Evolution Land
White Paper

Simplified Version

https://www.evolution.land/

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EVOLUTION LAND

Abstract

Evolution Land is a simulation game with game asset management as its core. It is also an open platform and self-governing ecology based on blockchain and is dedicated to the development, operation and resource integration of blockchain games. Game assets refer to game IP, game props, and other game value. Evolution Land will design a good game asset model and economic system to increase the value of game assets by expanding high-quality game scenarios and increasing player social activities.

Evolution Land uses the blockchain technology to ensure the balance and sustainability of the game economy system. The economic rules of the game, the token model, the game IP copyright, and the systematic voting process will all be on the chain. All operations are completed with cryptographic signatures or smart contracts. In addition, Evolution Land will develop a public blockchain technology (Darwinia network) for the game industry, and through cross-chain, sidechain and other kinds of methods it will implement the barrier-free connection with the game system, game Dapp and the game application chain.

Evolution Land will strive to develop, operate, and integrate blockchain games to form a blockchain game and a Decentralized Autonomous Organization (DAO). DAO is not only the purpose of the design, but also the vision. Evolution Land will start and unfold around a series of consensus rules, systemic invariants and laws. The system will be designed to be a self-evolving, scalable and open system. The game will initially set the basic rules. As the game progresses and the module expands, the rules of the game will be determined by all members of the DAO community to enable the game itself to evolve on its own, making sure that each user is both a player and a game designer.

Prologue

From the end of 2017 to the present, the Evolution Land team has studied nearly 100 blockchain games. Overall, the current blockchain games are still driven by a speculative mind. The phenomenon of people making enormous wealth in short periods of time results in a large number of game developers, speculative players swarming into the blockchain game field. But with the fall of the first batch of blockchain game products or teams, the reasons and the problems that arise from it are thought-provoking to everyone in the industry.

After the hype of CryptoKitties, domestic and foreign companies have both followed suit. Most of them have similar ideas as CryptoKitties: they have uniqueness, rarity-based value, and can produce new individuals through pairing. However, as a game, CryptoKitties and its many imitators lack the pioneering nature of the product. The product type is too single, and the game playability is still relatively mediocre. Although it caused congestion in Ethereum, the current On-chain DAU of CryptoKitties is only hovering around 400, which is obviously not as promising as a successful game product should be. Users are more concerned about its relationship with digital currency and its valve. How much wealth can I get out of this? It seems more like a product that is specifically designed for users that are active in crypto-currency. This also brings up another problem: the lack of target users.

Who is the blockchain game for? crypto-currency player or a real gamer? If you want to cater to the crypto-currency players, these pet-raising game does not show any additional advantages compared to the conventional crypto-currency project. Especially when countries begin to strengthen supervision and restrictions on digital currencies, the realization of products and the enthusiasm for trading with other users will be affected. However, we have seen that the CryptoKitties-like games are rapidly decreasing in terms of on-chain DAU due to lack of playability, proving that, at this stage, blockchain is unattractive to the real hard-core gamers. Obviously, it is difficult for these kinds of games to become the mainstream form of blockchain games.

Those who have seen the movie "Ready Player One" must be impressed with the scenes in the movie. Tracer from the overwatch and Chun-Li from the Street Fighter are fighting side by side and even Gundam can help you fight monsters! This idea where different characters from different IPs show up in the same fantasy world is virtually unprecedented and this idea has never appeared in the blockchain game. Based on this setting, is it

possible to achieve a barrier-free connection with other game systems, blockchain games IPs and Dapp through methods of cross-chain, sidechain, etc. and create a brand new blockchain game ecology to make the scenes from the movies obtainable?

Plus, in the existing blockchain games, all the logic is created by the developers, players are not actually involved in the making process. Developers may make thousands of designs for gameplay, but if they hand this possibility to the players, not only will they be able to raise their curiosity, they can also provoke imaginations. Thus substituting a sense of participation, allowing users to interact and collaborate in the game world and expand their social interactions. Letting each user be both the player and the designer of the game could be a new idea that is worth trying. To put this in someone's quote, "No matter what kind of a game it is, it has is to return to the essence of a true game: being fun!" the ability of being fun is reflected in the soul of the game, not on the package. In a world that is as fast-paced as this one we're living in, it is disappointingly hard to find a team that is dedicated solely to making a great game that caters to crypto-currency users and hard-core gamers alike.

Game world view

Geographic setting

Evolution Land is one of the planets in the universe, with a radius of 5,279.58 m and a equator of 36,000 m. The climatic conditions are similar to those of the Earth. There will be rivers, land, mountain valleys, plains and all kinds of other various landforms on the planet.
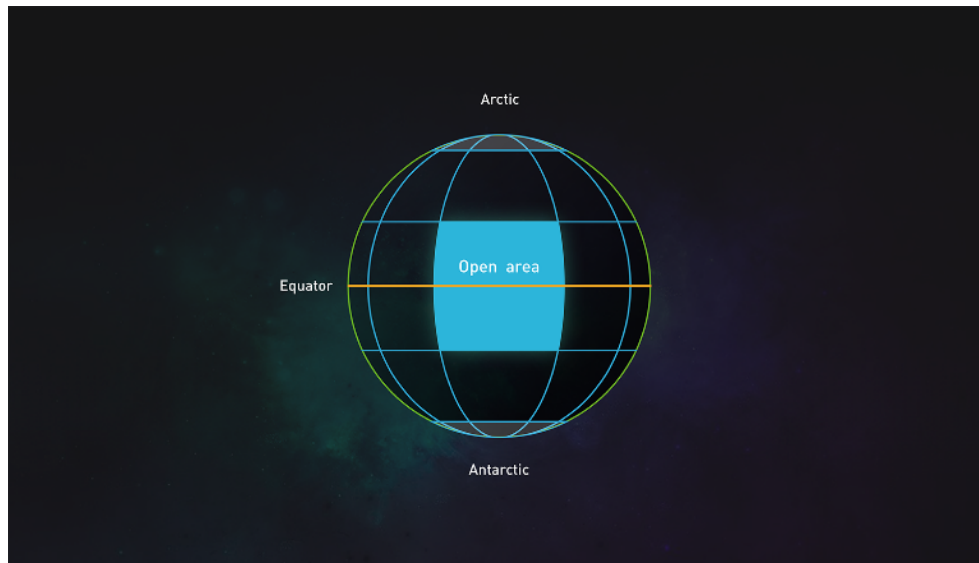
The Evolution Land continents from planet view

Abbreviated sketches and summaries of maps: The planet contains a total of 26 continents, of which 24 contain 2025 (that is, 45x45) lands, and two special large continents contain 7921 (22x360). + 1) Lands, each land is 100 m x 100 m.

