements.

Of course, Satoshi Nakamoto may have considered neither the "full replacement of the legal currency" nor "a globally single currency" when designing the Bitcoin system at first. But in reality, it is now facing severe regulations seemingly generated by the adverse effects of a frenzy of speculation as well as a sense of crisis spread within various government agencies. Not only Bitcoin, but all alternative coins calling for deregulation and decentralization to replace legal currencies are concurrently facing this crisis.

Therefore, we would like to focus on the blockchain technology per se by excluding the value orientation of a so called "cashless society" in Bitcoin. Essentially, the Blockchain technology is a **"distributed DB of the supercomputing powers"** which consist of numerous computers scattered around the world.

In order to optimize the advantages of this system, the electronic coin system, Bitcoin, was initially proposed, and then numerous altcoins designated to complement the problems or extend the functions of Bitcoin have been proposed and are now under development. Significant attempts such as the Golem (GNT) project have consistently been made to exploit the idle resources from your PCs for such tasks which require **"supercomputing power"** including graphics processing (CG) works, artificial intelligence, and so forth.

We have found a great possibility of connecting completely isolated games via the **“distributed DB system”** of the blockchain technology and would like to create the blockchain based distributed DB platform on which each game can be shared and compatible.

Our Recognition of Problems

We have previously stated that the ownership of game assets should be reserved for gamers. However, as for many games operating their services in most countries, developers own the ultimate ownership of game assets based on the terms and conditions. Therefore, even for the cases of gamers quitting the game or the game service unilaterally terminated, it is hard for those gamers to expect a reasonable compensation for the cost they paid.

Sales of game assets such as gamers’ accounts or equipment/items, etc. to other gamers through cash transactions are tacitly accepted. But most of them are deemed as violations of the terms and conditions. Due to the ambiguity of the law enforcement, online gamer assets and cash transactions are always vulnerable to fraud, and even if it can be protected by the law, accidents caused by such transactions can occur at any time. It is extremely dangerous (1) **to transfer gamers’ assets through** (2) **cash transactions which do not happen concurrently** to a transaction where the other party is not a trusted source and is not guaranteed. These types of incidents occur frequently.

In order to solve these kinds of problems, an item trading agency has emerged as a reliable third party that guarantees not only the credit of its trading partner but the payment of the game assets and cash transactions [8]. Although the safety of the asset transaction has improved, the high commissions to be paid to the agency have become a burden to gamers.

To solve this problem, we are devising a system that can store and move game assets within the blockchain. This system does not aim to develop the blockchain technology per se. We will continue to focus on applying the technological advancements of blockchain that the blockchain pioneers have shown so far, on the game industry in order to fulfill our target.

We have reviewed various platforms to take advantage of the many blockchain technologies that have been released to date and have identified the following issues.

Implementations of tokens, DApp, etc. based on the Ethereum (ETH) platform may only depend on the Ethereum system and limit the extension of the functionality. In addition, with the high fees on every transaction and that

all gamers around the world must have an account with remaining balance, there exists such serious problems in terms of usability and accessibility.

The Proof-of-Work method, represented by Bitcoin, is not in accordance with our philosophy and goal due to excessive energy waste and slow speed in confirming a transaction.

The Proof-of-Stake method, represented by DASH, EOS, and etc., which generates the entry barriers to the following participants and deepen the concentration of wealth, is not in accordance with our ideals providing fair participation opportunities to all developers and gamers.

Based on the awareness of above mentioned problems, we have devised the BCP (Bryllite Consensus Protocol) in accordance with our philosophy and goal, and we will be achieving our targets through this protocol.

Our Goal and Future Games

Our goal is not as grandiose as “advancement of the blockchain technology.” The ultimate goal is to break the boundaries between isolated games and develop an integrated ecosystem for trustworthy global game assets.

Through this ecosystem, we will securely store gamers’ assets and build secure asset trading systems without any agency or fees. In addition, our system will provide the function to move or trade gamers’ assets across game boundaries. This process will return the game assets vested in the developers to gamers who should actually be the owners of those assets.

Almost all gamers have no doubt that VR-based games will become commonplace in the near future. The AR (Augmented Reality) based “PokemonGo” was a phenomenal success and gave birth to numerous remakes [9]. Moreover, it can be easily predicted that games based on MR (Merged Reality) absorbing the merits of VR and AR will become universalized in the near future.

However, we are not trying to predict the future of the games in terms of hardware forms. Apart from the advancements in the hardware technology, we are dreaming of the new future game world in which people can move characters and equipment used in “World of Warcraft” to “Granado Espada” and transfer my “Audition” character to the new VR game just released today.

Introduction of the Bryllite Platform

The Bryllite Platform is a platform that provides functions which enable gamers to securely store and move their assets and allow asset transactions in order to facilitate reliable transactions without an agency involvement. It is also a platform designed to move the assets having been stored in the internal DB of the game service among various games by storing those assets in the database outside the game service, i.e. the blockchain.

The expansion of these capabilities can be made possible through the **Bryllite Master Node** and the **Bryllite Bridge Service**, which combine legacy game systems and the Bryllite blockchain at a game contents level. Developers of the legacy game systems can easily integrate the game contents levels with the abstracted API provided by the Bryllite Bridge service.

On the Bryllite Platform, Bryllite Coin (BRC) is used as a medium currency to measure the value of gamer assets, and anyone playing games in linkage with Bryllite Platform can acquire BRC fairly and easily.

Features

Decentralized

By building the global gamer asset ecosystem independent of game service providers (developers, distributors, service companies, etc.), the gamers' assets can be protected safely.

Reliable Game Asset Deal

People can trade game assets safely even without any trustworthy agencies.

No Transaction Fee

The platform does not require transaction fees in the process of transferring and trading BRCs. In general, transactions that occur based on a blockchain system require a certain amount of fees for each transaction such as defense fees against DDOS attacks or for the purpose of operating nodes. However, Bryllite Platform facilitates transactions or transfers without any additional charge.

Fast Transaction

The movement and transaction speed of game assets is faster than any other blockchain. Transactions within the same game are immediately completed, and transactions between different games are confirmed via only one confirmation.

Asset Transfer over Games

It is possible to move and trade assets between different games. Gamers can transfer all of their assets including BRCs into other games or trade with other gamers.

Smart Contract

The platform supports smart contract function, and each developer can use this function to support a variety of contract types among gamers. For example, gamers can implement an item auction or trading system across different games and utilize the smart contract function to deal with a variety of contracts atypical to ordinary game contents, such as a disputable mercenary system between gamers. Developers can create completely new game contents by generating smart contract code without any modification on the ongoing game systems.

Easy to Use

Bryllite Platform does not force gamers to learn more about transferring/trading BRCs and game assets. Gamers can simply acknowledge that the BRC is credited to the game screen while playing the game, transfer the BRC in the same way as transferring the game money to their colleagues, and transfer gamers' assets in the same way as trading items with other players. The above mentioned easy-to-use method will play a significant role in improving the accessibility and usability for many gamers.

Device Free

Any type of networkable games, such as PC Game, Mobile Game, Web Game, and Console Game, can participate in the Bryllite Platform, and any gamer can participate in the Bryllite Platform regardless of what types of device they possess.

Open Source

Our source code will be made available via GitHub, etc. so that the progress of the development can be speculated at a glance. In addition, we will provide easy-to-understand and friendly interface guidance documents so that anyone can easily link its game to the Bryllite Platform, and will also focus on feedback through the community.

BRC Specification

Gamers can acquire Brilliant Coin (BRC) simply by playing a game linked to the Bryllite Platform. The acquired BRC can be used for purchasing paid items provided by the game service and can be used for asset transactions with other gamers. Gamers can also transfer money to other game accounts or personal wallets.

