

MINERAL TOKEN

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WHITEPAPER



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1 Executive summary

Creating a blockchain game that can go viral calls for driving down the technical barriers to entry while ramping up the quality. Gameplay, storyline, characters, graphics, and originality must all be excellent, coupled with configuration that enables anyone to play. However, blockchain games guarantee access and facilitate a thriving secondary market for trading in-game items. Moreover, they provide a means for these assets to effectively leave the confines of the game in which they originated, and to be represented in new virtual worlds, where items can be bought, sold, bartered, collateralized and borrowed against. Finally, because gaming DApps bypass traditional app distribution stores, they can be accessed virtually anywhere in the world, giving players the confidence to invest time in building up characters and crafting items, in the knowledge that they will always be able to retrieve and exchange them at a future date wherever they are.

Unfortunately, a series of issues have so far hindered this segment of the cryptosphere from reaching its full potential. This includes the various logistical, financial and technical barriers to entry associated with the blockchain, issues with scaling, and concerns over ownership and the security of in-game digital assets that have significant real-world value. Without a solution to these fundamental problems, blockchain gaming would likely be doomed to remain stuck in its present form, unable to progress.

Seeing this problem, a team comprising some of the most respected game developers in the industry came together to form Mineral Hub with the aim of enabling ordinary gamers to engage with and enjoy blockchain games. The team's solution is to develop a series of games that can generate and assign keys and wallets to players automatically, can be played without any cryptocurrency, have no initial transaction fees, are not limited by transaction speeds, and are of a quality that is equal to or exceeds that of commercial games.

To catalyze the blockchain gaming industry and allow it to bloom, Mineral Hub is launching an eponymous token that has an array of applications. A KCT built on the Klaytn blockchain, MNR will serve as the primary currency within the Mineral ecosystem. In time, adoption will grow as MNR comes to power a suite of immersive, and highly playable blockchain games. To kickstart this process, Five Stars, a new blockchain game from Mineral Hub, will serve as the proof-of-concept for MNR.

Five Stars is a turn-based RPG DApp game produced by Mineral Hub that will run on the Klaytn blockchain. Players can use the MNR to make purchases within the game's built-in marketplace. To further drive adoption of MNR, this flagship game will show the strengths of blockchain gaming, with superior graphics and gameplay complemented by a tokenized ecosystem and trading, spawning a thriving economy all built around MNR.

2 The DApp gaming market

2.1 Market overview

Blockchain and gaming have a long history born from shared synergies. Both industries tap into a demographic comprising a young and tech-savvy audience that is receptive to new ideas and innovation. It is no coincidence that many of cryptocurrency's staunchest adopters have been gamers. Nor is it coincidental that one of the first industries to be tokenized and to have its assets placed on-chain should prove to be gaming.

Blockchain games can be traced all the way back to Bitcoin's earliest days when sites like SatoshiDice provided a means to wager on-chain. This was one of the first use cases for bitcoin, and while the industry has long since transcended hi-low dice games, it remains deeply enmeshed with gaming in all its forms. From simple puzzles to elaborate fantasy titles, RPGs, and battle games, blockchain gaming has developed to assume many forms.

Placing data on-chain is computationally expensive, obliging developers to make economic compromises, constraining what could otherwise be achieved. Furthermore, while the interface that came with retro consoles was easy for even beginners to master, blockchain games are more complex, requiring a degree of technical sophistication. Players who can wield an Xbox or PS4 controller effortlessly have to start afresh with blockchain technology, which calls for learning the basics of private-public key pairs, mnemonic phrases, and adjusting to the latency of transactions being recorded on-chain.

Technical barriers serve as a deterrent to broader adoption of blockchain games, but they are not the only reason why no crypto-based games have yet to achieve critical mass: lack of quality has also been a contributing factor. To date, developers have devised an array of quirky and entertaining blockchain games, but the wait for a "killer" release goes on.

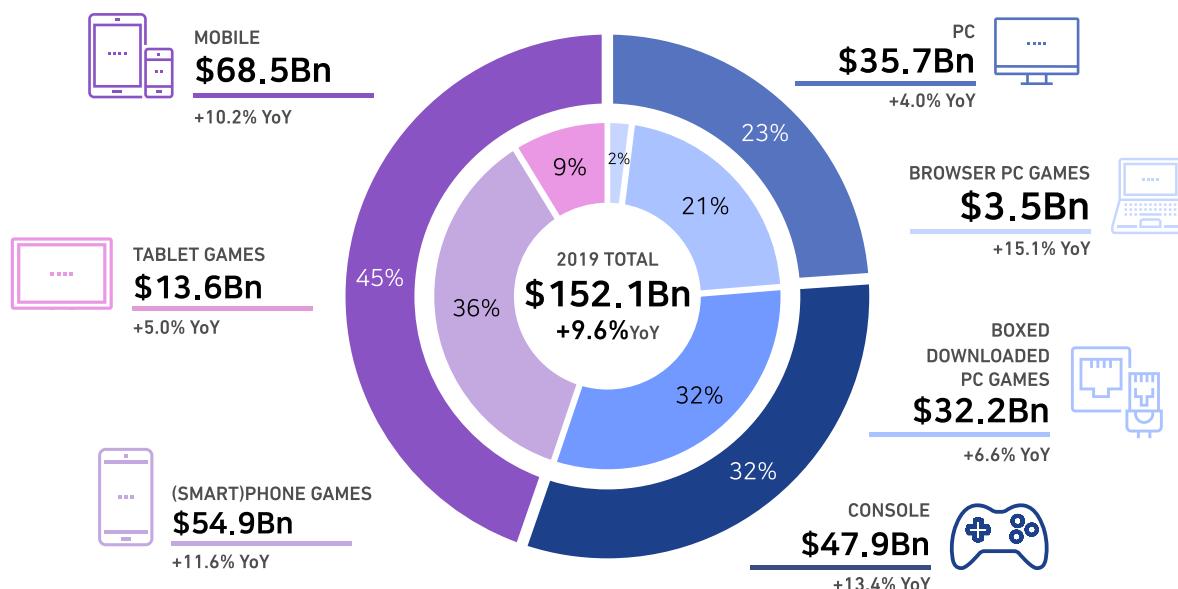
Given the high bar to creating a highly accessible and enduring blockchain game, whose appeal is not merely limited to crypto converts, it is necessary to consider why this vertical exists in the first place. Blockchain games are not the product of a technology in search of a use case. Their initial implementations may have arisen as a means of experimenting with the tech, but it quickly became apparent that blockchain provides some unique capabilities that solve problems inherent to traditional online and console-based games.

The same censorship-resistance that makes Bitcoin so powerful can equally be applied to games, not so as to combat overt censorship, but to indelibly store assets. As a result, in-game items, characters, and unique content that players have spent countless hours nurturing can be permanently stored, eliminating the problem of virtual worlds, customizations and

content being removed without warning on the whim of game developers, or being restricted through arbitrary geographical constraints. In the past, software houses have gone bust, taking entire franchises down with them, and leaving players high and dry. Blockchain enables games and the ecosystem they have spawned to live on, in perpetuity.

2.1.1 Games market

The global gaming market is experiencing a period of sustained growth that is showing no signs of slowing down. There are now over 2.5 billion gamers around the world, spending \$152 billion on games and driving year on year growth of around 10%.¹ Whether playing on console, PC, tablet or smartphone, gamers are finding more ways than ever before to engage with the gaming industry. This has helped to drive a sustained boost to gaming revenues that will see the industry hit \$196 billion in sales over the next three years.²



The 2019 global games market, per device and segment with year-on-year growth rates³

Of the various gaming verticals, the fastest growth is for mobile and tablet devices which are integral to the consumption of decentralized applications (DApps) and specifically DApp gaming. The mobile sector of the total gaming market alone is currently worth \$68.5 billion, or 45% of the global market share.⁴ By 2022, mobile gaming (smartphone and tablet combined) will produce revenues of \$95.4 billion, accounting for 49% of the entire games market.⁵

1 <https://newzoo.com/insights/articles/the-global-games-market-will-generate-152-1-billion-in-2019-as-the-u-s-overtakes-china-as-the-biggest-market/>

2 <https://www.gamesindustry.biz/articles/2018-12-17-gamesindustry-biz-presents-the-year-in-numbers-2018>

3 <https://newzoo.com/insights/articles/the-global-games-market-will-generate-152-1-billion-in-2019-as-the-u-s-overtakes-china-as-the-biggest-market/>

4 <https://newzoo.com/insights/articles/the-global-games-market-will-generate-152-1-billion-in-2019-as-the-u-s-overtakes-china-as-the-biggest-market/>

