

# PÂRSEC FRONTIERS

A persistent game universe with  
a transparent, blockchain-based economy

DRAFT WHITEPAPER

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## Abstract

Parsec Frontiers is a massive multiplayer online persistent world with a virtual economy blockchain. Players can explore the Milky Way galaxy, extract and trade resources, freight goods, attack others at their own peril, manufacture new and more advanced objects, research technology, create or join alliances and utilize ownership of space stations and resource extraction rights to ultimately expand their empire and wealth. All in-game items and resources are stored on a blockchain.

Parsec Frontiers' economy is open and player-controlled. The currency for facilitation of trade and measure of wealth are Parsec Credits - an ERC20 token shortened to PARSEC. It is used for transactions on trading exchanges throughout the galaxy, for transactions between the participants and for transactions with the

backend system. Parsec Credits will be traded on secondary markets against major coins like BTC, ETH as well as fiat currencies.

**By using blockchain technology, Parsec Frontiers advances virtual economies to a new level. The project provides transparency and gives complete confidence in resources and ownership inside the world. Additionally, holders of in-game assets and in-game currency can quickly trade in and out of their holdings for fiat currencies or other cryptocurrencies on exchanges.**

into investable assets alongside more traditional asset classes. Combined with a deflationary mechanism related to economic activity, holders of Parsec Credits should see steady value growth.

The project is undertaken by renowned game development studio Artplant, based in Norway and Russia. The team of 15+ people have 5-25 years of game dev experience, and extensive experience with MMOs and virtual worlds.

This document further details how the world will be created, the technical considerations and the mechanics of the economy and gameplay.

# 1 Overview

Parsec Frontiers features a virtual economy where all transactions of items in the game are stored on a decentralized ledger. The transparency this brings is an innovation for online games that enables new business models in the industry, and revolutionize how live online game services are continuously developed and used. We believe this will be an important trend in the games industry going forward.

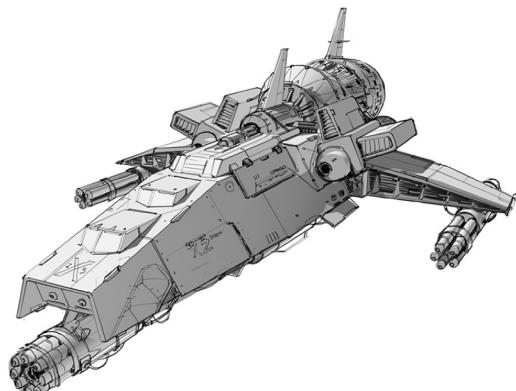
## 1.1 Introduction

The popularity of massive multiplayer online games and virtual worlds has grown tremendously during the last 20 years, and some of the largest services have seen tens of millions of users. Advances in internet connectivity, in computation and visual quality as well as an acceptance of gaming as a normal and mainstream pastime are important reasons for this. Due to the time invested in such games or virtual worlds, it is natural that progress, skills and virtual items resulting from player participation gains a tangible value. Sometimes illicit markets are created outside of such games to facilitate transactions of in-game currencies for real money.

As blockchain technology advances, several public projects are working to solve problems relating to scalability. Many projects are exploring new algorithms and architectures to either improve and expand existing platforms, or are simply creating new ones.

An MMO that supports millions of players with thousands of digital asset classes with corresponding positional information is a highly complex and demanding use-case for blockchain technology. Having all such in-game transactions on a main ledger platform such as Ethereum or Bitcoin would both cost millions of dollars per day, not to mention that current network validation capacity would bring them to a halt. Confirmations would also be so slow that usability in the game would suffer.

Parsec Frontiers plans to combine Ethereum with an open, public custom chain with permissioned for cost, speed, capacity and storage reasons. As scalable and cost-effective platforms become mainstream, switching to a new platform will continuously be considered.



## 1.2 The Foundations of Virtual Economies

Virtual item transactions have become commonplace in games, and the norm is now that online worlds develop humanistic economics. This highlights to all those involved with transactions that there is a real value attached to virtual items. The virtual market functions similarly to real markets, with fluctuating markets from fluctuating supply and demand enabling profits to be made.

Parsec Frontiers will be both an online game and a complex virtual economy, both largely impacted by decisions made by the players. Accountability of the economy is ensured by the virtual economy blockchain, which enables players to have full certainty on the number of items available and every single digital asset transaction.

Though there are many different motivations for purchasing virtual items, it is evident that a major ingredient to a successful multiplayer world is enabling social interaction. The longer participants are playing online and together, the more they invest emotionally and psychologically in the game. Parsec Frontiers will therefore be a game where joining alliances and interacting with other players in the world will be crucial to the experience.

## 1.3 Using blockchain for asset ownership

Online games have grown in importance and value over the years, and players are often spending as much money in a game as outside of it. As game assets in games have become valuable, accountability and proof of ownership is an important challenge in the face of cyberattacks, theft and fraud.

**Blockchain technology is a fast-moving field, constantly solving new problems discovered as the popularity and expansion of the technology grows. Some of the most popular platforms still have challenges regarding transaction costs, validation time or block time, capacity and handling storage of a large ledger.**

in-game assets. By registering ownership of assets on a blockchain we also provide full access to virtual goods from outside of the game client and give players the ability to securely trade or sell them.

