

Security Assessment THEGRAPHAI

Vital Block Verified on April 12th, 2023





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INTRODUCTION

Auditing Firm	VITAL BLOCK SECURITY
Client Firm	THEGRAPHAI
Methodology	Automated Analysis, Manual Code Review
Language	Solidity
Contract	TOKEN: 0xbd8145a38103cc9c4355b6f86b3338cd551f1cbe
Blockchain	COREDAO NETWORK
Centralization	Active ownership
Website	https://thegraphai.com/
Discord	https://discord.gg/dFb2rKJBM9
Twitter	https://twitter.com/thegraphai
Dapp	https://thegraphai.com/app
Prelim Report Date	April 10, 2023
Final Report Date	April 12, 2023

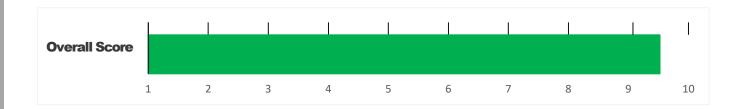


EXECUTIVE SUMMARY

THEGRAPHAI has performed the automated and manual analysis of the Sol code. The code was reviewed for common contract vulnerabilities and centralized exploits. Here's a quick audit summary:

Status	Critical !	Major " 🔴	Medium #	Minor \$	Unknown %
Open	0	0	0	2	0
Acknowledged	0	0	1	2	0
Resolved	0	0	0	0	0
Noteworty onlyOwner Privileges Set Taxes and Ratios, Airdrop, Set Protection Settings, Set Reward Proper Set Reflector Settings, Set Swap Settings, Set Pair and Router				ard Properties,	

THEGRAPHAI Smart contract has achieved the following score: 95.0



Please note that smart contracts deployed on blockchains aren't resistant to exploits, vulnerabilities and/or hacks. Blockchain and cryptography assets utilize new and emerging technologies. These technologies present a high level of ongoing risks. For a detailed understanding of risk severity, source code vulnerability, and audit limitations, kindly review the audit report thoroughly.

Please note that centralization privileges regardless of their inherited risk status - constitute an elevated impact on smart contract safety and security.





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SCOPE OF WORK

Vital Block was consulted by THEGRAPHAI to conduct the smart contract audit of its. Sol source code. The audit scope of work is strictly limited to mentioned .SOL file only:

o THEGRAPHAI.Sol

External contracts and/or interfaces dependencies are not checked due to being out of scope.

Verify audited contract's contract address and deployed link below:

Public Contract Link

0xbd8145a38103cc9c4355b6f86b3338cd551f1cbe

Contract Name	THEGRAPHAI
Token Symbol	GAI
Decimals	18
Total Supply	1,000,000,000





AUDIT METHODOLOGY

Smart contract audits are conducted using a set of standards and procedures. Mutual collaboration is essential to performing an effective smart contract audit. Here's a brief overview of Vital Block auditing process and methodology:

CONNECT

 The onboarding team gathers source codes, and specifications to make sure we understand the size, and scope of the smart contract audit.

AUDIT

- Automated analysis is performed to identify common contract vulnerabilities. We may use the
 following third-party frameworks and dependencies to perform the automated analysis:
 - Remix IDE Developer Tool
 - Open Zeppelin Code Analyzer
 - SWC Vulnerabilities Registry
 - DEX Dependencies, e.g., Pancakeswap, Uniswap
- Simulations are performed to identify centralized exploits causing contract and/or trade locks.
- A manual line-by-line analysis is performed to identify contract issues and centralized privileges.
 We may inspect below mentioned common contract vulnerabilities, and centralized exploits:

	 Token Supply Manipulation
	 Access Control and Authorization
	Assets Manipulation
Centralized Exploits	Ownership Control
ocitianzoa Exploto	o Liquidity Access
	○ Stop and Pause Trading
	 Ownable Library Verification





Common Contract Vulnerabilities

- o Integer Overflow
- Lack of Arbitrary limits
- Incorrect Inheritance Order
- Typographical Errors
- Requirement Violation
- Gas Optimization
- Coding Style Violations
- Re-entrancy
- Third-Party Dependencies
- Potential Sandwich Attacks
- Irrelevant Codes
- Divide before multiply
- o Conformance to Solidity Naming Guides
- Compiler Specific Warnings
- Language Specific Warnings

REPORT

- The auditing team provides a preliminary report specifying all the checks which have been performed and the findings thereof.
- o The client's development team reviews the report and makes amendments to the codes.
- The auditing team provides the final comprehensive report with open and unresolved issues.

