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Security Assessment

26 Oct 2023

This security assessment report was prepared by SolidityScan.com, a cloud-based Smart Contract Scanner.



Self-published

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- NAME MAPPING PARAMETERS
- PUBLIC CONSTANTS CAN BE PRIVATE
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Scan History

Disclaimer

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Project Summary

This report has been prepared for using SolidityScan to scan and discover vulnerabilities and safe coding practices in their smart contract including the libraries used by the contract that are not officially recognized. The SolidityScan tool runs a comprehensive static analysis on the Solidity code and finds vulnerabilities ranging from minor gas optimizations to major vulnerabilities leading to the loss of funds. The coverage scope pays attention to all the informational and critical vulnerabilities with over (140+) modules. The scanning and auditing process covers the following areas:

Various common and uncommon attack vectors will be investigated to ensure that the smart contracts are secure from malicious actors. The scanner modules find and flag issues related to Gas optimizations that help in reducing the overall Gas cost It scans and evaluates the codebase against industry best practices and standards to ensure compliance It makes sure that the officially recognized libraries used in the code are secure and up to date

The SolidityScan Team recommends running regular audit scans to identify any vulnerabilities that are introduced after introduces new features or refactors the code.

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Audit Summary

Contract Name

Libertatis

Contract Type

Smart Contract

Contract Address

0×32D36EC677F26cc9640a3113705baCB421090438

Contract Platform

etherscan

Contract Chain

mainnet

Contract URL

https://etherscan.io/address /0×32D36EC677F26cc9640a3113705baCB421090438

Language

Solidity

Website

https://libertatis.finance

Date Published

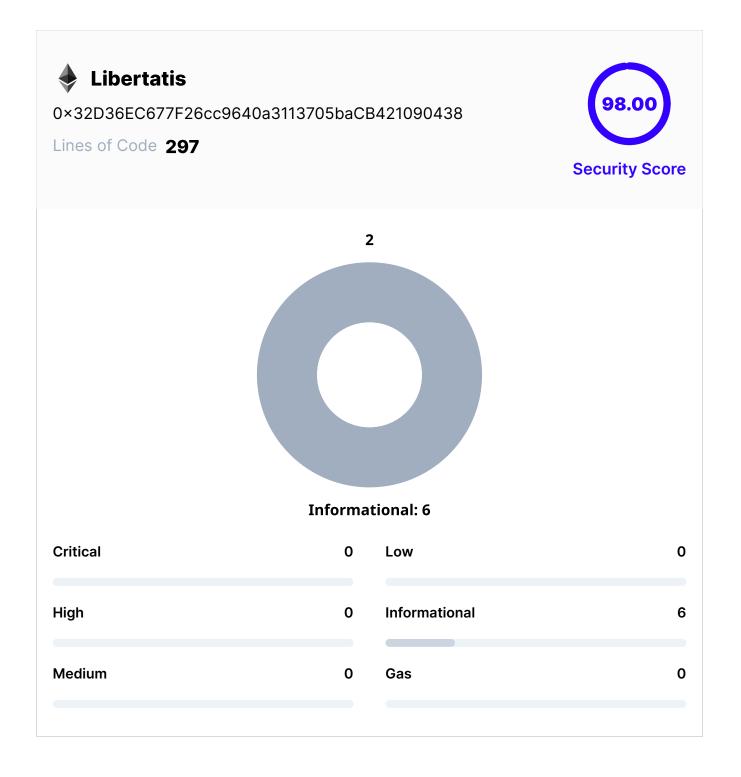
26 Oct 2023

Organization

Libertatis	
Publishers/Owners Name	
Libertatis Team	
Audit Methodology	
Static Scanning	

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Findings Summary



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ACTION TAKEN			
Fixed • O	False Positive 18		
Won't Fix 6	Pending Fix ! 0		

Bug ID	Severity	Bug Type	Status
SSB_63443_1 3	Informational	BLOCK VALUES AS A PROXY FOR TIME	False Positive
SSB_63443_1 4	Informational	BLOCK VALUES AS A PROXY FOR TIME	False Positive
SSB_63443_1 5	Informational	BLOCK VALUES AS A PROXY FOR TIME	False Positive
SSB_63443_1 6	Informational	BLOCK VALUES AS A PROXY FOR TIME	False Positive
SSB_63443_17	' • Informational	BLOCK VALUES AS A PROXY FOR TIME	False Positive
SSB_63443_1 8	Informational	BLOCK VALUES AS A PROXY FOR TIME	False Positive