## 2 The game

### 2.1 Vision

After Earth's demise, humanity is desperate to colonize the galaxy and rebuild civilization. It is a galaxy without space stations, travel gates, spaceships and advanced technology. It is up to the players to explore, expand and develop this new world together.

The game universe is based on the real Milky Way galaxy, and the players are free to explore and exploit any corner of it. As they do, the persistent shared world will evolve together with the player base, from the infant gold rush age of an unexplored galaxy, to later stages of prosperity and player-run interstellar societies - and war for profit, expansion and glory.

At the heart of it all lies the virtual economy blockchain. Where other online games give players virtual value to build as they play, the time invested in Parsec Frontiers will result in tangible real world assets that can be invested or cashed out. Previous games have proven that our game design is one that will encourage hundreds of hours of trading and exploration, and infuse real economy into the virtual one. Thus, increasing the player's engagement into gameplay that can be both fun and profitable.

### 2.2 Backstory

*"We discovered interstellar travel around the time we destroyed our own planet. Some people typically pointed out that necessity is the mother of invention. Others claimed it was proof of divine intervention – that for some reason their gods wanted humans to exist. Most, though, were too busy trying to carve out a new life for themselves. And in chaotic aftermath of the apocalypse, the opportunities are fantastic, but so are the perils.*



*Freighting goods between solar systems became the most lucrative activity, and quickly created the need for a common currency. Not trusting any of the attempts from interstellar federations, a group of wealthy individuals came together and created the Parsec Credit, a currency controlled by its owners, modeled after the cryptocurrencies that rose to popularity in the early 21st century."*

## 2.3 Gameplay overview

Parsec Frontiers builds on the 4X game genre, adding its elements into a persistent, online sandbox where players are free to explore and colonize the Game Universe. You are alone

in the universe, but through collaboration with other players you can accomplish grand things:

**Explore:** Pilot your ship freely through the galaxy, flying to any point of interest or celestial body in a fully populated 3D world with other players in it.

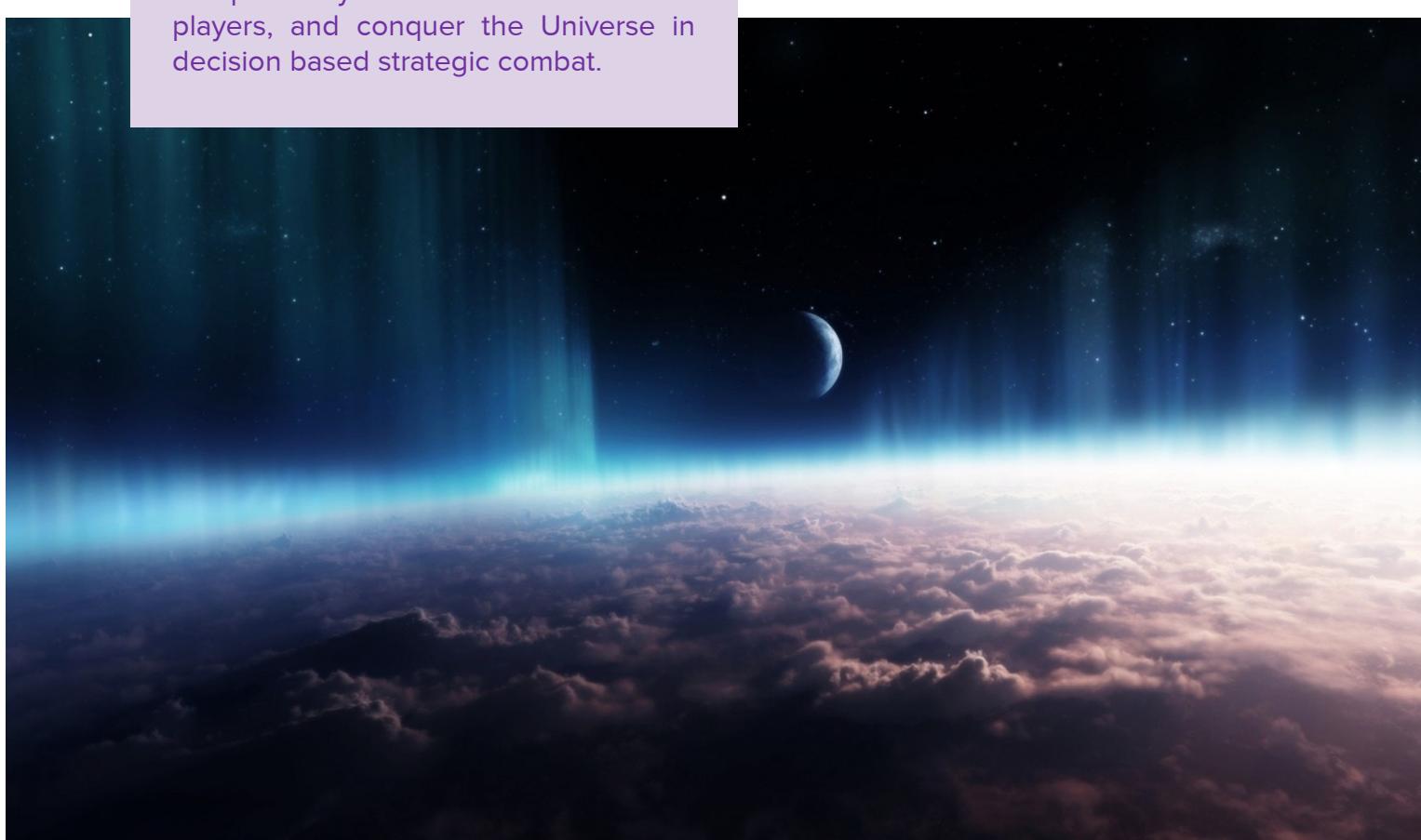
**Expand:** Erect structures and settle colonies on planets, choose how to develop them with new buildings and technologies while balancing their every need.

