Six Network

Definix Core Contracts

Security Assessment

March 29th, 2021

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Overview

Project Summary

Project Name	Six Network - Definix Core Contracts
Description	The core DEX contracts of the Definix implementation based on Uniswap.
Platform	Ethereum; Solidity, Yul
Codebase	GitHub Repository
Commits	1. fbcee365914d1eeea933a058ba2f82d3fb3160e6

Audit Summary

Delivery Date	March 29th, 2021
Method of Audit	Static Analysis, Manual Review
Consultants Engaged	1
Timeline	March 26th, 2021 - March 29th, 2021

Vulnerability Summary

Total Issues	1
Total Critical	0
Total Major	0
Total Medium	1
Total Minor	0
Total Informational	0

Executive Summary

We were tasked with auditing the Definix DEX implementation that is based on PancakeSwap which in turn is based on Uniswap.

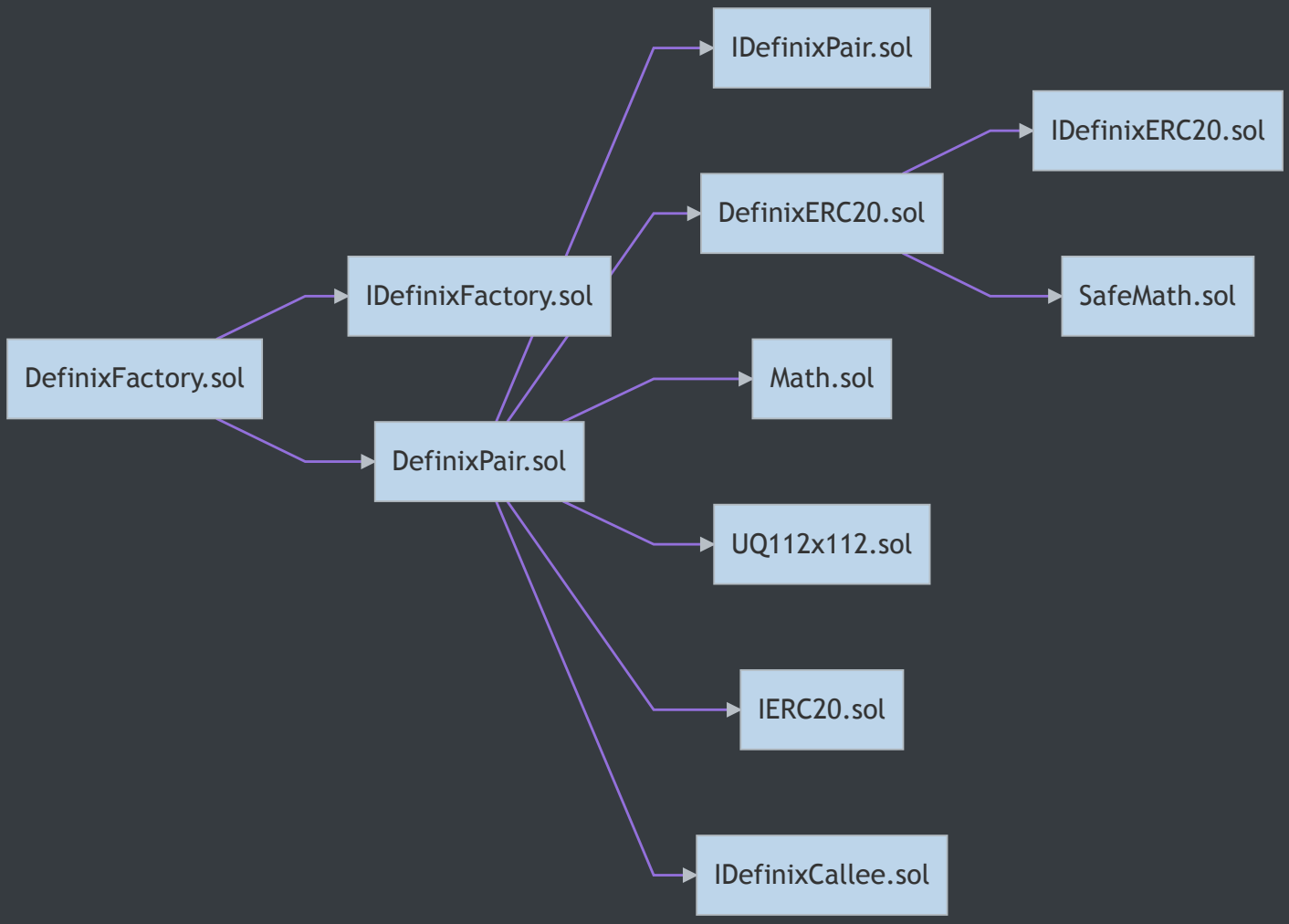
There were no changes introduced to the Definix codebase from the PancakeSwap implementation, however, we should note that the PancakeSwap implementation deviates from the Uniswap implementation in that it imposes a 0.2% fee on trades instead of a 0.3% fee and continues to split that fee in a final resulting 0.05% fee towards the fee address of the protocol.

A single finding was identified that is a well known issue with regards to the usage of a domain separator that we advise the Definix team to fix to ensure no issues may arise in a consequent fork of the chain the project deploys to.

Files In Scope

ID	Contract	Location
DER	DefinixERC20.sol	contracts/DefinixERC20.sol
DFY	DefinixFactory.sol	contracts/DefinixFactory.sol
DPR	DefinixPair.sol	contracts/DefinixPair.sol
IDC	IDefinixCallee.sol	contracts/interfaces/IDefinixCallee.sol
IDE	IDefinixERC20.sol	contracts/interfaces/IDefinixERC20.sol
IDF	IDefinixFactory.sol	contracts/interfaces/IDefinixFactory.sol
IDP	IDefinixPair.sol	contracts/interfaces/IDefinixPair.sol
IER	IERC20.sol	contracts/interfaces/IERC20.sol
MAT	Math.sol	contracts/libraries/Math.sol
SMH	SafeMath.sol	contracts/libraries/SafeMath.sol
UQ2	UQ112x112.sol	contracts/libraries/UQ112x112.sol

File Dependency Graph



Manual Review Findings

ID	Title	Type	Severity	Resolved
DER-01	Cross-Chain Replay Attack	Logical Issue	Medium	

DER-01: Cross-Chain Replay Attack

Type	Severity	Location
Logical Issue	Medium	DefinixERC20.sol L29-L37

Description:

The `DOMAIN_SEPARATOR` used by the contract is only computed once during its `constructor` whereby the current `chainid` is evaluated once.

Recommendation:

We advise it to be re-computed each time on the `permit` function instead as calculating the separator once causes cross-chain replay attacks to be possible whereby the chain the contract is deployed in forks, contains a different `chainid` but due to the separator being assigned once utilizes the main chain's `chainid` thus enabling a single permit to be used on both chains.

Alleviation:

The Six Network team has stated that their contracts are already live and as such, it is not possible to remediate this particular exhibit. The security vulnerability that arises from this exhibit would only manifest if the Binance chain the contracts are deployed in forks and produces a satellite chain on which the signatures could be replayed.

Appendix

Finding Categories

Logical Issue

Logical Issue findings are exhibits that detail a fault in the logic of the linked code, such as an incorrect notion on how `block.timestamp` works.