Gradian

gradian.network

Algorand Standard Asset & Decentralised App Ecosystem for the Metaverse

VERSION 1.0

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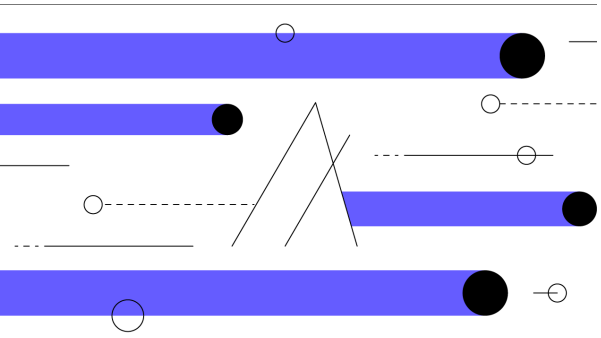

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1 Introduction

In this paper we propose a frictionless Algorand Standard Asset fungible token called Gradian and a collection of Algorand DApps which operate on Gradians to enable secure transactions within the Metaverse. Open-source APIs for all major game engines are provided, to facilitate game developers in integrating the ecosystem into their Metaverses. It seeks to address issues with existing tokens like high gas fees of ERC20 based tokens, lack of secure smart contracts for common metaverse transactions and limited API support. Gradian will address the low transactions per second (TPS) of existing metaverse tokens like ERC20, by being built on Algorand which supports up to 46000 TPS compared to ERC20 TPS of 12-15. This high throughput of TPS is needed for high volume base metaverse experiences. It is the first of its kind on the Algorand blockchain.

Algorand was chosen as the underlying blockchain platform as it is carbon neutral, fully decentralised, has very low fees, and a high throughput that can support the high volumes of transactions inherent to an expansive metaverse. Algorand uses a pure proof-of-stake (PPoS) protocol built on Byzantine consensus, offering superior fault tolerance and efficiency to other blockchains.

Gradian will provide easy to use and secure open source APIs for all major game engines including Unity3D, Unreal and Javascript to interface with Gradian Algorand smart contracts (decentralised apps) which live on the blockchain to facilitate secure Gradian and NFT transactions within games. The token itself has attractive properties which encourage appreciation and scarcity overtime through the thoughtfully designed tokenomics.

The following sections will expand on these points conveying the features we intend to add over time, the tokenomics, game engine and API support, and the unique selling points in contrast to existing offerings in the metaverse space.

2 Fungible Token Tokenomics

The token has anti-inflationary properties through a fixed supply and burning events which will burn 5% of the supply within the first 3 years. Burning is achieved by sending Gradian to an address whose secret key is destroyed to act as a Gradian sink, which can be verified by viewing the blockchain history.

To enable frictionless high frequency microtransactions, we have chosen to go with the lowest fee possible of 1 microalgo which at the time of writing is less than a cent. This way users won't be deterred from in-game transactions by high fees.

There's no clawback, freezing or reserve to remove the presence of any central authority as Gradian believes in decentralisation. Please see ASA Documentation for the definition of these terms. Since it's built on Algorand, it inherits all of Algorands appealing properties like high throughput thanks to 46000 TPS, carbon neutrality, and high fault tolerance.

Attribute	Value
Denomination	GRAD
Total Issuance	$10e9$ (FIXED)
Transaction Fee	0.001 ALGO
Burn Rate	5% within first 3 years
Blockchain	Algorand
Transactions Per Second	46000
Decentralised	Yes
Carbon Neutral	Yes
Clawback	No
Freezing	No
Reserve	No

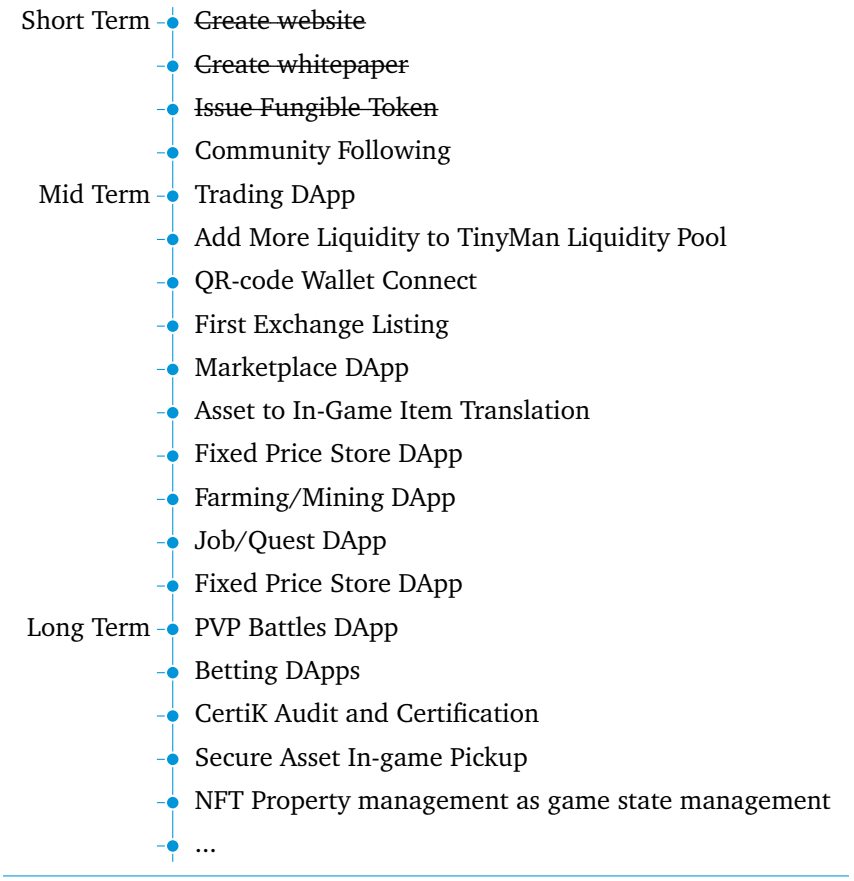
Table 1: Tokenomic properties of the Gradian token at a glance.