**Exploit:** Scan and mine surfaces for resources and extract them manually or through facilities, construct manufacturing plants and develop modules which can be combined into increasingly larger projects all the way from bullet shells to massive space stations.

**Exterminate:** Engage in space piracy or interplanetary warfare with other players, and conquer the Universe in decision based strategic combat.

Gameplay will be introduced modularly, and the game will grow together with the community. From the early exploration days, to the later interstellar civilizations and beyond.

The game is continuous, meaning that actions initiated by the player keeps unfolding when she logs off. Spaceships en route to destinations are still moving, research is still being conducted, resource extraction still taking place and production work still commencing. The player may configure notification settings to receive SMS or email alerts when not online.



## 2.4 Travel and exploration

When humanity left Earth, the distortion drive was still a relatively fresh technology. Only a limited number of ships throughout the planet could be fitted with it in time. By shifting space around the ship these pioneers could displace forward at speeds far exceeding the speed of light, and immediately set out to find a new home before the supplies aboard would run out.

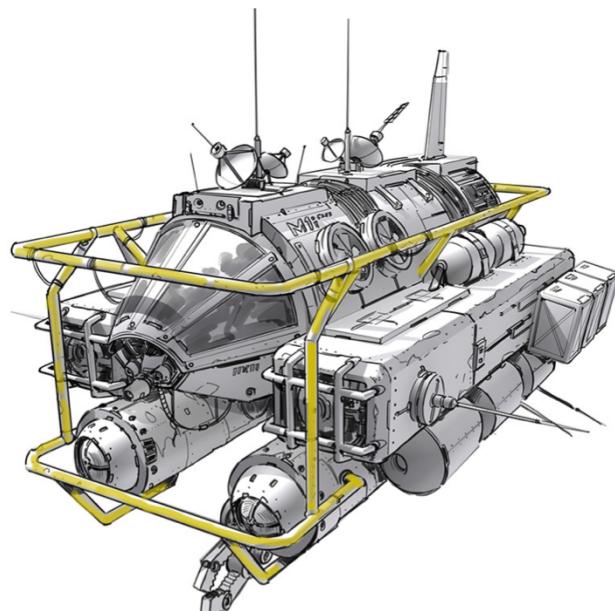
Travelling over the vast distances between star systems still takes a lot of time, and deciding how to spend that time is one of the most important decisions commanders face.

The player can choose any celestial body on a 3D map of the galaxy. Players can also plot coordinates for journeying to other unknown destinations.

The galaxy is still unexplored during the early phases of the game, and the pioneers must take a leap of faith when choosing their initial destinations. The players will eventually gather more information about locations of planets and moons, resource allocations and other potential points of interest. Information will carry great value, and players choose how to profit from gathering intel - including whether to share information with others.

