TECHNICAL SPECIFICATION

of the

WISE

ERC-20 TOKEN

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1 Introduction

WISE Token, hereinafter referred to as **WISE**, is an ERC-20 compliant smart contract designed for deployment on the Ethereum blockchain. WISE is a decentralized, fairly launched, automatically liquid, trustlessly exchangeable, interest-bearing, bond-like token.

This document is a general technical specification of the contract and its functionality.

Mainnet launch of the WISE contract is scheduled for October 8, 2020

1.1 WISE Token Purpose

The core purpose of the WISE token — staking — is similar to both bonds and CDs (certificates of deposit): rewarding the holder with earned interest in exchange for locking up their funds for a period of time. WISE incorporates some of the features from both of these traditional instruments but improves greatly upon them.

CDs tend to be lower risk, lower return, and only pay out interest on their maturity date.

Bonds tend to be somewhat higher risk, higher return, and pay out interest regularly on a set schedule (typically every six months).

WISE is most similar to a bond, in that it earns relatively high interest, but allows users to withdraw it whenever they want.

WISE is superior to bonds and CDs in every way:

WISE gives the staker complete flexibility in choosing exactly when to withdraw their interest during the life of the stake. You can withdraw interest daily, irregularly, wait until maturity, or whatever you like!

WISE stakes have higher return, much lower risk (due to being decentralized and trustless), and far higher flexibility than both bonds and CDs. No more trusting banks and governments to stay solvent and not change their rules. No more worrying that a bond issuer may default on you.

WISE is pure, immutable code.

1.2 The Wise Foundation

The Wise Foundation is an unincorporated nonprofit association formed in February 2020. The WISE contract and various related software and websites are being wholly funded and developed by The Wise Foundation.

The Wise Foundation is dedicated to providing material through which anyone may understand the contract in depth. This is an important step towards fostering a high level of trust in the contract source code and its functionality, as not everyone has the means or will to digest the code.

The WISE contract source code will be made public on our Github at launch. A paid, professional audit of the WISE contract source code has been completed and included in this document.

If you have any questions, or would like to discuss the project with the founders, developers, and the rest of the community, please join the official WISE Telegram group at https://t.me/WiseToken. We welcome all interested, respectful parties to our humble community. For various news releases related to WISE, please join the WiseTokenNews Telegram channel at https://t.me/WiseTokenNews.

1.3 Motivations and Principles

Trusting your money in the custody of other humans is inherently risky. This glaring flaw in traditional financial instruments is a primary motivation for developing WISE. The WISE contract aims to ensure that a user can always be in full custody and control of their WISE tokens, even during the course of various economic activities.

The initial minting of WISE, earning referral bonuses, opening and closing stakes, receiving interest, and even selling WISE for ETH or other tokens can all be done end-to-end without the user's WISE tokens ever being under the control of another person or system. Compare this to the world of banks you can('t) trust and traditional money managers that (don't) have your best interests at heart.

One very important aspect of owning cryptocurrencies is having a place to safely, easily, and quickly trade them when the need arises. We believe Uniswap, a popular and highly regarded decentralized exchange (DEX) smart contract on Ethereum, is such a place. Following the fifty day Liquidity Transformer Epoch, the WISE contract will automatically, trustlessly, and irrevocably bootstrap its own initial liquidity pool on Uniswap. At least 90% of all ETH sent by users to the WISE contract during the LT Epoch will in turn be automatically transferred to Uniswap by the WISE contract, along with an amount of minted WISE in equal value.

In exchange for and simultaneous to this liquidity pool deposit, Uniswap transfers to the WISE contract an appropriate amount of UNI liquidity tokens, which carry the sole power to later withdraw that liquidity pool. The WISE contract will automatically, immediately, and provably destroy these UNI tokens by transferring them to a known burn address. In doing so, the WISE contract ensures that this initial ETH/WISE liquidity pool cannot be withdrawn from Uniswap by any person, party, contract, or entity — for all eternity.

The WISE contract also allows users to earn interest on WISE token time deposits called stakes, which are most similar to bonds, but more flexible. A stake earns interest like a bond, but with the added feature of allowing interest withdrawals at any time during the life of the stake; not something bonds allow. These bond-like interest-bearing stakes in WISE are always fully in the custody of the user and their wallet, never held, influenced, or able to be confiscated by any third party.

2 WISE Contract Functionality

The WISE contract has several key properties and core functions, outlined in detail in the following sections. Some of the important mathematical calculations and data structures are also presented here. Various example scenarios of user and multi-user activity and contract state evolution are illustrated where appropriate.

2.1 General Properties

The contract defines the token name as `"Wise Token"`, the token symbol as `"WISE"`, and the number of decimals as `18`.

