GameGraph Protocol

Freedom of travel between digital worlds

White Paper

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One pager

GAMEGRAPH - Across games! Across worlds! Freedom of travel between digital worlds

1. THE PROBLEM: PLAYERS DO NOT OWN DIGITAL ITEMS THEY BUY IN GAMES.

GAMERS' PROBLEM:

- Buying games and in-game items, players don't own them.
- The player cannot transfer digital values between games.
- Players lose their money and time spent in the game when the developer stops to support it.

DEVELOPERS' PROBLEM:

- Game developers don't allow to transfer the digital value between games by technology reasons.

2.THE BIG IDEA: NEW RULES FOR THE GLOBAL GAME INDUSTRY: NO LIMITS! NO BORDERS! *ONE PLAYER - MANY WORLDS!*

- Players can travel between game worlds without losses;
- Every player or developer may earn money on the GAMEGRAPH Platform;
- Free traffic for developers.

3.THE SOLUTION: PRIVATE TOKEN WITH FULL PLAYER EXPERIENCE FOR DIGITAL FREEDOM!

GAMERS' BENEFITS:

- Players transfer digital items and play experience from game to game without losses.
- All information about game objects is stored in the decentralized database and can't be changed by a third party.

DEVELOPERS' BENEFITS:

- Get free traffic through players movement between games.
- Game developers receive revenue every time then their items sold from player to player
- Game developers reach the game audience directly and launch games without multimillion budgets.

VIRTUAL BUSINESS BASED ON GAMEGRAPH. Investors holding discount GameGraph tokens may create virtual businesses: a digital items megamall, a chain of in-game casinos, marketing services, etc.

4. GAMEGRAPH ICO DETAILS

- **Total Supply 60 000 000**
- **Sale Supply 42 000 000**
- Hard Cap 30 mln $

- **Token Format** ERC20
- Private Sale Date   February 2019
- Public Sale Date March 2019

5.GAMEGRAPH FOUNDING TEAM
Igor Demchenko, CEO   Dmitriy Belenkiy, COO   Andrey Klenin, Games Lead Evgeniy Nikonorov CFO Irina Demchenko CMO

 OPEN A CRYPTO BUSINESS & CREATE CASH FLOW!

   GAMEGRAPH SOLUTIONS & SERVICES. Players, developers, investors holding discount GameGraph tokens may create own business accessible from all the games and services connected to the Protocol. It can be a virtual megamall trading in-game items, a chain of lombards or casinos in different games and even a service for games promotion.

1. Project description

1.1 Problems of the current game market

Problems on Player's side:
Having bought a game and values in it, a player believes that he acquires digital ownership. This is not true! Game developers consider all players purchases, as providing access. This rule is spelt out in the standard End-User License Agreement (EULA) for modern videogames.
- A player at any time may lose access to paid values if a game administration or a marketplace decide that the player violated the EULA of the project.
- A player loses money invested in digital values if a gaming developer ceases to support and continue developing his game or introduces new and more powerful items there.
- A player can't transfer digital values from one game to another or do it to another player.
- A player spends his money and receives in return not property, but a virtual item that can lose its value at any moment or taken away.

Problems on the game industry side:
- Customer acquisition cost is very high, the price of project creation and withdrawal to the market is growing.
- The high cost of marketing forces developers to make similar games, having avoided creating innovative games.

1.2 A way out of the situation

Distributed Ledger Technologies (DLT), which includes blockchain, allow building up the game market and bring it into the state when a game becomes a service (but not game values owner) and the developer receives a reward for provided services. Any game developer gets an easy way out to the market, understands in advance what his audience wants to see in the game, and knows the audience size.

Players also get a serious advantage. In crypto games, unlike games of traditional game industry, a player owns purchased game values. All data about the game objects and their characteristics are decentralized and can't be deleted or changed by a third party.

Reliability, unchangeability and long-term storage of digital value are provided at the level of the chosen decentralized network.

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1.3 GameGraph Protocol

GameGraph Protocol (GGP) is a set of smart contracts working with ERC721 tokens.
GGP local currency: Hedera Token.

GGP elements (smart contracts):
- Game platform contract: GGP_Platform
- Player data token contract: GGP_Player
- Game token store contract: GGP_TokenStore
- Token conversion contract: GGP_Exchange
- Connected game contract: GGP_Game
- Voting contract about connecting game to the Protocol: GGP_Vote
- Game entities data token contract (gamer's digital avatar): GGP_Persons
- Token contract of a constituent part of a game entity (collectables, abilities, etc.): HGP_Atom

1.3.1 GGP_Platform Contract

The contract implements the Protocol logic.