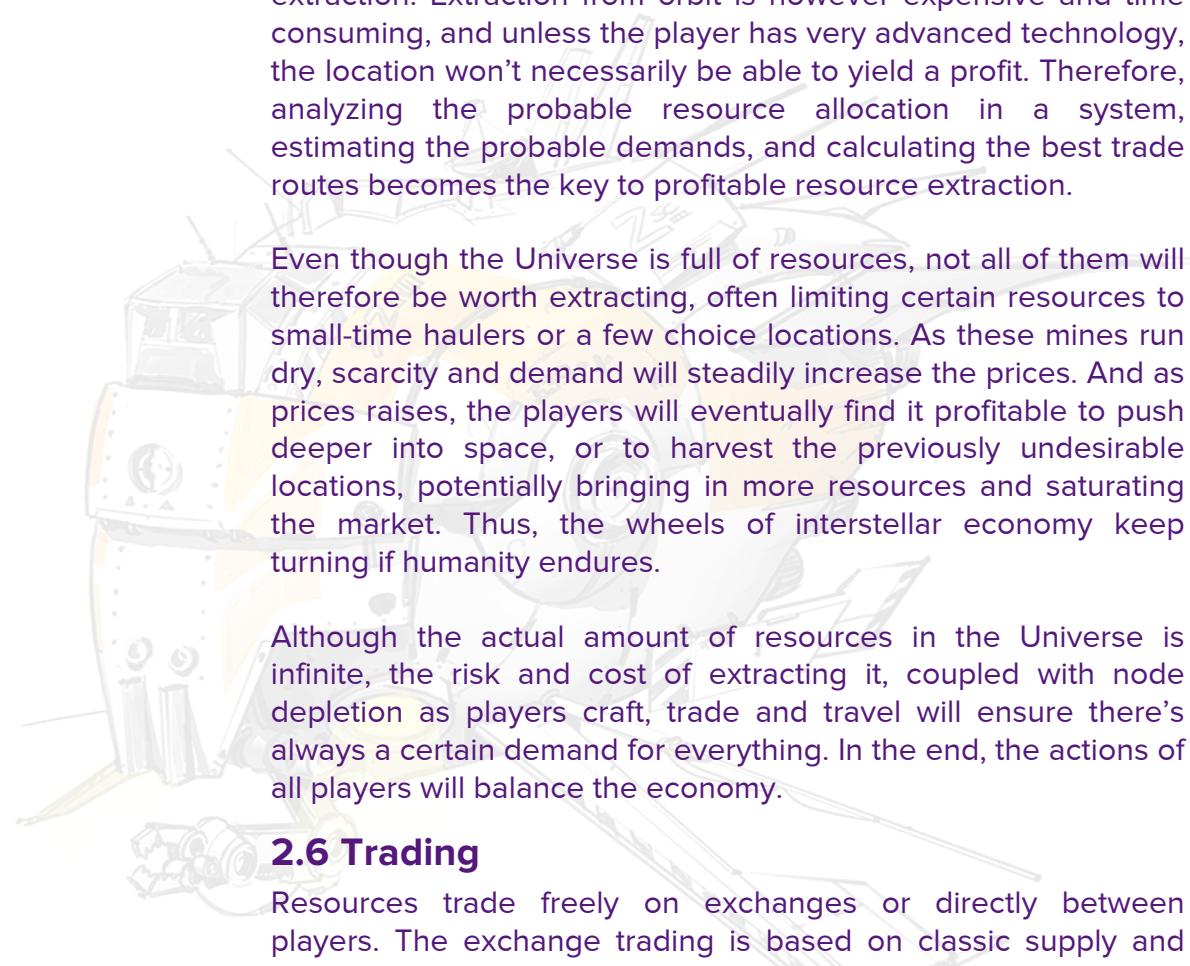
As travel is time consuming, trading hubs will most likely flourish around systems close to stars with habitable planets. But players are also free to take a 6-month journey to a star at the other side of the galaxy if that's where they want to travel.

**Whilst travelling, players can go about other business such as trading on exchanges, communicating with other players, training his skills, and more. Alternatively, players may observe the view of space from the bridge.**



## 2.5 Resources and extraction

There's a vast amount of resources scattered across the heavenly bodies in the Milky Way. As players visit planets, moons, and even large asteroids, they can initiate a scan for the material they are looking for. Depending on their computational systems, they will receive information about how rich and pure a resource supply the celestial body has of it before initiating extraction. Extraction from orbit is however expensive and time consuming, and unless the player has very advanced technology, the location won't necessarily be able to yield a profit. Therefore, analyzing the probable resource allocation in a system, estimating the probable demands, and calculating the best trade routes becomes the key to profitable resource extraction.



Even though the Universe is full of resources, not all of them will therefore be worth extracting, often limiting certain resources to small-time haulers or a few choice locations. As these mines run dry, scarcity and demand will steadily increase the prices. And as prices raises, the players will eventually find it profitable to push deeper into space, or to harvest the previously undesirable locations, potentially bringing in more resources and saturating the market. Thus, the wheels of interstellar economy keep turning if humanity endures.

Although the actual amount of resources in the Universe is infinite, the risk and cost of extracting it, coupled with node depletion as players craft, trade and travel will ensure there's always a certain demand for everything. In the end, the actions of all players will balance the economy.

## 2.6 Trading

Resources trade freely on exchanges or directly between players. The exchange trading is based on classic supply and demand. High demand will drive prices up, and high supply drives it down. Anything from a minor resource used in construction to a fully constructed ship can be traded.

As the galaxy is gigantic, supply and demand will be very different in separate locations. Moving cargo is therefore very lucrative. If a player owns a ship with sufficient storage to make the trip, she could set up trade routes to haul iron from a mining facility to a distant refinery. Pick up iron bars and bring them to a remote star system where the resource is scarce, then spend the money earned there to buy mining tools that could be sold back near the iron mine for a substantial profit.

## 2.7 Skill trees

Each player has skill trees to train throughout the game. The player can also choose skills to passively train over time. Learning takes a long time, and players can choose how best to focus their training.

We do not restrict actions the player can perform with their skills. However, mastering something means the outcome of actions can be much better. A skilled miner can extract far more - or additional - resources. Players more focused on governing their colonies should see faster growth, whilst tactical players experience superior results when engaging other players in combat.

## 2.8 Production

Production requires component materials, and access to the right type of construction facility either through owning one or arranging with another player to use theirs. Once production begins, the materials are spent by the player. Skills can modify the production time, the amount of required materials, or the quality of the final product. As production is happening, the player continues playing.