Lands with plane coordinates of (x, y) can correspond to latitude and longitude (except latitude x, longitude y, north and south poles, no flat surface coordinates).

The total number of lands is 360 × (135 + 44) + 2 = 64442. Due to the presence of geomorphic factors, the amount of auctionable lands will be less than the total number of lands themselves
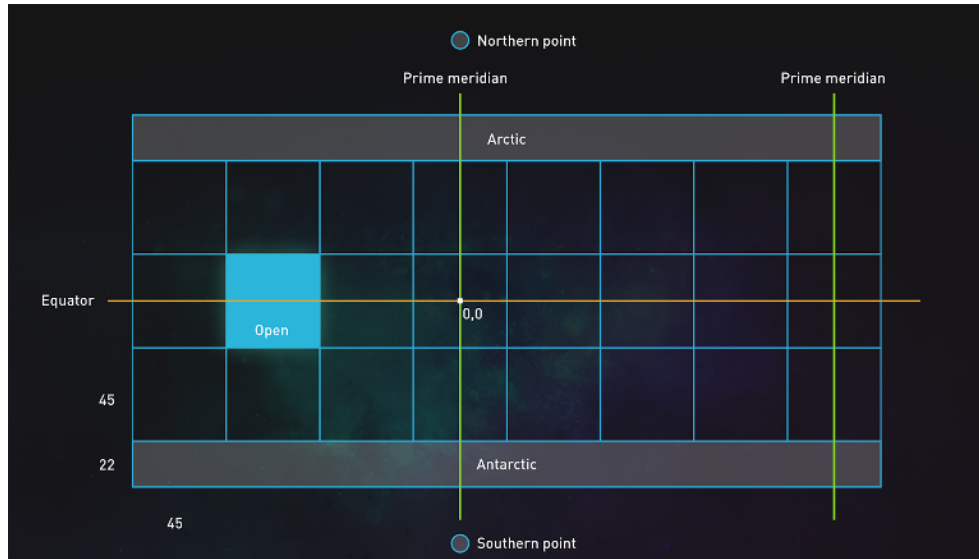
The plane of view of the Evolution Land's continent

The codes of the continents are defined by 2 methods, one of which is coded in the order of geographical location, from north to south, from west to east, and is numbered 1-26. Another method of coding is to use the English alphabet from A-Z in accordance with the time sequence of the opening of the continent.
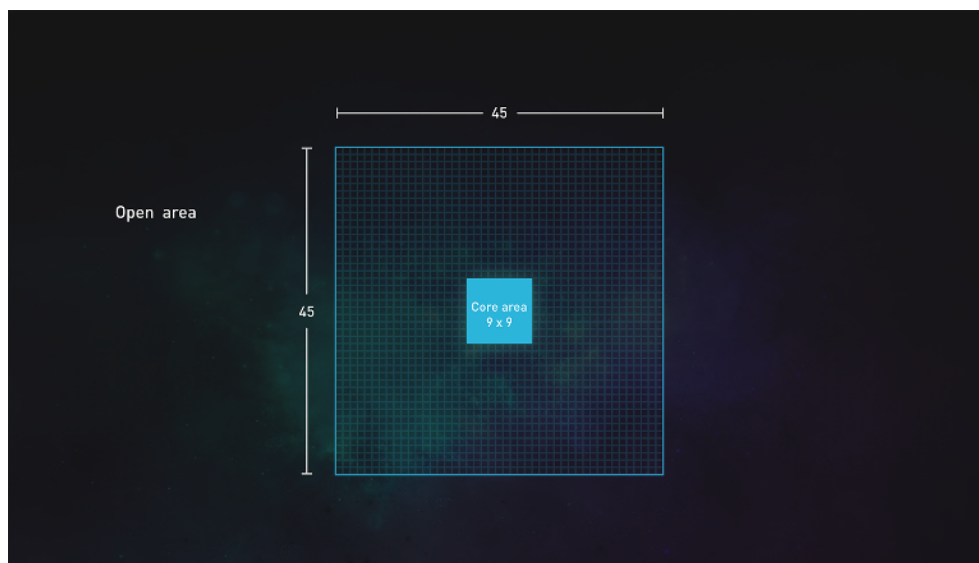
The distribution and design of the continent A's lands on Evolution land

Chemical setting

There are five basic elements of the Evolution Land: gold, wood, water, fire, and silicon.

Each land will produce these elements continuously. But because the properties of the lands are different, the output rate and quantity of the various elements are not the same: the production of gold is larger when closer to the mine. when near the forest, there are more woods, and likewise, there are more waters near the river. More fires near the volcano, and there are more silicon near the mountains. And by more, it means that the production speed is relatively fast, and the relative amount is relatively large.

These five elements are also five kinds of tokens. when built on the ground, the props need to consume one or more kinds of gold, wood, water, fire and silicon. The proportions of elements needed are different for every prop.

By combining the basic elements through a certain amount of ratio , you can synthesize a more advanced complex substance. And by combining these advanced complex substances you get even more advanced counterpart. The production and use of high-grade props requires elements of the same level of scarceness. As the game progresses, more basic elements and corresponding combination maps can be introduced.

For example, there is a composite item called a square block, similar to a "brick", which is the basic unit of a building, a square block, which is generated by a certain amount of different elemental materials according to a fixed ratio. Transformations and generation programs between

squares and elemental materials are recorded on the blockchain or written into smart contracts. When the square block is generated, the input element material will be destroyed, and the same square block can be disassembled and restored into the previous elements. The disassembled square block is equivalent to being destroyed in the system.

Physical setting

Following are the illustrations from perspectives of space and position. Some other physical variables (such as time, speed, etc.) are reserved for further design in the future.

Space

The size of each land is 100m x 100m, and there is no limit on the height (assuming it is also 100m). Then each land is a three-dimensional Euclidean Space. In this land space, the player can construct buildings. The building is made up of a number of basic units called "square blocks", each of which is 1m x 1m. Each land can only be placed in a building that does not exceed its size. Multiple buildings can be placed on the top of the block, as long as there is no overlapping area between any two of them, and can be separated by smooth movement.