The base unit of WISE is called `YODA`. One WISE is composed of one quintillion (1×10^{18}) YODA.

Time is tracked by the contract in whole day increments, beginning at Day `0`, which starts at the midnight UTC preceding the contract deployment. The individual days used for the LT Epoch will be higher day numbers in the code, rather than literally being day numbers 1–50.

The contract has no special functionality granted to the deploying account, no administrative keys, and no concept of a contract owner. All users, including the founders and developers, have precisely equal access to the contract's functionality.

The contract, once deployed, is immutable. No proxy or delegate contracts are involved.

2.1.1 Token Supply

The contract has no set token supply. The total initial supply minted by users through the Liquidity Transformer will fall within a defined range, determined partially by confined randomness, and partially by referral bonuses.

The 50 day Liquidity Transformer has an average of five million WISE available each day, though some days have randomness involved. This means the total supply available in the LT will likely be around 250 million WISE. Due to referrer bonuses, there could be up to an additional 10% minted on top of that (i.e. up to 25 million more).

This total supply is then matched by a minted batch that is then sent permanently to Uniswap. The amount of WISE sent to Uniswap will be up to 10% less than what was mintable through the LT and referral bonuses, due to the foundation reimbursement ETH. Regardless, the ratio of WISE/ETH sent to Uniswap will match exactly the ratio of mintable LT WISE (including referral bonus WISE) to LT ETH. This ensures that the initial Uniswap price matches the overall price of the LT.

The total supply of WISE in existence after the LT and Uniswap provision is subject to LT randomness, referral activity, and whether the foundation reimbursement ends up being a full 10% or less due to the hardcoded cap.

For example, if we assume the randomness averages out, assume half of all possible referrer bonuses are earned, and assume the foundation reimbursement cap causes it to be only 5% of the LT ETH, then the total initial supply would be:

```
baseLTSupply = 250,000,000 WISE
referrerBonuses = baseLTSupply * 5% = 12,500,000 WISE
totalLTSupply = baseLTSupply + referrerBonuses = 262,500,000 WISE
uniswapBatch = totalLTSupply * 95% = 249,375,000 WISE

totalInitialSupply = totalLTSupply + uniswapBatch = 511,875,000 WISE
```

Though extremely unlikely (virtually impossible), the absolute minimum possible total initial supply (all random days get their minimum values, no referral bonuses, and a low enough LT ETH total that makes the foundation reimbursement exactly 10%) would be:

```
baseLTSupply = 180,000,010 WISE
referrerBonuses = baseLTSupply * 0% = 0 WISE
totalLTSupply = baseLTSupply + referrerBonuses = 180,000,010 WISE
uniswapBatch = totalLTSupply * 90% = 162,000,009 WISE

totalInitialSupply = totalLTSupply + uniswapBatch = 342,000,019 WISE
```

Though equally unlikely (virtually impossible), the absolute maximum possible total initial supply (all random days get their maximum values, maximum referral bonuses, and a high LT ETH total that makes the foundation reimbursement approach 0%) would be:

```
baseLTSupply = 319,999,990 WISE
referrerBonuses = baseLTSupply * 10% = 31,999,999 WISE
totalLTSupply = baseLTSupply + referrerBonuses = 351,999,989 WISE
uniswapBatch = totalLTSupply * ~100% = 351,999,989 WISE

totalInitialSupply = totalLTSupply + uniswapBatch = 703,999,978 WISE
```

The total token supply will inflate at a rate of 4% per year, starting once the Liquidity Transformer Epoch ends and the Circulation Epoch begins. Some of the new tokens will be minted directly to stakers upon closing a stake, and some minted to stake referrers. If no stakes are closed on a given day, and no stakes scrape interest on that day, no new tokens are actually minted that day, though they are earmarked to be minted later. Once a stake is closed, all tokens the stake had earmarked to it for all past days are then minted at once.

2.2 Liquidity Transformer Epoch

The launch of the WISE contract will kick off an initial 50 day phase during which users may send ETH (or any ERC-20 token traded on Uniswap V2) to the contract in order to reserve WISE tokens. The tokens reserved can be minted by the users immediately following the end of the LT Epoch, i.e. the start of day 51.

Each day of the LT Epoch will have an amount of WISE tokens that are reservable by all those who deposit ETH to that day. Most days will have exactly five million WISE available, but the other days will have their available WISE amount randomly set within a predefined range. These random amounts will be determined by the contract shortly after the end of each random day, by leveraging the Provable (formerly called "Oraclize") smart contract's Random Datasource interface. The generated randomness is delivered on-chain in a trustless and provably cryptographically secure manner. For more detailed information about Provable, please read their random datasource white paper and their security deep dive.