Data fields and contract methods examples:

playerCreate	It creates a new GGP_Player token during a player registration on the platform. The token is attached to a specific wallet number and can be transferred from one to another user by the ERC721 standard.
playerCloak	It erases the personal data of the token holder if it fills in.
gameRegister	It connects game contract GGP_Game to the platform. The contract is written according to the HPG standard and contains itself all the methods required to integrate the game into the platform. Registration is carried out by contract decision GGP_Vote.
gameUnregister	It disconnects the game from the platform. Disconnection is performed using the GGP_Vote contract decision.
gameList	It displays the list of games connected to the platform contract.
playerData	It gives player data. - Number….
tokenStore	It gives out the address of the contract containing all the platform game tokens.
gameTokenCreate	Attaches game token GGP_Persons to GGP_Player token.
gameTokenBurn	Burns game token GGP_Persons
investorTokens	It gives the list of investment tokens on gamer account GGP_Player.
Pay	It accepts payments from a player HGP_Player to pay for a game service GGP_Game for argument Reason. It's the only method of the platform payments to transfer money to a specified game's account. It also charges a fee at the rate set by the platform creator. It takes into account the presence of investment tokens on the player's account and automatically reduces the payment by the discount amount.
Exchange	Method for exchanging Game A tokens to game tokens B. Calls the

	corresponding contract method GGP_TokenStore.
getPromo	The platform issues a link to an advertising banner of a random connected game.

1.3.2 GGP_Player Contract

This is a digital representation of a player, his experience, personal preferences and accumulated game progress. Each game creates its own tokens GGP_Persons, which contains gamer progress in this particular game.

A player can convert progress in one game into another game progress. He uses the GGP_Exchange contract for this.

Data fields and contract methods examples:

Personal data	Nickname, email, etc. GGP_Player becomes the universal account, through which a player can log into any connected crypto game. Once the player moves it to a game product, the game remembers all authentication methods associated with it, gets the username, etc.
A set of avatars	Coming into a game, a player no longer needs to make settings himself, avatars, divisions and account description. It will be connected automatically. When registering on the platform, the game indicates a set of avatars that provides the user and conditions for obtaining them (the list of game achievements). Avatars get stored in Hedera HashGraph file storage.
Gamer's achievements	Upon registration, a game indicates a set of achievements, that a player can get in it and awards in the form of avatars and the number of achivePoints. It allows organizing Roster (list of platform leaders).
Trophies	Trophies can be used by games to attract players, as well as by the platform itself to celebrate players' achievements in visual form.
GameTokens	Links to tokens in GGP_TokenStore contract

1.3.3 GGP_TokenStore Contract

The contract holds all tokens of all games on the platform. It registers new tokens checking them for compliance with platform rules. It converts a token of one game into a token of another one by player request.

Each game stores own tokens independently. Only references to arrays in the game contract get stored in GGP_TokenStore.

Data fields and contract methods examples:

tokens	Array type: GameId, tokenId, OwnerAddress, GGP_Game address
registerToken	When a token created, the game calls this method to verify that the token matches internal platform rules and registration in the shared store.
burnToken	Burns game token
Exchange	Calls GGP_Exchange contract for final conversion of one game token into a token of another game.

1.3.4 GGP_Exchange Contract

When connecting to the platform, a new game indicates weight ratios in contract fields - GGP_Exchange template, from which GGP_Persons tokens have to be inherited. These weight ratios are used to match attributes of characters in different games.
In case there is no direct analogy, such data are written in the field GGP_Persons.rawData.

Data fields and contract methods examples:

ExchangePeview	The method is used for gamers to estimate results of future token conversion.
ExchangeDo	Converts tokens

When converting game A token into game B one, and immediately back to game A, we get token identical to the original one. Players pay only for the conversion process.

1.3.5 GGP_Persons Contract

A token contains game entity data relating to a particular game. A token has to be released by a game, transferred to another player, destroyed or converted into another game token.

Data fields and contract methods examples:

rawData	game data in JSON format. In the absence of direct analogue, it used to save data in transposing to another game.
ExchangeData	An array of players' game attributes used to move from game to game. Each attribute has the "Weight ratio in moving" characteristic.
Atoms	An array of entities tied to the game entity GGP_Persons. The array may contain references to contracts GGP_Persons and HGP_Atom.

