SpaceTombo - NFT Charitable Lotteries

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11 December 2021
v1.1

Contents

1. Introduction Chainlink

      People often donate money to support charitable actions but it is hard to ensure the money is sent and stored securely as third-parties must be trusted in the process. Also, donating money is usually a redundant process in which donors do not feel engaged.

At SpaceTombo, we believe donating money to charitable organizations should be a playful and rewarding process wrapped in a secure and transparent ecosystem.

Leveraging blockchain technologies allows us to propose a new paradigm for donors, offering a modern way to donate while also engaging in a thrilling adventure. The aim is to bring gamification to donation mechanics via an event-based on-chain lottery.
Ultimately, we want to shape a new standard for lotteries in the modern world. This standard allows charitable organizations and donors to engage in a lucrative process that benefits both parties, while keeping a primary focus on helping organizations fighting for important causes.

By purchasing lottery tickets, buyers become donors as 100% of ticket revenues will be sent to the charitable organization specified at lottery creation. The trick is that the lottery ticket also provides a special NFT to donors and automatically registers them as potential winners of lottery prizes. The given NFT is dynamic. It evolves through lottery events.

Our team was formed in late 2021 to compete in the Chainlink Fall Hackathon.

2. Technologies

      This project aims to provide a fun, decentralized, global, secure alternative to traditional lotteries by relying on the power of public blockchains and oracle networks with an aim at charitable actions.

i. Public blockchain polygon

      The lottery rules, funds, mechanics are handed to an open source smart contract. The security of public blockchains enforces that the money raised by contributors can't be diverted.

Our first blockchain of choice is Polygon, a PoS sidechain on the Ethereum network. We chose this public blockchain for its reliability and low fees. MATIC is the ERC-20 token used to power Polygon, tradable on the Ethereum network.

Note that our lottery system can be used on all EVM compatible blockchains including the Ethereum network and Binance Smart Chain.

ii. Oracle networks

The following principles are ensured by the oracle networks:
- The lottery events are triggered by [Chainlink Keepers](#) (**coming in V2**)
- The equal chance of winning prizes is ensured by [Chainlink VRF](#)
- The minimum contribution price remains stable using [Chainlink Data Feeds](#)

3. Lottery mechanics

i. Lottery

A lottery is a form of gambling that involves the drawing of numbers at random for prizes.

To make this game system virtuous, the lottery smart contract is deployed on-chain with immutable parameters. Consequently, the ticket entry price, the address of the charitable organization's wallet, the events, the participation periods, and all other lottery parameters remain constant and verifiable. This way all potential donors can verify the lottery's legitimacy before any commitment is made.

After its creation, triggering lottery events is governed by the network and the Chainlink oracles.

ii. Tickets

To participate in the lottery, donors purchase tickets and get an NFT as a reward. The ticket has a fixed price in USD. The price is verified on-chain using Chainlink Data Feeds.

iii. Events

The lottery takes place through different events that allow its proper functioning:

1 - Smart contract deployment with its immutable parameters

2 - Funding of the lottery with LINKs for Chainlink computation

3 - Participation period :
This period allows people to mint their own customisable NFT. Minting requires paying a lottery entry price and provides a ticket for the lottery tied to their wallet address.

100% of the funds donated during the participation period are handed to the [earth pool](#).

4 - Preparation period :

*Participants have the possibility to upgrade their NFT before the event. They can not mint new ones. Upgrading allows adding funds to the [moon pool](...) **(coming in V2)**.*

5 - Events:
Events will gradually alter NFTs (change the IPFS image of the token). Only three NFTs will remain pristine (winners).

6 - Release of the funds:
The contract will release the funds from the pools to the charitable organization and the participants at the end of the last event.

4. Fund pools

i. Earth pool

The earth pool contains funds 100% dedicated to the charitable organization.