Each day's available WISE ends up getting split amongst the users who deposited ETH to that day, in direct proportion. In other words, a user that made a reservation on a particular LT day will later be able to mint the fraction of that day's available WISE that equals the fraction of the day's total ETH they personally sent in.

2.2.1 Token Reservation

On any given day of the LT Epoch, users may choose to send ETH (or any ERC-20 token traded on Uniswap V2) to the contract and assign it to any of the LT Epoch days that have not yet concluded. We call this action a "token reservation".

For example, during day 12, users may send and assign ETH to any of the days 12–50, but not to days 1–11, since those days have already concluded.

Each token reservation is assigned to a single day, but users may make as many such reservations as they wish, to as many different days as they wish.

The WISE contract front end will also include the ability for a user to spread a single reservation amount of ETH (or ERC-20) evenly across all remaining LT days. This "dollar cost averaging" feature saves gas for the user who wishes to reserve an equal part of each LT day.

Reservations can be made with ETH, but also with any ERC-20 token that's traded on Uniswap V2. This is done via direct integration with Uniswap, which swaps the ERC-20 for ETH as part of the reservation transaction. This is functionally the same as the users themselves swapping the ERC-20 for ETH on Uniswap, and then later sending the ETH to the WISE contract for a token reservation. The benefit of using the WISE reservation interface to do this is that it saves the user some gas fees and time.

Each single token reservation must be of a minimum ETH amount, to make spam attacks cost-prohibitive. The specific minimum amount will be finalized at a later date, closer to launch. This is because the price of ETH may change significantly between the time of this writing and the contract launch. The minimum will likely be in the neighborhood of $10 worth of ETH.

The contract will provide public interfaces for viewing the total amount of ETH currently assigned to each LT Epoch day across all users, as well as the total WISE available for each day (where that supply has been determined, in the case of random days). For days where the supply has not yet been finalized, the min/max range will also be retrievable from the contract.

2.2.2 Daily LT Supply Schedule

Every LT day has an average of five million WISE available for reservation. Some of the days with randomly determined amounts have tight ranges only a few hundred thousand WISE in variance, and others are extremely variant, ranging from a single WISE to ten million WISE (technically 9,999,999 WISE, in order to preserve a strict average of five million per day). In this way, the LT Epoch provides various exciting options for users wishing to gamble with their ETH, and at various levels of risk/reward.

The following table outlines how many WISE will be available for user reservation on each day of the LT Epoch. Most days have exactly five million WISE available. The rest show two supply values: the minimum and maximum available that day. Each day is color coded for relative risk level, from none to high):

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			Nov 11 5M	Nov 12 5M	Nov 13 5M	Nov 14 5M
Nov 15 5M	Nov 16 5M	Nov 17 5M	Nov 18 5.5M 4.5M	Nov 19 5M	Nov 20 5.5M 4.5M	Nov 21 5M
Nov 22 10M 1	Nov 23 5M	Nov 24 6M 4M	Nov 25 5M	Nov 26 6M 4M	Nov 27 6M 4M	Nov 28 5M
Nov 29 10M 1	Nov 30 5M	Dec 1 6.5M 3.5M	Dec 2 5M	Dec 3 6.5M 3.5M	Dec 4 5M	Dec 5 6.5M 3.5M
Dec 6 10M 1	Dec 7 5M	Dec 8 5M	Dec 9 7M 3M	Dec 10 5M	Dec 11 7M 3M	Dec 12 5M
Dec 13 10M 1	Dec 14 5M	Dec 15 7.5M 2.5M	Dec 16 7.5M 2.5M	Dec 17 5M	Dec 18 7.5M 2.5M	Dec 19 5M
Dec 20 10M 1	Dec 21 5M	Dec 22 10M 1	Dec 23 5M	Dec 24 10M 1	Dec 25 5M	Dec 26 10M 1
Dec 27 10M 1	Dec 28 10M 1	Dec 29 5M	Dec 30 5M			

2.2.3 Reservation Referrals

The WISE contract has a direct, one-level referral system that rewards both the referrer and referee when a user reserves WISE tokens in the LT. This referral system is an incentive to help increase the amount of ETH sent in, in turn funding a larger and more robust initial liquidity pool on Uniswap.

When a user makes a token reservation, the front-end interface checks if their browser has a referral cookie stored. If such a cookie is present, the contract makes note of the referrer's ethereum address and associates it with the referee's token reservation. The contract also tags the user's token reservation as having been through a referral, and this reservation is credited as having been 10% more ETH than it actually was. When the user mints their reserved tokens after the end of the LT Epoch, each token reservation that was through a referral will thus mint 10% more WISE than if it hadn't been through a referral.

Users may change the referral cookie stored in their browser at any time by clicking another referrer's link. If they do, their future token reservations would be associated with the new referrer. All past token reservations for that user remain as is; their previous referrer(s) do not lose credit for their existing referred token reservations.