1.3.6 GGP_Atom Contract

The smart contract contains data on an atomic and indivisible entity within HGP_Persons token (game subject, ability, or buff). It is an ERC721 token, can be separated from the contract of the HGP_Persons token and transferred to another player.

1.3.7 GGP_Game Contract

The contract implements the logic of the connected game and must comply with the platform rules.

Data fields and contract methods examples:

burn	Contract can be deleted
createToken	method of creating a new token, for token visibility on the platform, GGP_TokenStore.registerToken
receive	method for transferring funds from the GGP_Platform contract
withdraw	Transfers funds from the game contract balance to the game owner wallet
GameURL	Link to game site
GamePromo	Link to game advertising materials

1.3.8 GGP_Vote Contract

The voting contract for connecting games to the platform. When connected to the platform, a developer fills in the required form, indicates the link to the game contract and initiates the approval process.
After checking the application for compliance with technical requirements, the platform community votes in due course for the inclusion of the new game and, if approved, the game becomes available on the platform.

1.4. The Protocol and its services

GameGraph Protocol does not limit game developers in either the monetization model or game genres.It takes care of attracting players using the marketing budget. Games are required to provide quality service for players only.

A game developer has the right to use the f2p model in his game or to sell game tokens for a certain amount (similar to how it happens on buying games in stores like Steam). The developer can also create new tokens and chains of tokens as in CryptoKitties game.

Each game developer receives a promotion program for his game. Its rules and scope are included in the contract GGP_Platform.getPromo. But in turn, the developer provides an advertising slot in the game for demonstrating the advertising materials of other games platform.

The following services will implement on the platform:
- tokens conversion (transition from game to game)
- marketplace: game objects and characters trade, purchase and sale game accounts
- games registration on the platform (greenlite)
- crypto wallet with crypto-exchanges integration
- marketing campaigns
- chain service
- the set of ready contracts (GGP Framework)

1.4.1 Services for players

Tokens conversion

The service allows players to move from game to game, without losing their payments. The service is free and transparent to both a player and a developer. The developer gets the tool to enhance the impact of in-game actions since he can interest in the action not only the audience of his game but also the audience of the GGP platform generally.

Marketplace

Here players can sell their GGP_Player, GGP_Persons and GGP_Atom tokens. The player can sell both his skills (achievements saved in the GGP_Player token) and individual parts of his progress and experience (GGP_Persons token) or game items (GGP_Atom).

It gives players complete freedom to dispose of their game values. Developers receive the influx of paying audience, constantly moving from project to project.

1.4.2. Services for game developers

Easy game registration on the platform

A game must support GGP technical standards and be interesting for platform audience. There are no other restrictions.

Crypto wallet with crypto-exchanges integration

We will provide a ready-made solution for integrating crypto payments or use the corresponding solution of Hedera Hashgraph core network as soon as it is available for free access. This solution will allow to enter the mass market and attract broad masses of players to the platform.

Marketing campaigns

Game developers will be able to use the platform marketing service to promote their gaming projects.

Developer tools

A solution with a simple and intuitive API to simplify DLT integration into existing game projects. This solution will allow interacting with DLT from client applications through RPC calls to the node.

Core functions:
- API for user in-game authentication by wallet ID
- Sending transactions
- View transaction history

- Smart contracts compilation and placement
- Calling smart contract methods
- Subscription to smart contract events

GGP Framework

We create the game developers community, offering open source GGP Framework, which will contain all the necessary tools for creating crypto games.

To initiate the process, we will make contracts to implement the following logic:
- Auction
- Marketplace
- Game prize fund
- Guild bank
- Tournaments
- League Tables
- Matchmaking
- Loot boxes (lottery)

1.4.3. Platform development through consensus

In the process of platform developing, there may be a question about improving the platform contracts or adding functionality. The decision is made through the community approval process, using the GGP_Vote contract.

1.5. Games of GGP World

The project implements several games based on GameGraph Protocol to attract the audience at the start of the project and demonstrate the technology.

GGP Dragons Arena

The game is a battle of dragons. A player buys and grows his dragon, fight in the arena and getting wins in Hedera tokens. Dragons can be multiplied, sold and strengthened by fusing with other dragons.