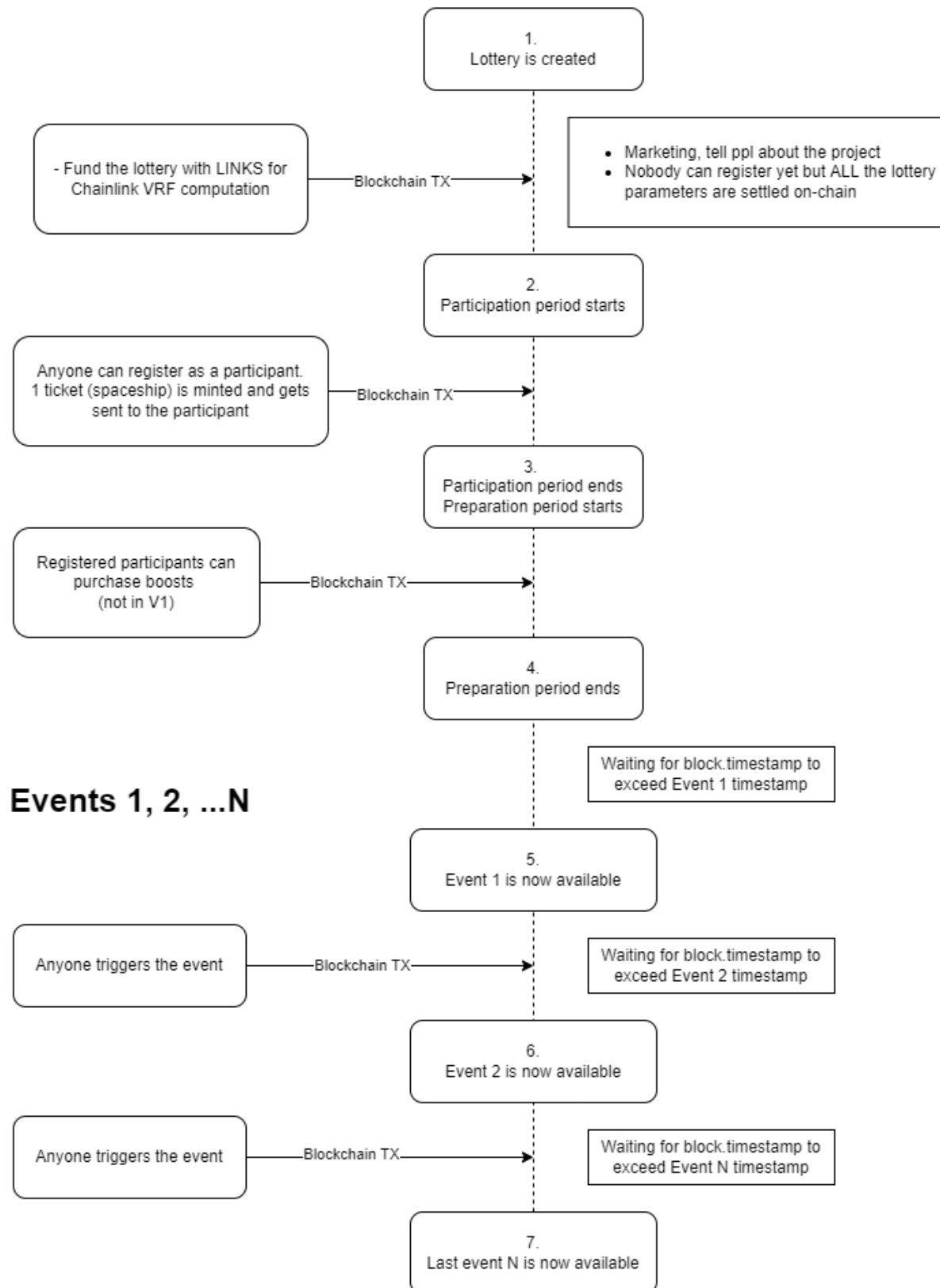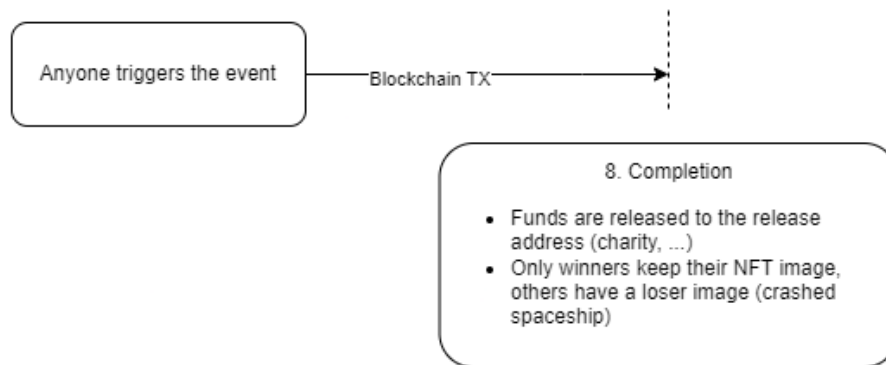## ii. Moon pool *(coming in V2)*