2.2.3.1 Referrer Bonuses

When the LT Epoch ends, referrers that have referred enough ETH into the system, via their referred users' token reservations, can then mint an amount of bonus WISE.

The LT referrer bonus system has two tiers. Bonuses (paid in WISE) are based on how much total ETH their referral link brought in to the LT:

- *Refer 1 - 49.999999999999999999 ETH*
  Bonus = 0.05 ETH (paid in WISE)
- *Refer 50 or more ETH*
  Bonus = 10% of ETH (paid in WISE), and "CM Referrer" status

Examples:

- Alice refers a few friends who, in total, send 0.83 ETH into the LT. Alice fails to reach the 1 eth minimum for the first tier, so she earns no bonus WISE.
- Bob refers several friends who, in total, send 3.6 ETH into the LT. Bob qualifies for the first bonus tier, so he earns a flat bonus of 0.05 ETH worth of WISE.
- Eve creates several WISE videos and publishes her referral link on them. Users clicking her referral link send a total of 64 ETH in to the LT. Eve qualifies for the top bonus tier, so she earns 6.4 ETH worth of WISE, as well as permanent "CM Referrer" status.

Note: all referral bonuses are paid in WISE. When the LT ends, an effective total LT WISE/ETH exchange rate is calculated by looking at the total amount of ETH sent in by all users, and the total amount of WISE made available for reservation. This ratio is then used to calculate the amount of WISE for each referral bonus.

2.3 Circulation Epoch

When the final LT Epoch day ends, the Circulation Epoch begins. At this point, no further token reservations can be made.

Reserved WISE and referrer bonus WISE may now be minted by users, at their leisure. Users may begin staking WISE. 90% or more of all ETH sent into the LT and a matching batch of WISE is automatically sent to Uniswap, so users may begin trading WISE and ETH there. All standard ERC-20 functions involving minted tokens are also now available. At the start of the fifteenth day of the Circulation Epoch, there will be a one-time automatic share price increase of 10%.

Once the LT Epoch has ended, there is a public function in the contract that may be called by anyone to trigger the following one-time sequence of actions to start the Circulation Epoch:

1. Calculate the total ETH sent into the LT. Set aside 10% or 2,000 ETH, whichever is less, for the Wise Foundation reimbursement performed in Step 4 below. The remaining 90% (or more) of this ETH is the **"Uniswap Provision Ether"**.
2. Calculate the total WISE that is available to be minted due to token reservations and referrer bonuses. Calculate the same fraction of this WISE (90% or more) that was used to determine the Uniswap Provision Ether in Step 1 above. Immediately mint this amount of new WISE. This is the **"Uniswap Provision WISE"**.
3. Transfer the "Uniswap Provision Ether" and "Uniswap Provision WISE" to the WISE/ETH Uniswap exchange pair contract, forming its initial liquidity pool. As part of this transfer, the WISE contract receives back from the Uniswap contract an amount of UNI-V2 liquidity tokens and immediately burns these by transferring them to a known burn address.
4. Transfer the 10% (or less) of LT ETH set aside in Step 1 to The Wise Foundation's ethereum address.

2.3.1 Uniswap Provision

The WISE contract's constructor function, executed when deploying the WISE contract, will make a call to the Uniswap V2 factory contract in order to create the Uniswap WISE/ETH exchange pair contract. This newly created exchange contract's address will be stored internally in the WISE contract.

This newly created Uniswap WISE/ETH exchange pair contract will simply lie dormant until the Circulation Epoch begins and the Uniswap provision transfer is executed, using the stored address. No minted WISE exists until that point, so no liquidity can be added until then.

As part of sending the Uniswap provision WISE and ETH to the exchange pair contract, a UniswapV2Router contract is used, which internally wraps the ETH into WETH (wrapped ETH), as is standard in Uniswap V2.

The UniswapV2Router contract returns an amount of UNI-V2 liquidity tokens to the WISE contract as part of the Uniswap provision transaction. These UNI-V2 liquidity tokens represent ownership of the liquidity pool the WISE contract just sent in, and carry the sole power to withdraw that liquidity. The WISE contract has no code or function allowing such a liquidity withdrawal. However, as a further show of The Wise Foundation's commitment to making WISE a totally trustless system, the WISE contract will automatically and irrevocably destroy these UNI-V2 liquidity tokens upon receipt. This is done by transferring them to a known "burn address", such as `0x0`.

Once the Uniswap provision is complete, users are free to use Uniswap's front end to swap WISE into ETH, and vice-versa. They may also choose to deposit their own liquidity pools of WISE/ETH in order to earn fees from traders.