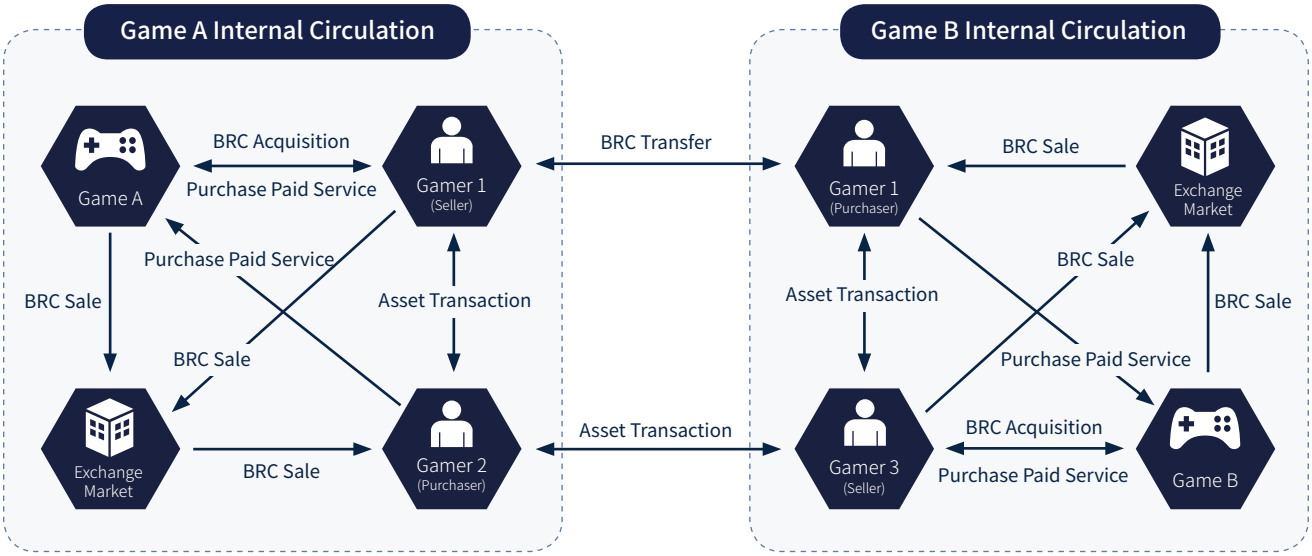
Bryllite Coin (BRC) Specifications		
Symbol	BRC	
Block Time	30 sec Fixed	
Block Reward	100 BRC	
Half-life	10% reduction per about 1,000,000 blocks. 100 BRC -> 90 BRC -> 80 BRC -> … -> 20 BRC -> 10 BRC (fixed thereafter)	
Event Block	10,000 BRC paid to gamers per day who have succeeded in creating blocks	
Number of BRC to be Issued	1 yr.	{ 100 BRC * (60/30sec) * 60m * 24hr * 365d } + (365d * 10,000 BRC) = 108,770,000 BRC
	2 yr.	{ 90 BRC * (60/30sec) * 60m * 24hr * 365d } + (365d * 10,000 BRC) = 98,258,000 BRC
	3 yr.	{ 80 BRC * (60/30sec) * 60m * 24hr * 365d } + (365d * 10,000 BRC) = 87,746,000 BRC
	(omitted)	
	9 yrs.	{ 20 BRC * (60/30sec) * 60m * 24hr * 365d } + (365d * 10,000 BRC) = 24,674,000 BRC
	10 yrs.	{ 10 BRC * (60/30sec) * 60m * 24hr * 365d } + (365d * 10,000 BRC) = 14,162,000 BRC
	11 yrs.	{ 10 BRC * (60/30sec) * 60m * 24hr * 365d } + (365d * 10,000 BRC) = 14,162,000 BRC
Remarks	- Approximately 600 million BRCs will be mined and issued over 10 years, and 14 million BRCs will continuously be issued annually thereafter - During the mining process, 2% DevFee for consortium operation fee and 0~2% of mining fees will be imposed according to the developer policy	

[Table 1] BRC Specifications

Like the Fiat Currency that the modern state issues for economic policies, the monetary policy of crypto currency, which does not have a separate issuing institution due to the decentralization, is also such a significant factor, and we are seriously aware of this importance. The supply of excessive or insufficient currency due to poorly established monetary policy at the beginning may cause problems such as a decline in the real value of currency or lack of liquidity. The reorganization of such monetary policy, in consideration of the nature of the cryptocurrency, will not be easy because it is anticipated that the consensus among the participants is difficult to be achieved.

We can limit the amount of currency issued each year by fixing the block time of the BRC, and control the amount of the issued currency at a certain level by applying the half-life of block compensation. The total issue volume is based on the demand for the global game asset market, which is estimated to about $ 150 billion by 2023.

BRC Circulation Structure



[Diagram 2] BRC Circulation Structure

The circulation of BRC can be expressed in the form as shown in [Diagram 2], and it indicates the possibility of circulation between different games.

Acquisition of BRC

Gamers can acquire BRCs simply by playing a game linked to the Bryllite Platform. In this process, according to the developer's policy, more rewards can be offered to gamers who show higher game contribution/achievement than just ordinary participants, or rewards can be restrained to those who are not active gamers. In addition, the developer can obtain BRCs from 0~2% as the name of the mining fee in accordance with its own policy.

BRC's Usage and Medium of Asset Value Storage

The acquired BRC can be used to purchase paid contents provided by the game service, and the BRC ownership gained from the transaction belongs to the developer. The developer can earn revenues by selling the acquired BRCs through exchanges and etc. BRC has the same value as cash in the game, so it will be deemed a great medi-

um to safely store the gamer assets.

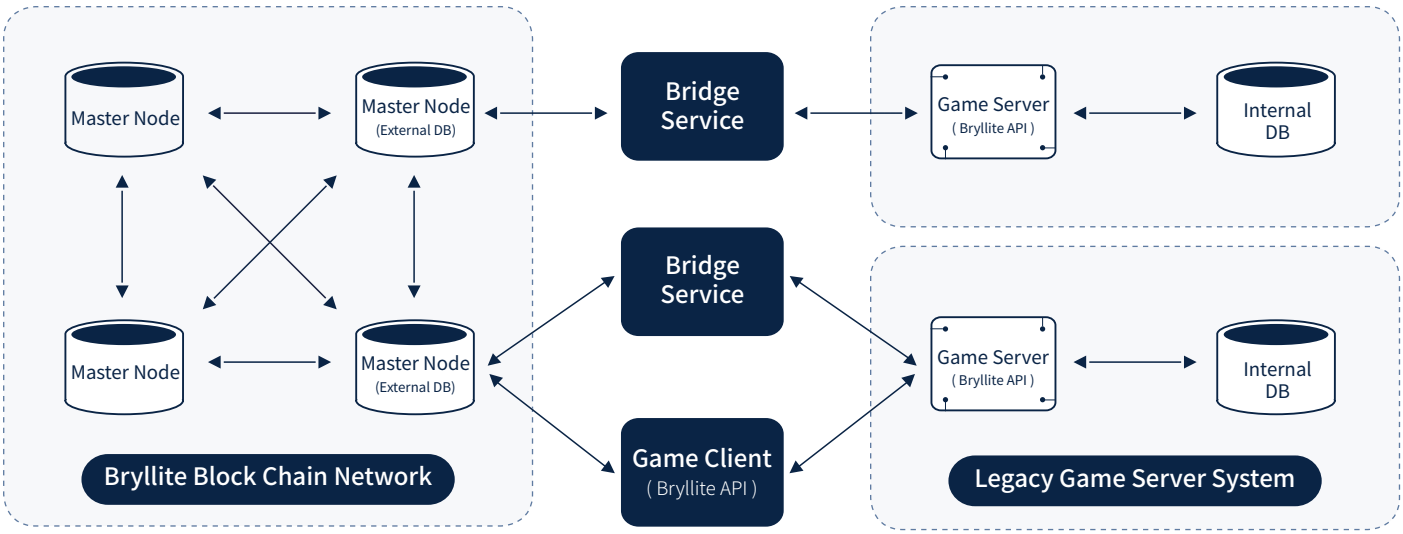
BRC's Asset Value Transfer Function and Transaction Medium

BRC can be used as an intermediary in the exchange of assets between gamers. With the trading system (transaction window, etc.) provided by the game system, it is possible to trade credible and instant assets without intermediaries or fees involved. In addition, you can transfer your BRC quickly and securely to wherever you want such as your accounts in other games, your friends' accounts, your personal wallet, or exchange. Through this process, a huge ecosystem for digital game assets is created for all the games participating in the Bryllite Platform.