The moon pool contains funds dedicated to the charitable organization, donors, lottery creators.
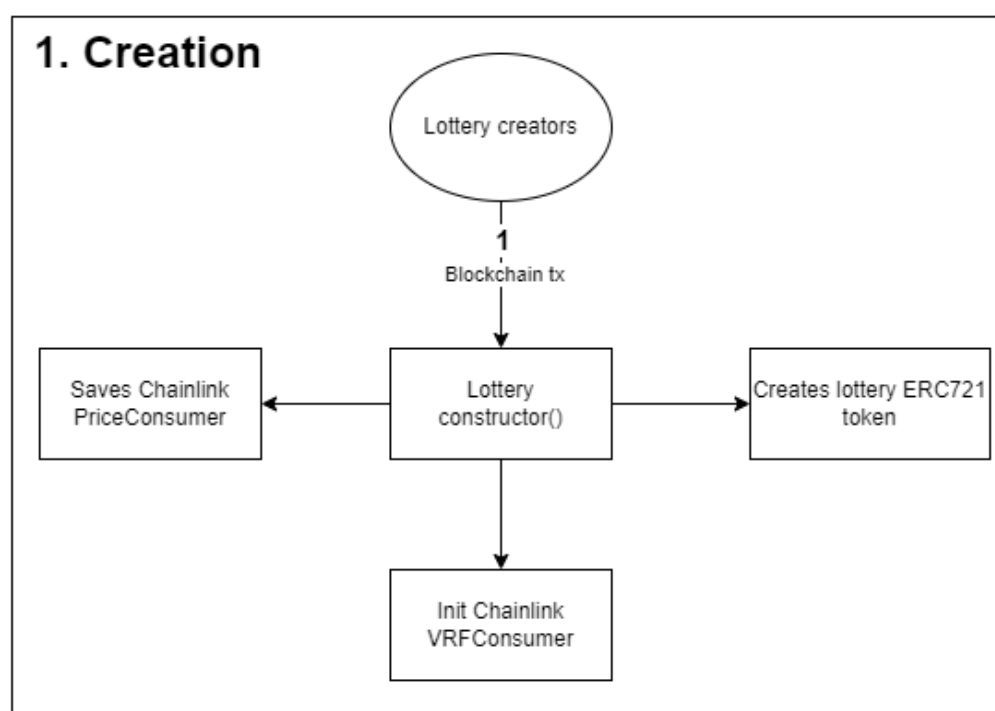
5. Lottery flow

i. Overview

1.
Lottery is created

- Fund the lottery with LINKS for Chainlink VRF computation ──Blockchain TX──►

- Marketing, tell ppl about the project
- Nobody can register yet but ALL the lottery parameters are settled on-chain