Position and distance

Because of the presence of geographical dimension in Evolution Land, non-standard assets such as props can be attached with location information, and then we have information such as distance. after having information like distance, time and speed, the idea of transportation and porters can be introduced.

For standard assets such as element resources (ERC20), it is not easy to add the location attribute to the asset. But we can store (stack) the element resource to a land resource management contract with location information. This management contract, which records all land resources, gives the resource the ability to place and transport based on location. The player's account will record the element assets held by the player. After the player pays the handling fee, the player can collect the resources lands to the wallet account of his own, or he can place his own resources to the land position.

Economic setting

System token model

The system token in Evolution Land is called RING (full name is Evolution Land Global Token, Decimal is 18 bits). In the first continent, the initial supply volume is 2 billion, and the maximum supply volume is 10 billion. RING will be used to pay for operator fees in the systems and network in Evolution Land and smart contract fuel costs. Likewise, Trading of various elemental resources, lands, buildings and props will also use RING as a pricing unit. At the same time, by holding assets such as RING and land parcels, you will be able to participate in the governance and voting of the Evolution Land, and determine the direction and progress of the development of the continent.

The release model

RING has a total cap of 10 billion (pieces). Except that 20% of total will be issued in the mainland (#A), the subsequent issuing will commence through the opening of the major continents.

$$Supply(X) = total\_supply * 0.2 * 0.8^{X-1}$$

The release amount of ring on each planet

Mainland opening hours number A – Z
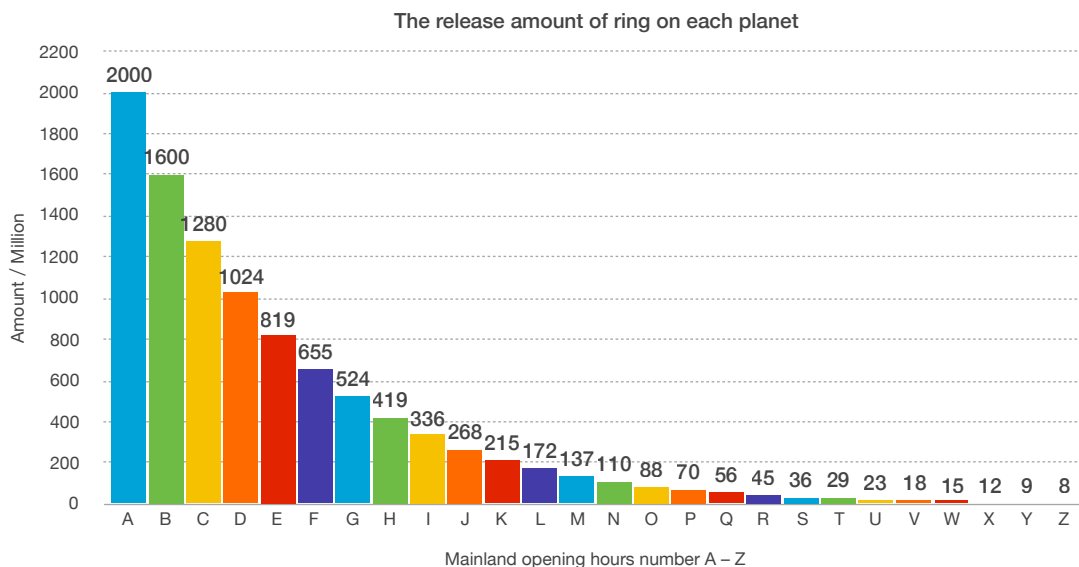
Element resource token model

According to the current chemistry settings, there are five standard element resources: gold, wood, water, fire, and silicon. Elements will be released using a model of attenuation supply with random factors, elemental resource release will be determined by the attributes of the land (the release rate of the five resources) and the player's industrial activity indicators.)

Resource generation rate V(time): refers to the resource release rate of the current time of the land.

The maximum resource generation rate is V_max(time): refers to the upper limit of the release rate that can be achieved by the current land.

The initial maximum rate of resource generation V_init_max: refers to the maximum rate , also the initial rate of resources generation with the opening of the continent.

Resource attenuation rate A_atten: The maximum rate of resource generation V_max will decrease from The initial maximum rate of resource generation V_init_max according to the Resource attenuation rate A_atten. The resource decay rate will be taken at a very slow rate, which is about 1/10000 a day.

$$V\_max(init\_time+DAYS)=V\_init\_max*(1-A\_atten)^{\wedge}DAYS$$

$$V\_max(time + 1) = V\_max(time)*(1 - A\_atten)$$

Resource recovery rate A_recover: The current resource generation rate V will be increased according to the resource recovery rate A_recover until the resource generation rate V_max is reached. The recovery is about 2/1000 of a day.

Resource destruction deceleration rate A_destroy(time): The current resource generation rate V will be reduced according to the current resource destruction deceleration rate A_destory until it reaches zero. Resource destruction deceleration rate A_destroy(time) is linearly related to the player's industrial activity index. The constant Const_destroy. is about 2/1000 to 5/1000 per day.

Player industry activity index Index_industry (time): refers to the player's current industry activities such as stacking resources, mining, element generation, construction and other industrial activities, and cumulative production of indicators, will directly affect the resource damage negative acceleration rate A_destroy (Time). Mining workers excavating resources from land, mining, resource accumulation, construction and construction placement will affect the rate of resource generation, which can be epitomized by the general indicators of industrial and agricultural activity.

$$Index\_industry(time) = SUM(Index\_stack(time) + Index\_mining(time) + Index\_forging(time) + Index\_building(time) + ...)$$

$$A\_destroy(time) = Index\_industry(time) \times Const\_destroy$$

Resource generation rate V(time) calculation formula:

$$V(time + 1\ day) = Max\{0,\ Min[V\_max, V(time) + A\_recover \times (1\ day) - A\_destroy(time) \times (1\ day)]\}$$

Mining rate of miners V_mining(time): refers to the rate of resource exploitation of all miners on this land. More miners or adding props to miners can increase the mining rate, which is capped at the resource generation rate.

