



Cyberscope

Audit Report

Lava Oracle

April 2022

File	Oracle.sol
Commit	605b9971b669eabf3e6727cb61d55f7cdd620e5a
Github	https://github.com/lavafinancial/LavaContracts
Audited by	© cyberscope

Table of Contents

Table of Contents	1
Contract Review	2
Audit Updates	2
Source Files	3
Contract Analysis	4
Contract Diagnostics	5
Update 13 April	5
FSA - Fixed Swap Address	6
Description	6
Recommendation	6
Update 13 April	6
Contract Functions	7
Contract Flow	9
Summary	10
Update 13 April	10
Disclaimer	11
About Cyberscope	12

Contract Review

Github	LavaFinance
commit	605b9971b669eabf3e6727cb61d55f7cdd620e5a
File	Oracle.sol

Audit Updates

Initial Audit	9th April 2022
Corrected	13th April 2022

Source Files

Filename	SHA256
@openzeppelin/contracts/access/Ownable.sol	75e3c97011e75627ffb36f4a2799a4e887e1a3e27ed427490e82d7b6f51cc5c9
@openzeppelin/contracts/token/ERC20/IERC20.sol	c2b06bb4572bb4f84bfc5477dad0fcc497cb66c3a1bd53480e68bedc2e154a6
@openzeppelin/contracts/utils/Context.sol	1458c260d010a08e4c20a4a517882259a23a4baa0b5bd9add9fb6d6a1549814a
contracts/interfaces/Pair.sol	8d8c081e548f3f8352218fa545a5b94d01c2221986e73db1e4e46f7b6d7ef9c1
contracts/lib/Babylonian.sol	074426507d1e75fe16687010fef4b66c00cab4c0d73774947a6ee797c6dbbf29
contracts/lib/FixedPoint.sol	599039d717b75eea4fe19fbac01638380cfdfece43b372e125c24d75a7b6bfd8
contracts/lib/UniswapV2OracleLibrary.sol	61e600bbdbad3588779839933a2347819e40277ea04d1d723d0cc59c0e5cc67d
contracts/Oracle.sol	8510d25eb8d8d7fa351a403a34b16f76ea9d303efc33668e4887571237921827

Contract Analysis

The Lava Oracle is trying to mirror the oracle mechanism that was initially introduced in the pairing contract of the Uniswap v2.

You can read more about the fundamental Oracle principals in the Uniswap v2 Core whitepaper, [section 2.2 Price oracle](#)

According to the whitepaper, the estimated price is a result of the price difference in a specific time frame. This logic is implemented in the pair contracts of all the decentralised exchanges. You can check the [core-v2 implementation of the Uniswap repository](#).

Since the pair already contains the price oracle mechanism, then the Lava price oracle could reuse this functionality instead of replicating it. That way, potential synchronization issues with the original price will be eliminated.

Contract Diagnostics

● Critical ● Medium ● Minor

Severity	Code	Description	Resolved
●	FSA	Fixed Swap Address	Acknowledged

Update 13 April

The team has resolved all the issues that were mentioned in the `d59617e3ac107eea6d7601aac6e73e7f45ee00eb` commit.

FSA - Fixed Swap Address

Criticality	minor
Location	contract.sol#L41
Resolved	Acknowledged

Description

The swap address is assigned once in the constructor and it can not be changed. The decentralized swaps sometimes create a new swap version, abandon the current or move to a different pair. A contract that cannot change the swap address may not be able to catch-up the upgrade.

```
pair = _pair;
token0 = pair.token0();
token1 = pair.token1();
price0CumulativeLast = pair.price0CumulativeLast(); // fetch the current
accumulated price value (1 / 0)
price1CumulativeLast = pair.price1CumulativeLast(); // fetch the current
accumulated price value (0 / 1)
```

Recommendation

It could be better to allow the swap address mutation in case of future swap updates.