2.
Participation period starts

Anyone can register as a participant. 1 ticket (spaceship) is minted and gets sent to the participant ──Blockchain TX──►

3.
Participation period ends
Preparation period starts

Registered participants can purchase boosts (not in V1) ──Blockchain TX──►

4.
Preparation period ends

Waiting for block.timestamp to exceed Event 1 timestamp

Events 1, 2, ...N

5.
Event 1 is now available

Anyone triggers the event ──Blockchain TX──►

Waiting for block.timestamp to exceed Event 2 timestamp

6.
Event 2 is now available

Anyone triggers the event ──Blockchain TX──►

Waiting for block.timestamp to exceed Event N timestamp

7.
Last event N is now available

Anyone triggers the event — Blockchain TX →

8. Completion
- Funds are released to the release address (charity, ...)
- Only winners keep their NFT image, others have a loser image (crashed spaceship)

ii. Detailed analysis

1. Creation

Lottery creators

1
Blockchain tx

Saves Chainlink PriceConsumer ← Lottery constructor() → Creates lottery ERC721 token

Init Chainlink VRFConsumer

State: WaitingForLINK

2. Fund link

Anyone

1

3

Blockchain tx

2

LINK
transfer()

Lottery

getLINKAmountRequired()
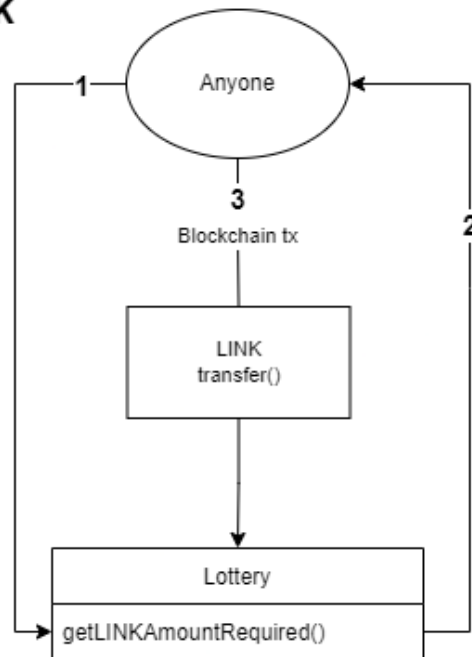
State: WaitingForParticipationPeriod

Participation period
Start timestamp exceeded
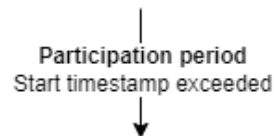
State: OngoingParticipationPeriod

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3. Participate

Anyone

Blockchain TX — 1

Lottery

participate(TokenInfo)

2

Verify participation
price with Chainlink

4

LotteryToken.mint(TokenInfo)

3

Preparation period
Start timestamp exceeded
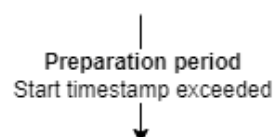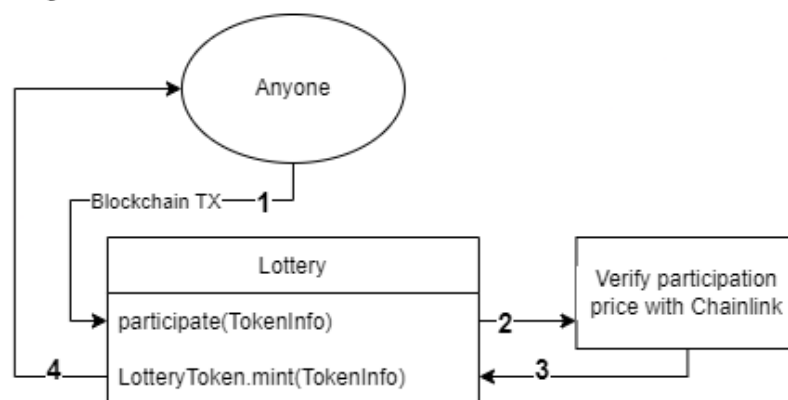
State: OngoingPreparationPeriod

