SOLIDProof

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Blockchain Security | Smart Contract Audits | KYC

MADE IN GERMANY

Audit

Security Assessment

15. January, 2022

For

VERSAL NFT

stay in eternity

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Version	Date	Description
1.0	15. January 2022	• Layout project • Automated- /Manual-Security Testing • Summary

Network
Binance Smart Chain (BEP20)

Website
https://versalnft.com/

Telegram
https://t.me/versalnft
https://t.me/versalnft_chat

Twitter
https://twitter.com/VersalNFT

Github
https://github.com/versalnft/smart-contracts

Reddit
https://www.reddit.com/user/VersalNFT

Medium
https://medium.com/@versalnft

Description

VersalNFT is a blockchain-based virtual legal space that contains a multi-user interface for creating, storing, and managing data. The basic function of the project is the ability to create a personal digital signature in NFT, containing information about the owner.

Versals (signature creators) will be able to sign documents for business or personal with its help. These documents, in turn, are minted into tokens and immortalized in the blockchain, and stored in crypto wallets. Information about the creator, signers, time, content is recorded in the token and protected from various kinds of manipulation. Using the Unlock protocol, access to content is provided only to signers or a limited number of persons.

The project has a set of rules that are consistent with English legal law. Thus, VersalNFT, using blockchain technology, provides the community with a connection between the crypto space and legal standards in the real world.

Project Engagement

During the 13th of January 2022, **VersalNFT Team** engaged Solidproof.io to audit smart contracts that they created. The engagement was technical in nature and focused on identifying security flaws in the design and implementation of the contracts. They provided Solidproof.io with access to their code repository and whitepaper.

Logo

Contract Link

v1.0

- Testnet
  - VersalToken
    - https://testnet.bscscan.com/address/0x0cbF2c0554fcBB527c27B19353f49A562dCAbcbE#code
  - Vest
    - https://testnet.bscscan.com/address/0x89f4d53f0486401bc8c97EE9F9aaFdb5F16bf6B9#code

Vulnerability & Risk Level

Risk represents the probability that a certain source-threat will exploit vulnerability, and the impact of that event on the organization or system. Risk Level is computed based on CVSS version 3.0.

Level	Value	Vulnerability	Risk (Required Action)
Critical	9 - 10	A vulnerability that can disrupt the contract functioning in a number of scenarios, or creates a risk that the contract may be broken.	Immediate action to reduce risk level.
High	7 – 8.9	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.	Implementation of corrective actions as soon aspossible.
Medium	4 – 6.9	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.	Implementation of corrective actions in a certain period.
Low	2 – 3.9	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.	Implementation of certain corrective actions or accepting the risk.
Informational	0 – 1.9	A vulnerability that have informational character but is not effecting any of the code.	An observation that does not determine a level of risk

Auditing Strategy and Techniques Applied

Throughout the review process, care was taken to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices. To do so, reviewed line-by-line by our team of expert pentesters and smart contract developers, documenting any issues as there were discovered.

Methodology

The auditing process follows a routine series of steps:

1. Code review that includes the following:
    i) Review of the specifications, sources, and instructions provided to SolidProof to make sure we understand the size, scope, and functionality of the smart contract.
    ii) Manual review of code, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
    iii) Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to SolidProof describe.

2. Testing and automated analysis that includes the following:
    i) Test coverage analysis, which is the process of determining whether the test cases are actually covering the code and how much code is exercised when we run those test cases.
    ii) Symbolic execution, which is analysing a program to determine what inputs causes each part of a program to execute.

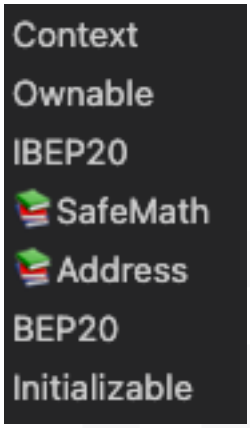
3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.

4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts.