GGP Trading Cards

There is the set of cards in the game - entities that fight each other on the battlefield. The goal of a player is to collect unique cards and win in the battle with the goal of earning currency, which can be spent, among other things, on the development of cards or the purchase of new ones.

GGP Heroes Adventures

The game process focuses on performing missions to develop other games characters. A player has a list of tasks to run it up. The more it runs up, the more complex tasks it provides. Tasks are an entity that has a timer, requirements for execution, and a reward.

As a prize, a character receives a reward that improves his characteristics.

GGP Cooking

The game is based on Cooking mechanics very popular in the Western and Japanese market. It's driven by dynamic gameplay, which is the process of cooking potions, making blades, etc. Nearest references are Potion Punch, Cooking Fever. Innovation is the advanced system of store development, learning different crafts and hiring craftsmen to automate the crafting process.

GGP Castle

The product is a reference for such commercially successful mobile games as Hustle Castle and Fallout Shelter.

The underlying idea is the base construction consisting of rooms. The base is inhabited by heroes which can be sent for upgrading or running missions. Any heroes action is a waste of time, after which they receive a reward in the form of new items of equipment or pumping characteristics.

The key product difference from competitors is the expansion of player capabilities and the depth of the game process. Since the crypto community is traditionally more hardcore, ready to understand complex mechanics and demanding depth and capabilities, it is their expansion that can be an important step forward in comparison with competitors.

1.6 Benefits

Value for players: the ability to move from game to game without losing progress and invested money. Complete security: token cannot be taken away, token data is protected, game payments are made by foreign currency.

Value for game developers: a part of all players payments within the platform, is spent on marketing budget for platform advertising. Thus, developers don't need to take care of independent traffic attraction.

Value for investors: early investors who bought GGP tokens at MVP stage, will receive preferential access to more services with the same amount of the Protocol tokens as the GGP network grows. With the growth of the GGP audience, the investor can freely sell its tokens to other users at a market price.

2. Who we are

Our team has been working together since 2005. Among the achievements is the development of Fragoria browser game, series of mobile games on franchises (Univer, Smeshariki), with more than 20 million installations. We have successful experience in game development and attracting players.

The team has experience in working with big data and payment systems, building highly-loaded servers and developing enterprise solutions.

In November 2017, we saw a new trend in the game market and made an experiment - EtherDragons Arena crypto game (www.etherdragons.world). In the process of developing it became clear that the market is waiting for the qualitative breakthrough and decided to take part in it, adding strong professionals to the team.

2.1. Project Team

Igor Demchenko, CEO

18-years experience as Executive in the field of software development and 14-year experience as General Producer of gaming projects buildup.

Igor was a co-founder and the producer of Datacroft LLC Company, inventing the idea and establishing Fragoria and Legend of Khans games with several million USD yearly sales.

He has concluded and created a project for "Univer" (shortly University) franchise being in the stage of operation.

For now, Igor is a Project manager at Gazprom media. Led teams up to 50 people, most of the projects finished under budgets and deadlines.He has considerable experience in building and running successful high volume systems with a peak of about 10 000 CCU. In December 2017, Igor created a project team and brought to release EtherDragons Arena crypto game.

Dmitriy Belenkiy, COO

15-year management experience. Headed the account management division in international gambling holding (business requirements collection, IT service level agreement, project portfolio management). 10-year business experience - product development, finance, lean startup, product design and prototyping. Took part in launching several startups, including newdigitaltimes.com - a platform for the automation of mobile apps development.

Irina Demchenko CMO

Experienced in managing positions in advertising and marketing, and in game marketing. Irina has experience of federal brands creation and promotion, managing integrated marketing. Applicant of Executive MBA of the Stockholm School of Economics.

Evgeniy Nikonorov CFO

Experienced in leadeing. Founder and CEO of a group of companies with over 400 staff.

Co-founder of an IT company/SKOLKOVO participant.

Andrey Klenin Game Front-end Lead

Specialist in computer graphics and front-end programming. 20-years experience in game development from the first 3D games to modern mobile ones. Participated in the establishment of the mobile app business unit in New Disc Company. Worked as the lead artist of Fragoria game. Participated in the creation of a project for Univer franchise for TNT TV channel. 6- year business experience. The author of the series of games "USSR Logos", become a hit in 2014. Now Andrey is in the process of establishing and production of a bunch of mobile games based on Kikoriki ("Smeshariki") animation series.