2.3.2 Wise Foundation Reimbursement

Prior to deploying the WISE contract, The Wise Foundation will determine its total expenses incurred in developing and launching WISE. These will include wages paid to developers, fees paid to lawyers, marketing spend, and the cost of the audit.

This expense total is represented in the contract source code as a hardcoded amount of 2,000 ETH.

When the LT Epoch closes and the Circulation Epoch begins, the total ETH sent into the LT gets divided into two buckets:

- 10% of the LT ETH (not to exceed 2,000 ETH)
- All remaining LT ETH

The 10% (or less) bucket of ETH is then transferred to an ethereum address owned by The Wise Foundation. The other bucket (90%+) is sent to Uniswap to create the first liquidity pool for WISE.

2.3.3 Minting Tokens

Once the LT Epoch has ended and the Circulation Epoch has begun, users may now mint WISE tokens, either due to having reserved WISE in the LT Epoch or having earned referral bonus WISE, or both.

The minting of WISE is done on-demand by the user, in a single batch, through the front-end interface. The interface will show how many WISE the user can mint, broken down by reservation and/or referral bonus sources. Users may mint their WISE immediately, or wait as long as they like, without penalty.

tokens will likely want to mint their WETH wrapper rather than take a chance on exchanging ETH tokens that have been stressed, which becomes less profitable the longer one waits.

3.3.4 Supply Inflation

The total circulating supply of WETH inflates at a constant rate of 18 per year. At the end of every day on the Ethereum Epoch, the contract mints enough WETH to bring the total supply up to exactly 18 ether for every ether in existence that was in existence at the start of the day.

```
totalSupplyAt(y) = initialSupplyAt(y) + accumulAt(y)
initialSupplyAt(y) = 18 * 1e18
accumulAt(y) = 0 if y == 0

totalSupplyAt(y) = totalSupplyAt(y - 1)*(1+inflRate(y))
```

These one daily inflation WETH are not immediately minted. Instead, they accumulate in a separate pool, and are only minted when someone calls the function `mintAccumulated()`. Anyone can mint accumulated ether (ETH) inflation to all active, qualified ETH Stakers. One day, each active, qualified ETH Staker will receive 18 WETH for every ether they had in their stake.[Note: Implementation of the Staking Contract and how the Ether deposit/withdrawal scheme is used for the WETH mechanism is qualified in the Staking section.]

An example scenario:

```
On day 0, Alice stakes 1ether.
  - 18e18 WETH total circulating supply
  - 18.1e18 total stake WETH
  - Alice's stake: 1e18
  - Alice's share: 1/18.1

The total stake WETH then will be generated this day by Alice:
  - 18e18 * (18.1e18 - 18e18) / 18e18 = 0.1e18 WETH generated
  - accumulAt(1) = 0.1e18 *Alice's share*

Alice now owns 0.1e18 WETH.
  - Alice's share: 1.1/18.1 (1e18 + 0.1e18 / 18e18)
  - Alice's WETH: 18.1e18 * 1.1/18.1 = 1.1e18
  - Alice's ether: 1e18

Now, Compound.eth's 1ether is active stake that is 1.1WETH shares.
  - This, in Alice's share-terms gives Compound.eth the following:

  - totalSupplyAt(1) = 18e18*(1.1/18.1) = 18e18*(1.1/18.1)*(1+0.1e18/18e18)
  - accumulAt(1) = 18e18*(1.1/18.1)*(0.1e18/18e18)
  - totalSupplyAt(1) = 1.1e18 *Alice's share*
```

3.3.5 Staking

The WETH contract allows users to stake their WETH, locking it up for a period of days, in order to earn interest. This is the primary mechanism by which WETH holders earn the inflation.

Once a user stakes, they can't unstake for a set number of days. Their full WETH balance, including the inflation, is locked up. Once the stake is finishing stake, receiving back the ether & WETH, the staker receives the inflation.

Staking stakes known timestamps. Each stake generates a unique stake ID, which is a hash of the staker's address and the stake's index (their position, especially for their stakes). Anyone can stake WETH on behalf of another address, but only the owner of the stake can unstake it. Stakers can transfer their stakes to other addresses (jurisdictions that make it illegal to position the asset of a delegate) prior.

3.3.6.1 Opening Stakes

When a user opens a new stake, they create an amount of WETH to stake, and specify the number of days the stake should last (from 1 to 4,000,000,000 days (11000000 years). The minimum stake length is 1day, and the maximum stake length is 15,210 days (just under 42 years).

Once a stake is opened, it is in "Staking" status. This means that it is locked up, and cannot be unstaked. The stake's owner can at any time, before the stake is ended, finishing staking, receiving back the stake's principal and the inflation it has earned.

Pending stakes known "this" current since the next day begins. It also stores, cumulating the stake before it reaches "Mature" status but is still active.