Used Code from other Frameworks/Smart Contracts (direct imports)

Imported packages:

VersalToken



Vest

Tested Contract Files

This audit covered the following files listed below with a SHA-1 Hash.

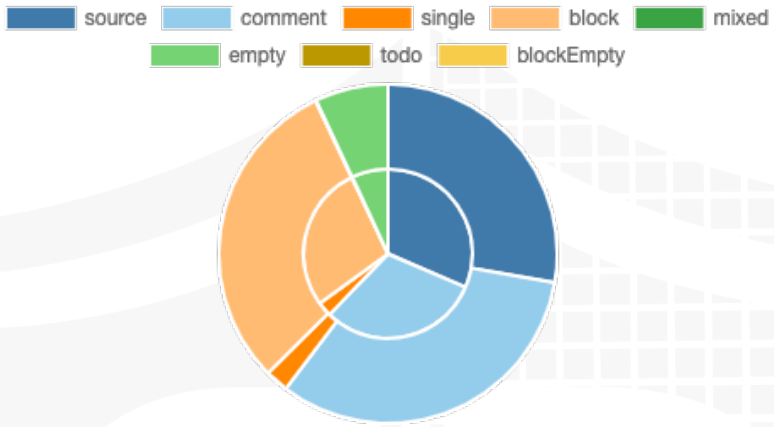
A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.

v1.0

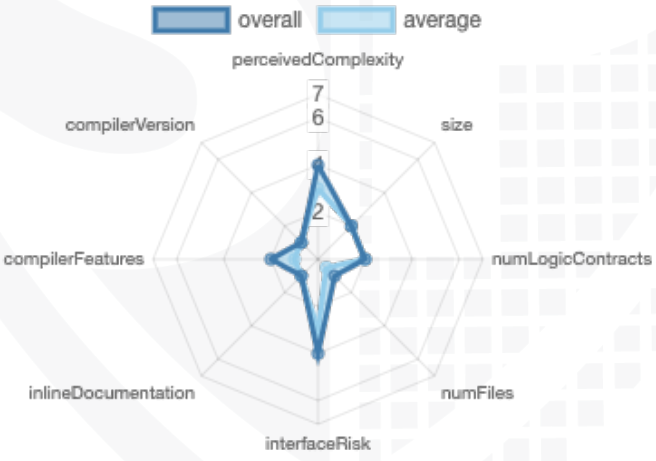
File Name	SHA-1 Hash
contracts/Vest.sol	c72ccc95cdb336ef77c4f9cdf5dd117ef4b566d8
contracts/VersalToken.sol	69ace2432933880913a1652cc35f01affb2f88db

Metrics

Source Lines
v1.0



Risk Level
v1.0



Capabilities

Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	7	2	2	1

Exposed Functions

This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.

Version	Public	Payable
1.0	48	0

Version	External	Internal	Private	Pure	View
1.0	21	70	2	10	29

State Variables

Version	Total	Public
1.0	38	28

Capabilities

Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	`0.8.4` `0.6.12`			`yes` (3 asm blocks)	