Purchase and Sales of BRC

Anyone can acquire BRC while playing games, but many modern types of gamers who regard time as assets are willing to invest their money instead of their time to enjoy games, and other gamers may possibly sell their BRCs to earn profits. These gamers' demands can be fulfilled via the BRC Exchange. We will be opening a reliable and stable cryptocurrency exchange ourselves, in addition to listing BRC in other existing cryptocurrency exchanges such as Binance, Bittrex, Poloniex, etc., and the exchange service is being progressed through a different company independent of the Bryllite Project.

Platform Structure



[Diagram 3] Bryllite Platform Structure

Bryllite Platform can be basically structured as shown in [Diagram 3]. Bryllite blockchain network composed of

Bryllite master nodes is linked with the legacy game server system through the Bryllite bridge service.

The Bryllite master node delegates the proof of gamers' participation, mines (block generation) and keeps BRCs in proportion to number of concurrent users, and functions as an external DB for the legacy game system.

The Bryllite Bridge Service is responsible for the connection between the legacy game system and Bryllite block-chain network, enabling two-way communications. This indicates that not only does the legacy game system generate transactions on the blockchain, but the bridge service also detects the transactions that occurred in the heterogeneous games to facilitate instant notification of event-driven to the game server.

Cyprus Network: Federated Local Blockchain

Many blockchain networks, such as Bitcoin and Ethereum, are suffering from chronic scaling issues, and are adopting various off-chain processing methods such as shading techniques, lightning networks, Rayden networks, and plasma [10]. The essence of this off-chain technology is summarized in the form of streamlining transactions which process many transactions outside the block-chain via state channels and reflect only the results of these transactions in the main chain. Bryllite Platform can solve scaling issues with applying a Cyprus network designed and inspired by these off-chain models.

Transactions on the Bryllite Platform can be classified into two types: In-Game Transaction (Internal Game Transaction) occurring in the same game and Ex-Game Transaction (External Game Transaction) occurring between different games.

In-Game Transaction, which is the transaction of assets through the direct transaction with the opponent facing the nature of the game, must be concluded immediately and the movement of assets must occur concurrently. In-Game Transaction is handled immediately by the off-chain Cyprus network, and the Cypriot network is made up of combination of a few games predetermined by the Bryllite Consortium. For instance, if 1,000 games are participating in the platform, approximately 200 Cyprus networks consisting of four or five games if necessary can be developed.

By handling In-Game Transactions, which is expected to account for a large portion of total asset transactions, using the Cyprus network, scaling issues of the blockchain network can be solved, and can further facilitate immediate transactions as requested by the nature of game genres.

Ex-Game Transaction is a transaction for the main purpose of moving and trading assets between different games, which requires neither immediate conclusions nor transfers of assets, and is recorded directly in the main chain without passing through the Cyprus network. This transaction is confirmed through 1 confirmation which is relatively quickly processes the transactions, albeit not immediate in effect.

Synchronized Transaction

The trading of assets on Bryllite Platform is designed to force simultaneity and thus enable reliable transactions without intermediaries being involved in the transactions. Gamer's assets trading, including legacy items, enables the atomic swap of assets through the trading system provided by each game. A transaction is established only when both trading partners approve those transactions via the transaction screen provided within the game, and the transaction of assets is transferred as soon as the transaction is concluded with In-Game transaction.

If gamers wish to sign transactions between BRC and a legacy item, (1) they should request a transfer of BRC from the game server to the bridge service. (2) After confirming the successful response to the request, they should move the legacy item to the counterparty's inventory. (3) If a failure of response or a successful response in certain period of time is not acknowledged upon a request, the transaction will be regarded as a failure and the transaction screen of both users will display an error message along with the transaction failure.

Benefit to Gamers

BRC Acquisition of Gamers

Gamers can acquire BRCs simply by playing the game without any complicated processes. BRC can be used for the paid service provided by the game service and can be used for trading game assets with other gamers. You can also earn money by selling BRCs to the exchange markets, etc.

Capability to Move and Trade Assets between Different Games

With BRC, gamers can transfer and trade assets between different games, indicating that they can keep their assets safe even if the game is stopped or the game service is terminated. With the auction system provided by the Bryllite platform, gamers can avoid the hassle of having to seek transaction opponents and negotiate prices.

Liberation from Game Subordination

Gamers usually play one or two types of games at a time. Due to the limited time and resources available, it is not easy to play multiple games at the same time. If you stop playing the game, you lose all the time and resources you have put into it, so you need to be cautious of choosing the game to play, and it is difficult for those gamers to quit a game. We call it the gamer's "Game Subordination Phenomenon." The Bryllite Platform will liberate game-dependent gamers from certain game by returning game assets to gamers and developing circumstances that facilitate their migrations to other games.

Maximization of Revenue through Event Block Compensation

The Bryllite Platform assigns a block corresponding to every first day as an event block and pays 10,000 BRCs to gamers who are successful in finding that block. For gamers, it is just like being entered into a daily lottery for just playing the game. If the gamer wins, he/she will get numerous rewards and benefits.

Benefit to Developers

Improvement of Marketing Effect and Activation of Games

Since BRC can be acquired through game play, it is possible to attract a large number of new gamers and to activate dormant accounts, which will lead directly to increase sales for the developers. This will drastically improve the marketing effect. In addition, regularly generated event blocks will generate new peak times, which will maximize marketing efficiency for developers.

Sales Increase Due to Market Volume Increase

The developer can collect a certain amount of mining rewards at the expense of gamers' game play as fees (0~2%) and acquire BRC by using the Bryllite Platform service fees such as community service or auction service. Also, the developer can offer paid services to gamers from the game service and re-claim BRCs having been paid to gamers. Acquired BRCs can be sold through exchanges which will be linked to the sales. As gamers can easily move their assets from one game to another, the entry barrier to purchase paid services will significantly be lowered, which will lead to an increase in the pie of the entire game asset market, in order to bring positive effects into realizing additional profits for the developer.

Support for Interlocking Development Cost

Beginning with a developer whose participation is determined at the early stage, developers are able to receive funding from the Bryllite ICO as support for interlocking development cost linked to the Bryllite Platform. It can

be supported in the form of nominal currency, BTC, ETH, BRC, and etc., reduce the burden on developers relevant to participation in the platform, and greatly help secure early development funding. It may also support the server hosting costs for such developers like a single founder.

Concentration on Development of Game Contents

If all game assets are developed through the Bryllite Platform, people can be liberated from numerous management tasks such as membership management, account management, and item management, so that they can focus more on development of game contents.

Alleviation of Entry Barriers for New Games

High market entry barriers which new games confront due to the gamers' game-dependency can be alleviated by participation in the Bryllite Platform. Since it provides an opportunity for gamers participating in the platform to easily interact with new games, it significantly lowers the marketing cost of the new games and provides opportunities for games with high game quality to easily be established in the market.

Management of Developer's Reputation

By participating in the global game asset ecosystem at which the Bryllite Platform aims, a developer may construct its image as the next-generation game developer who can transfer game assets to gamers and freely move between games, and this could act as a key to build trust with gamers around the world, which will lead to the great success of the game title.

Multiple Actual Users of Coins Available

One of the many differences which the Bryllite Platform shows compared to other common crypto-currencies or game-related crypto-currencies is that it can retain an overwhelming number of BRC users. Although many cryptocurrencies have secured cryptocurrency users through ICO, the number of users participating in ICO is limited, and even with the exception of exchange transactions to obtain compensations out of investments, the number of real users can be deemed extremely small or none at all.

Bryllite Platform has already signed MOUs with global gaming companies, whose sum of subscribers equal 1 billion and will be the only platform which enables all gamers participating in games to be secured as the actual users of BRC.

Consortium BlockChain

The Bryllite Platform is a consortium blockchain consisting of global game service providers (developers/distributors/service companies, etc.). A consortium blockchain is a public blockchain in which anyone can participate in a network, such as Bitcoin or Ethereum, but in a manner shows different characteristics from private blockchains used for specific purposes in closed organizations. It can be defined as a form in which a number of authorized organizations form a consortium to participate in the network like Ripple (XRP).