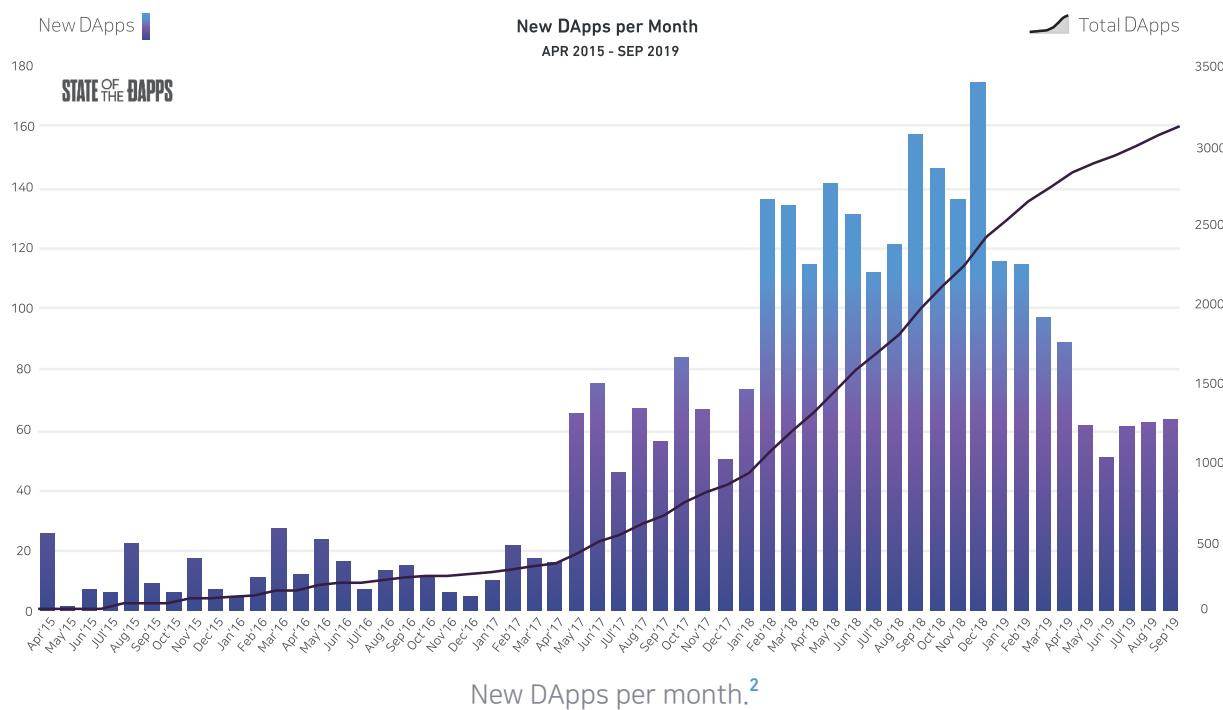
5 https://resources.newzoo.com/hubfs/2019_Free_Global_Game_Market_Report.pdf?utm_campaign=Games%20Market%20Report&utm_source=hs_automation&utm_medium=email&utm_content=76474808&_hsenc=p2ANqtz-8TeIIo1Bn5yE3quoVTFNUVP5qkYacPdZK3-DNbJJ9rNcFy-2PoEjoOyWwREgVbdcaNPEw-QTEkOyY6_9MP8FvPtp62hjhi74f1X4unl6_4SDdq8&_hsmi=76474808

Gaming has been transformed from a pastime that was enjoyed in the home by a subset of devotees to one which is conducted everywhere by all kinds of people. A recent study showed that 70% of Americans play some kind of video games, with 90% of those playing on tablet, smartphone or both.¹

The growth of mobile gaming does not, however, signal the demise of console and PC gaming. By 2022, the console segment will generate revenues of \$61.1 billion in 2022, (CAGR of +9.7%), while PC gaming will rise to \$39.5 billion (CAGR of +3.5%).

2.1.2 DApps

Since 2015, when the total number of decentralized applications (DApps) was barely into double figures, the number of DApps has exploded into the thousands. One DApp tracking site alone lists 3,070 DApps across nine blockchains, with the most popular networks comprising Tron, EOS, and Ethereum. In 2015, the average number of new DApps per month was just over 11, in 2018 that figure reached an average of 130 per month, with December of that year seeing an all-time high of 172 DApps. In 2019, the market is in good health.



As of Q1 in 2019, the four major DApp blockchains, Ethereum, EOS, Steem, and Tron, have hit a total transaction volume of \$3.2 billion.³ EOS and Tron alone have accrued \$1 billion. EOS and TRON also boasted the most active users on their respective blockchains with 262,000 and 303,000 in Q1 respectively.

1 <https://variety.com/2018/gaming/news/how-many-people-play-games-in-the-u-s-1202936332/>

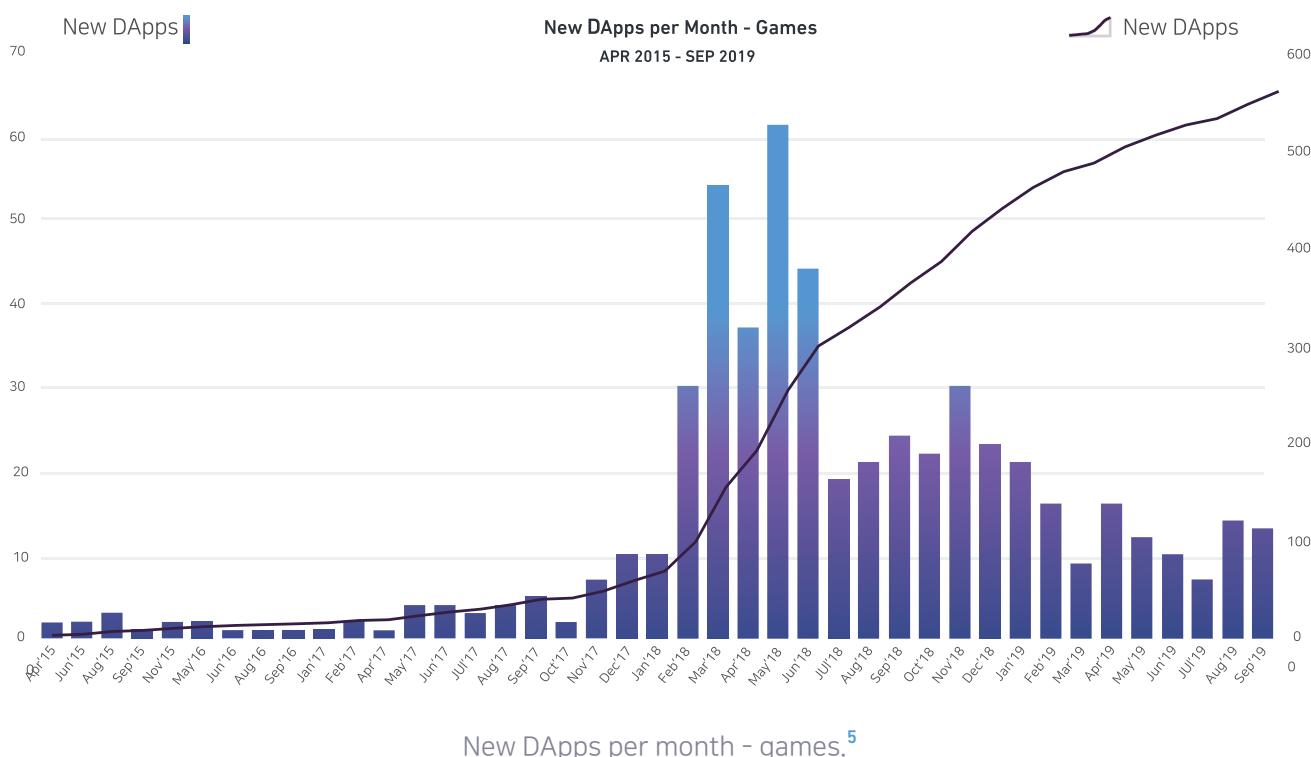
2 <https://www.stateoftheDApps.com/stats>; The purple bars shows new DApps this month. The black line shows the total number of DApps.

3 <https://www.DApp.com/article/DApp-com-q1-2019-DApp-market-report>

2.1.3 Crypto games

In terms of utility, gambling and gaming are the two most popular uses for DApps, with gambling still retaining a slight edge. For sheer user retention, however, gaming, especially on the Ethereum blockchain, has the advantage. Today, there are over 400 DApp games built on Ethereum alone.¹

Among all DApp users, gamers are the most active vertical, with the most stable and loyal communities. More than 40% of daily active DApp users are gamers, from a total audience share of only 30%.² Research conducted by DApp.com shows that the number of gaming DApps has skyrocketed in 2019 across the four main DApp chains (Ethereum, EOS, Steem, and Tron).³ As of Q1, 2019, DApp games represent around 1% of the overall DApp industry with a value of \$35 million.⁴



2.2 Challenges

As noted in section 2.1 of this document, a series of logistical and technical challenges have hindered the evolution of the DApp games market and prevented the emergence of an exceptional game that integrates blockchain technology in a functional way.

1 <https://DAppRadar.com/rankings/protocol/ethereum/>

2 <https://hackernoon.com/q1-2019-DApp-market-report-7aca7cbbcad>

3 <https://www.DApp.com/article/DApp-com-q1-2019-DApp-market-report>

4 <https://www.DApp.com/article/DApp-com-q1-2019-DApp-market-report>

5 <https://www.stateoftheDApps.com/stats/category/games#new>

2.2.1 Blockchain entry barrier

A large number of games have been created across the main DApp blockchains, and a few have gained significant traction and a loyal user base. Nevertheless, the blockchain dimension raises the barrier to entry on a number of fronts.

Most of the existing DApp games require players to generate a private key and to set up a wallet directly outside of the main game and its functions. Some platforms even require the ownership of cryptocurrency assets before functional play can begin. At present, approximately 81% of the global population has never purchased cryptocurrencies in any form.¹ This being the case, the requirement to engage in the relatively technical processes of setting up crypto storage, purchasing crypto assets (which typically mandates undergoing KYC), ensuring the security of the crypto assets owned, and implementing various other necessary procedures deter a large portion of the existing gaming community from participating.

Some existing DApp games emphasize the blockchain element as the defining feature of the product. This can result in games that are extremely generic, relying on the inclusion of blockchain as their unique selling point. An example of this game type is collector games, where the user purchases “rare” images tied to a tradable non-fungible token (NFT). These titles are unlikely to appeal to ordinary gamers who do not have any special interest in cryptocurrencies and fail to see the attraction in a blockchain game that is devoid of any recognizable gameplay.