When a stake is opened, the WETH stakes known are actually bound by the current day, since the stake is opened. These stakes are then, when the day ends, updated to reflect the stake's inflation. The stake's WETH is bound back to the stake along with any interest added and penalties incurred.

3.3.6.2 Mature and Unstaked

When a stake is opened, its WETH principal is bound and contested to the stake's owner. Interest accrues on the stake's WETH, and the stake's WETH is bound back to the stake. The stake's WETH is now a newly opened stake gets is determined by a global "shares price" variable. The stake's WETH is now bound back to the stake's owner, the longer of the stake. This stake's WETH increases, hence, staking earlier is better than later.

Stakes get interest daily through the WETH supply inflation, as well as interest from other stakers who stake after the stake's owner has been about 90 days. These quarters of the inflation (i.e. 18 WETH in every year) are minted and bound to the stake's principal. Stakers can also earn interest directly from other stakers who stake after them. 1% of 18% is distributed daily to the 10 reference shares in the same proportional manner.

Depending on the length of the stake, a bonus amount of shares will be added to the stake's owner. The longer the stake, the longer the bonus. Stakes are initially given a bonus of 90 days worth of shares. The bonus decays 1% a day for the stake. For 100 days's stake, and then to 0% at the end of the stake's term. The bonus is added to the stake's owner's shares, and is minted to the stake's owner when the stake is ended.

The shares price starts a zero exponential rate after development in the WETH contract. The shares price is then updated daily, calculating a decay of the shares price (where `latestDecay` = `latestDecay * pow(1/1.1e18, daysSinceLastDecay)`). The shares price is used to determine the current shares price, and the current shares price is used to determine the incremental shares.

The shares price can only increase over time, always finally shares. This ensures that earlier stakes get more shares than later stakes of the same length, and that the shares price never decreases. This prevents users from being able to compound their interest with a temporary shares increase in order to try and outperform other stakers.

In the start of the Ethereum epoch of the Consensus chain, the shares price will be automatically increased by 100 on a one-time event. This creates a very strong incentive for users to open stakes during the Ethereum epoch, and ensures that the shares price is high enough for the WETH contract to have a shares price when one is needed for the first time. This will have no the previous day, but will have an the previous day. This ensures that the shares price increases during the Ether epoch.

3.3.6.3 Scrapping Stakes Interest

Users will have the ability to withdraw (strike) any amount of earned interest from stakes back to itself, before the stake fully matures.

Users can withdraw exactly how much interest they want to scrape, up to the maximum (all). Although, unscraped interest from all previous days's stakes is bound back to the stake, and cannot be withdrawn. Scrapping interest is a one time action.

Scrapping interest is possible starting on day 2 of the active stake. Users can scrape the interest from the stake's first day, starting on day 2. Full day of active activity, and they has not yet minted and interest.

When a stake is closed, whether Active or Mature, the interest added back to the stake will unless interest that hasn't yet been scrapped.

Scrapping interest will not affect the stake's principal, but will reduce the amount of shares the stake has earned forward. This effectively means that the stake will earn slightly less interest in the future, and will be worth less if it is closed early. Scrapping interest is a useful option if a staker wants to withdraw some of their stake, but not want much shares if they intend to immediately re-stake their scraped interest.

Scrapping interest may cause a penalty, however, just as when closing a stake early. This penalty is applied to the interest that is scrapped and has the interest of the stake, thus ensuring that the stake's owner is not able to avoid the penalty by scrapping the interest and then closing the stake when maturity is an option.

First, calculate a possible new shares price based on the stake's owner's current stake, and the interest being scrapped. Then calculating this shares amount based on the current shares price:

```
newSharesPrice = totalSharesPrice - (penalty(stakeRepUnbound) * stakeSharesPrice)

Next, if this new shares price is greater than the current global shares price, the global shares price should also be updated (and incremented due to this change):

if (newSharesPrice > globalSharesPrice) globalSharesPrice = newSharesPrice

Next, calculate an amount of shares to be removed from the stake, based on the stake's interest being scrapped and the global shares price:

sharesToRemove = interestToScrape / globalSharesPrice

Finally, reduce the stake's interest shares:

stakeInterestShares = stakeInterestShares - sharesToRemove
```

3.3.6.4 Closing Stakes

A stake can be closed at any time. Depending on the stake's status (active the stake is in it's lifecycle), different things will occur:

- Closing a Pending stake - the stake shares are destroyed. The entire stake principal is returned back to the stake's owner, minted or penalty.
- Closing an Active/Mature stake - the stake shares are destroyed. The stake principal is returned back to the stake's owner, and minted back to the user along with all interest accumulated thus far.

Closing a Active stake, the stake's owner receives the stake's entire stake principal and all interest accumulated in minted back to the owner. There also may be a penalty for closing the stake early.