PUBLISH

- o The client may use the audit report internally or disclose it publicly.
- It is important to note that there is no pass or fail in the audit, it is recommended to view the audit

as an unbiased assessment of the safety of solidity codes.





RISK CATEGORIES

Smart contracts are generally designed to hold, approve, and transfer tokens. This makes them very tempting attack targets. A successful external attack may allow the external attacker to directly exploit. A successful centralization-related exploit may allow the privileged role to directly exploit. All risks which are identified in the audit report are categorized here for the reader to review:

Risk Type	Definition
Critical !	These risks could be exploited easily and can lead to asset loss, data loss, asset, or
	data manipulation. They should be fixed right away.
BA Cion II	These risks are hard to exploit but very important to fix, they carry an elevated risk
Major "	of smart contract manipulation, which can lead to high-risk severity.
	These risks should be fixed, as they carry an inherent risk of future exploits, and
Medium #	hacks which may or may not impact the smart contract execution. Low-risk re-
	entrancy-related vulnerabilities should be fixed to deterexploits.
	These risks do not pose a considerable risk to the contract or those who interact
Minor \$	with it. They are code-style violations and deviations from standard practices. They
	should be highlighted and fixed nonetheless.
	These risks pose uncertain severity to the contract or those who interact with it. They
Unknown %	should be fixed immediately to mitigate the riskuncertainty.

All statuses which are identified in the audit report are categorized here for the reader to review:

Status Type	Definition
Open	Risks are open.
Acknowledged	Risks are acknowledged, but not fixed.
Resolved	Risks are acknowledged and fixed.





CENTRALIZED PRIVILEGES

Centralization risk is the most common cause of cryptography asset loss. When a smart contract has a privileged role, the risk related to centralization is elevated.

There are some well-intended reasons have privileged roles, such as:

- o Privileged roles can be granted the power to pause()the contract in case of an external attack.
- Privileged roles can use functions like, include(), and exclude() to add or remove wallets from fees,
 swap checks, and transaction limits. This is useful to run a presale and to list on an exchange.

Authorizing privileged roles to externally-owned-account (EOA) is dangerous. Lately, centralization-related losses are increasing in frequency and magnitude.

- The client can lower centralization-related risks by implementing below mentioned practices:
- Privileged role's private key must be carefully secured to avoid any potential hack.
- Privileged role should be shared by multi-signature (multi-sig) wallets.
- Authorized privilege can be locked in a contract, user voting, or community DAO can be introduced to unlock the privilege.
- Renouncing the contract ownership, and privileged roles.
- o Remove functions with elevated centralization risk.
- Understand the project's initial asset distribution. Assets in the liquidity pair should be locked.

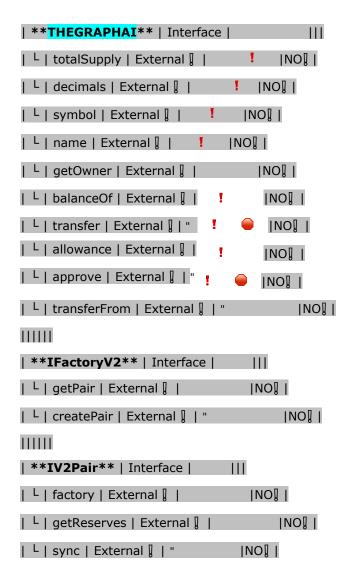
 Assets outside the liquidity pair should be locked with a release schedule.