Scope of Work

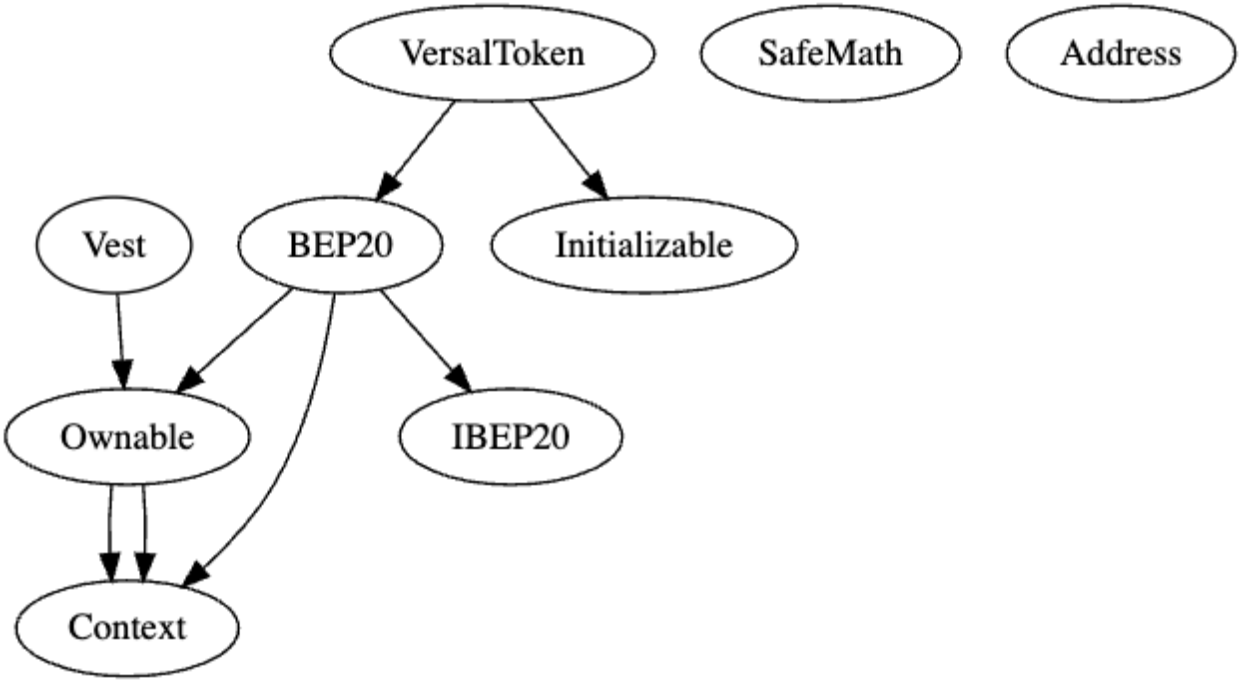
The above token Team provided us with the files that needs to be tested (Github, Bscscan, Etherscan, files, etc.). The scope of the audit is the main contract (usual the same name as team appended with .sol).

We will verify the following claims:

1. Correct implementation of Token standard
2. Deployer cannot mint any new tokens
3. Deployer cannot burn or lock user funds
4. Deployer cannot pause the contract
5. Overall checkup (Smart Contract Security)

Inheritance Graph

v1.0



Verify Claims

Correct implementation of Token standard

Tested	Verified
✓	✓

Function	Description	Exist	Tested	Verified
TotalSupply	provides information about the total token supply	✓	✓	✓
BalanceOf	provides account balance of the owner's account	✓	✓	✓
Transfer	executes transfers of a specified number of tokens to a specified address	✓	✓	✓
TransferFrom	executes transfers of a specified number of tokens from a specified address	✓	✓	✓
Approve	allow a spender to withdraw a set number of tokens from a specified account	✓	✓	✓
Allowance	returns a set number of tokens from a spender to the owner	✓	✓	✓

Write functions of contract

VersalToken

1. approve
2. decreaseAllowance
3. increaseAllowance
4. renounceOwnership
5. setVest
6. transact
7. transfer
8. transferFrom
9. transferOwnership
10. updateWallet

Vest

1. addPrivateWallet
2. claimPrivate
3. claimSeed
4. claimTeam
5. contractLock
6. initialize
7. renounceOwnership
8. transferOwnership

Deployer cannot mint any new tokens

Name	Exist	Tested	Verified
Deployer cannot mint	✓	✓	✗

Max / Total Supply: -

Comments:

v1.0

- Deployer can mint with transact function
  - If function called a percentage of the amount is sent out to addresses
    - Amount * develpPercent goes to development
    - Amount * airDropPercent goes to airDrop
    - Amount * presalePercent goes to presaleWallet
    - Amount * idoPercent goes to idoWallet
    - Amount * partnerPercent goes to partnersWallet
    - Amount * 39.5e18 goes to vest
    - Amount * marketingPercent goes to marketingWallet

