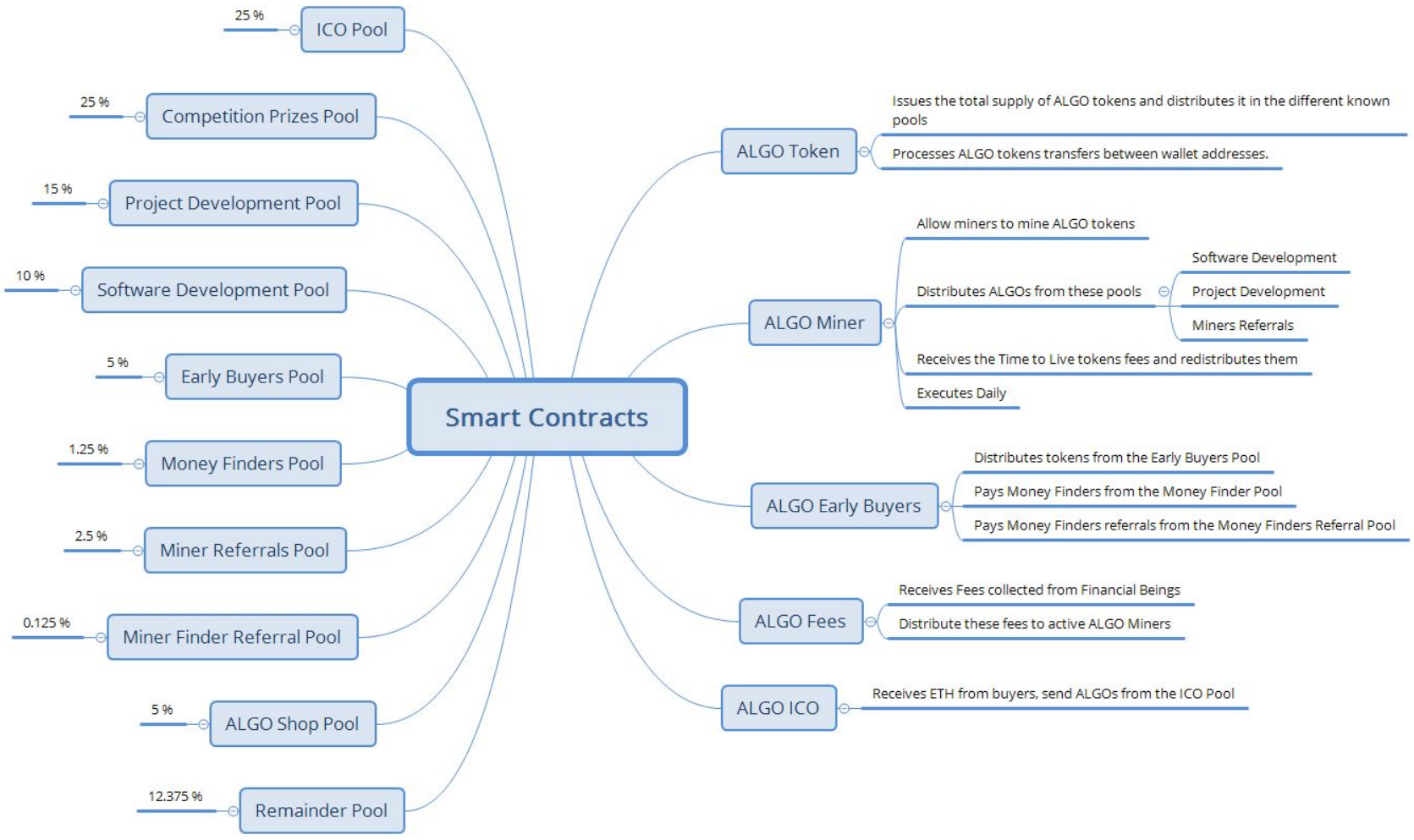
Smart Contracts Requirements / Specifications

Version 0.1 - November 2018

Author: Advanced Algos Ltd.