And we have witnessed consortium blockchains such as Ripple being blamed or attacked by fervent blockchain believers, the main rationale behind the blame and the attack being that “it is not a true blockchain technique”, “it is a blockchain technology that is not sustainable due to difficulty in securing many users” or “it cannot prevent the arbitrary actions of centralized organizations.”

Again, our goal is neither to “improve the blockchain technology per se” nor “the emergence of a global single currency.” We have the ultimate goal of breaking down the boundaries of each isolated game and creating a global single game asset ecosystem. If we, in the pursuit of the public blockchain, would have to authorize the participation of nodes irrelevant to the game which could be malicious, how would that help us to achieve our goals?

The Bryllite Platform is able to reach one billion actual users and possibly secure more real users in the future. In other words, with a conceptual exaggeration to the word “public” on a current basis, it may be said that it is a true public blockchain which has more actual users than any other public blockchain.

Developers can participate in the Bryllite Platform, regardless of its size or development history, from large developers and distributors to individual developers. Bryllite Consortium exists for the purpose of operating and maintaining the platform, and it is not an organization which makes platform policy decisions such as permission to participate in the platform. Policy decisions related to the platform are determined by ONE GAMER ONE VOTE of those participating gamers, and Bryllite Consortium has an obligation to comply with these voluntary voting results of gamers.

BCP: Bryllite Consensus Protocol

The consensus protocol between nodes, which is most important in the blockchain technology with compensation, is fundamentally a process for agreeing on who shall have the right to create blocks – i.e. who shall receive block compensation.

Proof-of-Work method is a method where the node which has won in the **computing power competition** gets the right to create blocks. However, this method has been creating big side effects in the society for leading into excessive energy consumption competition, and has encountered a difficult problem where execution of transactions cannot be confirmed immediately due to partial occurrence in quarters.

Proof-of-Stake method is a method where the node which has won in the **stake holding competition** gets the right to create blocks. Such stake holding competition acts as an entry barrier for late participants, and may intensify the concentration of wealth which may eventually end up in a problem where all cryptocurrency users are lost.

We believe that excessive competition will lead to side effects of any kind, and therefore, the only solution would be to completely eliminate, or minimize, the element which intensifies competition in the consensus process between nodes. If possible, it would be best to reach a consensus by selecting the winner by a rock-paper-scissors game, which does not include any competition intensifying element.

The Bryllite Consensus Protocol is designed so that it excludes any elements which intensify competition, and thus a consensus between nodes may be reached by a fairly simple method, through proof of participation.

Consensus Protocol Achievement Goal

ONE GAMER ONE VOTE

The consensus must be reached so that all participating gamers get fair rights, regardless of the system resources quota or his/her stake holding ratio, etc. The block creation rights may be achieved in proportion to the number of concurrent connectors.

Temporary Partial Forks Not-Allowed

Temporary partial forks are not allowed, and immediate confirmation of transactions shall be allowed with just 1 confirmation.

Device Free

Participation shall be allowed for all devices, such as PC Game, Mobile Game, Tablet Game, Web Game, Console Game, etc. This is only possible if unnecessary calculations are eliminated through the consensus process.

No Transaction Fee

No fees shall occur in the process of BRC transfer and transactions. This is possible by creating a situation where no profits are generated even when intentionally omitting transactions in the node's block creation stage, and where it is profitable to include as many transactions as possible. Also, adequate restrictions and penalty shall be imposed on users who create unnecessary and excessive transactions for malicious purposes.

Consensus may be reached even where an Obstacle has occurred on a Node

Even in such circumstances where obstacles, such as system down, network disconnection, etc. have occurred or where malfunctioning has occurred on some nodes, consensus should be reached in all participating nodes as one same block.

Creation of Irreversible Blocks

Blocks which have been created by the consensus of the majority of the blockchain networks shall be irreversible and the contents of the blocks shall not be editable in any event.

Proof of Participation

The participation in the game shall be proved, and through such proof, defense against Sybil Attacks are possible. Consensus shall enable participants to receive rights to create blocks in proportion to the number of participating gamers.

Proof of Participation

What we are trying to actualize through proof of participation, this is to enable as many participating gamers to mine BRC fairly without causing effect to the performance of the device while the gamer is playing the game. This can be implemented by granting block creating rights in proportion to the number of gamers who have participated in the node.

	No. of Concurrent User	Percentage of Block Creation	Block Compensation	Gamer's Expected Value of Acquiring BRC per Block
Game A	50,000	50%	100 BRC	(100 BRC * 50%) / 50,000 people = 0.001 BRC
Game B	30,000	30%	100 BRC	(100 BRC * 30%) / 30,000 people = 0.001 BRC
Game C	20,000	20%	100 BRC	(100 BRC * 20%) / 20,000 people = 0.001 BRC

[Table 2] Gamer's Expected Value of Acquiring BRC per Block

For example, assume that there are 3 games which have 50,000, 30,000, and 20,000 concurrent users each. In such a case, we can presume that each game may receive block creation compensation in a percentage of 50%, 30%, 20% each. One may think that it is more advantageous in percentage to participate in Game A (which has 50,000 concurrent users), but as can be seen in [Table 2], the participating gamer's expected value of acquiring BRC per block is the same for each game, which is 0.001 BRC. We believe that the above method of distribution is the most reasonable and fair method for the gamers.

Proof of participation can be expressed by the process of the gamer digitally signing on the block header which the gamer has received through the game server. Therefore, participation in the game can be proved without any influence to the game play, and at the same time provide an opportunity to fairly acquire BRC to all gamers who have participated.

Bryllite Block Header and Process of Proof of Participation

The below [Table 3] abstractly shows the block header used for Bitcoin. The mining node constitutes merkle tree by arranging transactions which are to be included in this block, and hashes the block header with SHA256 function until the result value which satisfies the target level of difficulty (BITS) is found by increasing the 4 Bite NONCE value from 0 to 43 hundred million.

The 4 bite NONCE value is exorbitantly short compared to the current device performances or the target level

of difficulty. Therefore, the arithmetic operation of hashing the block header is infinitely repeated until a result value which satisfies the target level of difficulty is found, after changing the merkle tree hash value by changing the TIME STAMP value or the order of transaction lists [11].

+ BLOCK HEADER		
VERSION		
PREVIOUS BLOCK HEADER HASH		
TRANSACTION MERKLE ROOT HASH		
TIME	NONCE(4B)	BITS
+ TRANSACTIONS		

[Table 3] Structure of Bitcoin Block Header

However, we would like to point out that such consumptive arithmetic operations are not in any way helpful for us in achieving our goal, and that it may also incur a tremendous encumbrance in the game play of gamers.

+ BLOCK HEADER	
VERSION	
PREVIOUS BLOCK HEADER HASH	
TRANSACTION MERKLE ROOT HASH	
TIME STAMP	TX CNT
GAMER SIGNATURE	
+ TRANSACTIONS	

[Table 4] Structure of Bryllite Block Header

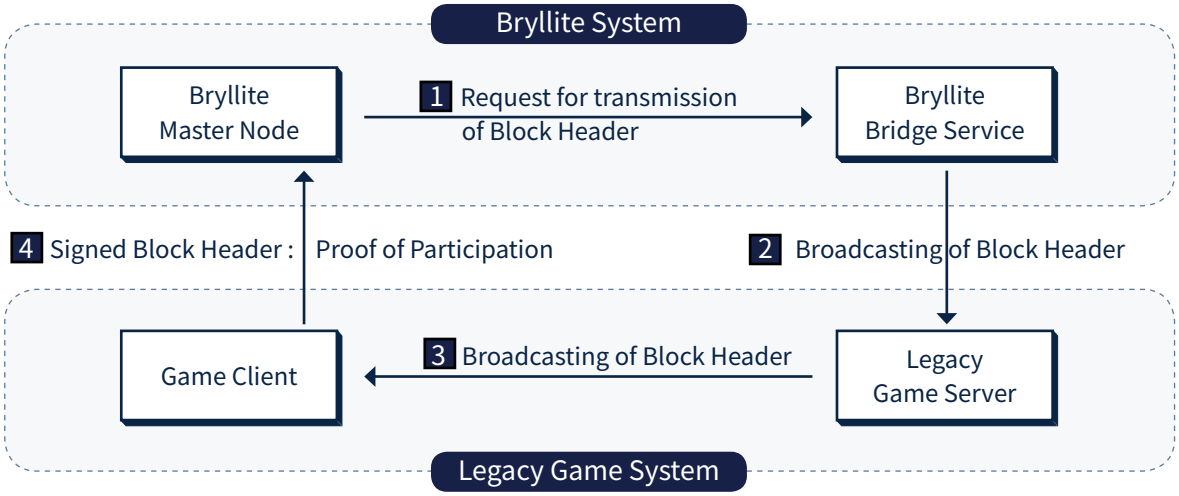
[Table 4] Abstract shows the block header used in Bryllite platforms. Compared to the Bitcoin block header, the NONCE and BITS items have been excluded from the Bryllite block header, whereas the TX CNT (number of transactions) and GAMER SIGNATURE items have been added. The GAMER SIGNATURE item includes the gamer's public key (the gamer's account) as well as his/her signature.