The completed item can be collected when production is finished.

We anticipate players to enter smart contract agreements to share products and profits, and

to hire specialized groups of players to perform work on their behalf. As an example, one player may specialize entirely in wing construction, and another group may hire her to perform work on their jointly owned spaceship. The players can configure smart contracts to make sure agreements are carried out as agreed.

**To produce more advanced equipment, other items may be used as component materials. This enables complex chain crafting, with immense freedom for players but also making large scale operations extremely demanding.**

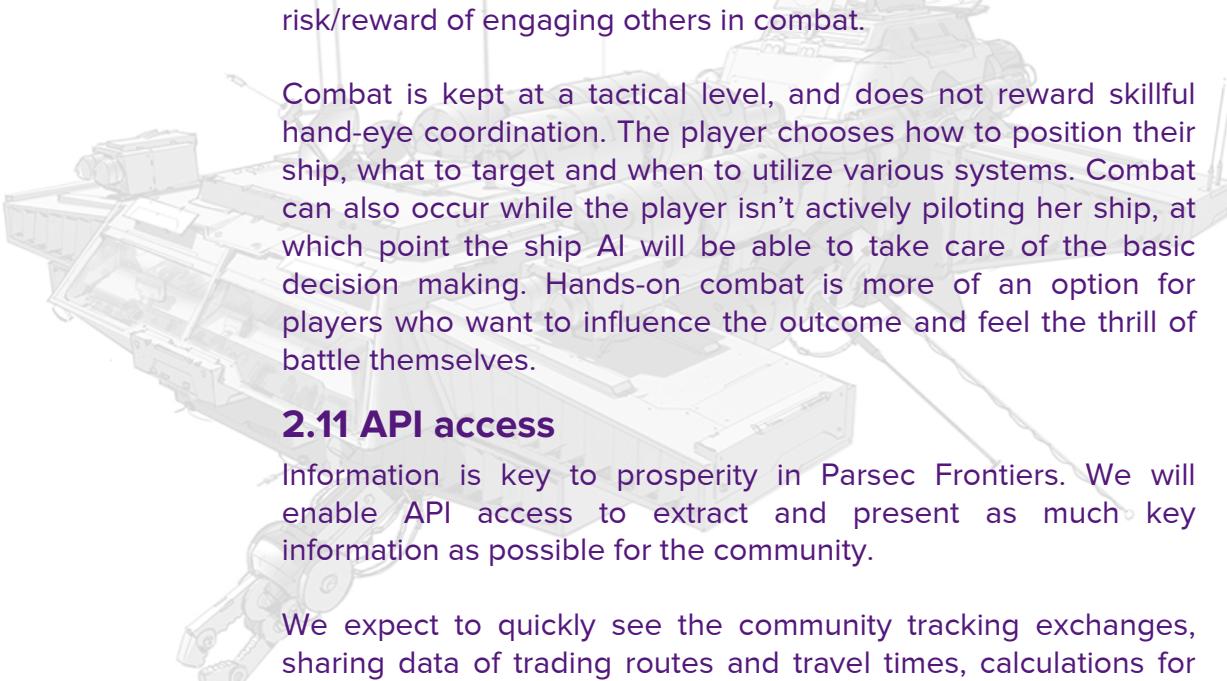
## 2.9 Settlements and colonies

As humans left Earth, all infrastructure that was taken for granted was lost. Now, in the golden age of colonization, everything must be rebuilt from scratch. Players are free to colonize planets when they find it worth the investment. A settlement will then be established, and the player will oversee its further development.

Colonization is a hard and expensive process, and planets have varying potential. Players must carefully choose suitable environments, and plan upgrades to further its goal. A colony may simply function as an exchange where anyone can land to buy or sell goods, or specialized purposes such as construction of specific ship parts of equipment, ore refineries, or even agriculture. Players trade to ensure the colony obtains a supply of required resources.

## 2.10 Battle

The first ships that will be available for purchase are colonization ships with no combat abilities. However, as mines, corporations and eventually societies establish and expand, players start producing their own ships and research new technologies. No doubt, getting offensive capabilities will be a priority for many. Exploring deep space will then suddenly carry a certain amount of danger, leaving the player to calculate not only the cost, but also the risk involved with every journey as well as the risk/reward of engaging others in combat.



Combat is kept at a tactical level, and does not reward skillful hand-eye coordination. The player chooses how to position their ship, what to target and when to utilize various systems. Combat can also occur while the player isn't actively piloting her ship, at which point the ship AI will be able to take care of the basic decision making. Hands-on combat is more of an option for players who want to influence the outcome and feel the thrill of battle themselves.

## 2.11 API access



Information is key to prosperity in Parsec Frontiers. We will enable API access to extract and present as much key information as possible for the community.

We expect to quickly see the community tracking exchanges, sharing data of trading routes and travel times, calculations for mining, refining and construction, as well as skill and build pathing.

## 3 Business model

For Parsec Frontiers to succeed and thrive, it needs a successful business which funds continuous operations of the game world.

This chapter provides more details on how Parsec Frontiers will operate successfully from a business perspective.