Overview


Smart Contracts
25 %
ICO Pool
25 %
Competition Prizes Pool
15 %
Project Development Pool
10 %
Software Development Pool
5 %
Early Buyers Pool
1.25 %
Money Finders Pool
2.5 %
Miner Referrals Pool
0.125 %
Miner Finder Referral Pool
5 %
ALGO Shop Pool
12.375 %
Remainder Pool
ALGO Token
Issues the total supply of ALGO tokens and distributes it in the different known pools
Processes ALGO tokens transfers between wallet addresses.
ALGO Miner
Allow miners to mine ALGO tokens
Distributes ALGOs from these pools
Software Development
Project Development
Miners Referrals
Receives the Time to Live tokens fees and redistributes them
Executes Daily
ALGO Early Buyers
Distributes tokens from the Early Buyers Pool
Pays Money Finders from the Money Finder Pool
Pays Money Finders referrals from the Money Finders Referral Pool
ALGO Fees
Receives Fees collected from Financial Beings
Distribute these fees to active ALGO Miners
ALGO ICO
Receives ETH from buyers, send ALGOs from the ICO Pool

Introduction

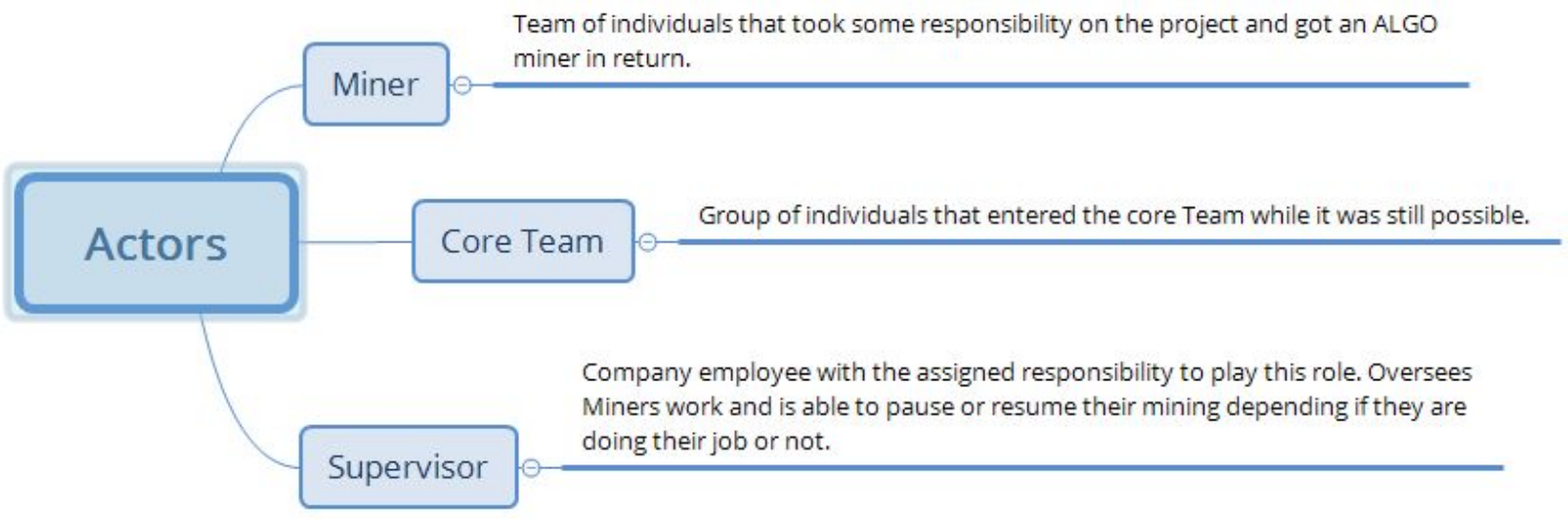
This document will lay out the specifications for the smart contracts needed at the Advanced Algos project. We will go first though some basic considerations and definitions to later enter into details.

Governance

The Advanced Algos project is born out of Advanced Algos Ltd., a company incorporated in Malta. The project is governed by the company, which itself is governed by the company bylaws under Malta's regulatory framework. The company is owned by the project's core team and company equity investors. The core team is still open to new members.

Actors

We expect the following actors to have a role interacting with the smart contracts:



ALGO Token

We refer in this way to the ERC20 ALGO smart contract that issues the tokens and transfer them to the different Pools. This contract is also the one processing transfers of tokens between accounts.