The Bryllite master node constitutes merkle tree by arranging transactions which are to be included in this block, and transmits same to the legacy game system through the bridge service by completing a block header which

excludes the gamer signature.

The legacy game system broadcasts the block header to all game clients who are connected onto the game, and the game client may prove his/her participation by transmitting the block header which has been completed by signing his/her secret key to the Bryllite master node.

The below [Diagram 4] shows the above procedure in the order of sequence.



[Diagram 4] Process of Proving Participation by using the Gamer's Signature

The master node chooses one block, among the signed block headers which it has received from its many gamers, which has the smallest hash result value, and prepares for it to be used in the consensus process with other nodes. If blocks which have the same hash result value of block headers exist, the master node shall choose one block by calculating the Gamer's public key value.

Now, we are all ready to participate in the rock-paper-scissors game with the node of a different game.

Practical Byzantine Fault Tolerance and Bryllite Consensus Protocol

The Byzantine Fault Tolerance algorithm is an algorithm to solve the traditional Byzantine general problem [12].

"Byzantine refers to the Byzantine Generals' Problem, an agreement problem, (described by Leslie Lamport, Robert Shostak and Marshall Pease in their 1982 paper, "The Byzantine Generals Problem"),[1] in which a group of generals, each commanding a portion of the Byzantine army, encircle a city. These generals wish to formulate a

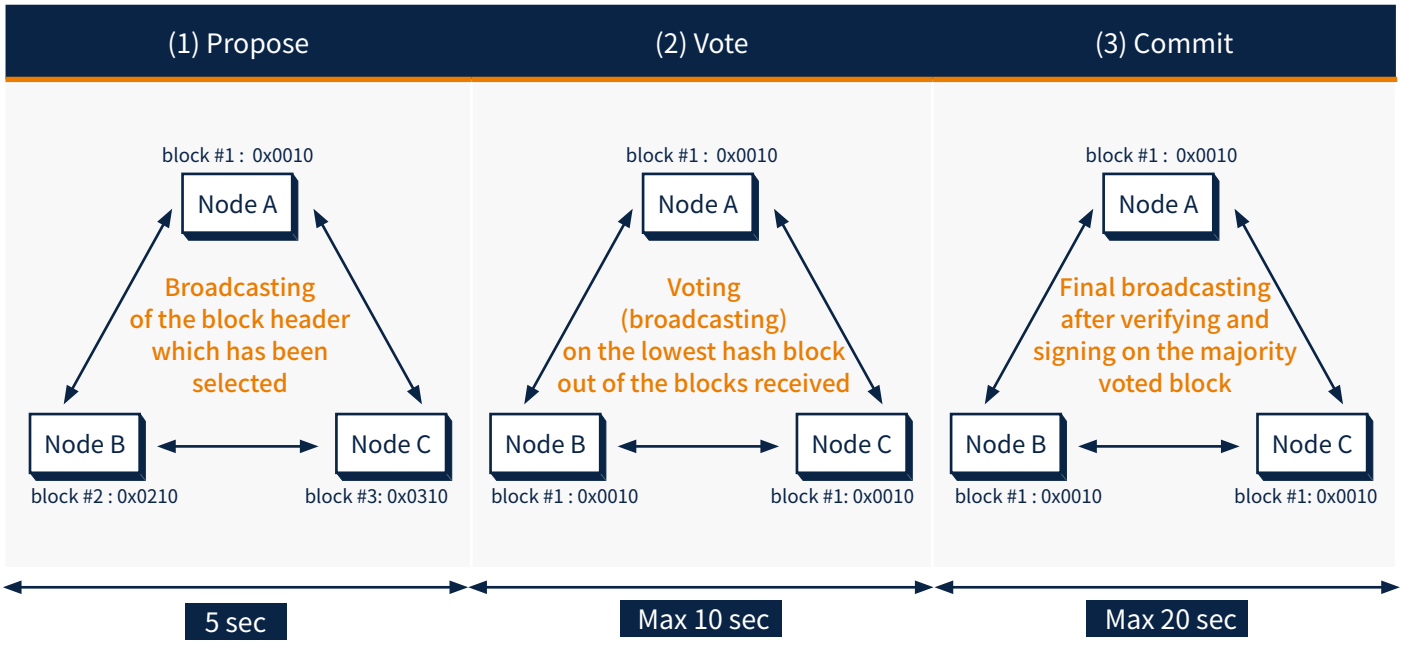
plan for attacking the city. In its simplest form, the generals must only decide whether to attack or retreat. Some generals may prefer to attack, while others prefer to retreat. The important thing is that every general agrees on a common decision, for a halfhearted attack by a few generals would become a rout and be worse than a coordinated attack or a coordinated retreat."

- https://en.wikipedia.org/wiki/Byzantine_fault_tolerance

The proof of work method and proof of stake method are both proving methods to solve the Byzantine general problem which act fairly well according to each individual goal, but as these methods do not accord with the philosophy and goal of Bryllite, we wish to solve the Byzantine general problem through the Bryllite Consensus Protocol, which is based on the "Practical Byzantine Fault Tolerance" model. The Practical Byzantine Fault Tolerance model which we wish to adopt is an algorithm designed by Miguel Castro and Barbara Liskov of MIT Computer [13].

The basic concept of the Bryllite Consensus Protocol is to ensure that, just like the Practical Byzantine Fault Tolerance model, even if a participating node is a malfunctioning node like the Byzantine node through 3 broadcasts, if normal nodes which exceed the majority of the nodes are active, then final consensus may be reached to one and the same ordinary/normal block.

Now, we will proceed the rock-paper-scissors game using the block which has been selected through proof of participation.



[Diagram 5] Working Mechanism of the Bryllite Consensus Protocol

[Diagram 5] shows the Bryllite Consensus Protocol which is composed of 3 steps: (1) Propose, (2) Vote, and (3) Commit. Each step has a certain standby time, and any packet which is transmitted passed the standby time becomes null and void. During the consensus procedure, only block headers inside or outside of around 100 bites are transmitted in order to attempt for consensus, and during the Commit step, the information of the final block including the transaction details are shared. All participating nodes get to verify the block after they have received the information on the final block. If verification fails at this step, the block consensus of this time will become null and void, and penalty will be imposed on the node which had suggested the relevant block.

(1) Propose Step

At the Propose Step, each node will suggest the block candidate which it has selected through the proof of participation of the gamers. At the (1) Propose step of [Diagram 5], Node A, B, and C each select block headers having a hash result value of 0x0010, 0x0210, 0x0310 each as candidates, and spread them to all participating nodes. Each node will then select another block which has the smallest block header hash result value, at the time the standby time ends.

If certain blocks have the same block header hash result value, then one block which has (1) a larger TX CNT value, (2) a faster TIME STAMP value, or (3) which is specially calculated through the Gamer's public key will be selected. At the time the Propose Step ends, most nodes will have selected the same block candidate.

(2) Vote Step

The Vote Step is a procedure where the block which has been re-selected through the Propose Step confirmed by the majority vote. In the (2) Vote Step of [Diagram 5], we can see that each node has selected the block which has the smallest hash result value of block #1: 0x0010.

In the Vote Step, each node will spread to all participating nodes in the block with the smallest hash result value in its possession, and the block which has received consent of over 1/2 of all participating nodes will be selected. During this process, the node which had proposed the relevant block can transfer the whole block data, including the block's transaction details, to the nodes which had voted for its block.