Deployer cannot burn or lock user funds

Name	Exist	Tested	Verified
Deployer cannot lock	✓	✓	✓
Deployer cannot burn	✓	✓	✓

Comments:

v1.0

- Deployer can lock claims in Vest for
  - Team
  - Seed
  - Private
- Deployer cannot lock user funds the VersalToken

Deployer cannot pause the contract

Name	Exist	Tested	Verified
Deployer cannot pause	-	-	-

Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

Legend

Attribute	Symbol
Verfified / Checked	✓
Partly Verified	⚑
Unverified / Not checked	✗
Not available	–

Modifiers

- VersalToken
  - onlyOwner
    - setVest
    - updateWallet
    - transact
- Vest
  - onlyOwner
    - initialize
    - contractLock
  - isLock
    - claimSeed
    - claimTeam
    - claimPrivate
    - addPrivateWallet

Comments

- Deployer can set following state variables without any limitations
- Deployer can enable/disable following state variables
- While initialising the totalSupply amount of current address is multiplied by privatePercent (17e18) divided by 100e18. The result of this calculation is multiplied by 10/100 and will be send to privateWallet address.
  - Initialize function can be called without any limitations
- ClaimSeed, claimTeam, claimPrivate and addPrivateWallet can be called without any limitations also if there is a isLock modifier because there is a function which can set lockStatus without any limitations by the owner
- claimTeam
  - Can only called if
    - msg.sender is teamWallet
    - teamTime[msg.sender] == 0 or block.timestamp >= teamTime[msg.sender] + 30 days
    - claimCount[msg.sender] < 10
  - Team can only claim 10 times
  - Following amount will send to team address
    - uint amount = totalSupply * teamPercent /100e18;
    - token.transfer(msg.sender,amount*10/100);
- claimSeed
  - Can only called if
    - msg.sender is seedWallet
    - seedTime[msg.sender] == 0 or block.timestamp >= seedTime[msg.sender] + 30 days

        - claimCount[msg.sender] < 10
    - Seed address can only claim 10 times

    - Following amount will send to seed address
        - uint amount = totalSupply * seedPercent /100e18;
        - token.transfer(msg.sender,amount*10/100);

Keep it in mind, if deployer initialize new seed or team address it is possible to claim again 10 times each address

PrivateWallet can add new private details, but cannot be reverted

CallGraph


Legend
Internal Call
External Call
Defined Contract
Undefined Contract
Initializable
initializer
_isConstructor
Address (lib)
sendValue
functionCall
_functionCallWithValue
isContract
functionCallWithValue
SafeMath (lib)
add
sub
mul
div
mod
min
sqrt
Ownable
transferOwnership
_transferOwnership
owner
<Constructor>
renounceOwnership
onlyOwner
IBEP20 (iface)
totalSupply
decimals
symbol
name
getOwner
balanceOf
transfer
allowance
approve
transferFrom
Vest
<Constructor>
isLock
initialize
claimPrivate
claimSeed
claimTeam
addPrivateWallet
contractLock
Context
<Constructor>
_msgSender
payable
_msgData
BEP20
increaseAllowance
name
decimals
symbol
totalSupply
allowance
decreaseAllowance
transferFrom
approve
_burnFrom
getOwner
_transfer
_approve
_burn
owner
VersalToken
setVest
updateWallet
transact
_amount
mul
_totalSupply
sub
add

Source Units in Scope
v1.0

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
📝🔍	contracts/Vest.sol	3	1	298	219	144	111	113	🔺
📝📚🔍🎨	contracts/VersalToken.sol	7	1	928	787	315	484	242	💻🔺🔆
📝📚🔍🎨	**Totals**	**10**	**2**	**1226**	**1006**	**459**	**595**	**355**	💻🔺🔆

Legend

Attribute	Description
Lines	total lines of the source unit
nLines	normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
nSLOC	normalized source lines of code (only source-code lines; no comments, no blank lines)
Comment Lines	lines containing single or block comments
Complexity Score	a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces, ...)