AUTOMATED ANALYSIS

Symbol	Definition
•	Function modifies state
#	Function is payable
Ş	Function is internal
93	Function is private
	Function is important







```
\Pi\Pi\Pi\Pi
| **IRouter01** | Interface | | | | | | | | | | | | | |
| L | factory | External | | NO | |
| L | CORE | External | | | | | | | | | | | | |
| L | addLiquidityCORE| External | | # |NO|| |
I L | addLiquidity | External | | " | NO| |
| L | swapExactCOREForTokens | External | | # |NO|| | | | | | | | | | | |
| L | getAmountsOut | External | | | | | | | | | | | | |
| L | getAmountsIn | External | | | | | | | | | | | | | | | |
\Pi\Pi\Pi\Pi
| **IRouter02** | Interface | IRouter01 |||
| L | swapExactTokensForCORESupportingFeeOnTransferTokens | External [ | "
                                                                                   INOI
L | swapExactCOREForTokensSupportingFeeOnTransferTokens | External | | # |NO| |
| L | swapExactTokensForTokensSupportingFeeOnTransferTokens | External | | "
                                                                                  ■ INOI I
| L | swapExactTokensForTokens | External | | " | NO | |
\Pi\Pi\Pi\Pi
| **Protections** | Interface | | | |
| L | checkUser | External | | "
       | L | setLaunch | External | | " | NO | |
| L | setLpPair
                     | External | | " | | | | | | | | |
| L | GAI
                      | External | | " | NO | |
| L | removeSniper | External | | " | NO | |
\Pi\Pi\Pi\Pi
| **Cashier** | Interface | | | |
| L | setRewardsProperties | External | | "
                                                  INOI
| L | tally
             | External | | " | NO | |
| L | load
           | External | | # |NO|| | |
| L | cashout | External [ | " | NO[ |
| L | giveMeWelfarePlease | External | | " | NO | |
| L | getTotalDistributed | External | | NO | |
| L | getUserInfo | External | | NO| |
| L | getUserRealizedRewards | External | |
                                                  INOI
```





```
| L | getPendingRewards | External | | NO | | |
| L | initialize | External | | " | NO | |
| L | getCurrentReward | External | | NO| |
\Pi\Pi\Pi\Pi
| **CORE** | Implementation | SafeMath |||
| L | <Constructor> | Public | |
                                # |NO]|
| L | transferOwner | External | | " | onlyOwner |
| L | renounceOwnership | External | | " | NO!
| L | setOperator | Public [ | " | NO[ |
| L | renounceOriginalDeployer | External | | "
                                              INOI
| L | <Receive Ether> | External [ | # |NO[ | |
| L | totalSupply | External [ | | NO[ |
| L | decimals | External | | NO| |
| L | name | External | | NO | |
                              INO] I
| L | getOwner | External ] |
                             INO] I
| L | balanceOf | Public | |
                               INO] I
| L | allowance | External [ |
                           ■ INOI I
| L | approve | External | | "
| L | approve | Internal $ | " | | | |
| L | transfer | External | | " | NO | |
| L | transferFrom | External [ | " | NO[ |
| L | setNewRouter | External [ | " | onlyOwner |
| L | setLpPair | External | | " | onlyOwner |
| L | setInitializers | External | | " | onlyOwner |
| L | isExcludedFromFees | External | | NO| |
| L | isExcludedFromDividends | External | | NO | |
| L | isExcludedFromProtection | External | | NO | |
| L | setDividendExcluded
                        | Public | | " | onlyOwner |
| L | setExcludedFromFees
                        | Public | | " | onlyOwner |
```





GMT-02 POSSIBLE OVERFLOW

Category	Severity •	Location	Status
Status Mathematical Operations	Minor	contracts/code/THEGRAPHAI.sol	Acknowledged

Description

In **updateForMinter**, the following equation is used inside an unchecked block

function _mint(address account, uint256 amount) internal virtual {
 require(account != address(0), "ERC20: mint to the zero address");

Minter can not issue more **GAI** tokens indefinitely. Note that as of the date of publishing, the above review reflects the current understanding of known security patterns as they relate to the EMT contract.

Recommendation

We recommend either checking for overflow in this case, or ensuring that the PairsIn is close enough it will never cause an overflow.





OPTIMIZATIONS | THEGRAPHAI

ID	Title	Category	Status
GMT- 097	Logarithm Refinement Optimization	Gas Optimization	Acknowledged
GMT- 689	Checks Can Be Performed Earlier	Gas Optimization	Acknowledged
GMT- 023	Unnecessary Use Of SafeMath	Gas Optimization	• Acknowledged
GMT- 432	Struct Optimization	Gas Optimization	• Acknowledged
GMT-016	Unused State Variable	Gas Optimization	• Acknowledged





General Detectors

Missing Zero Address Validation

Some functions in this contract may not appropriately check for zero addresses being used.