If no block receives the consent of over 1/2 of all participating nodes, then that round will become null and void, and a new round will begin.

(3) Commit Step

The Commit Step is a process where the block which will be connected to the blockchain is finally determined, through the verification of the block which has been selected through the Vote Step. Through the Vote Step, the node which proposed the relevant block and the nodes which voted for the relevant block receive information on all blocks including their transaction details. In the Commit Step, the nodes which carry the data of all blocks spread the block data to the nodes which don't have such information, and all nodes verify the flawlessness of the relevant block.

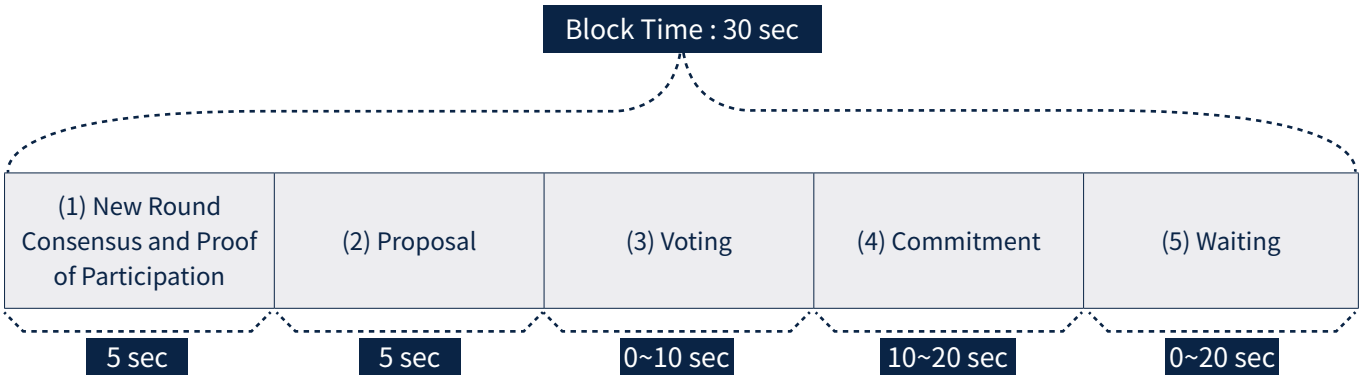
Once the flawlessness of the block is confirmed, the block header which includes the signature of the verifying node is spread to all participating nodes. During this procedure, blocks which have been verified by the approval of over 1/2 of the participating nodes get registered on to the blockchain, and from this point of time, the transaction details can be determined.

If the flawlessness verification of the relevant block fails, the block consensus becomes null and void, and a penalty is imposed on the node which proposed the relevant block, by restricting its participation for a certain period of time, etc.

The Bryllite Consensus Protocol goes through 3 steps of proposal, voting and commitment, and once over 1/2 nodes operate normally, all participating nodes may always retain the same blocks by consensus, which contents shall be irreversible and non-forgeable.

Overall Flow of the Bryllite Consensus Protocol

The Bryllite Consensus Protocol is largely composed of 2 procedures of proof of participation and consensus procedure, and again, the consensus procedure is composed of 3 steps, of propose step, vote step and commit step. The below [Diagram 6] shows the overall procedure from the starting stage of new block generation to its completion, together with the time required.



[Diagram 6] Overall Flow of the Bryllite Consensus Protocol

In the proof of participation stage, the process of agreement between master nodes of the fact that new blocks will be generated is included. If generation of previous blocks have been completed or if an agreement on previous blocks has failed and has thus become null and void, the nodes will broadcast the start of new blocks, and the generation of new blocks (New Round) will commence from the point over 1/2 block commencement message have been received, and thereafter, completed block header information are collected from gamers through proof of participation. This process contains a total of 5 seconds of obligatory standby time, including the time used for agreeing on the New Round. Gamer's block header information which is received passed this time limit will be discarded, and the relevant gamer will be excluded from participation of the block generation of that time.

In the proposal step, the node will, among the block headers which has been collected from gamers, select a block header which has the smallest hash value, and broadcast same to all participating nodes. This process also contains a total of 5 seconds of obligatory standby time, and any block header information which is received passed this time limit will be discarded.

In the voting step, voting will be made on the block header with the smallest hash value, among block headers

which were proposed during the proposal step, and the relevant block header will be broadcasted on the network. The voting will close at the point where a certain block header has received over 1/2 votes, and the process will then move on to the commitment step. This process contains a maximum of 10 seconds of standby time, and if no block receives over 1/2 votes during the 10 seconds, the relevant round shall be considered as having failed in consensus, and blocks will be re-generated.

The commitment step is the step for verifying the block which has been selected through the voting step, and depending on the time used for the voting step, a maximum of 20 seconds of time limit will be granted. For example, if 1 second was used in the voting step, 19 seconds will be granted in the commitment step, and if 10 seconds were used in the voting step, 10 seconds will be granted. If a verification completion message exceeding the majority votes is not received within such time limit, the relevant round shall be considered as having failed in consensus, and blocks will be re-generated.

Even if consensus on generation of blocks is successfully reached within the time limit in the commitment step, the next round will not start right away, and waiting time will have to pass until the 30 second block time before starting the next round. For example, if 1 second is used in the voting step and 5 seconds are used in the commitment step, 14 seconds will have to pass until the final block time of 30 seconds before starting the next consensus round. Through such procedure, the block time will always be fixed to 30 seconds.

Well-Known Block Chain Issue

51% Attack & Double Spending Issue

51% attack refers to attacks where nodes which have more than 50% of hash power and shares in a network may cause double spending, breaking down trust in the blockchain and thus destroying the network in the end. Proof of Work and Proof of Stake methods are based on the weak faith that more than 50% of power will not be used to destroy the network, but due to several external factors aforementioned, the possibility of such occurrence cannot be excluded from its root.

Through the Bryllite Consensus Protocol, we can intrinsically exclude the problem of double spending by making an agreement to generate irreversible blocks which do not allow temporary part forks. This would mean that the blockchain network can be trusted even if a certain game secures more than 50% of the gamers.

Sybil Attack

Bitcoin started with a concept of 'ONE CPU ONE VOTE', but its goal has now become hard to be achieved due to the generalization of ASIC devices. Bryllite wishes to accomplish our own philosophy of 'ONE GAMER ONE VOTE' through the Bryllite Platform.

In the Bryllite platform, block compensation are provided in higher probability to games which have secured a large number of concurrently connected gamers. Gamers might be highly tempted to obtain abnormal block generation compensation by abusing the system, such as by way of creating large numbers of fake accounts.

These kinds of multiple account attacks can be solved by proof of participation during the game. Furthermore, improvement and supplementation of the proof of participation method can enable continuous actions against various forms of Sybil attacks that might occur in the future due to the characteristics of games. This is an advantage of consortium blockchains, and in case it is determined to be necessary for the maintenance of the platform, problems may also be solved by the policy engagement of the consortium.

We will strive to cooperate with developers that are confirmed to have good will, in order to be free from these kinds of attacks to the best extent possible.

DDoS Attack

As trading and transfer of BRC do not require transaction fees, we need to get prepared for attacks that may cause a large amount of transactions that paralyze the Bryllite network. The Bryllite platform will reasonably limit the number of transactions which is to be included in one block with regard to each gamer's account. In case malicious transactions which exceed the limitation are detected, the relevant account will be excluded from the network and BRC will be confiscated.

Nothing at Stake Issue

Malicious actions such as attacks using multiple accounts or DDoS attacks can be detected on the Bryllite platform, and the subjects who commit such actions will be excluded from the network and BRCs which he/she owns will be confiscated. In this regard, such malicious actions will be excluded by the roots.

Bryllite Platform Service : “Beyond the Game Boundaries”

As the Bryllite platform blurs the boundaries between games and establishes one external DB which every game can trust and share, more new services will be available beyond our expectations. In the course that the Bryllite platform matures, we will be able to continue to discuss and develop novel and wonderful ideas proposed by all the global gamers and developers.