2.2.2 Ownership and centralization

Many games allow players to collect in-game assets, be that a native currency (Minecraft Coins, New California Republic dollars or Atoms in the Fallout series, Riot Point coins in League of Legends), items, skins, texture packs, playable characters, or vehicles. Such items often become highly sought after within the gaming community and can attain a significant “real-world” market value.²

Many games also allow for the collection of data that translates into some form of advantage for the player. This could be some form of multiplier bonus, “lvl” or “exp,” a high-score, or skill status. For many players, it is the acquisition of these achievements which is the most fulfilling element of gaming. The struggle to overcome adversity and the subsequent claim of some form of trophy provides a fundamental thrill in gameplay.

1 <https://www.kaspersky.com/blog/cryptocurrency-report-2019/>

2 <https://www.telegraph.co.uk/news/2018/07/16/meet-gamers-willing-spend-hundreds-thousands-living-video-game/>

Unfortunately, such in-game assets and player data are usually owned by the entity governing the game, typically the software house, rather than the players themselves. Should the game close down for some reason, the company collapse or the people running the game simply choose to remove the player's hard-earned assets and delete their data, everything will be irredeemably lost. This threat looms large over the online gaming community today.

Another troubling aspect of centralized games that involve the purchase and sale of in-game assets is that the value of items and general market prices are usually determined by the company rather than players. A famous case of pricing exploitation came with the release of Fallout 76 where Bethesda (the company behind the Fallout series) was accused of price gouging and creating fake "original" prices and discounts to inflate demand.¹ Some games also charge exorbitant transaction fees and wildly disproportionate buy/sell prices on items. Such market conditions have been cultivated to maximize the profits of games companies by burning the players who support them.

1 <https://www.eurogamer.net/articles/2018-12-17-fallout-76-players-say-the-atom-shop-prices-are-getting-out-of-hand>



3 Mineral solution

3.1 Mineral overview

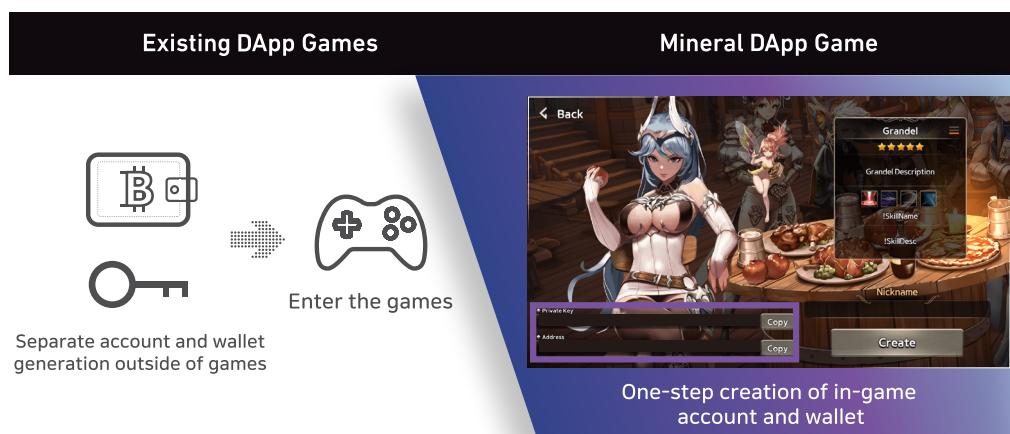
To solve the issues that currently beset blockchain games, Mineral Hub, a team of developers behind some of the biggest blockchain games of the last few years, will launch and govern the Mineral token (MNR). MNR is the primary currency of the Mineral Hub ecosystem. It will act as a primary currency across multiple games, allowing players to buy and sell in-game items as non-fungible tokens.

As the Mineral ecosystem expands with the development of new games and the creation of new NFT items, demand for these items will increase commensurate with the number of transactions made using MNR. The resulting increase in token demand, coupled with the transaction fees collected by Mineral, will facilitate the further expansion and improvement of the Mineral Hub ecosystem.

3.2 Accessibility

With Mineral, there is no need for players to endure the laborious processes associated with interacting with the blockchain. Mineral abstracts away the blockchain component to provide DApp game onboarding that will feel familiar to ordinary gamers.

As mentioned in section 2 of this whitepaper, one of the key barriers to entry for non-crypto-savvy gamers is the technical and logistical issue of setting up the various components necessary to deal with the blockchain. Mineral automates the setup process, allowing gamers to bypass these arduous procedures. Upon the creation of a Mineral account, Mineral automatically generates public and private keys for the player as well as a Unity-Klaytn wallet and assigns these to the player's profile. As a result, players can create their account in a couple of clicks and begin playing their favorite games.



Another common roadblock that dissuades many from participating in blockchain gaming is the necessity to pre-own crypto assets in order to "buy-in." This is only possible after overcoming the technical and logistical initialization hurdles described earlier. Following setup, these players must traverse another technical challenge in visiting an exchange, acquiring an accepted cryptocurrency, and transferring it into the game. This challenge is also financial since some amount of funding is required. Although the amount required may be small, first-time users may still be reluctant to hand over their money to have it converted into a digital currency that they do not understand to play a game that they do not yet know if they will even enjoy playing.

With Mineral, players have no need to pre-own any crypto assets due to Mineral's entrusting function. Klaytn allows developers to subsidize the network fees required to onboard users so that players can begin playing games instantly and without payment, thus removing another potential barrier to entry. Players need only to pay transaction fees when buying or selling items.

Users can acquire MNR by playing Mineral games, winning items and selling those items for MNR either via item auctions or through Mineral's NFT marketplace (see section 4.4 of this whitepaper for more information on this). In this way, players are rewarded for playing Mineral Hub games and supporting the ecosystem without having to perform an initial "buy-in."

Players will be able to purchase extra MNR on exchanges with a range of cryptocurrencies. In the future, players will also be able to purchase MNR with fiat in-game through direct card payments (see section 7 of this whitepaper for more information).



3.3 Ownership and decentralization

As discussed in section 2.2.2, ownership of in-game assets is a major concern for today's gamers. Mineral Hub solves this problem by leveraging the immutability of the blockchain. Every time a player unlocks a new hero or acquires equipment in the game, a record of ownership is made and stored on the blockchain.

Mineral Hub is creating a diverse series of games, all of which will utilize MNR and across which all in-game items will be usable. Due to this interoperability, players are not limited to a single game in which all of their items and tokens are stored. Should a player wish to transfer their in-game assets from Five Stars into another game within the Mineral ecosystem, they can do so with only a few clicks.

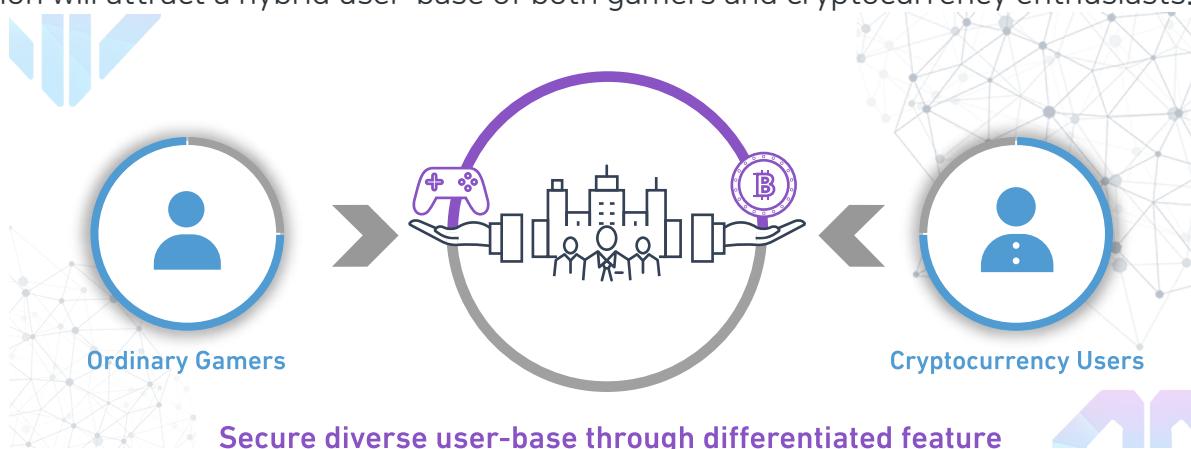
Finally, unlike other games and platforms that manipulate item prices, players within the Mineral ecosystem can use MNR to trade freely with each other in real-time. Items will find their true market value in accordance with the laws of supply and demand.

3.4 Next-generation blockchain gaming

The Mineral will revolutionize blockchain gaming by producing truly high-quality games with superior graphics and engaging gameplay which integrate the blockchain as a productive tool that provides genuine utility rather than as a functionless marketing ploy.

As a cross-game token, Mineral incentivizes engagement with all games in the Mineral Hub ecosystem, allowing players to transfer items between games or sell items in one game to gain MNR that can be used instantly to purchase items in another. This allows players to seamlessly transition between games rather than trapping their acquired assets within a single game and disincentivizing them from playing other games.

Such a combination of high-quality gameplay and thoughtful token economics and value creation will attract a hybrid user-base of both gamers and cryptocurrency enthusiasts.



3.5 Scaling the game item trading market

The Mineral will facilitate peer-to-peer item trading and in-game auctions through a dedicated marketplace. Users can sell items acquired through gameplay for MNR. Once a player has gained sufficient stores of MNR, either through these sales or through purchase on exchanges, they can purchase items from the open market to help them progress in the game or simply to serve as trophies and collectibles.

For example, a player may have reached a level of a Mineral Hub game that they simply cannot overcome. The enemies that appear at that level are too powerful for the player to beat with their current playable characters and items. The player has, however, accumulated significant stores of items from gameplay up to this point. The player sells all of their items to acquire a large quantity of MNR and goes to the Mineral open market to find an item that will allow them to overcome the wave of enemies stalling their progress.