Evgeniy Beloglazov, Game Back-end Lead

Deep understanding of lower-level client systems (transport, graphics formats, memory handling, performance optimization, data exchange interfaces, class and data structures), requirements and limitations of mobile devices. He has all the necessary knowledge to deal with the project architect to optimize the performance of the given devices.

Pavel Rumkin CTO

Developer with more than 10 years experience. Of these, 7 years of development on Node.js. One of the most experienced developers at Node.js in Russia, an active technology popularizer. Included in the top 3 blockchain authors on Habr. A full-cycle specialist in server and web applications development.Pavel worked in the largest distributor of online video advertising in Russia, Vibum Company. There he implemented the accounting framework for ad impressions with fraud protection. Peak loads of up to 5 million hits per hour with up to 1-second response
Collaborated with Crypti (now Lisk.io, ranks among top 20 CoinMarketCap), as a contract developer. Later developed a sandbox for running distributed applications on the basis of libuv and google V8, mastered C ++ and the above libraries. In 2018, he developed a standalone wallet with the ability to launch DAPP on the Ethereum network entirely based on the web-stack.

2.2. Team achievements

The team members participated in the implementation of the projects :

- Browser game **Under Control (Crisis), 50 mln players worldwide**
- Browser MMO project **Fragoria**
- A bunch of games themed on "**Kikoriki**" brand (http://www.smeshariki.mobi/)
- Match 3 for mobile devices "**Универ",** TNT brand
- Browser game **"Vengeance"**$10000 / monthly in 2007
- Client action-RPG **Panzar**
- Mobile game **Evolution: Heroes of Eutopia**
- Browser game **Dakota Farm Adventure**
- Browser RPG project **Legend Of Khans**
- Card RPG battler for mobile devices **Dungeons of Evilibrium**

- Puzzle for mobile devices **Draw Jelly for Kakao**
- PvP Arena for mobile devices **Etherlords (Arena)**
- Match 3 for mobile devices **Rolling Yarn: Amazing Puzzle**
- Mobile strategy **Mushroom Wars**
- Quiz **Pocket Blonde: Your Cyber Girl**
- Racing **Road Smash 2: Hot Pursuit**
- Mobile shooter "**Get the Gun"**
- Match3 for mobile devices "**Treasure Master: Dragon World**"
- Puzzle for mobile devices "**Kick and Think**"
- Puzzle for mobile devices "**Supernatural Words**"
- Puzzle for mobile devices "**Supernatural Rooms**"
- Puzzle for mobile devices "**Logos of USSR**"
- Turn-based RPG **Golden Land 2**
- Crypto fighting **EtherDragons Arena** (pre-launch stage)

Project links:

http://fragoria.com
https://vk.com/app4527932_-68477742
https://itunes.apple.com/ru/app/%D1%83%D0%BD%D0%B8%D0%B2%D0%B5%D1%80/id1127747539?mt=8
https://play.google.com/store/apps/details?id=com.datcroft.getthegun
https://play.google.com/store/apps/details?id=ru.klenin.pryncess
https://play.google.com/store/apps/details?id=ru.klenin.superwords&hl=en
https://play.google.com/store/apps/details?id=ru.klenin.rooms&hl=en
https://play.google.com/store/apps/details?id=ru.klenin.SUQuiz&hl=ru
http://www.smeshariki.mobi/
https://itunes.apple.com/us/app/dungeons-of-evilibrium-rpg-card-battle-role-playing-game/id828362719?mt=8
https://itunes.apple.com/se/app/draw-jelly-for-kakao/id756725051?mt=8
https://itunes.apple.com/ru/app/etherlords-arena/id808158334?mt=8
https://play.google.com/store/apps/details?id=com.arkvar.partria
https://itunes.apple.com/us/app/mushroom-wars/id590233979?mt=8
https://itunes.apple.com/us/app/mushroom-wars-space/id864880281?mt=8
https://play.google.com/store/apps/details?id=zw.voice.pocket.game.en&hl=ru
https://play.google.com/store/apps/details?id=com.creativemobile.roadsmash.two&hl=ru
https://ru.wikipedia.org/wiki/%D0%97%D0%BB%D0%B0%D1%82%D0%BE%D0%B3%D0%BE%D1%80%D1%8C%D0%B5_2
https://itunes.apple.com/us/app/cake-break/id1134516647?mt=8
https://vk.com/app5610455
https://fotostrana.ru/play/logic/gurmaniya/
http://game.etherdragons.world