Looking forward to such possibility, we would first like to suggest the following services:

Community Support over Game

Through the Bryllite platform, we can provide better community features that transcend the boundary of games. The community system of current games such as a guild or a clan only remains as lower contents subordinated in the game, but community support of the Bryllite platform enables integrated asset management systems which transcend boundaries between games, various messaging system including bulletin boards and postboxes and democratic voting system regardless of nationality. These kinds of community support enable management of clubs like e-sports teams that are independent from sponsors and operated by directors democratically elected. Private guilds regardless of kinds of games can be operated by offline friends and acquaintances without having to make profits.

Auction System

Through the Bryllite platform, we can also provide an auction feature that transcends boundaries between games. The platform can generate one giant auction market which all the games and gamers all over the world can share. Through this platform, gamers will be liberated from the tiresome effort of having to search for sellers and purchasers of game assets, and also from the burden of bargaining for reasonable prices.

The existence of one giant auction market where the item which has been registered by a gamer can be won by any gamer all over the world. This will resolve the problem of imbalance between values of game assets arising out of various environmental factors such as connected server groups.

As soon as a gamer wins an item which had been registered as an article for sale in a different game, he/she can immediately receive the item as his/her inventory.

Such auction system can also be provided as a third-party service connected with game services.

Value of Bryllite Coin

The First Cryptocurrency which has Secured Numerous Real Users

Traditionally, the comparative value of currency can be determined by its supply and demand. The point where demand (users and places to use) and the amount of issuance meets can be said to be the comparative value.

However, so far, the rosy hope that cryptocurrency is the hope of the future has only caused speculative rise in value in most cases, without having secured actual demand –i.e. users and places for use.

The Bryllite Platform has already entered into MOUs with global games that have 1,000,000,000 users. As the platform grows bigger, it will be able to continuously secure many gamers in the world as real users of BRC. BRC can secure many gamers in the world and thus secure the global game asset markets as its place to use the coin, it will become the feasible alternative for value-stable cryptocurrency.

Stability of Value

Value of BRC will at last be determined by the ratio of exchange between paid services offered by developers and BRCs, which means that the developers will be deciding the value of BRC. At this point of time where the Bryllite Platform's main network is being launched, we will be setting the value as 1 BRC = 1 USD, and induce developers to determine the value. This will help maintain stability of value which is a basic function of cryptocurrency, and further restrain rapid changes in price.

Gradual Rise in Value through Service Competition

The price of BRC is stabilized by the places to use in-game contents. In the Bryllite ecosystem in which many

developers take part, competition among the participant developers wanting to increase profits by selling BRC will necessarily occur. As numerous games which have different BRC values set start to compete with one another, BRC will be gradually absorbed into the games which set a higher value of BRC due to the market logic of demand and supply, eventually causing the value to rise. This will bring positive effects in terms of long term investment value.

Reduction of BRC Issuance through Half-Life

Approximately 600,000,000 Bryllite coins will be issued over 10 years through the Bryllite Platform, and thereafter, 14,000,000 coins will be regularly issued per year. As block compensation will be reduced by 10% annually, as time goes by, the value of BRC will be expected to rise due to the principle of scarcity.

BRC burn as Platform Service Fees

Bryllite Platform services such as community services and auction systems will be continuously expanded, and certain amount of fees may be imposed on gamers when using such services. Parts of the commissions charged as fees will be paid to the developers and the rest will be burned in order to restrain inflation of BRC coins.14,000,000 BRCs which will be issued regularly from the 10th year, or even more will be expected to be burned as platform fees. As this controls the total amount of circulation in the market, the value of BRC coins will remain stable.

Ability to use Offline Contents

Besides being used as payment for game digital content, we are also planning to provide private wallets (web wallets/mobile wallets) that can be used for various offline contents such as associated game character goods. At the same time, we will focus our marketing capacity on expanding places to use BRC coins. Increases in demand caused by the offline expansion will elevate the value of BRC.

BRC Crowd-Sales & Token Allocation

Summary of Token Sale

BRC, which is the core of which maintains and operates the Bryllite platform, can be mined via playing games as well as purchasing them through the ICO (Initial Coin Offering) presale. Tokens sold at the ICO are provided in the form of ERC20 tokens, and can be exchanged with BRCs at the ratio of 1:1 when the main net of the Bryllite platform launches at a later date.

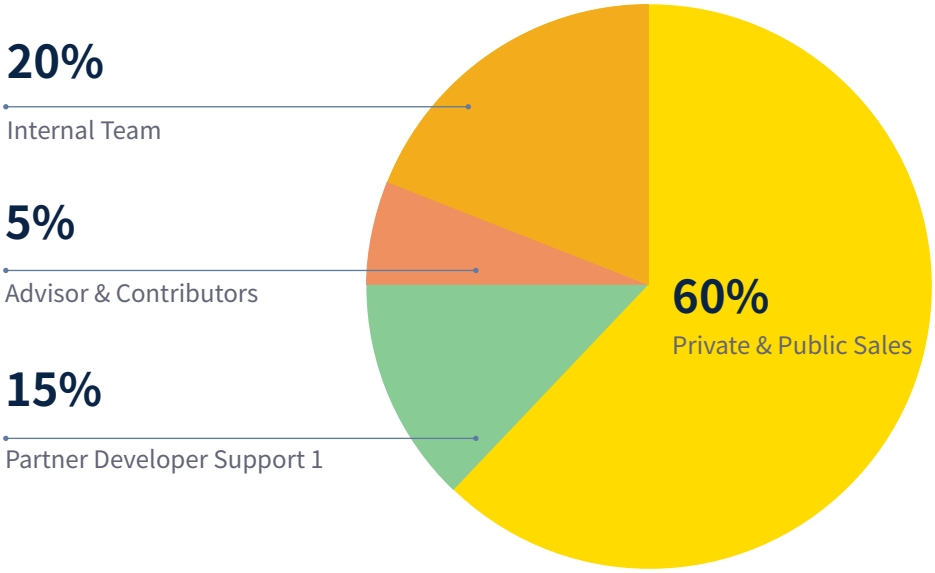
Number of Issuance	1,000,000,000
Hard Cap	USD 100,000,000
Soft Cap	USD 10,000,000 (In the case the soft cap is not reached, the investment amounts already collected will be all returned to the investors and the business will be terminated)
Means of participation	BTC, BCH, ETH, ETC, XRP, ADA, and PLC

[Table 5] Summary of Bryllite Token Sale

Token Allocation

A total of 1,000,000,000 Bryllite tokens will be issued, 600,000,000 tokens of which will be sold at the ICO presale.

15% of the tokens will be spent on costs relating to with partner developers, and 5% of them will be granted to advisory groups and contributors who have worked for the success of the Bryllite platform. In addition, 20% of the tokens are allocated to the core development team and internal development team, and as a part of such tokens are allocated for reserve and liquidity management purposes of BRC, they may later be burned for value stability if no reserve funds are spent and if BRC does not face liquidity risks.



[Diagram 7] Bryllite Token Allocation

Timeline and Details for Token Sales

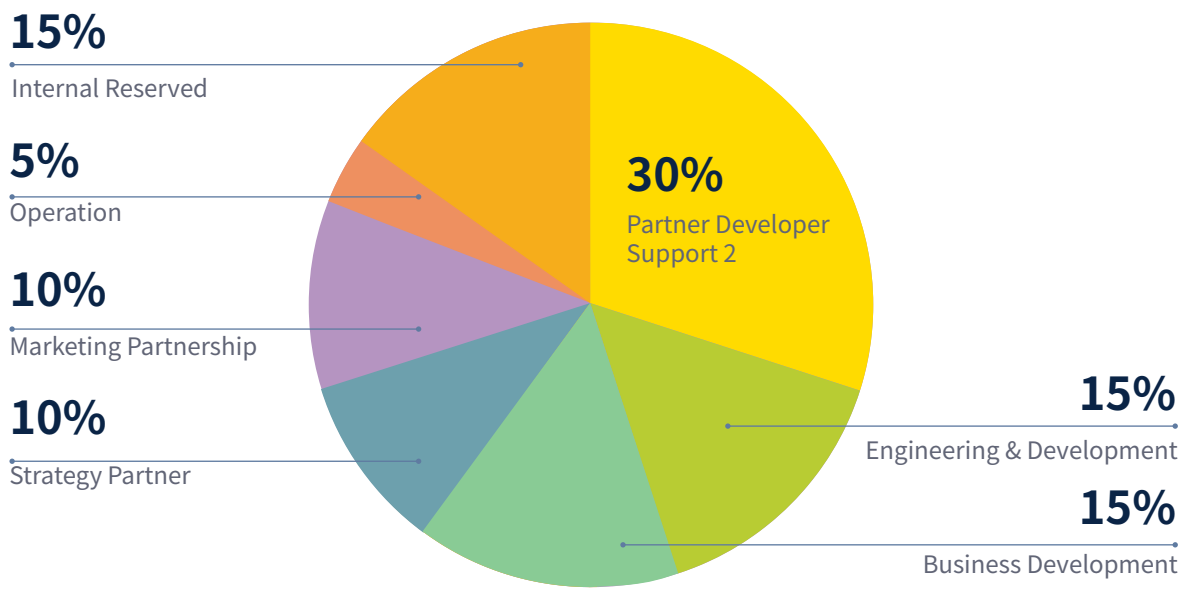
Bryllite token sales will be carried out in 3 ways – those being Private Presale, Public Presale and Public Sale, according to the timeline. In case that the target goal (hard cap) is met during the Presale stage, Public Sale may not take place.