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SSB_63443_1 9	Informational	BLOCK VALUES AS A PROXY FOR TIME	False Positive
SSB_63443_1 0	• Gas	CHEAPER INEQUALITIES IN REQUIRE()	False Positive
SSB_63443_7	• Low	MISSING EVENTS	False Positive
SSB_63443_8	• Low	MISSING EVENTS	False Positive
SSB_63443_9	• Low	MISSING EVENTS	False Positive
SSB_63443_3	Informational	MISSING UNDERSCORE IN NAMING VARIABLES	₩ Won't Fix
SSB_63443_4	Informational	MISSING UNDERSCORE IN NAMING VARIABLES	₩ Won't Fix
SSB_63443_5	Informational	MISSING UNDERSCORE IN NAMING VARIABLES	₩ Won't Fix
SSB_63443_6	Informational	MISSING UNDERSCORE IN NAMING VARIABLES	₩on't Fix
SSB_63443_1	Informational	NAME MAPPING PARAMETERS	₩on't Fix
SSB_63443_2	Informational	NAME MAPPING PARAMETERS	₩ Won't Fix
SSB_63443_11	• Gas	PUBLIC CONSTANTS CAN BE PRIVATE	False Positive

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SSB_63443_1 • Gas 2	PUBLIC CONSTANTS CAN BE PRIVATE	False Positive
SSB_63443_2 • Gas	STORAGE VARIABLE CACHING IN MEMORY	False Positive
SSB_63443_2 • Gas	STORAGE VARIABLE CACHING IN MEMORY	False Positive
SSB_63443_2 • Gas 2	STORAGE VARIABLE CACHING IN MEMORY	False Positive
SSB_63443_2 • Gas	STORAGE VARIABLE CACHING IN MEMORY	False Positive
SSB_63443_2 • Gas	STORAGE VARIABLE CACHING IN MEMORY	False Positive
SSB_63443_2 • Gas 4	STORAGE VARIABLE CACHING IN MEMORY	False Positive
SSB_63443_2 • Gas	STORAGE VARIABLE CACHING IN MEMORY	False Positive

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Vulnerability Details

Bug ID

SSB_63443_13

Severity

Informational

Line nos

85-85

Confidence



Action Taken

🔀 False Positive

Bug Type

BLOCK VALUES AS A PROXY FOR TIME

File Location

contracts/Libertatis.sol



Issue Description

Contracts often need access to time values to perform certain types of functionality. Values such as block.timestamp and block.number can be used to determine the current time or the time delta. However, they are not recommended for most use cases.

For block.number, as Ethereum block times are generally around 14 seconds, the delta between blocks can be predicted. The block times, on the other hand, do not remain constant and are subject to change for a number of reasons, e.g., fork reorganizations and the difficulty bomb.

Due to variable block times, block.number should not be relied on for precise calculations of time.



Issue Remediation

It is recommended to use trusted external time sources, block numbers instead of timestamps, and/or utilizing multiple time sources to increase reliability. These practices can help mitigate risks of timestamp manipulation and inaccurate timing, increasing the reliability and security of the smart contract.

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Bug ID

SSB_63443_14

Severity

Confidence

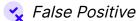
Informational

Firm

Line nos

Action Taken

171-171



Bug Type

BLOCK VALUES AS A PROXY FOR TIME

File Location

contracts/Libertatis.sol



Issue Description

Contracts often need access to time values to perform certain types of functionality. Values such as block.timestamp and block.number can be used to determine the current time or the time delta. However, they are not recommended for most use cases.

For block.number, as Ethereum block times are generally around 14 seconds, the delta between blocks can be predicted. The block times, on the other hand, do not remain constant and are subject to change for a number of reasons, e.g., fork reorganizations and the difficulty bomb.

Due to variable block times, block.number should not be relied on for precise calculations of time.

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Issue Remediation

It is recommended to use trusted external time sources, block numbers instead of timestamps, and/or utilizing multiple time sources to increase reliability. These practices can help mitigate risks of timestamp manipulation and inaccurate timing, increasing the reliability and security of the smart contract.