Although there are random factors designed according to topographical geography and other factors, in the sense of probability and statistics, the universal release model of each continent and each land follows the following laws:

A. The comprehensive value of the elemental resources between the major continents is almost the same, although the distribution of resources between the major continents is different. For each continent, the initial rate of total resource generation is the same, and the subsequent rate of resource generation is greatly different with the degree of development, and the rate of resource generation varies from continent to continent. . (The principle of fair competition between the big continents)

B. On different lands with the same attributes, the release rate of the elements should be the same (although in the latter application, the user may use the props to give their own land attribute enhancement) The amount of elemental resources on the different lands and the rate of release and disappearance may or may not be the same.

C. Over time, the resource release attribute will be weakened at a very slow rate, which is manifested by the attenuation of resource release rate.

D. After placing a building on a land, it will destroy the natural state and attributes of the land to a certain extent, which in turn affects the release rate of the elemental resources.

Unlike the system token RING, the release of element resources will be attenuated, but the supply is not fixed. On one hand it is affected by the natural state of the Evolution Land lands, and on the other, the demand for elemental resources in the open market will also affect its release or destruction. This market-based token model will form a market economy and improve the playability of the game.

Complex substance token model

All the complex substance is forged by basic elements. As the name implies, the generation of its token means that a corresponding amount of elements are destroyed, and the destruction of its token can bring the corresponding quantity of elements to be restored. Therefore, the release model of its token is completely dependent on market demand and supply models.

Square blocks

Square blocks are a basic compound and the basic unit of a building. Each square block is forged by gold, wood, water, fire and earth elements with a fixed ratio (the specific ratio to be determined). Therefore, the generation of

one-to-one square token certificate means that the corresponding amount of element token is destroyed or frozen. The amount of supply of the square block token is mainly determined by the supply and the demand, that is, the price of the elements required for the production of the square block, and the demand of square blocks for the buildings. By dismantling the building, you can restore the squares that are generated, but there may be a certain amount of loss in the process.

Non-fungible tokens

Land

Lands are the most important geographic resources for Evolution Land. The amount of land on the Evolution Land is fixed, and capped at a certain limit, which will be distributed to different continents. Refer to the chapter on the geography of the world for details.

Building

The building consists of square blocks and architectural models. The square blocks form the body of the buildings, including parts like the wall surface and other body parts of a building. The building model represents the space design of the building. Each building model needs a considerable number of square blocks to form. These square blocks will be frozen in the building and cannot be transferred. The hash index of the building model will also be stored in the chain (or in the smart contract). The data of the building model can be stored in the cloud server or IPFS and will be provided to external access in an open manner. When one building is created, other players can create the same building by providing an equal amount of square blocks and building model cloning fee, which will be paid to the original creators to help protect creativity and encourage innovation. Because the API for accessing building model data is open and accessible to anyone, in order to protect the copyrights and prevent piracy, the Evolution Land Network will provide a copyright arbitration mechanism to destroy buildings that have too much similarities or being pirated. Architectural model and its architecture. (How piracy standards are arbitrated depends on the complexity and similarity of the model. The more complex the buildings are, the simpler the similarity requirements are, and vice versa. The simplest buildings won't even be considered as a piracy).

The buildings can be dismantled and restored into square blocks by paying a certain amount of deductible handling fee.

Prop

Each prop in the Evolution Land will be endorsed by a certain amount of resources or equity attributes, created by the mainland developers who also define the resources or rights that the item can represent. The props here refer to the ones generated inside the Evolution Land, not including the externally accessed props assets.

External props

Evolution Land has an open game ecology, third-party blockchain game assets, props (such as CryptoKittes) can also be inserted into the Evolution Land to become Evolution Land game props, as long as the third-party blockchain game assets have corresponding resources or rights endorsements, and meet the interstellar asset coding standards. For details, refer to the interstellar asset coding standard in the architecture technology.

Transportation

When the resource or the item with the location information is about to change its location, it needs to be transported, which would require a certain amount of The transportation fee RING. The farther the distance is, the higher the handling fee is.

The standard assets in the player's wallet account, due to the fact that there is no geographical location information, do not need to pay for transportation costs, and are not subject to time constraints.

Society

Occupation

The user's account can be associated with a certain occupation such as miners, elemental workers, construction workers, transportation workers, etc once at a time (the landlord does not belong to the system occupation) . When associated with a certain occupation, in addition to obtaining the professional basic attribute bonus, you can also obtain the raw production efficiency attribute such as proficiency according to the account's own props, occupational continuous time, labor and other parameters to commence related production activities. In order to encourage professional varieties, when changing occupations and obtaining new occupations, frequent occupation switches can be discouraged due to the fact that the proficiency will be affected when the continuous time is zero.

The concept art of different professions

Social connections

Currently, normal games' social elements are mostly practiced by people that are familiar with each other, leaving the other half, which is about strangers getting to know each other, stranded. And this is where we come in, based on the game itself, the Evolution Land will make efforts to experiment on social interactions between strangers with blockchain technology.

Not only will the anonymity of the blockchain strengthens the curiosity of social interactions of strangers,   The asset attribute of the blockchain game can also decrease the rate of fraud between strangers.

Evolution Land will build credible socialization based on the advantages of blockchain and blockchain games. Evolution Land will use the natures of the blockchain to achieve trust between the platform and the users, between the users themselves and also between the users and the asset, and then further explore the value of trustworthy social connections, such as mortgage financing of blockchain assets, blockchain contracts, blockchain marriage certificates, etc.

Evolution Land will focus on the construction of the underlying infrastructure, and more social scenarios will require the joint efforts of community members.

Governance model

By Establishing a credible voting mechanism and thus forming a scalable blockchain voting system, the rights of the users of the Evolution Land can be guaranteed

We will discuss with the Evolution Land residents to build a public management model. The residents will use the voting system to express their appeal and participate in the management of the Evolution Land. The Evolution Land residents participate in the decision-making of the Evolution Land by using RING to vote. Related matters include but not limited to: decision-making in the direction of the development of the land, naming of the lands, recovery, development , props, construction, circulation; third-party projects, Dapp, landing, cooperation; The expansion, recovery, and change of the rights of the Evolution Land residents.

Game design

Ways to play game

Here are a few of the typical game modes including lands trading, resource mining, square block refining, construction, transportation, etc.:

A. The player becomes the landlord by purchasing the land.

B. The landlords obtain elemental resources by hiring miners or mining. They pay RING compensation (according to time) to the miners. After the resources are dug out, they are placed on the lands. After the landlord pays a certain fee, he can directly put it on his own account to take it to any other places. Landlords can pile up resources from their own accounts on a land.