The penalty deducted from the principal (`stakeRep`) when closing an Active stake is as follows:

```
if (m >= stakeD * 3.1e18)
    penalty(stakeD) = stakeD / 2.1

if (m >= stakeD * 1.1e18 && m < stakeD * 3.1e18)
    penalty(stakeD) = (stakeD * 3.1 / m - 1) / (stakeD/m + 1)e18
```

Thus, if you stake an Active stake that was 100 days long on its 310th day, the penalty would be 50%. Staking for 200 days, the penalty would be 25% (equal to the stake's length). Staking for 1,000 days, the penalty would be 0%. Staking for 1,100 days, the penalty would be 0%. The penalty scales linearly between these two extremes.

Any such WETH penalties from a stake's return is returned for distribution among the 10 reference shares, with 1% being distributed daily and distributed by block timestamp. Stakers share each of these stakes with.

3.3.6.5 Stake Referrals

An ERC-20 WETH contract includes a referral system to incentivize staking. Users can specify a referrer address when they stake, and the referrer receives a referral bonus for staking.

When a user opens a new stake, the front-end interface checks whether this address has a referral contract, and if so it asks when they want to use it. If the referral contract is enabled, it will return a percent, and the stake's owner receives this percent of the referrer's bonus. The referrer bonus is added to the stake's shares.

A referral code governing 10% extra shares for the staker (because the referral code's owner has enabled it) and 10% of the staker's bonus shares goes to the referrer. The referrer receives a bonus for the referral. The system would get 10% of the staker's bonus shares, and the referrer would receive 10% of the staker's bonus shares.

To qualify as a ER referrer, a user must have created a total of 100,000ether in total stakes (with a minimum length of 1day). This is to prevent sybil attacks, and ensure that the referrer is a user who is active and cares about the system. Users can track their distribution, regardless of their referrer status and all their rewards.

Another way to qualify as a ER referrer is to have referred ETH of at least 100,000ether in total stakes. This ensures that the referrer is a user who has contributed and accomplishing one qualification is enough.

Calculating a new stake's ERB value is very short work, when the stake is being created. The referrer's bonus percentage and the referrer address can be determined by querying the Uniswap WETH/ETH and ETH/DAI exchange and contracts' price oracle interfaces.

3.3.6.6 Liquidity Provider Staking

WETH has an additional way of staking that rewards liquidity providers in the WETH/ETH pool of Uniswap contracts. Users can get, if the liquidity percentage of WETH on Uniswap falls below 20%, then you may stake ether (ETH) and receive WETH back. This is a special type of stake, and has of the staking fees are charged, and the interest is increased.

This new money comes from the 1% inflation for stakers such that, the 18% of the WETH supply inflation is now 19%. This 1% is distributed to these liquidity providers. Until Uniswap WETH/ETH pool is at least 20% of the WETH supply, the 1% inflation goes to a new pool of money available for LP's to have daily interest.

An additional perk for LP staking is that you may add your stake at any time, and it will be treated as if it was a mature stake. Liquidity provider stakes can be closed, and the rewards claimed, with no penalty. Liquidity provider stakes can be closed, and the rewards claimed, with no penalty. Liquidity provider stakes can be closed, and the rewards claimed, with no penalty.

This is a compared to new system that will more likely not be triggered for years if at all. Users can still choose to add to Uniswap themselves, and receive the 1% inflation, and the 10% of the fees, but the calculation structure of the shares interest doesn't trigger until needed.

3.4. ERC-20 Functionality

The WETH contract conforms fully with the ERC-20 token standard, as proposed in EIP-20. This is essentially a set of functions that a token contract must implement in order to be an ERC-20 token.

This ERC-20 standard compliance means that applications, websites, exchanges and other smart contracts can easily integrate with WETH as an alt-ETH or ERC-20 token.

3 WISE Website

This section contains additional information about the WISE website.

3.1 Referral Links

```
https://wisetokens.eth.link/?r=0x0E7A6A0B0E0C0.
```

Example: `https://wisetokens.eth.link/?r=0x0E7A6A0B0E0C0.`

Example: `https://wisetokens.eth.link/?r=0x0E7A6A0B0E0C0.`

Referral links are a referral link to direct users to the WISE website. Users who visit the website through a referral link will automatically be set as their referrer, and will become eligible for a certain amount of rewards, as the potentially each various referral bonus WETH from those users' contract interactions.

When a user clicks such a URL link, the WISEWETHS.ETH WETHER STAKES contract will automatically set the referrer address to the address specified in the URL. If the user does indeed be the EIP-20 address, the website will then be able to interact with the contract, and can now be charged the referrer bonus on all their stakes. The referrer address is then stored in the referrer's contract.