Technically the tokens are balances managed by this contract and in fact they never leave the scope of this contract. When we say that this contract send tokens to a Pool, what really happens is that is credits a Pool account with a certain amount of tokens.

This means that Pool contracts needs to be deployed before the issuing and pool distribution is done, in order to know which are the accounts of each pool.

Pool

We define a Pool as a the "place" where the tokens goes after issuing. The project has defined several Pools as seen at the Overview Diagram with a certain percentage of the total issued tokens to be deposited at each one.

From the Pools the tokens will later be transferred to other smart contracts with the business logic needed for their final distribution.

At runtime, we expect to have several instances of the Pool smart contract deployed. Each one constructed with different parameters for them to understand their specific role.

For instance, a Pool deployed and constructed with type = 4, will know it is the "Software Development Pool", and that its tokens will be sent to Algo Miner contracts when requested so by the authorized party.

Many of these pools are already well defined, while others are not. This means that the Pool contract needs to have a method to tell it which business contract will be authorized to ask for its tokens.

The Algo Miner

ALGO Miners

An ALGO Miner is an abstraction of a physical cryptocurrency miner and is the mechanism of choice to distribute 25% of ALGO tokens: those corresponding to the Software Development and Project Development pools listed above.

The project is divided in *n* areas of responsibilities expected to be undertaken by different individuals. Briefly, this is what happens when an individual wants to mine ALGO tokens:

1. An individual gets interested in participating and contacts the project Core Team. The team identifies a responsibility not yet assigned and lets the interested party start work on it.
2. The area of responsibility is flagged as taken at the AA Module that manages all this, and the Core Team guides the new entrant on the work to do, the scope of his responsibility, expectations, etc. At that moment the entrant acquires a new ALGO Miner. That means that an ALGO Miner contract is deployed by the Core Team and constructed with the following initial properties.
    a. Type
    b. Pool
    c. Capacity
    d. Source
    e. Distribution Table
    f. Referrer
    g. Public Key of the Miner
3. The Core Team then executes this method at the corresponding Pool contract in order to transfer the funds to the ALGO Miner:
    a. **trasferToMiner:** Validating that it still have the funds requested on its own balance, and that the request is done by the Core Team (signing with its private key), the Pool transfer the requested amount of tokens from its account to the ALGO Miner account (via the ALGO Token smart contract of course). From there on, the newly deployed ALGO Miner is fully loaded with the tokens the Miner can mine during the ALGO Miner lifetime.
4. Before activating the Miner, the Core Team waits until the miner delivers value to the project. In the case of software, the Core Team waits until his work is integrated into the system. For business miners, similar criteria is to be applied.
5. When the Core Team believes value has been added by the new miner, the Core Team uses its key to activate the ALGO Miner. These are the related commands at the ALGO Miner smart contract:
    a. **activateMiner:** This is the command used to activate the miner. Only the Core Team can execute it.
    b. **deactivateMiner:** This command is useful for the Core Team to migrate an ALGO Miner to a new version of its contract. The deactivate command requires a parameter which will tell the ALGO Miner where to transfer the remaining tokens at its account balance.
6. While a Miner is in “Activated” status, the miner can use his Private Key to run these commands:
    a. **startMining:** This command starts the ALGO Miner and initiates the mining of ALGO tokens. The ALGO Miner needs to have been activated prior to running this command for it to work.
    b. **stopMining:** In case the miner decides to leave the project, he can also use his Private Key to stop the ALGO Miner voluntarily.
7. The Supervisor is an official at Advanced Algos LTD. responsible for monitoring the work of miners. He holds a third Private Key for that ALGO Miner that can be used for the following purposes:
    a. **pauseMining:** Pauses the miner in the event that the miner stops fulfilling his job (in the case of software development, when the contributor does not maintain his module according to what is expected or does not do what was agreed). A protocol is followed to allow the miner to get back on track and eventually get the ALGO Miner started again.
    b. **resumeMining**: To resume the ALGO Miners’ operations after a pause period.