Project Advisors

Sergey Belets

CEO and co-Founder Hypersphere (ex-Wukker Team), Hedera Hashgraph Ambassador

Alexander Belets
DLT Advisor

Matthias Beele
Game Design Advisor

Matthias is a game design expert and creator of Seafight and DarkOrbit, two of the financially most successful browsergames of their time. He was one of the first to utilize Adobe Flash as core technology for cross-platform realtime MMORPGs, to use RAM-Discs (SSD predecessor) in game servers, has been an advocate for episodic content and an avid supporter of Unity since 2008, validating his intuition for future technologies and concepts. Originally a Graphic Artist and Creative Director with 28 years experience, he dove into game design and became a passionate specialist for game mechanics, virtual economies, storytelling and game psychology with now over 12 years experience. He worked across the globe with game design pioneers like Brian Green, for and with companies like Bigpoint, SevenGames, NBC Universal or Spil Games and is the founder of Phantom AE, an arcane design- and think-tank.

3. Roadmap

Q3 2018	Develop GGP architecture and launch the development of Dragons Arena game
Q4 2018	Protocol MVP + GGP Dragons Arena release + launch the development of Heroes Adventures game
Q1 2019	Heroes Adventures game release The release of "Tokens conversion" service
Q1 2019	GameGraph Protocol ICO
Q2 2019	GameGraph Marketplace release Establish GGP Fondation (GGP promotion, developers and gamers support)
Q2 2019	The release of "Games registration" service on the GameGraph Marketplace Launch the development of TradingCards and GameGraph Cooking games
Q3 2019	Launch the program to integrate game developers on GameGraph Protocol The release of "Marketing campaigns" service
Q3 2019	Engaging Partners for GGP evolution GGP Framework release
Q4 2019	"Crypto wallet" service run-out
Q1 2020	TradingCards и GameGraph Cooking games release
Q4 2020	Achieving the size of GGP Marketplace audience of 300,000 MAU
Q4 2021	Achieving the size of the Marketplace audience of 1 000,000 MAU

Q1 2022 | Transferring functions of the Protocol evolution and management to the Community and GGP Foundation

4. Circumstances

At the moment, there is a business opportunity: to create a killer feature that generally allows to increase the game market size and partially transfer the market turnover to decentralized solutions.

The market pains described in the section "Problems of the modern games market". This is an urgent need for both players and a lot of game developers.

The killer-feature sounds like this: "everything that you get in games - belongs only to you."
Since traditional gaming companies will never be able to agree on the consensus on this issue, disruptive crypto game developers get a good chance to enter the market with such proposal.

This feature could be implemented only within DLT and on a platform that allows making micropayments with bank speed. Of existing DLT solutions, only Hedera Hashgraph meets technical requirements of the gaming industry here and now.

It makes possible to attract game developers filling the platform with games and making players interested.

The most important part of any platform, especially a gaming one, is the Community. GGP community is players that interact with each other and game developers through the infrastructure provided by the Protocol.
The main task of the GGP team is to create links between users and developers, to promote the exchange of digital goods, contributing to the creation of value by all participants. Effective platforms can quickly and easily increase in size, multiplying the value of the network effect. They are valuable thanks to the community formed on these platforms

The main GGP goal is to create incentives to unify the game community, offering the best quality games and digital products. To generate incentives, it requires data about developers, players, created units of value, and products that platform participants exchange.
In 2-3 years the GGP team plans to completely transfer the Protocol management to the Community and GGP Foundation.

GameGraph global perspective is the entry into the game mass market and complete decentralization.

Besides transaction speed, a number of additional criteria were used to select among modern DLT solutions the technology platform for the Protocol implementation.
Currently, the mass consumer lives in the fiat world, because in comparison the point of simplicity of transferring funds to the currency of the chosen crypto platform was introduced.

	Ethereum	NEO	Lighting	Waves	EOS	Hedera HashGraph
Speed	1	4	5	2	3	5
Scalability	1	5	4	3	4	5
Smart Contract Execution price	2	3	2	5	3	5

Smart-contracts применимость в проекте	10	10	1	1	5	10
Smart-contracts speed reaction	1	2	5	5	3	5
File storage	0	5	0	0	5	5
Fiat gateway Usability	1	1	1	3	1	2
Decentralization	5	3	5	2	2	2
Total points	21	33	23	21	26	39

The table shows that even without taking into account the process of transferring the fiat, Hedera Hashgraph is confidently leading.