Token Sales Details			
No. of Token Issuance	1,000,000,000 (Presale 600,000,000)		
Stage	Private Presale	Public Presale	Public Sale
Sales Period	April 16th – June 30th		July 9th – July 27th
Means of participation	BTC, BCH, ETH, ETC, XRP, ADA, and PLC	BTC, BCH, ETH, ETC, XRP, ADA, and PLC	ETH only
Participants	Strategic Partner	Accredited Investors such as Institutions	Individual Investors who have been KYC certified
Lock-up period	2 months	1 months	N/A
Minimum Participation	Over USD 50,000	Over USD 20,000	Over USD 1,000
Expected Price	USD 0.2		

[Table 6] Details for Token Sales

Plan for Use of Proceeds

Proceeds earned by the Bryllite token sales will be fundamentally used for the successful establishment of the Bryllite platform. They will be used for the development and operational costs for the Bryllite platform and various third-party services, and for supporting development costs for interlocking with partner developers, and parts of the proceeds will also be paid to advisory groups and those who have contributed to the successful development of the Bryllite platform. In addition, some proceeds may be used as marketing costs for the alliance with global game companies.



[Diagram 8] Plan for Use of Proceeds

Roadmap

2018

The Beginning of Bryllite

2018 Q3
- Bryllite Core Development (Bryllite Master Node / Observer Node, Excluded Light-weight Node)
- Bryllite token to be listed in exchange markets

2018 Q4
- Bryllite Bridge Service Development
- Bryllite Server/Client API Development
- Bryllite Platform Test-Net Launching

2019

The Dawn of Bryllite

2019 Q1
- Cyprus Network Implementation
- Bryllite Platform Main-Net Development
- Partner Developer Game Integration Reference

2019 Q2
- Bryllite Platform Main-Net Launching
- Bryllite token to be exchanged with BRC
- BRC to be listed in major exchange markets

The Sunrise of Bryllite

2019 Q3
- Legacy Game Asset Converting Development
- Bryllite Light-weight Node Development (Gamer Personal Wallet Support, PC/Mobile/Web)

2019 Q4
- Smart Contract Support

2020

The Brilliant Sunlight

2020 Q1
- Bryllite Platform Service Development: Auction System

2020 Q2
- Bryllite Platform Service Development: Community System

2020 Q3
- Extended Bryllite Platform Service Development

“The Third Impact”

“We have always been leading the game culture of the future, and will further lead ‘The 3rd Impact’ of the future game culture through the Bryllite platform.”

-Bryllite Ltd. CEO, Yura Kim

We envision to aim for the value of games rather than short-term profits, and wish to look at the future of game cultures rather than its present value. Hanbitsoft Inc. has been a hero of the PC room sensation which started in the late 90s, and on the basis of same, has introduced new game cultures to not just Korea but all over the world. Also, as the first chief company of the E-sports Association, it has devoted itself to the development of e-sports in Korea and abroad, and has prepared the founding stone for a new sports culture. T3 Entertainment Inc. provides game services to more than 700,000,000 cumulative users over the world and has been striving for the selection of e-sports as an official medal sport in the Asian Games.

We are now preparing for the giant “3rd Impact” of the game culture. Our new challenge is to lead to “Hyper Connected Game Society” by bringing down boundaries between isolated games and giving back game assets to the gamers who should have owned them. Through a new game culture named “Hyper Connected Game Society”, gamers will be liberated from games which they used to be subordinated to, and will be able to enjoy infinite liberty through easy inter-game transactions.

As a player and center of the global game industry for nearly 20 years, we know better than anyone else that achievement of such goals and realization of our ideal would be a very difficult challenge. We, however, are proud to say that we are more prepared and passionate for the engagement in development than anybody else as we understand how difficult the challenge will be. We have many experiences of having won over a lot of past challenges, and have been accredited for continuous creation of new game cultures. These victorious memories will act as a cornerstone for the success of the Bryllite platform, and our own know-how which has been accumulated for a long time will become great strength for our new challenges.

The Bryllite platform is a promise to all the gamers over the world, and also a small present to countless gamers who have shown their passion and dedication until we become what we are now. For this reason, we will not stop our challenges, prepare with our pleasant hearts and strive to protect the rights of gamers and value of game assets. In addition, we will continually verify technical and logical consistency of the Bryllite platform using various ways, and will not fear or neglect of being pointed out for problems.

We believe that the start of a change comes from embracing questions on many things which have been taken for granted from the past, and questioning why so. Until now, we have been raising questions about various problems that have been taken for granted, and now wish to take one step further to find their answers.

Paying tribute and gratitude to all the gamers in the world..

Fin.

References

[1] Korea Game Industry Development Institute, “In-depth investigation of cash transactions in online game items”, May 2006, http://www.kocca.kr/knowledge/research/__icsFiles/afieldfile/2010/05/02/69855.pdf

[2] Korea Creative Content Agency, “2017 Korea Game White Paper”, Dec 2017, http://www.kocca.kr/cop/bbs/view/B0000146/1834974.do

[3] (C)Newzoo, “Newzoo Global Games Market Report 2017”, Jun 2017, https://newzoo.com/insights/trend-reports/newzoo-global-games-market-report-2017-light-version/

[4] Satoshi Nakamoto, “Bitcoin: A Peer-to-Peer Electronic Cash System”, Oct 2008, https://bitcoin.org/bitcoin.pdf

[5] wikipedia, “Cashless society”, Feb 2018, https://en.wikipedia.org/wiki/Cashless_society

[6] wikipedia, “Double-spending”, Mar 2018, https://en.wikipedia.org/wiki/Double-spending

[7] bitcoin.org, “51% Attack, Majority Hash Rate Attack”, https://bitcoin.stackexchange.com/questions/658/what-can-an-attacker-with-51-of-hash-power-do

[8] Free enterprise market economy, college lecturer, Kim Jeon Yoo,Creating a $1.5 billion dollar underground market outside the world, ‘Itembay CEO, Kim Chi Hyun”, Mar 2016, http://lecture.cfe.org/info/bbsDetail.php?cid=13113&idx=42943

[9] Naver Games social media press release ‘무아유지향’, “Looking at Augmented Reality (AR) Game Market”, Jun 2017, http://m.post.naver.com/viewer/postView.nhn?volumeNo=8252598&memberNo=793124

[10] blockgeeks.com, “Blockchain Scalability: When, Where, How?”, https://blockgeeks.com/guides/blockchain-scalability/

[11] Bitcoin Developer Reference, “Block Headers”, https://bitcoin.org/en/developer-reference#block-headers

[12] wikipedia, “Byzantine Fault Tolerance”, Aug 2017, https://ko.wikipedia.org/wiki/비잔티움_장애_허용

[13] Miguel Castro & Barbara Liskov, MIT Laboratory for Computer Science, “Practical Byzantine Fault Tolerance”, Feb 1999, https://www.usenix.org/legacy/events/osdi99/full_papers/castro/castro_html/castro.html