C. The landlord will refine the elementary resources into blocks by hiring the refining workers, meanwhile paying the RING reward (according to the time) to the those workers.

D. The landlord builds the buildings according to the building model by hiring a construction worker and pays RING compensation (according to time) to those workers. The above-mentioned industrial and industrial (or agricultural) production activities need to be carried out on the lands, the elemental resources that are for refinement, the square blocks used for construction and other similar objects all need to be stacked on the land before they can be refined and used to construct buildings.

E. If the landlord wishes to transport the items and resources from one land to another, he or she can hire porters. By paying for the transportation and remuneration fees to the porters, they can complete the transportation of the goods and resources.

Players who like to socialize can rent buildings to complete the construction of the Dapp store, incubate and nurture future generations, and other social activities.


Eco-game applications

Because the Evolution Land is an open and borderless game system, in addition to the resources and gameplay built into the Evolution Land,

system developers or third-party developers can also open various kinds of game Dapp to allow access to the game.

These Dapps will be able to utilize the API services and system smart contracts provided by Evolution Land, such as account SSO authentication services, land management services, social relationship services, RING token transfers, Resource mining, square block forging, etc. After the developers have finished developing Dapp, they can also bind it to a building. The three-dimensional interactive scene of the building also provides a good user interface for users to access these Dapps.

The following list shows some of the game applications that come with the system, or those that will be inserted by third-party developers.
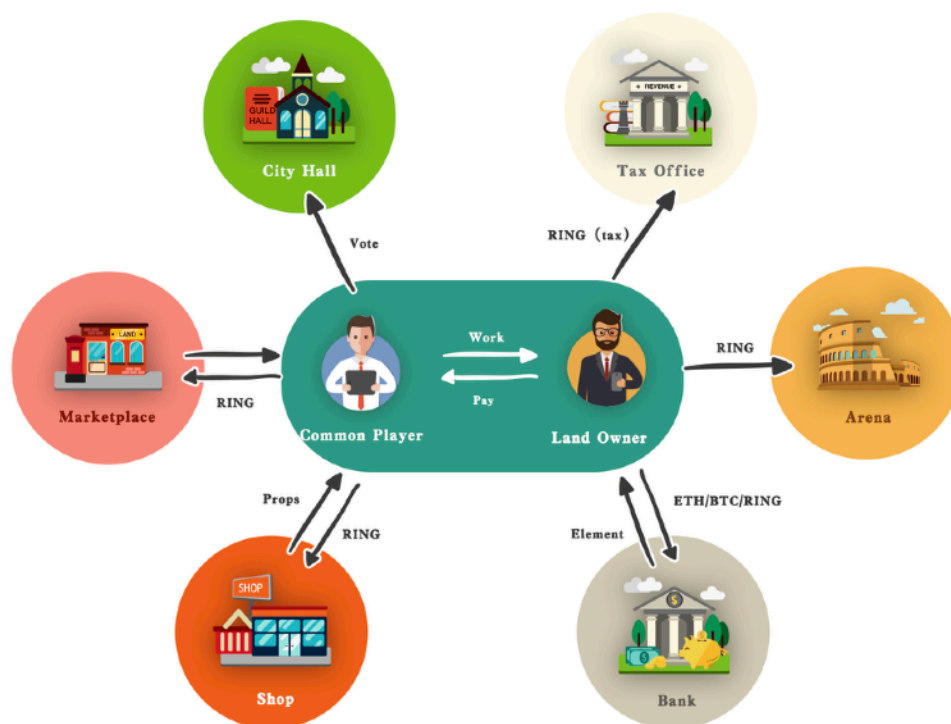
RING circulation

Virtual city hall

Evolution Land proposes to set up a city hall application and building on each of the major continents for the relevant management of them, including parameter adjustment, resource allocation and repurchase, voting , public proposals and decision management, elections. The City Hall will call on some of the underlying governance services provided by Evolution Land, including equity or asset proof services, voting template contracts, resource allocation and repurchase template contracts. Applications such as the City Hall will be an important component and facility for Evolution Land to implement DAO.

Virtual bank

This is an experimental idea of application: developers can open virtual banks and players save RING into virtual banks to get a certain amount of interest set by the developers and the developers can lend the RING to those in need for construction, but will require full assets to be mortgaged into the Dapp application. These assets can be lands, constructions, props, etc., when the asset price fluctuations and is not sufficient to support the value of the RING of the loan, the assets will be closed to stabilize the risk. The virtual banks are hugely different from actual banks. On one hand, token is recorded on the blockchain, and there is no concept of deposit reserve. Therefore, there is no monetary coefficient and a large effect of enlargement. On the other hand, the assets collateralized by borrowing may be non-standard assets. The market liquidity is not enough, and there is no need to immediately close the position, so there will be a lot of liquidity risk. Therefore, players need to cautiously check the credits of developers of virtual banks beforehand.

Land trading market

Land Trading Market is a virtual scenario and application for the purchase of land between players and trading of second-hand blocks, including functions like land auctions, browsing, and second-hand trades. The initial land of the first continent will be sold to the player through the auction, and the auction will use the Dutch auction method. After the user purchases the land, he can also hang out the land price range and the sale time, and sell it to other players through the second-hand trade.

Virtual stores

Third-party developers can develop apps like stores. Players can purchase props or other things in the store, which will be set with the progression of Evolution Land. If the purchased items can be used to enhance access to resources, they should be sold by the mainland openers. So there are two kinds of stores, one is the system store, and the other is the store that is inserted by third parties. For example, cat market (cryptokitties.co)

Arena

The arena is a PK game application that implements PK functions between players through player item attributes and luck values. Winning players can receive prizes. After players enter the competitive state through the arena, although it is possible to obtain additional rewards through PK, their assets are also risked of being attacked or stolen, which is more suitable for players with high risk preference, not suitable for those who do not play games but want their assets to be stable and value-added. Because Evolution Land is based on game assets, competitive PK games are not used as system games, but can be used as an ecological application. By introducing a PK-type game, players only need to agree to enter this type of risk-based game or state, so it is entirely feasible to play PK or mutual attack between them.

Mining pool

POW, POS or other mining algorithms types of blockchain projects can be introduced, and the mining algorithm can be contextualized, so that more client machines can be easily involved in mining and receive token as a reward.