Given the clear focus of Hedera on the corporate market, in the future, we expect the emergence of a simple and transparent (for the end user) mechanism of bank transfers to/from the project.

Transition mechanism to Hedera Hashgraph

The team developed GGP Dragons Arena game, which will be ported to Hedera HashGraph.
As present a part of the game logic is outside of the distributed ledger, we need to transfer these blocks into Hedera.

We'll do the following:
1. realize a set of GGP contracts
2. transfer all the offline logic of the game (work with data, fight calculation) in Hedera HashGraph smart contracts.

At the output, we get the project consisting of a web server, a game client and game smart contracts in Hedera HashGraph.

5. Tokenomics and Use cases

There to types of internal tokens used by GameGraph Protocol: IT and G2. All GameGraph services and transactions are paid for in Hedera tokens.

5.1 IT Token

IT token (Intergame Transferable Token) is an internal GameGraph token that used to transport gamers accounts, digital avatars, virtual items and in-game experience between games and digital universes.

IT token parameters:

1. ERC20 standard compatible;
2. The total token supply is unlimited;
3. It's separable into parts;
4. The token is traded freely;
5. It can be signed up or gifted to another person without limitation.

A gamer register in the GameGraph protocol for the first time and get it for free. He plays any game he likes and move this token between games. Any player may have as much IT tokens as he wants.

5.1.1 Use cases

#1 A gamer plays a game about a dragon world. His character is a dragon fighting on a battle arena with other players. The gamer buys or wins in a battle the unique armour for the dragon. The armour is a variety of IT token. At some point, the player wants to cross to another game - a space-based role-playing game. In the space game, the player is a spaceship pilot who can update his spaceship. As there is armour class for spaceships in this game, the player can transfer the dragon armour there. Ths token will become a spaceship armour. In the traditional game industry, the player has to leave all his items in an old game and to start from scratch in a new one.

#2 A game cross from a Medieval strategy to a racing. He owns gold and a magic potion. These classes are off in the racing. So the gamer sells them on a marketplace and crosses to the second game, saving his in-game investments and profits.

1.2 G2 Token

G2 (GameGraph) is a discount and service token. G2 holders get discounts on services made on GamegGraph Protocol. Only G2 token gives its owners the right to open business units on the Protocol (virtual marketplaces, in-game shops, B2B services, etc.)

G2 token parameters:

1. ERC20 standard compatible;
2. The total token supply is 60 000 000;
3. It's available during ICO only;
4. It's separable into parts;
5. The token is traded freely;
6. It can be signed up or gifted to another person without limitation.

5.2.1 Use cases

#1 Found a business on GameGraph. A G2 holder has 2000 tokens. It needs 500 tokens to found a business unit. So the token holder can open four businesses. It can be marketplaces in different game. For example, a tavern in a fantasy world, a marketplace on an asteroid to trade metals mined in space, and a casino in a game like Grand Theft Auto. The fourth business unit is a marketing service to help developers promoting games on the GameGraph Protocol. The G2 holder may operate his business empire from one account.

#2 Get a discount on a GameGraph service. Any service on the Protocol can be bought or rented without limits. However, G2 token owners get cuts holding the tokens on their service accounts. A developer can use GameGraph Framework or API at a reduced price or even for free if he holds a certain amount of G2 tokens. The detailed tokenomic model is described in the GameGraph Black Paper.

5.3 Token model

The economic model of the G2 discount token is based on Sweetbridge Foundation research.

G2 is not cancelled (or burned) after use but remains in owner's possession for regular use. Discount token holders activate them in their Hedera wallet to get a discount using GGP services.

GameGraph Protocol calculates a service cost when using G2 according to the formula

$$C(t) = \begin{cases} t \le \frac{T}{U} & c \cdot (1 - \frac{t \cdot U}{T}) \\ \text{else} & 0 \end{cases}$$

5.1

where *C(t)* is the fiat cost paid by a user for a given period of time, when activates **t** number of G2 tokens in the service's smart contract; *U* is the total number of users who have subscribed to the service at the moment; *T* is the total number of G2 tokens activated on the Protocol.

Example. A product provides its services for $ 10 per month. It has 1000 registered users. In total, 100,000 tokens are activated in the system, used to access various platform services. In this case, one user needs to own 100 HGPT to access to the product for free.

Users need to take additional steps to activate G2 tokens and start receiving discounts according to the above formula. This formula confirms that the discount increases as the network grows (parameter U).