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Bug ID

SSB_63443_15

Severity

Confidence

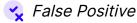
Informational

Firm

Line nos

Action Taken

204-204



Bug Type

BLOCK VALUES AS A PROXY FOR TIME

File Location

contracts/Libertatis.sol



Issue Description

Contracts often need access to time values to perform certain types of functionality. Values such as block.timestamp and block.number can be used to determine the current time or the time delta. However, they are not recommended for most use cases.

For block.number, as Ethereum block times are generally around 14 seconds, the delta between blocks can be predicted. The block times, on the other hand, do not remain constant and are subject to change for a number of reasons, e.g., fork reorganizations and the difficulty bomb.

Due to variable block times, block.number should not be relied on for precise calculations of time.

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Issue Remediation

It is recommended to use trusted external time sources, block numbers instead of timestamps, and/or utilizing multiple time sources to increase reliability. These practices can help mitigate risks of timestamp manipulation and inaccurate timing, increasing the reliability and security of the smart contract.

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Bug ID

SSB_63443_16

Severity

Confidence

Informational

Firm

Line nos

Action Taken

242-242



Bug Type

BLOCK VALUES AS A PROXY FOR TIME

File Location

contracts/Libertatis.sol



Issue Description

Contracts often need access to time values to perform certain types of functionality. Values such as block.timestamp and block.number can be used to determine the current time or the time delta. However, they are not recommended for most use cases.

For block.number, as Ethereum block times are generally around 14 seconds, the delta between blocks can be predicted. The block times, on the other hand, do not remain constant and are subject to change for a number of reasons, e.g., fork reorganizations and the difficulty bomb.

Due to variable block times, block.number should not be relied on for precise calculations of time.

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Issue Remediation

It is recommended to use trusted external time sources, block numbers instead of timestamps, and/or utilizing multiple time sources to increase reliability. These practices can help mitigate risks of timestamp manipulation and inaccurate timing, increasing the reliability and security of the smart contract.

Page 13.

Bug ID

SSB_63443_17

Severity

Confidence

Informational

Line nos

Action Taken

251-251



Bug Type

BLOCK VALUES AS A PROXY FOR TIME

File Location

contracts/Libertatis.sol



Issue Description

Contracts often need access to time values to perform certain types of functionality. Values such as block.timestamp and block.number can be used to determine the current time or the time delta. However, they are not recommended for most use cases.

For block.number, as Ethereum block times are generally around 14 seconds, the delta between blocks can be predicted. The block times, on the other hand, do not remain constant and are subject to change for a number of reasons, e.g., fork reorganizations and the difficulty bomb.

Due to variable block times, block number should not be relied on for precise calculations of time.

Issue Remediation

It is recommended to use trusted external time sources, block numbers instead of timestamps, and/or utilizing multiple time sources to increase reliability. These practices can help mitigate risks of timestamp manipulation and inaccurate timing, increasing the reliability and security of the smart contract.

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Bug ID

SSB_63443_18

Severity

Confidence

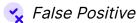
Informational

Firm

Line nos

Action Taken

252-252



Bug Type

BLOCK VALUES AS A PROXY FOR TIME

File Location

contracts/Libertatis.sol



Issue Description

Contracts often need access to time values to perform certain types of functionality. Values such as block.timestamp and block.number can be used to determine the current time or the time delta. However, they are not recommended for most use cases.

For block.number, as Ethereum block times are generally around 14 seconds, the delta between blocks can be predicted. The block times, on the other hand, do not remain constant and are subject to change for a number of reasons, e.g., fork reorganizations and the difficulty bomb.

Due to variable block times, block.number should not be relied on for precise calculations of time.

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Issue Remediation

It is recommended to use trusted external time sources, block numbers instead of timestamps, and/or utilizing multiple time sources to increase reliability. These practices can help mitigate risks of timestamp manipulation and inaccurate timing, increasing the reliability and security of the smart contract.

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Bug ID

SSB_63443_19

Severity

Confidence

Informational

Firm

Line nos

Action Taken

271-271



Bug Type

BLOCK VALUES AS A PROXY FOR TIME

File Location

contracts/Libertatis.sol



Issue Description

Contracts often need access to time values to perform certain types of functionality. Values such as block.timestamp and block.number can be used to determine the current time or the time delta. However, they are not recommended for most use cases.

For block.number, as Ethereum block times are generally around 14 seconds, the delta between blocks can be predicted. The block times, on the other hand, do not remain constant and are subject to change for a number of reasons, e.g., fork reorganizations and the difficulty bomb.