Public channel and chat

Evolution Land public channels and chats help players to communicate and share more efficiently. The privacy and the security of the chat in the Evolution Land can be protected and enhanced with services such as point-to-point encrypted communication.

Non-blockchain application

It's not just the application related to the blockchain that can be bound to the building and connected to the Evolution Land platform. Because the Evolution Land platform is a game asset scenario and service, it will not limit the range of applications. Therefore, the traditional Internet application can also be used to access the Evolution Land. This greatly expands the application scope of the Evolution Land, similar to social applications, and portal applications (for example Dating sites, etc.), web site applications can be accessed, and Evolution Land can be used as entrances to these applications.

Design principles

Minimum design

In order to ensure that the system can self-evolve and reduce the conflict between various functional parts, the system designers should try to reduce the unnecessary design, leaving only the necessary protocol and rule design, and more specific Application design should be applied to third-party application whenever possible.

All services can be accessed through APIs

All that can open to third parties should consider providing APIs and allowing third-party resources to be introduced by publishing APIs or plug-ins in order for them to provide IP assets or participate in collaboration.

Sustainability

The principle of sustainability refers to the fact that after the development of the system is completed, with the design of a good economic model, just like the Bitcoin network or the Ethereum network, the game can run quite autonomously for a long time.

Upgradability

The early design of the upgradeable system may introduce some restrictions, just like the size of Bitcoin's block. In order to avoid these early design flaws which could affect the continuous operation and improvement of the system, the system contracts and features should be designed to be upgradeable as much as possible.

Architecture design

Technical architecture

The technical architecture of Evolution Land can be divided into: cross-chain network layer, consensus layer, content storage layer, real-time layer, domain specific state channels, account system according to the design from bottom to top.
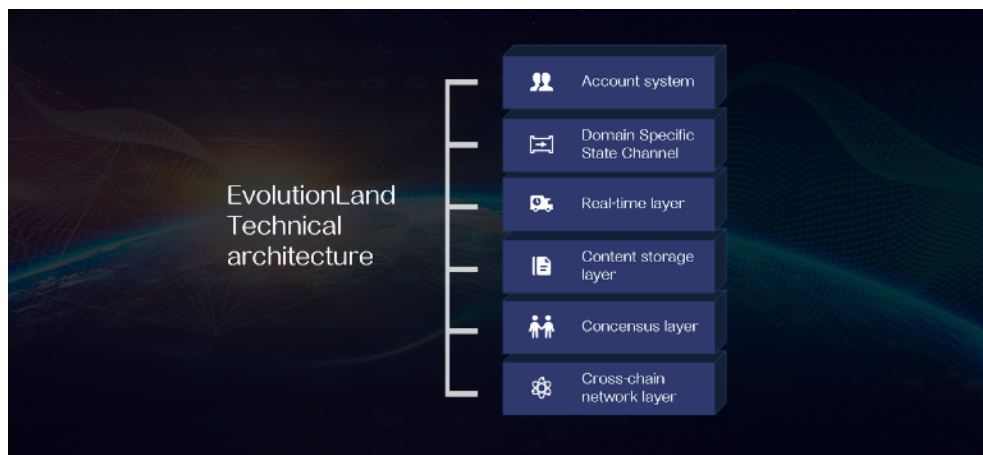
Cross-chain network layer

Evolution Land is running on the entire blockchain world network rather than a specific smart contract platform. Therefore, it is very important for Evolution Land to allow different continents to interoperate between different blockchain networks. In the Evolution Land different continent may be developed on different smart contract platforms and public blockchain networks, but each continent will only run on a specific public blockchain, so The topology of the blockchain networks on Evolution Land is isomorphic to the geography topology of the major continents of the Evolution Land. We will develop an independent Darwinia network for the use of cross-chain interoperability between different blockchain networks.
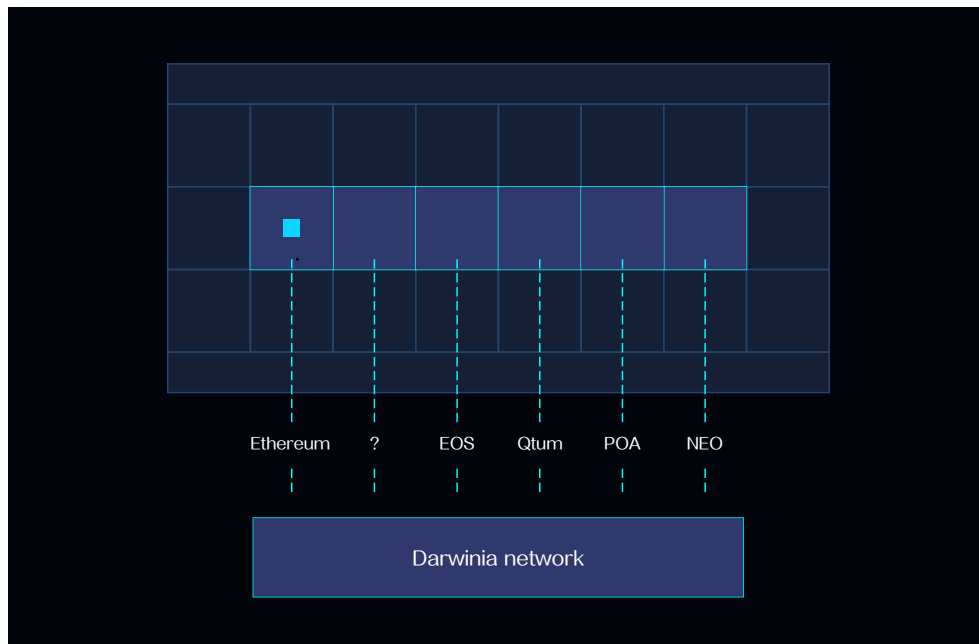
Consensus layer

The encrypted game token on Evolution Land will be recorded on the smart contract platform such as Ethereum, following the ECC20, ERC721 and other token standards to maintain a distributed ledger of the encrypted game token. These encrypted game certificates include standard assets such as System Token RING, Element Resource Token, Composites, etc., as well as NFT such as lands and props as well as adapter-inserted game assets that are from a wider range of exterior networks.

The economic rules and the token model of the Evolution Land are expressed in the form of code that are formed by means of blockchain's on-chain operations and smart contracts and then recorded on the blockchain.