c. **stopMining:** Company officials can also stop the ALGO Miner which effectively stops the miners operation and invalidates the miner's key. This is useful when the miner does not fulfill his responsibility, makes himself unavailable, or other circumstances of the sort. The miner can only be used again after a *reset*.

d. **resetMiner:** This operation is needed after a *stop* only when the project finds someone willing to take this area of responsibility from where it was left. Along with the reset, the company can inject a new public key into the ALGO Miner for which a new private key will be needed to get it started again. That private key will belong to the new responsibility taker, aka, the new miner. Company officials will decide who shall take that responsibility and continue using this ALGO Miner. During the reset the tokens held by the ALGO Miner are unaltered and whoever replaces the previous miner will be able to mine the rest of the tokens at the ALGO Miners account.

ALGO Miners Pools

There are two possible ALGO Miners pools from where to take the tokens to be mined:

1. **Software Development:** It includes only software-development type of responsibilities.
2. **Project Development:** It includes only project-development type of responsibilities.

ALGO Miners Capacity

ALGO Miners distributes tokens it got from one of the Pools plus tokens it gets from the fee collection mechanism implemented as the ALGO Fees smart contract.

Each ALGO Miner has a pre-defined capacity that cannot be changed over time. According to its capacity, each miner can be in either of these six different categories:

1. **Cat 0:** Can distribute 0.1M ALGO tokens received from the Pool. Mines 1/10 of the fees of a Cat 1 ALGO Miner.
2. **Cat 1:** Can distribute 1M ALGO tokens received from the Pool.
3. **Cat 2:** Can distribute 2M ALGO tokens received from the Pool. Mines 2 times the fees of a Cat 1 ALGO Miner.
4. **Cat 3:** Can distribute 3M ALGO tokens received from the Pool. Mines 3 times the fees of a Cat 1 ALGO Miner.
5. **Cat 4:** Can distribute 4M ALGO tokens received from the Pool. Mines 4 times the fees of a Cat 1 ALGO Miner.
6. **Cat 5:** Can distribute 5M ALGO tokens received from the Pool. Mines 5 times the fees of a Cat 1 ALGO Miner.

The category number is a reflection of the perceived level of criticality, urgency and difficulty entailed in the particular area of responsibility. The higher the number, the more critical, urgent and / or difficult the area of responsibility is recognized to be.

ALGO Token Sources

ALGO Miners mine tokens daily. There are two different sources for tokens:

1. **Pool tokens:** 25% of the total supply of tokens are to be distributed in this way. There is a set of rules on how many tokens are distributed as a function of time. During the first year 50% of the ALGO Miner's capacity is distributed. During the second year, 25% of the capacity is distributed, and each subsequent year, half of what was distributed the previous year. See table below for clarity. In practice, tokens are "mined" everyday: once a day each ALGO Miner runs and distributes 1/365 of the ALGO tokens corresponding to the year the miner is positioned on. Every time it runs, the ALGO Miner checks the previous transactions and positions itself at the right spot in the timeline. Once positioned, it knows if it is at year 1, 2, 3 or whichever. The days passing while the miner is PAUSED are not considered as mined days, meaning those ALGO tokens are not lost, but it distribution delayed.

2. **Fees tokens:** Financial Beings must pay a fee (in ALGO tokens) to be kept alive, called Time to Live. Once collected by the ALGO Fees smart contract, these fees are distributed among all running ALGO Miners, in proportion to their capacity, in a daily distribution process. For example, in any given day 100 ALGO tokens are collected in Time to Live fees; there are 2 ALGO Miners active, the first is a Cat 1 and the second a Cat 4; for that day the distribution of those 100 ALGO is as follows: 20% goes to the Cat 1 ALGO Miner, and 80% goes to the Cat 4 ALGO Miner. In the event an ALGO miner is paused during the distribution of fees, it does not participate in the collection of fees during that day. Only after the ALGO Miner resumes operations it resumes its ability to collect fees; fees distributed during the paused periods go to running ALGO Miners only; paused miners permanently loose those fees.

ALGO Miners Types

There are two possible ALGO Miner types:

1. **Pool-based:** The ALGO Miner is distributing tokens from one of the pools mentioned above. It is also collecting fees as mentioned above.
2. **Non-Pool-Based:** It only collects fees. It does not distribute tokens from any pool. This type of ALGO Miners will be used at the final stage, when there are no more tokens available at the pools, and the project anyway would like to get people to mine the fees.