Due to variable block times, block.number should not be relied on for precise calculations of time.

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Issue Remediation

It is recommended to use trusted external time sources, block numbers instead of timestamps, and/or utilizing multiple time sources to increase reliability. These practices can help mitigate risks of timestamp manipulation and inaccurate timing, increasing the reliability and security of the smart contract.

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SSB_63443_10

Severity

• Gas

Firm

Confidence

Line nos

201-201

Action Taken

False Positive

Bug Type

CHEAPER INEQUALITIES IN REQUIRE()

File Location

contracts/Libertatis.sol



Issue Description

The contract was found to be performing comparisons using inequalities inside the require statement. When inside the require statements, non-strict inequalities (>=, <=) are usually costlier than strict equalities (>, <).

~

Issue Remediation

It is recommended to go through the code logic, and, if possible, modify the non-strict inequalities with the strict ones to save ~3 gas as long as the logic of the code is not affected.

Confidence

Firm

Action Taken

False Positive

Page 17.

Bug ID

SSB_63443_7

Severity

Low

Line nos

276-278

Bug Type

MISSING EVENTS

File Location

contracts/Libertatis.sol



Issue Description

Events are inheritable members of contracts. When you call them, they cause the arguments to be stored in the transaction's log—a special data structure in the blockchain.

These logs are associated with the address of the contract which can then be used by developers and auditors to keep track of the transactions.

The contract Libertatis was found to be missing these events on the function _burn which would make it difficult or impossible to track these transactions off-chain.



Issue Remediation

Consider emitting events for the functions mentioned above. It is also recommended to have the addresses indexed.

Page 18.

Bug ID

SSB_63443_8

Severity

Low

Confidence

Firm

Line nos Action Taken

Bug Type

MISSING EVENTS

File Location

contracts/Libertatis.sol



Issue Description

Events are inheritable members of contracts. When you call them, they cause the arguments to be stored in the transaction's log—a special data structure in the blockchain.

These logs are associated with the address of the contract which can then be used by developers and auditors to keep track of the transactions.

The contract Libertatis was found to be missing these events on the function _afterTokenTransfer which would make it difficult or impossible to track these transactions off-chain.



Issue Remediation

Consider emitting events for the functions mentioned above. It is also recommended to have the addresses indexed.

Page 19.

Bug ID

SSB_63443_9

Severity

Low

Confidence

Firm

Action Taken

False Positive

Line nos

284-286

Bug Type

MISSING EVENTS

File Location

contracts/Libertatis.sol



Issue Description

Events are inheritable members of contracts. When you call them, they cause the arguments to be stored in the transaction's log—a special data structure in the blockchain.

These logs are associated with the address of the contract which can then be used by developers and auditors to keep track of the transactions.

The contract Libertatis was found to be missing these events on the function _mint which would make it difficult or impossible to track these transactions off-chain.



Issue Remediation

Consider emitting events for the functions mentioned above. It is also recommended to have the addresses indexed.

Page 20.

Bug ID

SSB_63443_3

Severity

Informational

Confidence

Tentative

Line nos

48-48

Action Taken

₩ Won't Fix

Bug Type

MISSING UNDERSCORE IN NAMING VARIABLES

File Location

contracts/Libertatis.sol



Issue Description

Solidity style guide suggests using underscores as the prefix for non-external functions and state variables (private or internal) but the contract was not found to be following the same.



Issue Remediation

It is recommended to use an underscore for internal and private variables and functions to be in accordance with the Solidity style guide which will also make the code much easier to read.



Comments

According to the style guide of the team we won't fix this informative issues

Page 21.

Bug ID

SSB_63443_4

Severity

Informational

Confidence

Tentative

Line nos

49-49

Action Taken

₩ Won't Fix

Bug Type

MISSING UNDERSCORE IN NAMING VARIABLES

File Location

contracts/Libertatis.sol



Issue Description

Solidity style guide suggests using underscores as the prefix for non-external functions and state variables (private or internal) but the contract was not found to be following the same.



Issue Remediation

It is recommended to use an underscore for internal and private variables and functions to be in accordance with the Solidity style guide which will also make the code much easier to read.



Comments

According to the style guide of the team we won't fix this informative issues

Page 22.