### 3.1 Financing through crowd sale

The game development and launch will be secured by conducting a crowd sale where all contributors receive Parsec Credits to be used in the game. The currency will be traded on cryptocurrency exchanges. More details on the crowd sale process will be announced accordingly.

### 3.2 Success criteria

The Parsec Frontiers project has several objectives:

- Create a lasting, immersive game world experience
- Provide crowd sale participants with unique service access
- Maintain user acquisition to the game through marketing
- Contributing to continuing increased economic activity
- Ensure continued in-game operations

### 3.3 Deflation mechanism

To incentivize holders of Parsec Credits, a deflationary mechanism relating to all in-game value transactions will reduce the money supply in the economy.

Trading exchanges on space stations and planets are either operated by the game's backend or are owned by players who has purchased an exchange. Every transaction on a trading exchange will be subject to a transaction fee paid by the seller from the achieved sale price. The fee has a fixed portion of 3% paid to the server wallet, and an optional portion of up to 2% paid to the exchange owner's wallet as per the exchange owner's discretion.

As an example; A unit of iron ore is sold at 300 PARSEC. The seller receives 285 PARSEC, the server wallet receives 9 PARSEC and the exchange owner receives 6 PARSEC. Of the 3% paid to the server wallet, 2% will be burnt by sending the amount to be burned to a smart contract. The remaining percentage is contributed to the foundation to ensure continued operations of the game service, including maintenance.

The game thus contributes 2% of all transactions proportionally to all token holders by reducing the total money supply in the economy.

### **3.4 Foundation**

The Parsec Frontiers Foundation is set up solely to oversee Parsec Frontier's development and operation, and will manage the funds collected through the crowd sale. The foundation shall be domiciled in Switzerland due to the country's political and legal stability as well as legislation relating to digital assets and cryptocurrencies.

### **3.5 Development contract**

The game will be developed by Artplant AS, incorporated in Norway. Artplant has pledged to produce the game and provide operations services and will also provide continuous development after initial launch.

### **3.6 Treatment of market sensitive information**

The Foundation shall strive to ensure that persons with access to information, due to their duties and functions with the Parsec

Frontiers project, that may significantly affect the market pricing of Parsec Credits shall keep such information in strict confidence and to not either buy or sell Parsec Credits on 3<sup>rd</sup> party trading exchanges until such information is made public.

**The Foundation undertakes to publicize relevant news releases and keep a public schedule of planned events that may reasonable expected to impact secondary market pricing of tokens.**

### **3.7 User Acquisition and marketing**

The game will acquire users through several methods:

- Targeted online advertising
- Affiliate marketing
- Player referral rewards
- Mainstream PR

### **3.8 Enabling 3<sup>rd</sup> party development projects**

To incentivize the community to contribute useful third party extensions to the economy, a fund for rewarding such projects shall be created. The fund shall be operated by the Foundation in close cooperation with the community.

## 4 Blockchain and PARSEC token

### 4.1 Initial technical requirements and platform

The following technical requirements are key factors to develop the project:

- Enabling the project to issue own in-game digital assets
- Support for smart contract programming and execution
- The technology must scale to support tens of millions of transactions per day
- Most of the game's blockchain transactions should be processed without incurring fees paid in a 3<sup>rd</sup> party token
- Fast (seconds) transaction validation
- The technology should support pruning/checkpointing
- Ease of organizing and executing crowd sale process
- Simple token trading integration for exchanges

There are multiple scaling technologies currently being worked on that could possibly satisfy the project's technical requirements.

### 4.2 Combining Ethereum with a customized public chain

For cost, speed, capacity and storage reasons it is not suitable to use the Ethereum main net for an MMO with millions of transactions per day for thousands of digital assets based on separate smart contracts. However, Ethereum has become the current platform of choice for funding projects, and having an Ethereum token enables easier access to trading exchanges and enhances liquidity for all economy stakeholders.

Parsec Frontiers plans to use an open public customized blockchain with permissioned elements inside of the game, with node operation possible for everyone in the community. This will allow the project to process transactions without asset costs. It is also important to use a pruning technology to maintain an updated and leaner ledger with archival of older transactions.

### 4.3 Dual token structure and exchangeability

The PARSEC token will be an ERC20 token on Ethereum to allow for an easier crowd sale process and ease of trading on external cryptocurrency exchanges. A corresponding PARSEC asset will also exist on the game chain for use in the game world.