Referral Program

According to the Miners Referral Program mentioned in the section below, there is a sub-pool of the Funding Pool which contains 2.5% of the total supply of tokens, and is destined to be used for payouts to people referring new miners to the project. What this means in practice is the following:

1. Every ALGO Miner also receives a 10% of its Pool Capacity from the Miners Referral Pool.
2. Every day, when the ALGO Miner runs, from the ALGO tokens it distributes from received from it natural Pool and excluding the ones collected as fees, it will calculate a 10% and distribute this amount of tokens to the Referrer address, provided at construction time.
3. Remember the Referrer is first established when the ALGO Miner is created.
4. The Referrer is changed during the resetMiner operation.
5. All this is not executed if the ALGO Miner is Non-Pool-Based.

Cat.	Total Nr. of Tokens	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
1	1,000,000	500,000	250,000	125,000	62,500	31,250	15,625	7,813	3,906	1,953	977
2	2,000,000	1,000,000	500,000	250,000	125,000	62,500	31,250	15,625	7,813	3,906	1,953
3	3,000,000	1,500,000	750,000	375,000	187,500	93,750	46,875	23,438	11,719	5,859	2,930
4	4,000,000	2,000,000	1,000,000	500,000	250,000	125,000	62,500	31,250	15,625	7,813	3,906
5	5,000,000	2,500,000	1,250,000	625,000	312,500	156,250	78,125	39,063	19,531	9,766	4,883

Table 1: Tokens minted per year during the first 10 years.

To be continued...

Appendices

The following are tables from different active incentive programs that impact on the token distribution. They will be used later, once this document develop some missing sections:

Early Buyers' Sale	% of Total Supply	Nr. of Tokens	USD Token Price *	USD Amount	% Increase in Valuation
1. Friends & Family Stage A [COMPLETE]	0.841	8,409,578.60	0.0085	$71,481	
2. Friends & Family Stage B [IN PROGRESS]	0.459	4,590,421.40	0.0120	$55,085	29.17
3. Seed Round 1 - Accredited Investors	1.500	15,000,000.00	0.0170	$255,000	29.41
4. Seed Round 2 - Accredited Investors	1.000	10,000,000.00	0.0240	$240,000	29.17
5. Seed Round 3 - Accredited Investors	0.700	7,000,000.00	0.0340	$238,000	29.41
6. Seed Round 4 - Accredited Investors	0.500	5,000,000.00	0.0480	$240,000	29.17
*** Valuations proposed in the USD Token Price column should be considered provisional and must not be hardcoded in smart contracts.**					
SUBTOTAL	**5.00**	**50,000,000.00**		**1,099,566.47**	

Money Finders' Program	% of Total Supply	Nr. of Tokens	USD Token Price *	USD Amount
1. Money Finders Reward	0.210	2,102,394.65	0.0085	$17,870
2. Money Finders Reward	0.115	1,147,605.35	0.0120	$13,771
3. Money Finders Reward	0.375	3,750,000.00	0.0170	$63,750
4. Money Finders Reward	0.250	2,500,000.00	0.0240	$60,000
5. Money Finders Reward	0.175	1,750,000.00	0.0340	$59,500
6. Money Finders Reward	0.125	1,250,000.00	0.0480	$60,000
*** Valuations proposed in the USD Token Price column should be considered provisional and must not be hardcoded in smart contracts.**				
SUBTOTAL	**1.25**	**12,500,000.00**		**274,891.62**

Referrals Program	% of Total Supply	Nr. of Tokens
Project Development Referrals	1.000	10,000,000.00
Software Development Referrals	1.500	15,000,000.00
Money Finders Referrals	0.125	1,250,000.00
SUBTOTAL	**2.625**	**26,250,000.00**

Reserve	% of Total Supply	Nr. of Tokens
Reserve for potential ICO and other incentives	42.375	423,750,000.00
SUBTOTAL	**42.375**	**423,750,000.00**
GRAND TOTAL	**50.000**	**500,000,000.00**