The value $t_{max} = T / U$ is called *activation limit*, so users can't activate more than t_{max} tokens. In this case, $t_{max} = t_{free}$, the number of tokens to get access to service for free.

The discount depends on GGP network utilization and calculated by the following formula:

$$f(t; X) = \frac{t \cdot X_U}{X_T}$$

(5.2)

where t is a number of tokens activated by a user at the time of the selected service utilization, X_U is a total number of units of services on GGP, X_T is the total number of tokens activated on the Protocol. The discount can reach 100% allowing some users to access the GGP services for free. To do this, a user needs to activate a certain number of tokens calculated by the formula

$$t(y)_{free} = y \cdot \beta \cdot \frac{X_T}{X_U}$$

(5.3)

where *y* is a number of ordered units of the service; *β* is the coefficient of the GGP Protocol. *(1 / β)* denotes the economic discount factor. This value controls the total cost of GGP services for which the economy can make a discount. β-constant is manually determined once and for all time. The value of *β* controls the size of the G2 token activation effect influencing the decline in service prices. A share of expenses is determined by the parameter *Φ = 1 / β*, the recommended value *β = 10 i*s associated with 10% of the cost of all Protocol services compensated by G2 activation.

The monetary value of G2 (token discount value) is calculated as follows:

$$U(X) = \frac{C}{\beta} \cdot \frac{Xu}{Xt}$$

(5.4)

valid for *t* in the range *0 ≤ t ≤ t_free (1; X)*, where *C* is a price of one unit of a Protocol service. With increasing of the GGP network usage, the value of the utility function will grow, giving the first platform users the advantage of having tokens at their original cost.

GGP will charge a small commission for its services to avoid a discounted negative cash flow (when payments from users are not enough to cover costs of maintaining services). The commission is calculated by the formula:

$$\text{fee} = \frac{1}{\beta} \cdot 100\%$$

(5.5)

The service cost includes this commission for all types of users.

Example. Bob bought 100 G2 tokens at the GGP prototype stage. This number of tokens lets to use the GGP Framework for free. A year later, the amount of G2 required for free access is 40. The remaining tokens Bob can transfer to another user, sell through the exchange or use to get discounts on other GGP services.

5.4 Risks for investors

- This is DLT (distributed ledger technology), but not blockchain.
- The network is managed by the Council of 39 large companies that take decisions on the vector of the Hedera platform evolution.
- Any decentralized application can be deleted from Hedera by the Council's decision.
- Hedera ideology is ambiguously accepted by the crypto community

Despite the above risks, currently Hedera Hashgraph is the only solution combining safety, speed and economic feasibility. The project team is open to discuss with the community other options for the technical implementation of the Protocol.

6. ICO parameters

6.1 ICO Token Allocation

6.1.1 Issuing Tokens

G2tokens will be issued as a part of Partner Sale and Crowd Sale. The total issue is limited by 60 000 000 G2 tokens.

6.1.2 G2 Token Allocation

The tokens will be widely distributed among GameGraph customers (investors, gamers and developers) for use in the Protocol, and to impulse GameGraph development and promotion.

The tokens will be distributed as follows:

Beneficiary	Allocation, %	Tokens
Advisors	5	3 000 000
Community	5	3 000 000
Team	20	12 000 000
Partner Sale	30	18 000 000
Crowdsale	40	24 000 000
Total	**100**	**60,000,000**

Advisors —A team of experienced professionals.

Community —rewards for first GameGraph customers (players and developers) and The Protocol services testers.

Team— all key employees of GameGraphteam.

Partner Sale— Tokens may be purchased only by invitation in Q3 2018. Invitations will be distributed to qualified investors and businesses that contributed significantly to the platform's initial development and/or plan to play a big role in GameGraph Protocol future success. **Crowdsale**— It will last for 2 months (or until the tokens are all sold).

Stage	Date	Description
Partner Sale	February - March 2019	In this stage, 18 000000 tokens (30%) will be sold.
Crowdsale	April 2019	24 000 000 tokens (40%) will be sold in this stage.

6.1.3 Crowdsale Targets

The price of G2 token during the Crowdsale is set at $0.5 USD.

The Hard Cap is set at $30,000,000 USD.

Any tokens not sold will be added to the Reserve fund.

6.2 Use of funds

The chart shows how the funds collected during GameGraph ICO will be administered.