Alternatively, the player may not wish to sell their items as they are useful for other parts of the game. If the player holds crypto assets, they can alternatively go to an exchange and sell some of these for MNR. In the future, that player will be able to simply log in to their Mineral account and purchase MNR at the current market rate via a direct card payment (see section 7 of this whitepaper). For a detailed overview of how MNR is can be acquired and spent within the Mineral Hub ecosystem, please see Appendix II.

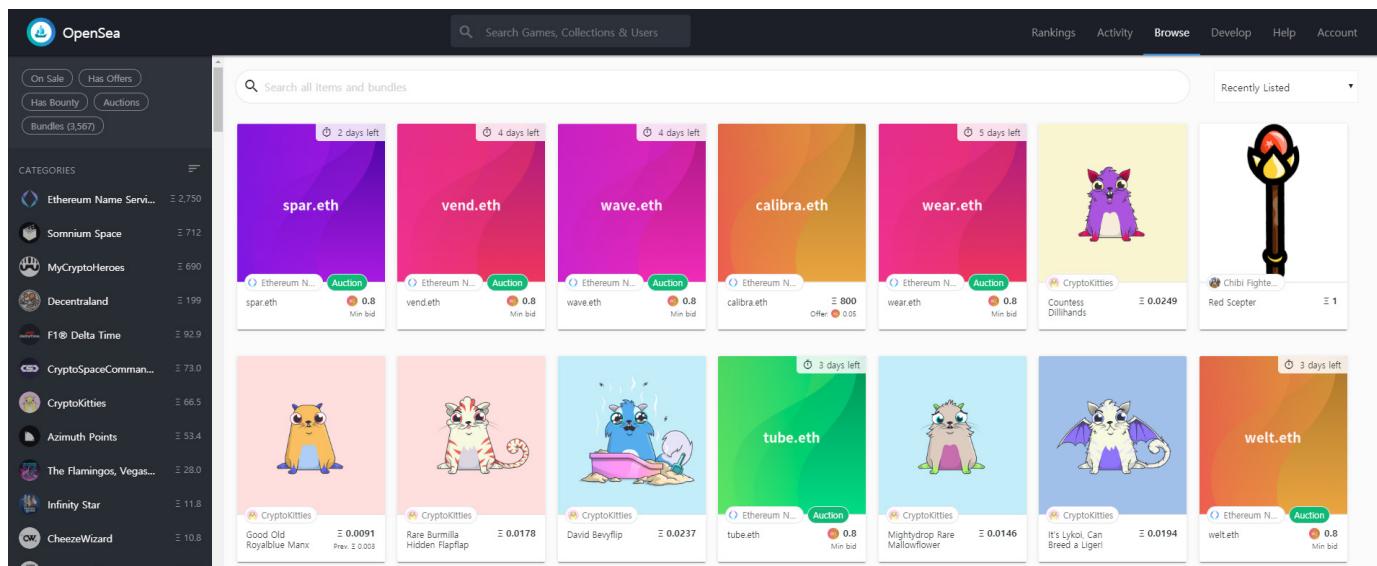
It is also anticipated that certain Mineral NFTs will become desirable collector's items. It is well documented that gamers are willing to spend significant amounts to acquire such items.¹ Particularly rare NFTs have the potential to become highly sought objects of desire which players are driven to purchase for pure possession and status rather than for use in-game.²

Acquiring particularly rare items organically through gameplay is often impractical. Where, for instance, there is a 1:10,000 chance of a defeated enemy dropping the particular rare item and that enemy takes a significant number of hits to defeat, it is probable that the player would need to expend thousands of hours playing the game to attain the item. It is often far easier for those collectors to simply browse the Mineral NFT market or check for the item at auction, and purchase it that way.

The Mineral will also support item-to-NFT conversions and will facilitate the trade of such NFTs in Mineral's external NFT marketplace powered by OpenSea.io (see section 4.4).

¹ <https://www.telegraph.co.uk/news/2018/07/16/meet-gamers-willing-spend-hundreds-thousands-living-video-game/>

² <https://nationalpsychologist.com/2007/01/the-psychology-of-collecting/10904.html>; <http://nationalpsychologist.com/2007/01/the-psychology-of-collecting/10904.html>;



Opensea NFT Market

3.6 Security

Whenever dealing with crypto assets and in-game virtual assets with significant real-world value, there are concerns over the safety and security of those assets. Mineral will follow all best practices in terms of security and will take measures to ensure that players' data and virtual assets are safeguarded.

Mineral Hub will also take measures to ensure security on the player side and mitigate the risk of fraud or hacking attempts. To combat this, Mineral Hub will allow users to enable Touch ID and Face ID, thus reinforcing accessibility and security.



4 Five Stars

4.1 Overview

Five Stars will be the first game to launch that makes use of MNR. Five Stars is a turn-based side scroller collective roleplaying game (RPG) for mobile (Android, iOS) and web browsers. The game is being developed by the Mineral Hub team and will run on the Klaytn blockchain.



4.2 Setup

A key goal of Mineral is to remove one of the most common barriers to entry associated with blockchain games, namely the setup of the various components required to acquire and securely store crypto assets. To solve this issue, a Unity-Klaytn wallet will automatically be generated and supplied to each player that creates a Five Stars account. This means that the player will be able to begin playing and earning from the outset and will not be deterred by the complexities of set-up that have held back the adoption of blockchain games in the past.

During setup, the player will be shown a screen (see image below) where they will be asked to choose their main character. After choosing their main character, each player will be assigned a group of other heroes through the "luck box," a random character assignment function. The style and progression of the game following this point will vary depending on the character chosen. As an example, the main "lobby" or home screen will reflect the character choice. The character's appearance, aspect, and gait will also change depending on the character's experience level.



The main character selection screen

4.3 Gameplay

Five Stars will feature graphics and in-game features that far outstrip those encountered in the blockchain games market today. The gameplay of Five Stars can be separated into two distinct stages: the preparation stage and the fighting stage.

4.3.1 Preparation stage

In the preparation stage, players can select their team of heroes, assign equipment to each hero (weapons, armor, potions, and a range of other items) and arrange their battle formation. Players are able to choose up to a maximum of five heroes. New players will be able to choose from a wide range of base playable characters. As players progress through the game, they will unlock new playable characters with more advanced abilities/traits which they can then add to their team (see section 4.4 for more information on this). Depending on the abilities/traits of the heroes selected, the items assigned to each and their formation, certain synergies can be created. When the player has chosen their formation, it is time for battle in the fighting stage.



Battle formation screen

4.3.2 Fighting stage

In the fighting stage, each of the player's team of heroes will take turns to attack or defend in a sequence of battles against waves of unique enemies. Upon each turn, the player can target a particular enemy and choose either an attack or a skill for their hero to execute upon that enemy. Each enemy is distinct and has its own special characteristics. For instance, a particular enemy may have elevated defenses against certain types of attacks and thus is able to take minimal damage from a certain hero.

The enemy may also have a form of attack that is particularly damaging to one or more of the player's heroes. This being the case, the player must act strategically to take out particularly dangerous enemies early before their team is decimated, to protect particularly vulnerable heroes against attack, and to choose the forms of attack that will be most damaging to the enemy forces upon every turn. If the heroes eliminate all on-screen enemies, the next wave will appear. There will typically be between two and three waves in a standard stage.



Battle screen

4.4 Heroes and equipment

As players progress through the game, overcoming waves of increasingly treacherous enemies and gaining battle experience, they can unlock new playable heroes with different skills and characteristics. Some heroes have attacks that are particularly damaging to certain types of enemies, some have defenses that make them particularly resilient to enemy attacks, some have special abilities that allow them to increase the overall attack capabilities of the team, and others have the capacity to heal other team members.

There are a total of 70 playable heroes in the game that fall into nine hero classes. Each hero is able to progress through five levels of experience. Each time a hero advances to a new experience level they attain new skills and greater powers.

Victory



Post-battle items acquired screen

Players can also acquire a wide variety of items that can be used in-game. Each item holds some kind of special property. Just as certain characters have increased attack capabilities, enhanced resilience to attacks and other special characteristics, so too do items. These items can be assigned to each hero during the preparation stage (see section 4.3.1). Players can assign a total of six items to each hero, though this is restricted to one item from each category. The categories are Weapon, Helmet, Armor, Glove, Shoes, and Accessory.

As with the heroes, it will be possible to increase the power of each item through "reinforcement". This will result in a stronger effect in the use of that item. Each item can be reinforced a maximum of 15 times. At the time of launch, there will be over 100 distinct items available in Five Stars. Items come in eight levels of rarity ranging from Normal to Epic.

Players can strategically combine heroes with certain items to give themselves a competitive advantage. For instance, should a player know that the next wave of enemies will be particularly dangerous to a certain hero on their team, they may assign a piece of armor to that hero to allow them to withstand the danger.

As a second example, a particularly damaging weapon could be assigned to a particularly damaging hero thus allowing that hero to defeat every enemy in a single blow. There are any number of combinations that can be made to create a range of effects.

4.5 Item trade



The initial item sale will take place via in-game auctions as well as through OpenSea, the world's largest marketplace for crypto collectibles.

Following the initial item sale, players can opt to sell and purchase items in real-time via auctions or via Mineral's external NFT marketplace (also run by OpenSea). Where a player puts an item up for public auction, the item will be advertised for a limited period before being won by the highest bidder. In the NFT marketplace, players can exchange equipment directly, sell owned equipment for MNR, or purchase equipment with MNR.

The screenshot shows the OpenSea marketplace interface. On the left, there is a sidebar with filters: 'On Sale', 'Has Offers', 'Has Bounty', 'Auctions', and 'Bundles (161)'. Below these are 'CATEGORIES' with links to 'Ethereum Name Servi...', 'Sommium Space', 'MyCryptoHeroes', 'Decentraland', and 'F1® Delta Time'. The main area has a search bar at the top with the placeholder 'Search all items and bundles'. Below the search bar, there are three cards for 'CryptoKitties' items:

- Mightydrop Rare Mallowflower** - Price: ₩ 0.0147
- Hyacinth Vigilante** - Price: ₩ 0.0239 (Prev. ₩ 0.128)
- Catua Sourwhoopsie** - Price: ₩ 0.019

i.e OpenSea.io

As Mineral Hub releases more games, players will be able to trade assets between different games within the Mineral Hub ecosystem and Klaytn partner games via the integrated DEX exchange. Players can also use the DEX exchange to trade MNR and KLAY.