Update 13 April

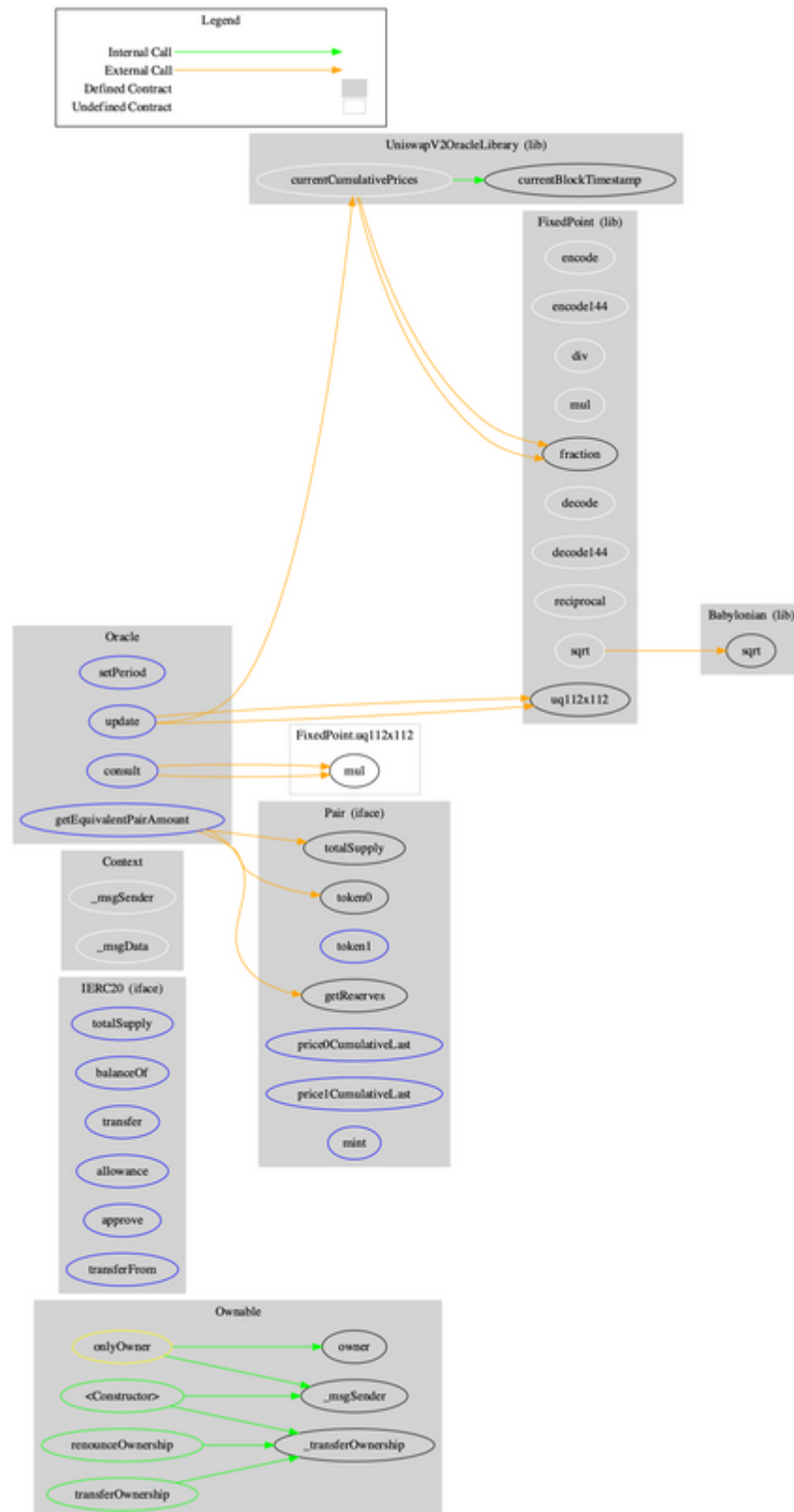
The team has noted that If there is an issue, we will create a new oracle and set it in LavaFinance.

Contract Functions

Contract	Type	Bases		
	Function Name	Visibility	Mutability	Modifiers
Ownable	Implementation	Context		
	<Constructor>	Public	✓	-
	owner	Public		-
	renounceOwnership	Public	✓	onlyOwner
	transferOwnership	Public	✓	onlyOwner
	_transferOwnership	Internal	✓	
IERC20	Interface			
	totalSupply	External		-
	balanceOf	External		-
	transfer	External	✓	-
	allowance	External		-
	approve	External	✓	-
	transferFrom	External	✓	-
Context	Implementation			
	_msgSender	Internal		
	_msgData	Internal		
Pair	Interface			
	totalSupply	External		-
	token0	External		-
	token1	External		-
	getReserves	External		-
	price0CumulativeLast	External		-
	price1CumulativeLast	External		-
	mint	External	✓	-
Babylonian	Library			

	sqrt	Internal		
FixedPoint	Library			
	encode	Internal		
	encode144	Internal		
	div	Internal		
	mul	Internal		
	fraction	Internal		
	decode	Internal		
	decode144	Internal		
	reciprocal	Internal		
	sqrt	Internal		
UniswapV2OracleLibrary	Library			
	currentBlockTimestamp	Internal		
	currentCumulativePrices	Internal		
Oracle	Implementation	Ownable		
	<Constructor>	Public	✓	-
	setPeriod	External	✓	onlyOwner
	update	External	✓	-
	consult	External		-
	getEquivalentPairAmount	External		-

Contract Flow



Summary

The Lava Oracle is a mechanism that provides a price estimation by tracking the swap's pair reserves. This audit mentions the initial price oracle fundamentals, discusses ways to reuse the core oracle functionality and suggested potential improvements.

Update 13 April

The team has resolved all the issues that were mentioned in the `d59617e3ac107eea6d7601aac6e73e7f45ee00eb` commit.

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Coinscope is the leading early coin listing, voting and auditing authority firm. The audit process is analyzing and monitoring many aspects of the project. That way, it gives the community a good sense of security using an informative report and a generic score.

Cyberscope and Coinscope are aiming to make crypto discoverable and efficient globally. They provides all the essential tools to assist users draw their own conclusions.



The Cyberscope team

<https://www.cyberscope.io>