Content storage layer

Like other blockchain games, Evolution Land has a lot of visual resources to store. These visual resources are not the same as the ownership data of the token. They usually take up large storage space and are not really similar to real assets, so they are not very suitable and necessary to be placed directly on the blockchain. Evolution Land will design a content storage layer for storing these data, including building model data, visual

image data, descriptive text files, and more. Technically, content storage can utilize cloud storage at the beginning, and later after using the token incentive mechanism, a decentralized storage service such as IPFS can be adopted.

Real-time layer

Blockchain games have many difficulties in terms of user-wide promotion compared to traditional games with the biggest one being user experience, because traditional game users have become accustomed to the software's real-time response and feedback. Evolution Land will establish a real-time layer between the blockchain and the user interface to improve user experience.

Real-time microservice

For the problem of blockchain network delay and synchronization, Evolution Land will let users updated with the latest information by providing server-side caching micro-services. At the same time, the game content is acquired, and the peer-to-peer communication between users will also be accelerated by the real-time layer.

Domain Specific State Channel

The transaction speed and TPS of the blockchain network are affected by the network size and delay. The second layer network technology such as the state channel technology (for example, the Raiden Network micro-payment) can help blockchain game reach the speed and experience that are of internet level in this scenario. When adding a off-chain state channel, the on-chain settlement channel will be transformed into a series of encryption credentials between rival gamers or gamer groups. The new part of these encrypted credentials can be submitted to the on-chain agreement or the smart contract for bank settlement. These series of certificate transmission and signature authentication channels between the opponent's participating parties can be abstracted into one state channel.

Previous state channels studies have generally focused on constructing a common state channel technology framework, such as the Raiden Network or Couterfactual. Instead, in the development of Evolution Land, we propose the concept and technical framework of the Domain Specific State Channel (DSSC). By summarizing and utilizing the design philosophy and ideas of the state channel, we will design the state channels technology combined with the specific business for the operations of different fields, so as to improve the efficiency of high-run operations and reduce the difficulty of design and development.

Currently, Evolution Land has adopted a number of domain-specific state channel technologies, including micro-payment state channel, reward airdrop state channel, etc. More new DSSC technologies are under development.

Micro payment state channels

In blockchain games, there are many digital currency payment scenarios. If each in-app purchase requires an on-chain payment, It will affect the user experience and service charge expenses. Therefore, Evolution Land will use a micro payment technology similar to mircoRaiden to establish a payment state channel that connected to the game system when the users are creating a user account or entering the game system, so that when the account needs to be paying with internal payment, it can use the previously established payment state channel to do so. For more technical details, please refer to the technical implementation of mircoRaiden 【11】

Reward airdrop state channel

In the account invitation reward system of Evolution Land, it is necessary to issue a token reward for the account address. Because the private key of the user's address is managed by the user himself, if the reward is issued or airdropped to the user through the way of the transfer of the token, then the cost of frequent disbursement of large amount of reward will be too much of a financial burden for the game system to handle. In response to similar problems, Evolution Land has designed a special state channel. Specifically, by making the disbursement and claiming of rewards into a special encrypted certificate, the beneficiary and the amount of the rewards will be marked inside the certificate, and the issuer of the certificate & the privileged account sign the certificate. User can require the certificate from the game system service at any time. After the user gets the encrypted certificate, it can be sent to the settlement contract on-chain for delivery, and the settlement contract will check the content of the encrypted certificate and whether it is issued by the reward issuer. Unlike the payment state channel, the reward airdrop state channel can be operated directly without the need to establish a state channel in advance.

In addition, in order to prevent the replay attacks and the expired encrypted certificate version, the inside of the encrypted certificate will be introduced into the design of a nonce that is uniquely incremented like the Ethereum transaction, so that the encrypted certificate will only be settled once and there is only one version (multiple versions use the same nonce, so nonce is similar to the credential ID).

Account system

Compared with the traditional account, the account used in the blockchain application also involves the management of the wallet private key. The running of the Dapp application is inseparable from the safe and credible running environment. Evolution Land will design and develop an independent account module based on the blockchain public-private key authentication system, and combine it with Dapp's running environment to provide reliable and convenient user account management functions for blockchain games.

Darwinia Network

The Darwinia Network is a underlying public blockchain designed and developed by Evolution Land. It will utilize cross-chain, sidechain and second layer network (such as state channel, Plasma) technologies to support the development of the Evolution Land and the future blockchain game world.

Cross-chain communication protocol IBC

The cross-chain IBC protocol is similar to Cosmos cross-chain protocol which is aimed to allow the crypto assets in the Evolution Land to circulation between different heterogeneous blockchain networks (including public and federated chains). At the same time, Darwinia Network will also adopt the design of hub chain and partition chain. IBC will also serve as the communication method between the hub chain and the partition chain.

Network topology

Now that we have a protocol that allows two heterogeneous chains to exchange encryption with each other. How do we create a blockchain internet network? One idea is to connect each blockchain in the network through IBC direct connections. But there are two problems with this method:

Number of connections: If there are 100 blockchains in the network and each partition needs to maintain an IBC connection, then there will be 10,000 connections. This will soon run out of control.

High trust requirements: When one chain receives the token assets of other chain, only one level of trust is required. In fact, the receiving chain only needs to trust the source chain's certifiers to freeze or not reuse the token. However, when a blockchain receives the token assets from the original chain of a token-through asset, several levels of trust are involved. This is because the receiving chain does not only have to believe that the source chain has frozen the token assets, but must also believe that all chains that receive the token assets will not double spend. As the amount of chain transfer increases, the number of chains that the receiver needs to trust will also increase. This is not unrealistic.

To solve this problem, Evolution Land uses a modular architecture similar to Cosmos, which consists of two categories of blockchains: hubs and partitions. A partition is a general heterogeneous blockchain, and a hub is a blockchain used to connect partitions. When a partition uses a hub to create an IBC connection, it can automatically access all other partitions (ie, send and receive) connected to the hub. Therefore, each partition only needs to establish a limited number of connections and use a limited hub. The hub also prevents double spend between zones. This means that when a partition receives tokens from a hub, it only needs to trust the original partition of the hub and hub itself.

Hub chain

The hub of the Evolution Land is a public blockchain on the Darwinia network, called the Darwinia chain, which is also a distributed ledger used to record the assets in Evolution Land.