Mineral will take a transaction fee of 5% on all trades made within the Mineral Hub ecosystem. This fee will be paid in MNR. Funds obtained via this fee will be automatically locked up for a

period of six months. This is to secure the value of MNR. Following this lock-up period, the funds will be added to the reserve amount and utilized in accordance with the plans detailed in section 6.2.



Five Stars Auction screen

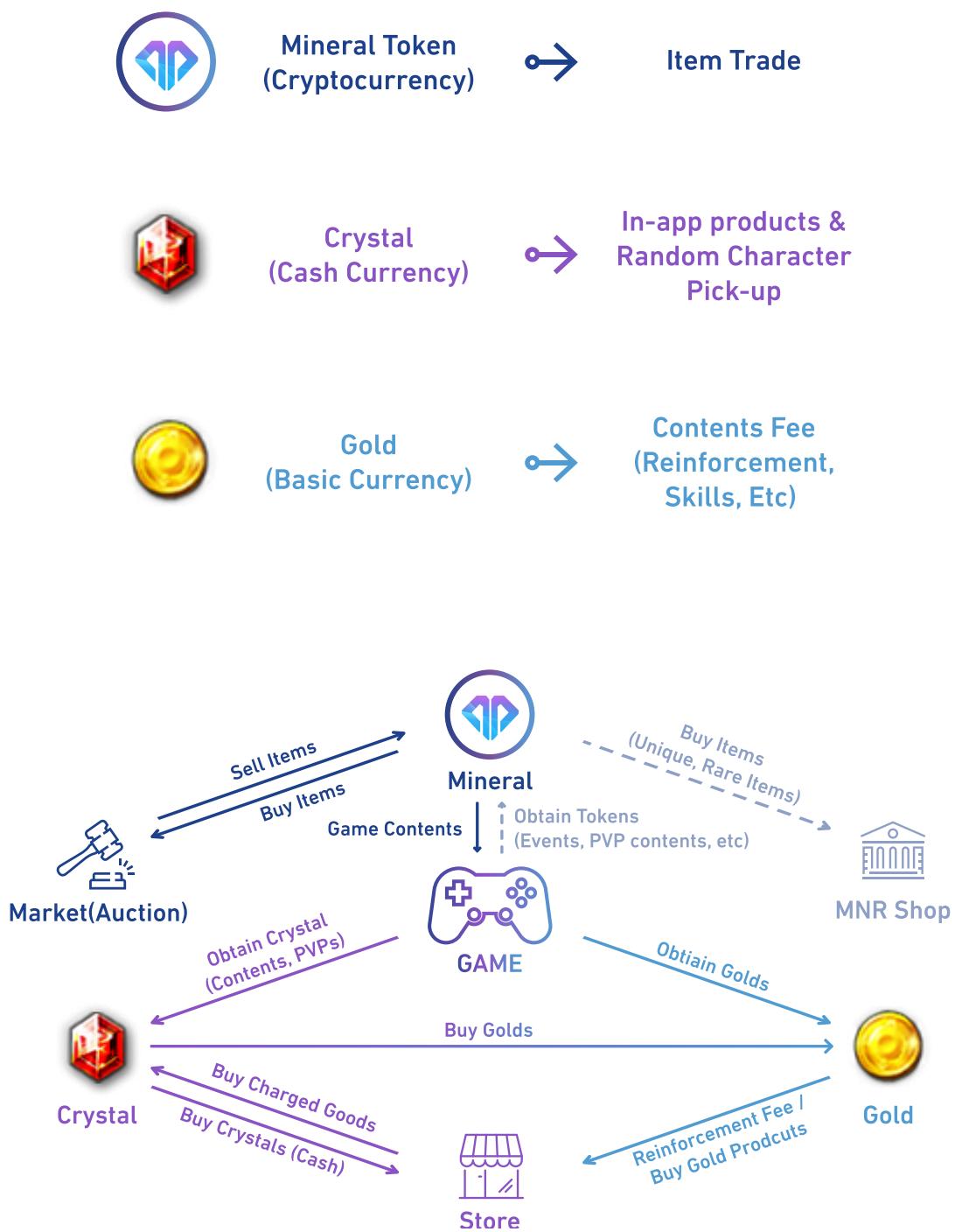
4.6 In-game currencies

Five Stars will contain multiple in-game currencies, each of which will have a slightly different function.

Gold: Gold is used as a standard in-game currency for the purchase of reinforcements, the purchase of skills and other in-game acquisitions.

Crystal: Crystal is a cash currency that can be used to purchase in-app cash items within the Five Stars app. Like Gold, Crystal can only be used within the Five Stars game and cannot be used as a means of payment in auctions or the NFT marketplace. In the future, players will be able to purchase Crystal within the game via credit card (see section 7 of this whitepaper). The inclusion of Crystal will ease the initial payment barrier of ordinary gamers who may not be familiar with cryptocurrencies.

Mineral: Mineral is a crypto asset that can be used across all games in the Mineral Hub ecosystem. It can be used as a means of payment in the trade of items both via auctions and in the MNR NFT marketplace. MNR is the only currency that can be used to trade the unique items available through the MNR ecosystem. It is also used to pay transaction fees.



Mineral Hub's collection of usable currencies has been thoroughly checked for inflation bugs that might allow hackers to increase the supply of tokens and fraudulently cash them out, crashing their value and impacting all players.

5 Token

5.1 Token overview

MNR is a KCT built on the Klaytn blockchain. Klaytn is a hybrid blockchain which combines the best features of public blockchains (decentralized data & control, distributed governance) and private blockchains (low latency, high scalability).¹ The Mineral Hub team chose the Klaytn blockchain over other crypto networks due to its high transaction throughput and the capabilities of its token standard.

Klaytn's KCT standard is based on Ethereum's ERC-20 token standard. However, Klaytn can implement 3,000-4,000 TPS per second while Ethereum can only handle a maximum of around 25 TPS.² This also greatly exceeds the TPS of Tron and EOS which can handle 2,000 and 1,200 TPS respectively.³

5.2 Token functions

MNR's primary use is for the purchase and sale of NFTs. Where a player wishes to purchase a particular item, they must acquire the necessary amount of MNR by selling some of their items for MNR, purchasing MNR on exchanges or, in the future by purchasing MNR in-game via card payment (see section 7 of this whitepaper for more on this).

Additionally, MNR is used to pay transaction fees. Since the acquisition of particular items is often required to progress in Mineral Hub games, and since some items are incredibly rare and will elicit a desire to collect them, it is anticipated that demand for MNR will remain high.

5.3 Token value capture

The Mineral Hub team has set out a number of strategies aimed at ensuring that MNR not only maintains its value but actually increases in value over time.

5.3.1 Expansion of the NFT market

Mineral Hub is committed to continuously expanding the range of heroes and items available as NFTs, creating new and novel aspects for its games while simultaneously increasing rarity and the value of some of the early-era items. As new games are developed and added to the

1 https://www.klaytn.com/Klaytn_Token_Economics_and_Governance_Paper_V1.01.pdf

2 <http://www.koreaherald.com/view.php?ud=20190709000768>

3 <https://cointelegraph.com/news/buterin-needs-bitcoin-cash-scaling-ethereum-before-sharding-casper>

Mineral Hub ecosystem, a greater number of players will be onboarded. Such additions will increase overall activity in the NFT markets and item auction.