Bug ID

SSB_63443_5

Severity

Informational

Confidence

Tentative

Line nos

226-245

Action Taken

₩ Won't Fix

Bug Type

MISSING UNDERSCORE IN NAMING VARIABLES

File Location

contracts/Libertatis.sol



Issue Description

Solidity style guide suggests using underscores as the prefix for non-external functions and state variables (private or internal) but the contract was not found to be following the same.



Issue Remediation

It is recommended to use an underscore for internal and private variables and functions to be in accordance with the Solidity style guide which will also make the code much easier to read.



Comments

According to the style guide of the team we won't fix this informative issues

Page 23.

Bug ID

SSB_63443_6

Severity

Informational

Confidence

Tentative

Line nos

262-265

Action Taken

₩ Won't Fix

Bug Type

MISSING UNDERSCORE IN NAMING VARIABLES

File Location

contracts/Libertatis.sol



Issue Description

Solidity style guide suggests using underscores as the prefix for non-external functions and state variables (private or internal) but the contract was not found to be following the same.



Issue Remediation

It is recommended to use an underscore for internal and private variables and functions to be in accordance with the Solidity style guide which will also make the code much easier to read.



Comments

According to the style guide of the team we won't fix this informative issues

Page 24.

Bug ID

SSB_63443_1

Severity

Informational

Confidence

Tentative

Line nos

66-66

Action Taken

₩on't Fix

Bug Type

NAME MAPPING PARAMETERS

File Location

contracts/Libertatis.sol



Issue Description

After Solidity 0.8.18, a feature was introduced to name mapping parameters. This helps in defining a purpose for each mapping and makes the code more descriptive.



Issue Remediation

It is recommended to name the mapping parameters if Solidity 0.8.18 and above is used.



Comments

According to the style guide of the team we won't fix this informative issues

Page 25.

Bug ID

SSB_63443_2

Severity

Informational

Confidence

Tentative

Line nos Action Taken

67-67

₩ Won't Fix

Bug Type

NAME MAPPING PARAMETERS

File Location

contracts/Libertatis.sol



Issue Description

After Solidity 0.8.18, a feature was introduced to name mapping parameters. This helps in defining a purpose for each mapping and makes the code more descriptive.



Issue Remediation

It is recommended to name the mapping parameters if Solidity 0.8.18 and above is used.



Comments

According to the style guide of the team we won't fix this informative issues

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Bug ID

SSB_63443_11

Severity

Gas

Confidence

Certain

Line nos Action Taken

Bug Type

PUBLIC CONSTANTS CAN BE PRIVATE

File Location

contracts/Libertatis.sol



Issue Description

Public constant variables cost more gas because the EVM automatically creates getter functions for them and adds entries to the method ID table. The values can be read from the source code instead.

The following variable is affected: LIBERTATIS_AI_ROLE



Issue Remediation

If reading the values for the constants are not necessary, consider changing the public visibility to private.

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Bug ID

SSB_63443_12

Severity

Gas

Certain

Confidence

Line nos

59-59

Action Taken

False Positive

Bug Type

PUBLIC CONSTANTS CAN BE PRIVATE

File Location

contracts/Libertatis.sol



Issue Description

Public constant variables cost more gas because the EVM automatically creates getter functions for them and adds entries to the method ID table. The values can be read from the source code instead.

The following variable is affected: LIBERTATIS_MODERATOR_ROLE



Issue Remediation

If reading the values for the constants are not necessary, consider changing the public visibility to private.

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Bug ID

SSB_63443_20

Severity

Confidence

Gas

Tentative

Line nos

Action Taken

58-58

False Positive

Bug Type

STORAGE VARIABLE CACHING IN MEMORY

File Location

contracts/Libertatis.sol



Issue Description

The contract Libertatis is using the state variable LIBERTATIS_AI_ROLE multiple times in the function addAiAccount.

SLOADs are expensive (100 gas after the 1st one) compared to MLOAD / MSTORE (3 gas each).



Issue Remediation

Storage variables read multiple times inside a function should instead be cached in the memory the first time (costing 1 SLOAD) and then read from this cache to avoid multiple SLOADs.

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Bug ID

SSB_63443_21

Severity

Confidence

Gas

Tentative

Line nos

Action Taken

59-59

False Positive

Bug Type

STORAGE VARIABLE CACHING IN MEMORY

File Location

contracts/Libertatis.sol



Issue Description

The contract Libertatis is using the state variable LIBERTATIS_MODERATOR_ROLE multiple times in the function addModeratorAccount.