Assets in the Evolution Land can be moved across the chain between Evolution Land partitions (blocks) through a special cross-chain protocol package. The Evolution Land Hub is responsible for controlling the release and total volume of the Evolution Land's assets and other non-invariant quantities to ensure that the volume control and release of the total amount between different partitions will not change. Content package transactions for cross-chain agreements must be transmitted from the original chain to the collection chain through the hub.

Consensus mechanism

The hub chain will use an improved algorithm based on Tendermint.

Blockchain game development platform

The developer community is an important force in the development of blockchain games. Evolution Land will provide blockchain game developers with comprehensive support to help them develop games and Dapp on open platform of Evolution Land. These support include blockchain browsers, account wallets, game development SDKs, Darwinia network suites, and more.

Blockchain browser

Evolution Land will develop a web-based and multi-chain-compatible universal blockchain browser that makes it easy for users to browse game assets and states in different blockchain networks and will provide developers with RESTFUL APIs.

Account wallet

The blockchain technology and smart contract platform represented by Ethereum and EOS are bringing the Internet into the Web 3.0 era, but the required safe and convenient environment for Apps to be running in Web 3.0 is not yet available. Users need to register, sign, and send transactions in a secure and convenient environment. This includes not only wallet clients, browser plug-in improvements, but also More functions support for

the Web browser function of the blockchain network, improve the readability of wallet signatures and transactions, and the integration of multi-chain account IDs. Evolution Land will improve in these directions to create a safe and convenient account wallet infrastructure for blockchain gaming.

Game development SDK

Evolution Land will not limit the direction of the future development of the game, but will develop in the direction of community management, so players and developers will participate more in the game production process. Not only players can participate in the design and production of the game, Evolution Land also APIizes the services and resources of the platform, and better integrates with game engines such as Unity and Godot to provide developers with an integrated game development tool and SDK . Making game developers an important participant and builder in the Evolution Land community, this shift in relationships, and the open accessibility of game assets provided by Evolution Land, may bring progress and change to the game production and distribution process.

Darwinia Network suite

Darwinia network is the most important blockchain network infrastructure and framework on the Evolution Land platform. Although the hub chain is the core part of the network, its design is open and convenient for other networks to Access and develop on. This is reflected in several aspects:

1. The chain components on the hub chain will be connected to the hub chain copy machine via Tendermint ABCI. Due to the componentization brought by Tendermint ABCI, it is convenient for other chain components to access.

2. Because the Darwinia network is a network topology with hub chain and partition chain interconnected, the developer can link other blockchain networks or federated blockchain to the hub chain under the premise of the cross-chain protocol IBC all together.

3. Because the network topology of the Darwinia network has lower requirements for the consensus mechanism and security of the partition chain, the blockchain developers can develop the sidechain of the public blockchain network and use this sidechain as a partition chain in the Darwinia network and connected it to the hub chain.

The development and deployment of the blockchain network is a complex engineering project with relatively high requirement. Evolution Land will make the blockchain network developing & deploying tools and services, on the basis of which a set of kits can be formed for developers to quickly and conveniently customize and deploy their own blockchain network, making full use of advantages of the Darwinia network and thus connect to the Evolution Land.

Interstellar asset coding standard

Encrypted assets are divided into standard assets and non-standard assets. Most of the standard assets or tokens in the market are based on the ERC20 standard (because the public blockchain is different, the standards will be similar but different). For non-standard Assets, also known as Non-Fungible Tokens (NFT), because game props or items may be unique, they should be classified as non-fungible assets. on Ethereum , there is also a smart contract standard similar to ERC-20 designed for NFT, called ERC721. It's likely that other public chains can also be able to develop standards like ERC-721.

Evolution Land is committed to creating an open, borderless network that is very different from traditional closed game systems. In order to make the ERC-721 of various blockchain networks easy to access, Evolution Land has designed a coding method for NFT assets, namely the interstellar asset coding standard. In any network, any NFT can get globally unique ID by this method, and through this ID, it can get its corresponding NFT ownership, attributes and other information.

The following is a brief description of the draft standard for interstellar asset coding:

Each NFT can be identified by the uint256 triplet. The three uint256 elements are: an uint256 length integer used to segment the source and attributes of the interstellar object, an integer of uint256 length used to map to the contract address of the target NFT, an integer of uint256 length used to correspond to the ID in the NFT contract.

The source and attribute of the interstellar item, if represented as a binary, consists of 256 bits (BIT). The interstellar item code is segmented according to the different parts of the 256 bits, which are used to identify different information.

1. The [0,7] bit is the size of one byte, used to identify the NFT's territorial number (birth place), and if it is an externally accessed NFT, it is to be set to 255.

2. The [8,15] bit is the size of one byte, used to identify the network ID of the network where the NFT contract is located. The ID number of the network will be enumerated by another standard.

3. The [16, 23] bit is the type of the item.

4. The [24,87] bit is the gene of the item.

5. A total of 168 bits, reserved for use in subsequent expansion designs.

Interstellar asset coding standard

● Birthplace ID   ● Chain ID   ● Type   ● Gen   ● Reserved

interstellar asset coding design

The contract address number, which is not a contract address, is mapped to the Evolution Land by an external contract address. It can be used to query the external contract address. Since different network addresses (such as ETH, EOS, etc.) may have different encoding methods, encoding is required.

Summary

The blockchain game and even the blockchain itself are still in their infancy, and there is no limit to the development of blockchain games. What Evolution Land is doing is to use game assets as its core to build a game ecology with infinite development possibilities.

On one hand, game assets is the derivative of RING or other kinds of tokens in the Evolution Land, on the other, they are the essence of the social interaction value generated by game interactions when users are gaming.

Building a game ecology with infinite possibilities means that the Evolution Land is a protocol ecology governed by all members. The evolution of the Evolution Land is jointly promoted by members of the planet, while the Evolution Land develops and improves the underlying facilities, such as the drafting and consummating of coding standards of NFT, the realization of cross-chain communication, the construction of Darwinia network, to achieve integration with other blockchain games, Dapp, and even other systems and public blockchains.

In summary, the Evolution Land has the following four characteristics.

1. Combine blockchain games with social interactions and explore the value of social elements

2. Promote and realize the decentralized self-government and build a common ecological environment.

3. Seamless integration with other blockchain games to achieve cross-game flow of game assets

4. Connect different blockchain networks to create a cross-chain game ecosystem

Evolution Land, a game that keeps evolving, being open to all newcomers who can stay connected, is waiting for you to join.

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