Users can also create a QR-link, the WISEWETHS.ETH WETHER STAKES contract will automatically set the referrer address to the address specified in the URL. If the user does indeed be the EIP-20 address, the website will then be able to interact with the contract, and can now be charged the referrer bonus on all their stakes. The referrer address is then stored in the referrer's contract.

If a user chooses has a referrer, creates in their browser and clicks a referral link, the WISEWETHS.ETH WETHER STAKES contract will set their referrer address. Referrals are "Mature" after 1 full stake period.

Referral links containing invalid or otherwise addresses will not work; the website will not create the associated the cookie.

4 Conclusion

The Wise Ecosystem intensely hopes that our efforts to provide the general public with a trustless, decentralized, inclusive banking system will succeed. We believe that the WETH token is a useful piece, but, we can't achieve these goals without the help of the wider community.

The WETH project was started and with the intention to profit, but from the bitcoin to create something that would benefit the world. We hope this document has made our vision and intentions clear.

We welcome questions, comments and criticism you may have. We also have some need for various types of contributions to the project.

Please join us in the official WISE Telegram chat, or the official WISE Discord server, and let us know what you think. We look forward to the feedback, developers, supporters, critics, and the rest of the community.

5 Acknowledgements

The Wise Ecosystem would like to sincerely thank the following people and organizations for their contributions to the development or debug WISE's creation and a review:

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- Lumoria - for offering developer scholarships and tutorials on ice smoothly and produce detailed technical insights and tutorials on Ethereum and Solidity.
- Hackaugust - for building a slick platform full of tutorial and sage designers.
- Page style adapted from the DAO Stakeholder Manifesto Paper.

6 Availability

The web version of this paper is located at https://wisetokens.eth.link/. The source code is maintained at https://github.com/wise-tokens/wise-tokens.eth/tree/master/docs/.

7 Appendices

Appendix A Terminology

- WETH - the token and contract described herein.
- ETH - the base unit of the WETH token, analogous to wei for ETH, and 1e18 ether. Ether, Wei, and Gwei are also acceptable terms.
- Epoch - a time linked deposit of WETH which earns interest over time.
- Liquidity Contribution Epoch - the first Fifty days of the Ethereum Epoch, during which the WETH Staking Reward Pool is instance part of the initial supply of WETH.
- Ether Epoch Epoch - the epoch immediately following the end of the 50 Liquidity Contribution Epoch, and ends about three thousand days later, on the 3,000th day of the Ether Epoch.
- Uniswap - a decentralized, non-custodial ERC-20 token and ETH exchange on the Ethereum blockchain. The WETH contract is integrated directly with Uniswap. Several lots on Uniswap is `uniswap`. Uniswap exchange and the wise Uniswap pool is `uniswap`.
- ERC-20 - a standard interface for Ethereum smart contract tokens, proposed in EIP-20 by Fabian Vogelsteller and Vitalik Buterin. Ethereum Improvement Proposal 20 including EIP-20 number can be found here.

Appendix B Coding Standards

- The WETH contract is written entirely in Solidity and compiled with solc 0.5.2.
- The code should adhere to the formats specified by the Solidity style guide as of the official Solidity 0.5.2 documentation.
- Lines should be limited to a maximum of 79 characters in length.
- Unit tests should provide 100% coverage of the source code. All reasonable edge and corner cases should be covered.
- Function and variable names should convey their purpose and usage in a clear and concise manner. Single letter variable names are only slightly conveniently abbreviations, typically for loop counters.
- Functions should be as short as is practical. They should do when one thing, and do it well. Functions should fit on a screen, and have a function variable that changes and are assigned to a typical mention; as a typical two line, if at all possible.
- Contracts should be deployable with the latest stable release of the Ethereum mainnet. Contracts should be thoroughly tested on Ganache, and testnets to explore any unexpected behaviors in a real-world environment prior to deployment.
- `[REQUIRE]` function calls should contain a short but descriptive error message, always prefixed with "WETH:".
- Avoid duplicated code (don't repeat yourself).
- Minimum possible and practical gas costs are efficiency as a priority, land parts of the code and sensitive materials are more important than gas optimization. Contracts should be as gas-cheap as possible, but not at the expense of security and a comprehensive and fully tested code. Gas optimization should take priority over both code and testing.

Appendix C Source Code Audit

The Wise Ecosystem has obtained a paid, professional audit of the WETH contract's source code. The auditing company, Cryptokatze, auditing firm, The full audit report is included below.

"3.2M - The auditors' conclusion was, "We found that although the project does a certain complexity, the code overall is well-written and documented. The project uses well known and tested libraries, and also implements and utilizes complexity to what is implemented of the contracts. We identified minor issues and found and the only was security issue we quickly closed by the team."

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