Incorrect Solidity Version

This contract uses an unconventional or very old version of Solidity



- No compiler version inconsistencies found
- No unchecked call responses found
- No vulnerable self-destruct functions found
- No assertion vulnerabilities found
- No old solidity code found
- No external delegated calls found
- ✓ No external call dependency found
- No vulnerable authentication calls found
- No invalid character typos found
- No RTL characters found
- No dead code found
- No risky data allocation found
- No uninitialized state variables found
- No uninitialized storage variables found
- No vulnerable initialization functions found
- No risky data handling found
- No number accuracy bug found
- No out-of-range number vulnerability found
- No map data deletion vulnerabilities found

- No tautologies or contradictions found
- No faulty true/false values found
- No innacurate divisions found
- No redundant constructor calls found
- No vulnerable transfers found
- No vulnerable return values found
- No uninitialized local variables found
- No default function responses found
- No missing arithmetic events found
- No missing access control events found
- No redundant true/false comparisons found
- No state variables vulnerable through function calls found
- No buggy low-level calls found
- No expensive loops found
- No bad numeric notation practices found
- ✓ No missing constant declarations found
- No missing external function declarations found
- No vulnerable payable functions found
- No vulnerable message values found





Vulnerability Scan

REENTRANCY

No reentrancy risk found

Severity Major

Confidence Parameter Certain

Vulnerability Description

✓ Not Mintable: The contract Does not contain additional issuance functions, which could maybe generate a large number of tokens, resulting in significant fluctuations in token prices. It is recommended to confirm with the project team whether it complies with the token issuance instructions.

Scanning Line:

```
abstract contract Ownable is Context {
    address private _owner;

    event OwnershipTransferred(address indexed previousOwner, address indexed
newOwner);

    /**

    * @dev Initializes the contract setting the deployer as the initial owner.
    */
    constructor() {
        _transferOwnership(_msgSender());
}

    /**

    * @dev Throws if called by any account other than the owner.
    */
    modifier onlyOwner() {
        _checkOwner();
        _;
    }

    /**

    * @dev Returns the address of the current owner.
    */
    function owner() public view virtual returns (address) {
        return _owner;
    }

    /**

    * @dev Throws if the sender is not the owner.
    */
    function _checkOwner() internal view virtual {
        require(owner() == _msgSender(), "Ownable: caller is not the owner");
    }
}
```





Repository:

https://github.com/Evameta-EMT

All Audited Files

THEGRAPHAI.sol

Contract Creator

address/0x595b773b52bc02590654a04766230e567f7b9999

Creator Tnx Hash

0x1ad3e38abea39a3fd9ef5c7b686e6ce2129dbdd4a8b3d30b0774d34bbddaefae

Contracts:

Contract:

TOKEN: 0xbD8145A38103Cc9c4355B6F86b3338Cd551F1cbE



Vulnerability Run check

Risk Analysis

Contract source code verified

This token contract is open source. You can check the contract code for details. Unsourced token contracts are likely to have malicious functions to defraud their users of their assets.

No mint function

Mint function is transparent or non-existent. Hidden mint functions may increase the amount of tokens in circulation and effect the price of the token.

Owner cant change balance

The contract owner does not have the authority to modify the balance of tokens at other addresses.

Honeypot Risk

This does not appear to be a honeypot

We are not aware of any code that prevents the sale of tokens.

No Anti Whale

There is no limit to the number of token transactions. The number of scam token transactions may be limited (honeypot risk).

No whitelist function

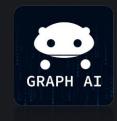
Whitelist function found

No Proxy

There is no proxy in the contract. The proxy contract means contract owner can modify the function of the token and possibly effect the price.

No function to retrieve ownership

If this function exists, it is possible for the project owner to regain ownership even after relinquishing it.



OKAPA AL

No trading cooldown

The token contract has no trading cooldown function. If there is a trading cooldown function, the user will not be able to sell the token within a certain time or block after buying.

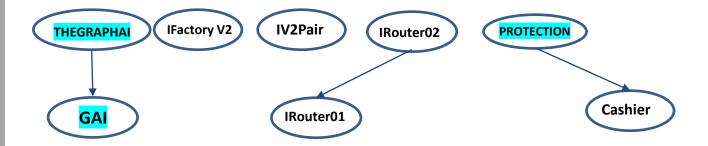
No blacklist function

No blacklist function is included.





INHERITANCE GRAPH



Identifier	Definition	Severity
CEN-12	Centralization privileges of THEGRAPHAI	Medium #

Vulnerability 0 : No important security issue detected.

Threat level: Low

External Contract Referencing

Description:

One of the benefits of the global computer is the ability to re-use code and interact with contracts already deployed on the network. As a result, a large number of contracts reference external contracts and in general operation use external message calls to interact with these contracts. These external message calls can mask malicious actors intentions in some non-obvious ways, which we will discuss.