4. Get Token boosts (not in V1)

Preparation period
End timestamp exceeded

State: WaitingForNextEvent

Event timestamp exceeded

5. Event

Anyone

Blockchain tx

1

Lottery
triggerNextEvent()
fulfillRandomness()

2 → Request randomness from Chainlink VRFConsumer

3 ← Blockchain tx

4

Performs participants pool halving and random picking of participants

5

Remaining events ?

YES

NO

State: WaitingForFundsRelease

6

6. Completion

Release funds

Pick winners

State: Complete

6. Practical case: Spaceships Lottery

The first lottery is a spaceship lottery.

During the participation period, donors customize a spaceship (NFT) and mint it upon purchasing a lottery ticket. Once the participation period ends, the preparation period begins.
The revenues from the lottery tickets are handed to the earth pool.

During the preparation period, participants can purchase boosts and shields to further customize their spaceship! Beware, those newly acquired upgrades may make the spaceships harder to kill during lottery events. Once the preparation period ends, the lottery awaits for its first event.
The revenues from purchasing upgrades are handed to the moon pool.

The time has come. The first lottery event occurs. Spaceships are taking off from the earth! The atmosphere is tough to get through on that day and only half the spaceships make it to space.

The second event happens a bit later. An unexpected meteorite shower erupts and all but 3 spaceships are destroyed.

The second event was the last. The survivors become the winners (1st, 2nd, 3rd). The remaining spaceships have now gained attention from the community.

Only the winners get to keep their spaceship in pristine condition.
Earth pool and moon pool funds are released.

7. Future of SpaceTombo

In the future we plan to expand SpaceTombo's functionality to offer participants a more complete and engaging experience.

i. Association Approval Protocol

Working on a protocol for selecting and approving associations is essential to avoid abuse and litigation. We will set up a program to allow organizations to nominate and verify their eligibility, commitment and actions. The legal framework for donations may vary depending on the country and government in which the donation is made. A supervision and an accompaniment will be necessary until the delivery of the funds. We will try to be as transparent as possible about the purpose of the donation.

ii. Governance

We want to implement a governance principle to select the association for each season/drawing. NFT holders will then be able to claim a certain number of votes to support the cause of their choice. At that time, a voting period will be instituted. This is intended to make our donations more democratic, while empowering every ticket holder.

iii. GameFi

We have already thought about the value we could bring to our NFT (spaceship and destroyed spaceship) beyond the donations they will generate. We want to develop an economy around them while promoting the growth of donations through the GameFi aspect. For example a retro video game playable with spaceships, probably a kind of Space Invader, themselves being lottery tickets. Concerning the utility of the destroyed ships, they could be used to craft new ships to participate again in the lottery or to use them in the game.
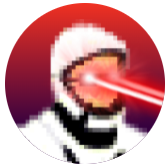
8. Roadmap

Coming Soon

9. Team

KonyTech / Nicolas Cortella   LinkedIn | Github

Experienced engineer from the video game industry with a strong background in backend applications development. Nicolas realizes the smart contract, the design of the lottery internal mechanics and the generation of dNFTs. Backend is its playground and web3 its new crush.

SoxZz5 / Lucas Giffard   LinkedIn | Github

Web engineer, typescript consultant, lead tech and front-end expert, Lucas creates the front-end of the application and the smart contract in collaboration with Nicolas. With several years of experience in the web2.0 world, he is now looking to sharpen his skills in web3.0.

Juicy / Julien Leprou   LinkedIn | Github

Head of Design, talented UX/UI Designer, decentralized application designer. After many years in the blockchain industry, Julien designs the application and the layers that make up the dNFTs. He also accompanies the project in the realization of a whitepaper by bringing a glance on the future of the project.