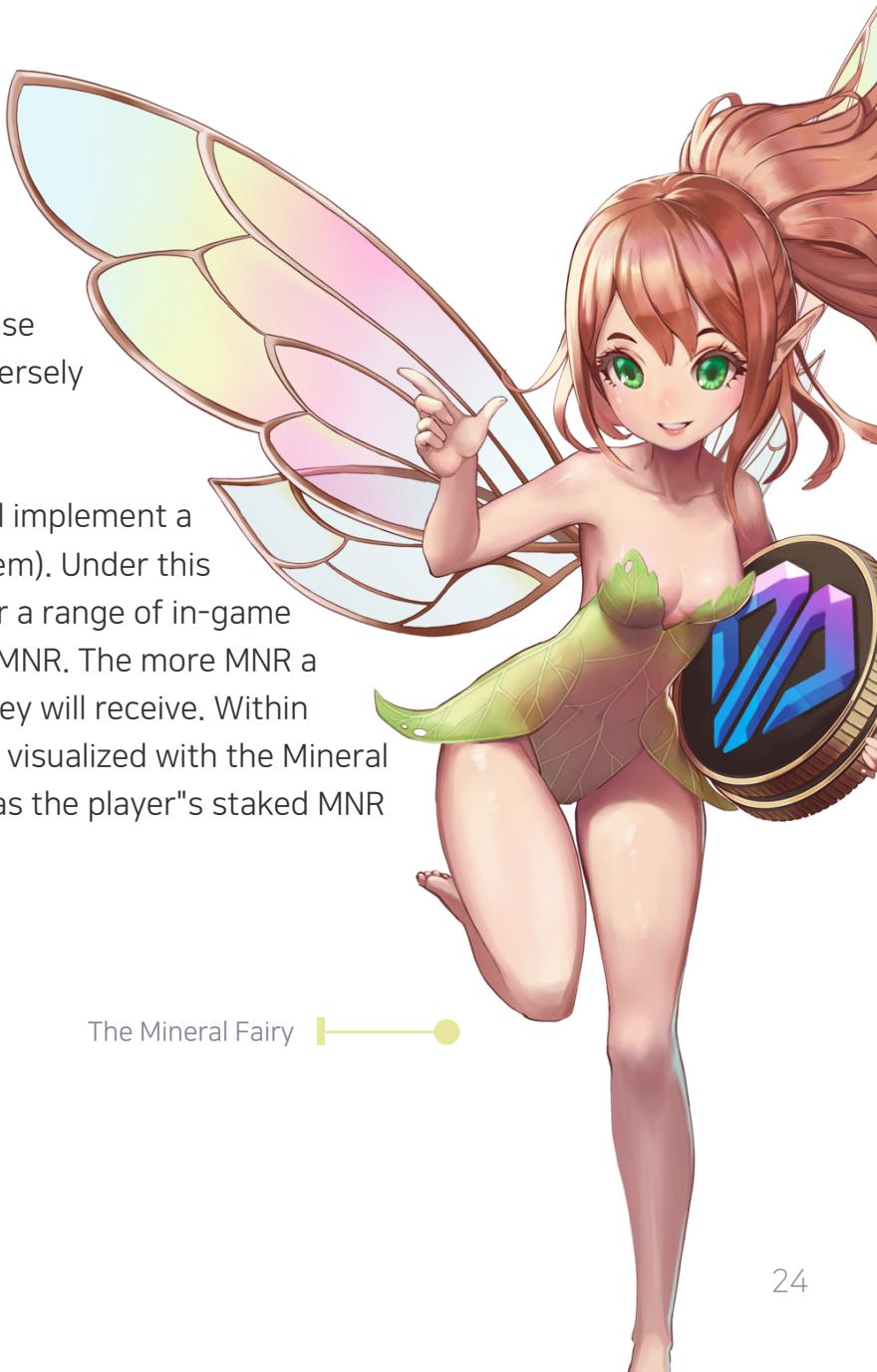
5.3.2 Staking

Many medium-of-exchange tokens encounter the velocity problem. To summarise the velocity problem, where a token's only use is payment for a service on the platform, there's no incentive to hold tokens rather than converting them to FIAT.

Those purchasing the token to access its utility within the platform (in Mineral's case, the purchase of items/NFTs) will simply purchase tokens for a specific transaction. Equally, those receiving the token in exchange for platform utility (in Mineral's case, MNR received for the sale of an item/NFT) will instantly sell the tokens they receive for FIAT to avoid the risk of price fluctuations.

This situation results in high velocity for the token, as the increase in demand driven by buyers acquiring tokens will always be quickly matched by a corresponding increase in supply from sellers converting these tokens to FIAT. Effectively, high velocity acts as an increase in circulating supply and is, therefore, inversely proportional to the value of the token.

To counter this, the Mineral Hub team will implement a staking mechanism called Fairy (VIP system). Under this staking mechanism, Mineral Hub will offer a range of in-game benefits that can be acquired by staking MNR. The more MNR a player stakes, the greater the benefits they will receive. Within the game, this staking mechanism will be visualized with the Mineral Fairy, a small character that will level-up as the player's staked MNR increases.



5.3.3 Token burns

Mineral Hub will also introduce token burns to further increase the value of the MNR token over time. As discussed in section 4.6, a 5% fee is charged on every transaction within the Mineral ecosystem. The funds generated via this fee will be locked-up for a period of six months before being added to the reserve. To increase the overall value of the circulating token supply, 20% of this MNR will be burned every month. The burning amount will always be set below 5% of the total minted token amount. This burning range will be also be applied to follow-up games created by Mineral Hub (i.e Game A token burn + Game B token burn < 5% of total).

5.4 Token advantages

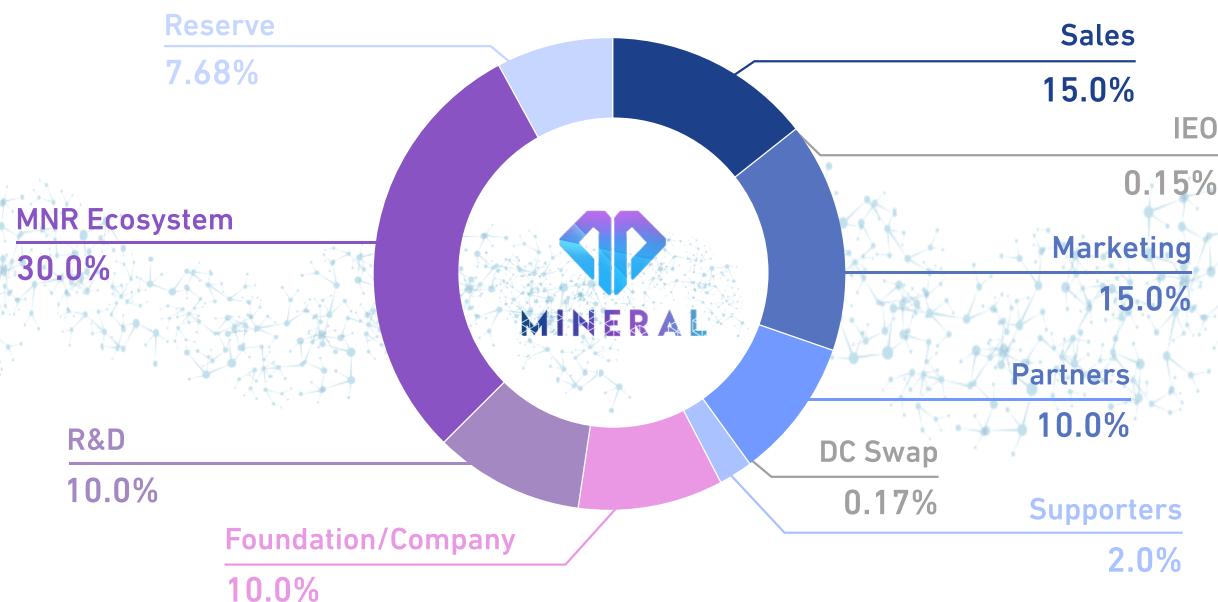
MNR offers a range of benefits for gamers and developers alike. Gamers can enjoy the stable token valuation afforded by MNR's value capture mechanisms (see section 5.3), the multiple functions of the token (see section 5.2) and the low entry barrier resulting from the automation of the set-up process and the subsidization of fees (see section 3.2). Equally, developers will benefit from MNR's capacity to improve user onboarding through increased accessibility, a significant reduction in development costs due to the existence of MNR as a readymade in-game currency solution and exposure to a body of gamers that play other games within the Mineral Hub ecosystem.



6 Token sale

6.1 Token allocation

Token Allocation



In Mineral's Token Generation Event, 10,000,000,000 (ten billion) MNR will be minted. No more MNR tokens will ever be created. These tokens will be allocated as follows:

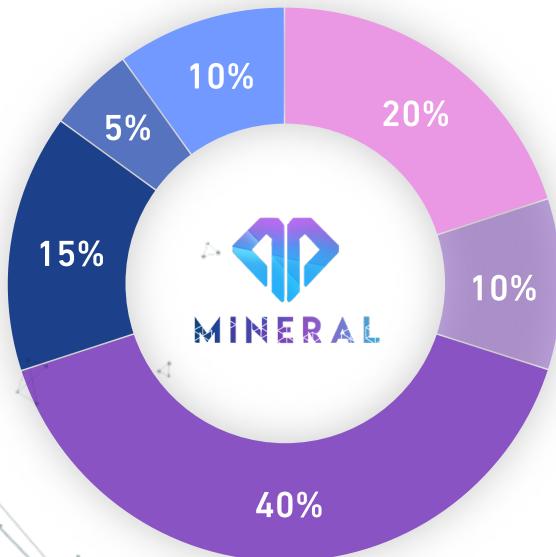
Sales: 1,500,000,000 (15%)
 Marketing: 1,500,000,000 (15%)
 Partners: 1,000,000,000 (10%)
 TRON SR Supporters: 200,000,000 (2%)
 Company: 1,000,000,000 (10%)
 Research and development: 1,000,000,000 (10%)

MNR Ecosystem: 3,000,000,000 (30%)
 Reserve: 768,000,000 (7.68%)
 DC Swap: 17,000,000 (0.17%)
 IEO: 15,000,000 (0.15%)

The Mineral Hub team is committed to ensuring the continued and healthy growth of the Mineral ecosystem beyond the initial token sale. This is why the team will allocate the bulk of all tokens generated to initiatives that will contribute to this end. Tokens allocated to marketing, the MNR ecosystem, the Mineral Foundation, research and development, and the reserve will all contribute to the expansion of the Mineral ecosystem in different ways. Combined, these allocations make up 73% of all tokens generated.

6.2 Use of funds

Funds obtained via transaction fees paid to Mineral Hub will be locked up for a period of six months after which they will be added to the reserve amount. These funds will be used to maintain the MNR token supply and to expand the MNR ecosystem.



Use of funds

| | |
|---|-------|
| Marketing | (20%) |
| Reserve | (10%) |
| Research and development/in-game operations | (40%) |
| Business operations | (15%) |
| Legal | (5%) |
| Partners | (10%) |

6.3 DC/MNR transition

Since the launch of Five Stars will coincide with the closure of Dragon Castle and, by extension, the end of the utility of the Dragon Castle (DC) token, SkyPeople has developed a number of mechanisms to provide DC holders with fair remuneration for their loyalty to the company and to facilitate a smooth transition to use of MNR and the new games in the Mineral ecosystem.

6.3.1 DC/MNR token swap initiative

Though SkyPeople previously had success in launching the DC token, the team has decided that this token is not optimized to sustain the form of token economy sought for Five Stars and future games. The team is, however, acutely aware of and grateful to all the players who supported the company by downloading Dragon Castle and earning DC. For this reason, the Mineral Hub team has created the DC/MNR token swap initiative to reward faithful players.