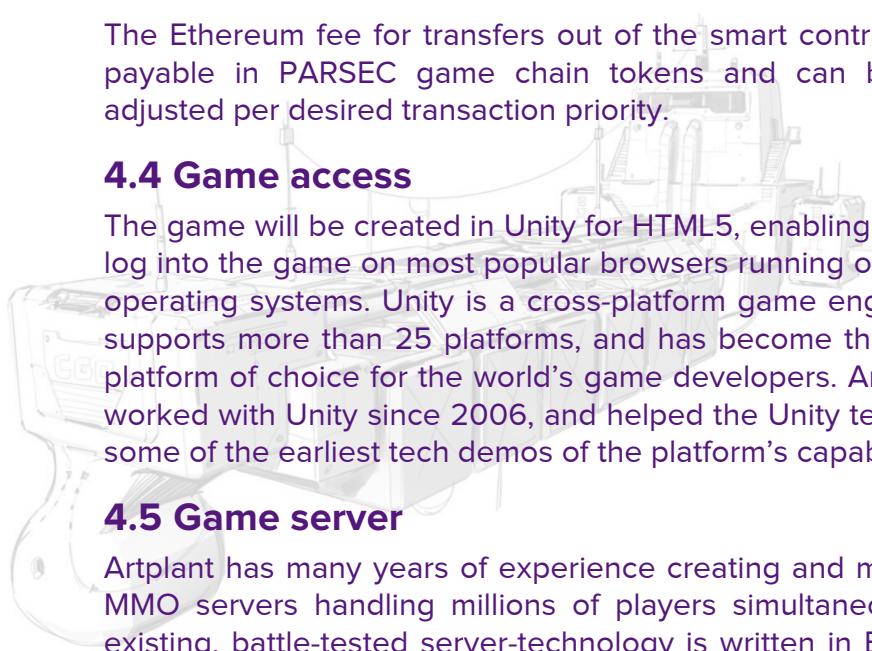
One PARSEC ERC20 token can be converted into one PARSEC customized chain token. The exchange between ERC20 tokens and the customized chain token is facilitated by smart contracts that control the exchange back and forth. The game client will contribute a front-end interface to facilitate the dual token swap transactions.



When a player transfers PARSEC ERC20 tokens into the smart contract they will be locked. Corresponding virtual economy chain tokens will be transferred from a smart contract in the customized blockchain to the player's address. To convert PARSEC from the game wallet to a player's Ethereum address, the player will transfer game chain tokens to the smart contract address and receive PARSEC ERC20 tokens to the connected Ethereum address.

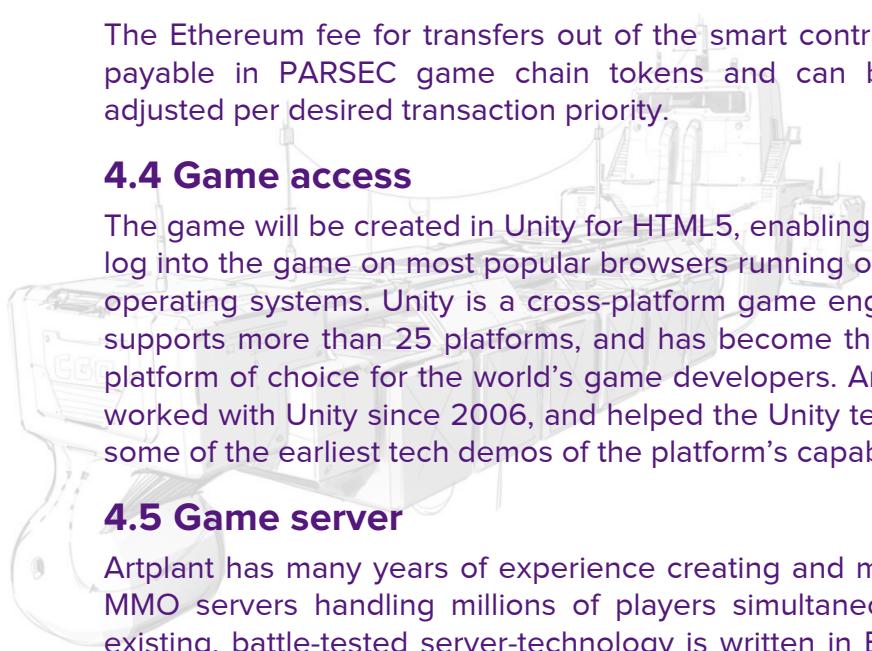
The Ethereum fee for transfers out of the smart contract will be payable in PARSEC game chain tokens and can be player-adjusted per desired transaction priority.

### 4.4 Game access



The game will be created in Unity for HTML5, enabling players to log into the game on most popular browsers running on all major operating systems. Unity is a cross-platform game engine which supports more than 25 platforms, and has become the de facto platform of choice for the world's game developers. Artplant has worked with Unity since 2006, and helped the Unity team create some of the earliest tech demos of the platform's capability.

### 4.5 Game server



Artplant has many years of experience creating and maintaining MMO servers handling millions of players simultaneously. The existing, battle-tested server-technology is written in Erlang and will be adapted for use with Parsec Frontiers and integrated with the virtual economy blockchain for the in-game assets.

## 5 Team

The project team consists of experienced developers, marketers, blockchain enthusiasts and business executives who has worked together for many years.

### 5.1 Core development team

**JACK K. WULFF***CEO, ARTPLANT*

Jack co-founded Artplant, and is a veteran in the games industry. Jack has worked as a game developer continuously for 24 years. Executive Lead on all projects.

**DANIEL STAKHOVSKIY***MANAGING DIRECTOR, ARTPLANT TVER*

Daniel co-founded the Tver office of Artplant, and has also done client, server and graphics programming on several Artplant games. Master's degree in Magnetic Physics from Tver State University.