3 Feature Roadmap

The Gradian ecosystem consists of decentralised apps (DApps) which execute smart contracts on the Algorand blockchain that operate on Gradian tokens to perform transactions within games. The types transactions of transactions the DApps perform are those which are common to all games, including:

- Trading Transactions
- Fixed price store Transactions
- Marketplace Transactions
- Questing Transactions
- Farming and Mining
- In-Game Betting
- Player vs Player Battles where the outcome is RNG determined

All transactions are handled via open source DApps. By doing so, Gradian ensures security by removing the token manager away from the game client to prevent in-game cheating from ruining the economy. Imagine a scenario where CheatEngine is used to find the function to call which deposits Gradian into your account – we can mitigate this with carefully designed Smart Contracts. All DApps are made open source, to ensure transparency into how they function, which will give players piece of mind in a fully trustless and decentralised environment.
We intend to implement these features by writing the smart contracts and accompanying DApps overtime following the timeline below. For a description of what each feature does, where not obvious, please see the corresponding subsection identified by the same name below.



3.1 QR Code Wallet Connect

Algorand's official WalletConnect SDK which authorises applications to perform transactions on the wallets behalf. Involves scanning a QR code, with message to tell them to create a new wallet if they feel it's not secure. This is how we will connect users wallets to the metaverse economy.

3.2 Asset to In-Game Item Translation

Scans your wallet for asset ids, which map to in-game items which will then, for example, appear in your inventory.

3.3 Trade DApp

DApp will take possession of both assets that are placed into the trade, and upon receiving both assets trigger a swap. This requires authorisation of both participants.

3.4 Marketplace DApp

Connects to your wallet, where you can sell the collected in-game NFTs on a marketplace. Gives players a monetary incentive for collecting NFTs in the metaverse.

3.5 Fixed Price Store DApp

Put up the required ASA, DApp will send you whatever it specifies in the metadata. E.g. Purchase a virtual beer with 100GRAD.

3.6 Betting DApps

There are two types of betting we intend to support. Fair chance: bet on a coin toss in the game, each participant stakes Gradian of the same size, once all participants are locked in, triggers RNG outcome that decides who gets all of it. House edge: specify payout and house edge, stake Gradian, once staked an RNG event is triggered which simulates a play.

3.7 Farming/Mining DApp

An NFT (or your wallet address) acts as a token to signify that your player is currently engaged in in-game mining or farming. While its out of your possession, as tracked by the DApp, you can't mine elsewhere. In the case of using NFTs as a token, they could give a different mining rewards based on the NFT you've provided (e.g. diamond pick axe).

3.8 Player vs Player Asset Battles

Based on traits of the participating assets, the DApp will decide the outcome and reward the winner wallet with both assets that were staked. The better the traits of a participating asset, the higher the chance they will win the battle.

3.9 Job/Quest DApp

Provide assets to the DApp which reward the wallet with a manager specified reward asset, as looked up in a manager defined map. In-Game non-playing characters can inform players about the quest.

3.10 Secure pickup of assets

Secure pickup of assets in game worlds. Upon picking up the asset in the virtual world, the corresponding Algorand asset is deposited into your connected wallet. The difficulty is in preventing in-game cheating from ruining the economy. For example, imagine a player figuring out how to call the function which triggers a pickup.

3.11 NFT Property Management

The ARC69 NFT standard includes a mutable property field which Gradian DApps will change to change their state, reflecting in-game events like taking damage, upgrades and leveling up. Only the manager of the asset has this ability, which the DApps will execute as.

4 Game Engines & API Support

Gradian will provide open source libraries for all major game engines. We intend to include a greater coverage of game engines compared to other metaverse offerings like Enjin, which doesn't support Unreal Engine natively.

- Unity3D package asset, available on the Asset Store
- Unreal Engine plugin, available on the Unreal marketplace

- Generic Javascript library, available on the Node Package Manager

Python (PyTeal) will be chosen as the language of choice for implementing smart contracts, as it is recommended by Algorand and has the greatest developer support. All smart contracts will be visible on the blockchain, and their source code available on our Github. That means transparency into our ecosystem, to uphold the decentralisation of Gradian.

Any REST APIs will be specified following the OpenAPI standard, which means they will support client generation for over 50 languages out of the box.