Audit Results

AUDIT PASSED

Critical issues

No critical issues

High issues

No high issues

Medium issues

Issue	File	Type	Line	Description
#1	Vest	Unchecked tokens transfer	279, 255, 267, 245	Use `SafeERC20`, or ensure that the transfer/ transferFrom return value is checked

Low issues

Issue	File	Type	Line	Description
#1	All	Contract doesn't import npm packages from source (like OpenZeppelin etc.)	-	We recommend to import all packages from npm directly without flatten the contract. Functions could be modified or can be susceptible to vulnerabilities
#2	VersalToken	Missing Zero Address Validation (missing-zero-check)	895, 902, 901, 904, 900, 905, 903	Check that the address is not zero
#3	Vest	Missing Zero Address Validation (missing-zero-check)	236, 238, 237	Check that the address is not zero
#4	VersalToken	Local variables shadowing	803, 661, 597	Rename the local variables that shadow another component

Informational issues

Issue	File	Type	Line	Description
#1	VersalToken	State variables that could be declared constant (constable-states)	890, 888, 892, 889, 893, 891,	Add the `constant` attributes to state variables that never change
#2	Vest	State variables that could be declared constant (constable-states)	208, 207, 209	Add the `constant` attributes to state variables that never change

Commented Code exist

There are some instances of code being commented out in the following files that should be removed:

File	Line	Comment
VersalToken	329	// assert(a == b * c + a % b); // There is no case in which this doesn't hold

Recommendation

Remove the commented code, or address them properly.

Audit Comments

15. January 2022:

- Deployer can lock claims in Vest
- Read whole report for more information

SWC Attacks

ID	Title	Relationships	Status
SWC-136	Unencrypted Private Data On-Chain	CWE-767: Access to Critical Private Variable via Public Method	PASSED
SWC-135	Code With No Effects	CWE-1164: Irrelevant Code	PASSED
SWC-134	Message call with hardcoded gas amount	CWE-655: Improper Initialization	PASSED
SWC-133	Hash Collisions With Multiple Variable Length Arguments	CWE-294: Authentication Bypass by Capture-replay	PASSED
SWC-132	Unexpected Ether balance	CWE-667: Improper Locking	PASSED
SWC-131	Presence of unused variables	CWE-1164: Irrelevant Code	PASSED
SWC-130	Right-To-Left-Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	PASSED
SWC-129	Typographical Error	CWE-480: Use of Incorrect Operator	PASSED
SWC-128	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	PASSED

SWC-127	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	PASSED
SWC-125	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	PASSED
SWC-124	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	PASSED
SWC-123	Requirement Violation	CWE-573: Improper Following of Specification by Caller	PASSED
SWC-122	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	PASSED
SWC-121	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	PASSED
SWC-120	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	PASSED
SWC-119	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	NOT PASSED
SWC-118	Incorrect Constructor Name	CWE-665: Improper Initialization	PASSED
SWC-117	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	PASSED

SWC-116	Timestamp Dependence	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SWC-115	Authorization through tx.origin	CWE-477: Use of Obsolete Function	PASSED
SWC-114	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	PASSED
SWC-113	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	PASSED
SWC-112	Delegatecall to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SWC-111	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	PASSED
SWC-110	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	PASSED
SWC-109	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	PASSED
SWC-108	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED
SWC-107	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	PASSED
SWC-106	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	PASSED

SWC-105	Unprotected Ether Withdrawal	CWE-284: Improper Access Control	PASSED
SWC-104	Unchecked Call Return Value	CWE-252: Unchecked Return Value	PASSED
SWC-103	Floating Pragma	CWE-664: Improper Control of a Resource Through its Lifetime	PASSED
SWC-102	Outdated Compiler Version	CWE-937: Using Components with Known Vulnerabilities	PASSED
SWC-101	Integer Overflow and Underflow	CWE-682: Incorrect Calculation	PASSED
SWC-100	Function Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED

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