**ANDREY TSIRULEV***TECHNICAL DIRECTOR*

Andrey joined Artplant in 2008, and has worked as Lead Programmer on some of the largest projects in the company. He has a Master's Degree in Magnetic Physics from Tver State University.

**TROND JOHANSEN***PRODUCER*

Trond has been a core Game Designer and Producer at Artplant since 2006, working on titles such as Mech Tactics, GI Joe Special Ops, Block N Load and Battlestar Galactica Online.

**MAXIM PUSHKAR***SENIOR PROGRAMMER*

Maxim has extensive backend experience, including core server engine and many in-house tools. He joined Artplant 8 years ago. PhD in Computational and Theoretical Physics, Tver State University.



**ALEXEY ANTROPOV***PROGRAMMER*

Alexey is a client-side programmer working in Unity. He has a Master's Degree in Information Technology from Tver State University.

**ANDREY ASHIROV***SYSADM*

Andrey keeps the servers humming 24/7. He has more than 14 years of experience as a network engineer. Andrey became part of the Artplant team in 2012.

**VALERII KRIAZHEV***ANIMATOR*

Valerii has more than 12 years of experience of 3D animation, and has worked with Artplant since 2014.

**DARIA RODIONOVA***UX DESIGNER*

Daria has a Master's degree in Computer Science and has been working with games since 2012. Being interested in applying machine learning to the field of UX, she advocates for user-centered and data-driven design approaches.

**IVAN KOREN***3D ARTIST*

Ivan has worked as a 3D character and environment artist since 2003, and with Artplant since 2009.





## VALENTIN PANTYUKH

*3D & 2D ARTIST*

Valentin's background includes 2D and 3D work on numerous games since 2004.



## JOACHIM BARRUM

*ART LEAD*

Responsible for visual style and quality of all games, coordinating with all artists. Working with programmers to ensure visual quality. Continuously worked in game development since 1993, and co-founded Artplant in 2001.



## HENNING ROKLING

*PROJECT FOUNDER*

Henning has a background from the C64 demo scene, working at Funcom before co-founding game developer Innerloop Studios. An entrepreneur with a passion for games, Henning has also consulted with some of the largest organizations in Norway.



## MORTEN LARSEN

*VP PUBLISHING*

Morten is an experienced gaming industry executive with a passion for the business side of the games industry. He has launched and marketed games both locally and internationally for more than 25 years, most recently as Senior Vice President, Sales and Marketing with Funcom in Oslo for almost ten years.



## 5.2 Advisors

### ØYVIND PEDERSEN JR.

*BLOCKCHAIN STRATEGIST*

Øyvind has been involved in the blockchain community since 2012, and has a background from telecom. He was a part of establishing content platform Hubii Network.



### FRODE ASCHIM

*CEO, ETHER CAPITAL LTD*

With 25 years of experience in the financial and technology markets, as a previous hedge fund manager and influential investor, Frode is now the CEO of Ether Capital Ltd. and active in the development and investment of the blockchain technology. He's been an early investor in many high-profile blockchain projects.



### KENNETH ERIKSEN

*DIGITAL MARKETING EXECUTIVE*

As the CEO of IAB Norway - INMA - Kenneth is an experienced digital marketer, web analyst and a prominent speaker on technology.



### JOHN KAVANAGH

*GAMES INDUSTRY EXECUTIVE*

John is an accomplished industry executive with a video game career of nearly 35 years as he started designing, developing and licensing games and technology to Sega, Nintendo, Apple, Atari, Commodore and Broderbund. He's since worked at Eidos, Crystal Dynamics and Paramount Pictures.



## 6 Project roadmap

The project team is dedicated to meet the development schedule to deliver a completely immersive sci-fi world.

### Completed

<b>2010/11</b>	Initial development of backend technology Used in Battlestar Galactica Online
<b>2012-2016</b>	Technology used in 4 more games
<b>June 2017</b>	Parsec Frontiers concept finalized
<b>July 2017</b>	Development agreement Legal structure Exploration of architectural concepts
<b>August 2017</b>	Team assembly / hiring Game pre-production initiated
<b>December 2017</b>	Public announcement Whitepaper release

### Future delivery

<b>January 2018</b>	Community building and marketing Pre-sale
<b>March 2018</b>	Foundation registered and set up
<b>April 2018</b>	Detailed game and economy design Prototype of galaxy Crowd sale
<b>May 2018</b>	Parsec Credits distributed to sale participants Token listed on exchanges Queue open for rollout of starter ship auctions Ships can be traded between players
<b>June 2018</b>	In-game asset definition and tokenization Cross-chain transaction module
<b>July 2018</b>	Auctions for colony rights on 17 initial planets Colony rights/development projects tradable
<b>September 2018</b>	Transparency dashboard and APIs
<b>December 2018</b>	Release of Travel module Population of all major heavenly bodies Resource distribution throughout Milky Way Scanning of heavenly bodies Travelling and exploring Transport of Earth's 15m surviving humans Release of Settlement module.
<b>February 2019</b>	Resource extraction/production In-game trading and DEX module
<b>May 2019</b>	Colonization upgrades Crafting of items
<b>December 2019</b>	End of the 'non-aggression pact' Weapon production