SLOADs are expensive (100 gas after the 1st one) compared to MLOAD / MSTORE (3 gas each).

Issue Remediation

Storage variables read multiple times inside a function should instead be cached in the memory the first time (costing 1 SLOAD) and then read from this cache to avoid multiple SLOADs.

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Bug ID

SSB_63443_22

Severity

• Gas

Line nos

43-43

Confidence

Tentative

Action Taken

False Positive

Bug Type

STORAGE VARIABLE CACHING IN MEMORY

File Location

contracts/Libertatis.sol



Issue Description

The contract Libertatis is using the state variable currentPhase multiple times in the function moveToNextPhase.

SLOADs are expensive (100 gas after the 1st one) compared to MLOAD / MSTORE (3 gas each).



Issue Remediation

Storage variables read multiple times inside a function should instead be cached in the memory the first time (costing 1 SLOAD) and then read from this cache to avoid multiple SLOADs.

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Bug ID

SSB_63443_23

Severity

Gas

Confidence

Tentative

Line nos

45-45

Action Taken

False Positive

Bug Type

STORAGE VARIABLE CACHING IN MEMORY

File Location

contracts/Libertatis.sol



Issue Description

The contract Libertatis is using the state variable phaseSupply multiple times in the function moveToNextPhase.

SLOADs are expensive (100 gas after the 1st one) compared to MLOAD / MSTORE (3 gas each).



Issue Remediation

Storage variables read multiple times inside a function should instead be cached in the memory the first time (costing 1 SLOAD) and then read from this cache to avoid multiple SLOADs.

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Bug ID

SSB_63443_23

Severity

Gas

Tentative

Line nos

45-45

Action Taken

Confidence

False Positive

Bug Type

STORAGE VARIABLE CACHING IN MEMORY

File Location

contracts/Libertatis.sol



Issue Description

The contract Libertatis is using the state variable phaseSupply multiple times in the function buyLibertatisWithReferral.

SLOADs are expensive (100 gas after the 1st one) compared to MLOAD / MSTORE (3 gas each).



Issue Remediation

Storage variables read multiple times inside a function should instead be cached in the memory the first time (costing 1 SLOAD) and then read from this cache to avoid multiple SLOADs.

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Bug ID

SSB_63443_24

Severity

Confidence

Gas

Tentative

Line nos

Action Taken

66-66

False Positive

Bug Type

STORAGE VARIABLE CACHING IN MEMORY

File Location

contracts/Libertatis.sol



Issue Description

The contract Libertatis is using the state variable stakes multiple times in the function registerNewStake.

SLOADs are expensive (100 gas after the 1st one) compared to MLOAD / MSTORE (3 gas each).



Issue Remediation

Storage variables read multiple times inside a function should instead be cached in the memory the first time (costing 1 SLOAD) and then read from this cache to avoid multiple SLOADs.

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Bug ID

SSB_63443_24

Severity

Gas

Confidence

Tentative

Line nos

Action Taken

66-66

False Positive

Bug Type

STORAGE VARIABLE CACHING IN MEMORY

File Location

contracts/Libertatis.sol



Issue Description

The contract Libertatis is using the state variable stakes multiple times in the function claimStakes.

SLOADs are expensive (100 gas after the 1st one) compared to MLOAD / MSTORE (3 gas each).



Issue Remediation

Storage variables read multiple times inside a function should instead be cached in the memory the first time (costing 1 SLOAD) and then read from this cache to avoid multiple SLOADs.

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Scan History



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Disclaimer

The Reports neither endorse nor condemn any specific project or team, nor do they guarantee the security of any specific project. The contents of this report do not, and should not be interpreted as having any bearing on, the economics of tokens, token sales, or any other goods, services, or assets.

The security audit is not meant to replace functional testing done before a software release.

There is no warranty that all possible security issues of a particular smart contract(s) will be found by the tool, i.e., It is not guaranteed that there will not be any further findings based solely on the results of this evaluation.

Emerging technologies such as Smart Contracts and Solidity carry a high level of technical risk and uncertainty. There is no warranty or representation made by this report to any Third Party in regards to the quality of code, the business model or the proprietors of any such business model, or the legal compliance of any business.

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As one audit-based assessment cannot be considered comprehensive, we always recommend proceeding with several independent manual audits including manual audit and a public bug bounty program to ensure the security of the smart contracts.