Upon the MNR Generation Event, Mineral Hub will retain 10,000,000,000 (ten billion) MNR that will be allocated to the token swap initiative. DC token holders will be able to exchange their DC for MNR at a 1:10 ratio (1 DC : 10 MNR).

Since the Tron and Klaytn networks are both based on Ethereum, Tron and Klaytn addresses are interoperable. As such, following the token swap, users can simply add an "0x" to the beginning of their Tron private key and use it to log in to their new Klaytn wallet.

6.3.2 Leveling system compensation initiative

Since Dragon Castle used a leveling system that gave bonuses to the ratio of mined DC, SkyPeople has decided that some form of compensation must also be provided to accommodate for this. Because Five Stars is developed as an RPG and does not feature Dragon Castle's dividends system, it is impossible to transfer a user's Dragon Castle user level to Five Stars. As such, a bonus package of limited items that is deemed to be equivalent in value to the player's Dragon Castle user level will be provided to help users to level up in Five Stars.

6.3.3 Fortune Tree rewards

The Dragon Castle Fortune Tree is a prize pot containing TRX which players can win by betting. Any TRX remaining in the fortune tree pot at the time of Dragon Castle's end-of-service will be used to buy back DC tokens from exchanges and burn them.



The Dragon Castle Fortune Tree

7 Business development

From the launch of Five Stars onwards, Mineral Hub will sustain itself financially through income from fees paid to the network by players of games within the Mineral ecosystem. Players will be charged a 5% fee on every transaction made in Mineral's NFT marketplace. Players will pay this fee in MNR, thus providing another use case for the token and increasing demand. Funds raised via transaction fees will automatically be locked up for a six-month period in order to ensure the stability of the token. Following the lock-up phase, these funds will be added to the reserve.

Since Mineral Hub intends to create a range of high-quality games for the international market, it is anticipated that the platform will quickly acquire and sustain a large number of users making daily transactions. For this reason, it is expected that the revenue generated from transaction fees will be sufficient to cover staffing costs, maintenance, research and development, advertising, geographical expansion, growing the team and developing new games.

The Mineral Hub team is committed to breaking down barriers to entry for gamers who may not have extensive knowledge of cryptoassets and improving accessibility. To this end, the team is currently developing a strategy to facilitate the purchase of MNR via direct card payments within Mineral games. This will negate any need for players to go through exchanges when they require extra MNR and will further abstract away the blockchain element.

Though Mineral Hub is headquartered in Singapore, putting it in an excellent position to access the Asia-Pacific games market which is due to generate \$72.2 billion in 2019, accounting for 47% of total global game revenues,¹ the team is focused on global expansion. In 2019, the U.S. gaming industry is due to generate \$36.9 billion, making it the largest gaming market by revenues globally. The Europe, Middle East, and Africa regions are due to reach \$34.7 billion, while Latin America is set to reach \$5.6 billion. Mineral Hub will place a particular focus on breaking into these growing markets.

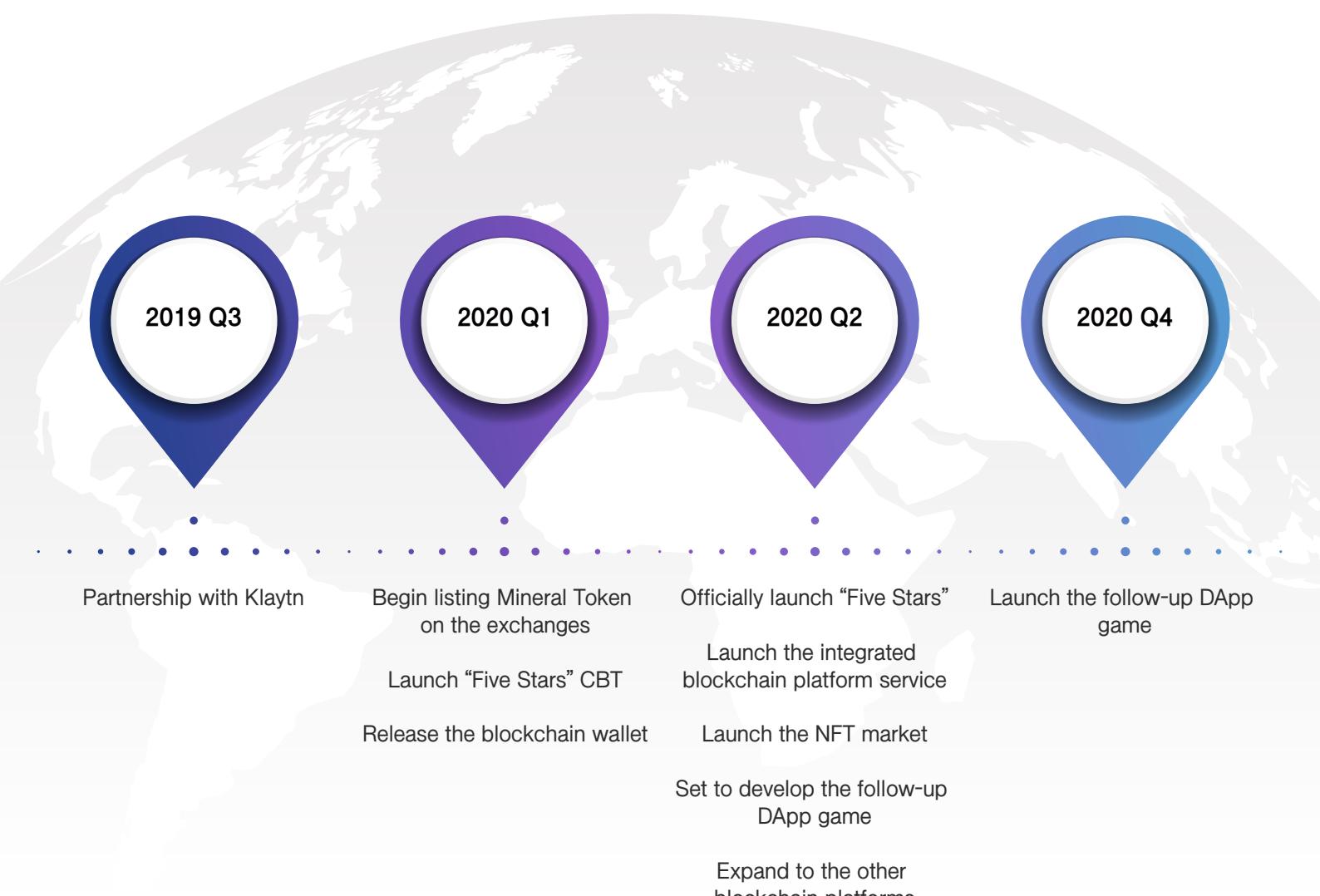
¹ https://resources.newzoo.com/hubfs/2019_Free_Global_Game_Market_Report.pdf?utm_campaign=Games%20Market%20Report&utm_source=hs_automation&utm_medium=email&utm_content=76474808&_hsenc=p2ANqtz-8TeI0a1IBn5yE3quoUvTFNUVP5qkYacPdZK3-DNbJJ9rNcFy-2PoEjoOyWwREgVbdcaNPEw-QTEkOyY6_9MP8FvPtp62hjhi74f1X4unl6_4SDdq8&_hs_mi=76474808

8 Competitor analysis

An analysis of the features and user experience of a typical blockchain game on each of the leading DApp networks shows that Five Stars/Klaytn is optimized on multiple fronts. Each of the leading second and third-generation blockchains (Ethereum, EOS, Tron) has certain attributes that make them suited to particular use cases and audiences. For the purposes of gaming, however, Klaytn's architecture makes it the ideal network for developers seeking to onboard new users in as seamless and intuitive a manner as possible.

| | One-click setup | TPS | Auto-wallet creation | Key generation abstracted | Third-party gas payment | Integrated NFT market | In-game currencies |
|--------------------------|-----------------|--------|----------------------|---------------------------|-------------------------|-----------------------|--------------------|
| Five Stars (Klaytn) | ✓ | 3.000+ | ✓ | ✓ | ✓ | ✓ | 3 |
| CryptoKitties (Ethereum) | ✗ | 20 | ✗ | ✗ | ✗ | ✗ | 1 |
| Prospectors (EOS) | ✗ | 50 | ✗ | ✗ | ✗ | ✗ | 1 |
| FragGoo (TRON) | ✗ | 2.000 | ✗ | ✗ | ✗ | ✗ | 1 |

9 Roadmap



10 Company background

Mineral Hub was established in late 2019 to build and govern the Mineral ecosystem. The Mineral Hub team brings together industry-leading experts from the fields of blockchain and game design.

A number of Mineral Hub's core team members are also members of the SkyPeople team, one of the most respected and innovative games design teams operating today. SkyPeople is maintaining the Tron Super Representatives (Tron SR) from its Mainnet and generating the most number of blocks of Tron so far. Accordingly, SkyPeople is currently located at the top 13 of all Tron Super Representatives.

In February 2017, the team released Final Blade, a mobile collective action RPG with a unique oriental 2D design and dynamic real-time battle gameplay. Final Blade went on to become the second most popular game in the Google Play store and the third in Apple's app store. Almost three years later, Final Blade can still be played in more than 140 countries and maintains high sales.

In early 2019, the team developed and operated the highly successful DApp game Dragon Castle built on the Tron protocol. This included the creation and management of DC token, a TRC20 token that players can mine. For more details on Dragon Castle and DC token please see: <https://dragoncastle.io/DragonCastleWhitePaper.pdf>



11 Partners

OpenSea



OpenSea is the first peer-to-peer marketplace for blockchain-based assets, which include collectibles, gaming items, and other assets backed by a blockchain. OpenSea team members have backgrounds from Stanford, Palantir, and Google. OpenSea is funded by YCombinator, Founders Fund, Coinbase Ventures, 1Confirmation, and Blockchain Capital.

OpenSea is currently the largest general marketplace for user-owned digital items, with the broadest set of categories (200 and growing), the most items (over 4 million), and the best prices for new categories of items. OpenSea partners with game developers to build customized marketplaces for their in-game items, and is currently the primary marketplace for several top blockchain games.

Klaytn



Kakao's global public blockchain project Klaytn is an enterprise-grade, service-centric platform that brings user-friendly blockchain experience to millions. It combines the best features of both public blockchains (decentralized data & control, distributed governance) and private blockchains (low latency, high scalability) via an efficient hybrid design. Klaytn is secured by participation from numerous highly-reputable brands around the globe, working together to create a reliable business platform atop a robust system of decentralized trust. Klaytn enables businesses and entrepreneurs today to capture value using blockchain technology, and designed by Ground X.

Tron



Tron is a decentralized content protocol. Tron strives to construct a global free content entertainment system, utilizing blockchain technology. This protocol allows each user to freely publish, store, and own data. Tron is one of the largest blockchain operating systems in the world. It is specialized in 3-High features: High-Throughput, High-Scalability, and High-Availability. users, making Tron a blockchain protocol with the most DApp users in the world.

The app partners of Tron protocol include Peiwo, Obike, Gifto, Uplive, BTT with a total of 4 million users, making Tron a blockchain protocol with the most DAPP users in the world.

Haechi Labs



Haechi Labs aims to remove technological barriers for clients to explore the potential of blockchain. Haechi Labs provides two key services, "blockchain security auditing" and "blockchain as a service". The company provides top-notch smart contract security auditing for enterprises to securely develop and deploy the smart contract. Moreover, Henesis ("Blockchain as a Service") is for enterprises to develop the most securely and easily integrate blockchain with their services. So far, based on the HAECHI AUDIT's security audit report, clients have successfully listed on the global cryptocurrency exchanges such as Huobi, Upbit, OKEX, and others. Trusted by the industry leaders, Haechi Labs have been incubated by the Samsung Electronics and awarded the Ethereum Foundation Grants and Ethereum Community Fund.

BCSolution



BCS is specialized in the field of cryptocurrency consulting and marketing. The company will give priority to customers based on credibility, accountability, transparency, and strive to become the current market leader through consistent effort and development. BCS will be the leader establishing a more systematic and stable system in the cryptocurrency market.

BCS is made up of elite professionals in each field with a global business mindset as background. As a member of "Enterprise Ethereum Alliance (EEA)", BCS is actively working on positive lines globally.

AmaZix



AmaZix is the premier provider of full-service advisory to blockchain businesses, providing expertise for both pre- and post-STO, as well as Token Generation Events. Beginning operations in mid-2017, the company is now a global enterprise, managing a portfolio of over 120 clients. AmaZix services span the entire process, from digital advisory, to community & marketing, to worldwide legal, and corporate finance. For more information visit <https://amazix.com>.

CertiK



CertiK is a blockchain and smart contract verification platform founded by top formal verification experts from Yale and Columbia University. Incubated by Binance Labs, Certik has strategic partnerships with the world's top crypto exchanges such as Binance, Coinone, and Huobi, as well as public chains such as Ethereum, Terra, and Tron. Different from the traditional testing approaches, CertiK's formal verification method mathematically proves blockchain ecosystem and smart contracts are hacker-resistant and bug-free.

CertiK's key features include a layer-based decomposition approach, pluggable proof engine, machine-checkable proof objects, certified DApp libraries, and smart labeling.

Xangle

Xangle

Xangle is a public disclosure platform developed by CrossAngle for the global crypto market. Building reputation as the "EDGAR for crypto", it holds the most accurate and complete information of crypto financed projects. Xangle provides due diligence reports of token projects to exchanges, crypto funds, and traditional corporates. It is currently onboarding more than 150 projects and more than 360 projects are involved. Partnership with the Mineral Project is for the transparent exposure of the information rather than business relationship. Mineral and Xangle are closely working together to create a healthy environment of blockchain industry.

Hedera Hashgraph



Hedera
Hashgraph

Hedera is an enterprise-grade, decentralized public network that uses hashgraph consensus – a faster, more secure alternative to blockchain consensus mechanisms. Hashgraph works efficiently to verify transactions and transaction ordering, ensuring fairness on the network; and, is built to deliver the highest standard of security available to safeguard the integrity of the network and prevent malicious attacks. Hashgraph achieves high-throughput with 10,000+ cryptocurrency transactions per second and low-latency finality in seconds from its innovative gossip about gossip protocol and virtual voting. Once consensus is reached, it is available on the public ledger for everyone to transparently see. Developers can build secure, fair, blazing-fast decentralized applications on top of the Hedera platform.

RocketFuel



RocketFuel is comprised of a number of leaders from MIT, UC Berkeley, and Columbia University as a crypto fund, organizing blockchain investment. Currently, it performs actively in the fields of business development, partnerships, engineering, funding and more, and has a history of investing in diverse projects such as ChainLink, ICON, Loom, Ox, etc. RocketFuel is doing the best in contributing toward the future progress of blockchain and digital asset industries.

Bananatok



Bananatok is a blockchain SNS which is launched in February 2019. It is established through the collaboration between Cafeunion (Chinese smart-order service provider) and Biyong (Chinese blockchain SNS). Bananatok generates more than 200 cryptocurrency wallets as users download, and allows users to transfer coins and offer the airdrops through chats. Besides, it plans to release "BananaEX" which enables users to exchange cryptocurrencies instantly in the chatroom.

12 Closing statement

Blockchain gaming is an industry with massive potential but which has yet to fully bloom. A lack of experience with blockchain among the gaming community at large has restricted the adoption of those games that have attempted to experiment with blockchain integrations so far. Equally problematic is the scaling limitations of most of the major blockchains. Any blockchain game that is too successful and gains a great number of players may fold under the financial weight of storing gaming data on-chain.

Mineral Hub aims to bring about the next generation of blockchain gaming by combining a truly high-quality gaming experience with a blockchain solution that abstracts away the difficulties associated with this technology while maintaining the value that it offers. Our team combines industry leaders in game design and blockchain with the aim of creating sophisticated games with equally sophisticated token mechanics.

With the launch of Five Stars, we will show that blockchain technology can support a truly immersive, high-quality gaming experience rather than limiting it. With high-end graphics, game mechanics, an immersive storyline, massive customizability and the capacity to create and claim real value, this game will mark the first release in a brave new era of blockchain gaming.

Through the Mineral project, we hope to allow gamers to enjoy the full advantages that blockchain can bring, empowering them with ownership of their in-game assets by fostering a thriving economy for the exchange of in-game tokenized assets and rewarding them for playing.



13 Glossary

E-sport: “A multiplayer electronic or video game competition organized as a spectator sport, typically involving professional contestants and watched by viewers online (frequently in plural). Also: such games or competitions collectively.”¹

Free-to-play (F2P) games: Games that can legally be downloaded and played without charge.

Fungible: “Of a good that has been contracted for: that can be replaced by another identical item without breaking the terms of the contract. More generally: interchangeable, replaceable.”²

Non-Fungible Token (NFT): A token that is unique and non-interchangeable.

Loot box: An in-game asset that can be “cashed-in” for a randomized selection of in-game assets (the loot).

Pay-to-play (P2P) games: Games that must be purchased. This encompasses both upfront payment and paid subscriptions.

Role-Playing Game (RPG): “A game in which participants act out roles; (now usually) spec. a game in which players take on the roles of imaginary characters who engage in adventures, typically in a particular fantasy setting overseen by a referee; (also in later use) a computer game of this kind.”³

Token swap: The direct exchange of one set of tokens for a different set of tokens usually equivalent value.

1 <https://www.oed.com/view/Entry/62195340?redirectedFrom=e-sport#eid>

2 <https://www.oed.com/view/Entry/75537?redirectedFrom=fungible#eid>

3 <https://www.oed.com/view/Entry/246441?redirectedFrom=role-playing+game#eid12237477>

14 Disclaimer

This Whitepaper, published by MINERAL HUB PTE. LTD., has been prepared for reference to provide information on the Mineral project (hereinafter referred to as "MNR Project") and Mineral Token based on Klaytn platform (hereinafter referred to as "MNR Token") being planned and developed at the time of publication of this Whitepaper. Accordingly, nothing in this Whitepaper provides any legally binding promise on the contents described herein, nor provides any refer to investment description, subscription of investment or security sales, invitation of offer, commitment of any performance, statement or guaranty. Every content in this Whitepaper is a plan of the MNR Project. Therefore, if any recent content and past announcement conflict with each other, the recent information shall prevail.

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This Whitepaper and related documents may be translated into other languages, but the Whitepaper in English shall be given priority in the event of conflicting its interpretation.

Appendix I - Game contents summary



Growth
Contents



Single
Contents



Multi
Contents

Hero

- Hero Random Pick-up
- Hero Reinforcement
- Hero Level

Equipment

- Equipment Reinforcement
- Equipment Creation
- Equipment Trade

Skills

- Skill Reinforcement
- Learn more skills

Adventure

- Main Story
- Sub Story
- Random Quests

Dungeon

- Infinite Dungeon
- Daily Dungeon

Raid

Rank System

- Personal Ranking
- PVP Ranking
- Guild Ranking

PVP

- Asynchronous PVP
- Real-time PVP

Guild

- Guild Benefits
- Guild Raids
- Guild Battle
- Siege/Capture Fight

Appendix II - Game contents flow

- (1) Players can obtain ingredients based on the Story Adventure / Growth
- (2) PVE for obtaining ingredients for hero promotion
- (3) PVP, RVR for both hero competition and cooperation

Players can obtain MNR via market trading / Shorten the growth time