MANUAL REVIEW

THEGRAPHAI: The technology that AI uses to generate images is called Generative Adversarial Networks (GANs). GANs are a type of neural network that consists of two parts: a generator and a discriminator.

TOKEN NAME: THEGRAPHAI

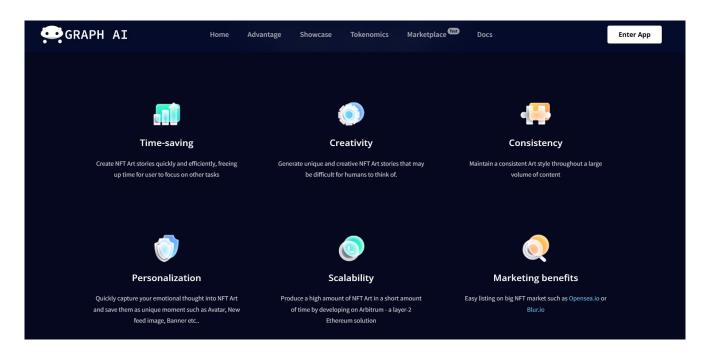
Ticker: GAI

Chain/Standard: CORE BLOCKCHAIN

Total Supply: 1,000,000,000



The THEGRAPHAI TOKEN Platform Is Launched On CORE CHAIN









issues checking status

Issue Description Checking Status

1.	Compiler errors.	PASSED
2.	Race Conditions and reentrancy. Cross-Function Race Conditions.	PASSED
3.	Possible Delay In Data Delivery.	PASSED
4.	Oracle calls.	PASSED
5.	Front Running.	PASSED
6.	Sol Dependency.	PASSED
7.	Integer Overflow And Underflow.	PASSED
8.	DoS with Revert.	PASSED
9.	Dos With Block Gas Limit.	PASSED
10.	Methods execution permissions.	PASSED
11.	Economy Model of the contract.	PASSED
12.	The Impact Of Exchange Rate On the solidity Logic.	PASSED
13.	Private use data leaks.	PASSED
14.	Malicious Event log.	PASSED
15.	Scoping and Declarations.	PASSED
16.	Uninitialized storage pointers.	PASSED
17.	Arithmetic accuracy.	PASSED
18.	Design Logic.	PASSED
19.	Cross-Function race Conditions	PASSED
20.	Save Upon solidity contract Implementation and Usage.	PASSED
21.	Fallback Function Security	PASSED





Identifier	Definition	Severity
CEN-02	Initial asset distribution	Minor 🌑

All of the initially minted assets are sent to the contract deployer when deploying the contract. This can NOT be an issue as the deployer and/or contract owner has Renounce the contract Ownable: new owner is the zero address.

function transferOwnership(address newOwner) public virtual onlyOwner {
 require(newOwner != address(0), "Ownable: new owner is the zero address");
 _transferOwnership(newOwner);

RECOMMENDATION

Project stakeholders should be consulted during the initial asset distribution process.





RECOMMENDATION

Deployer and/or contract owner private keys are secured carefully.

Please refer to PAGE-09 CENTRALIZED PRIVILEGES for a detailed understanding.

ALLEVIATION

The THEGRAPHAI project team understands the centralization risk. Some functions are provided privileged access to ensure a good runtime behavior in the project





Identifier	Definition	Severity
COD-10	Third Party Dependencies	Minor 🏐

Smart contract is interacting with third party protocols e.g., Pancakeswap router, cashier contract, protections contract. The scope of the audit treats third party entities as black boxes and assumes their functional correctness. However, in the real world, third parties can be compromised, and exploited. Moreover, upgrades in third parties can create severe impacts, e.g., increased transactional fees, deprecation of previous routers, etc.

RECOMMENDATION

Inspect and validate third party dependencies regularly, and mitigate severe impacts whenever necessary.





CERTIFICATE BY VITAL BLOCK SECURITY









DISCLAIMERS

Vital Block provides the easy-to-understand audit of Solidity, Move and Raw source codes (commonly known as smart contracts).

The smart contract for this particular audit was analyzed for common contract vulnerabilities, and centralization exploits. This audit report makes no statements or warranties on the security of the code. This audit report does not provide any warranty or guarantee regarding the absolute bug-free nature of the smart contract analyzed, nor do they provide any indication of the client's business, business model or legal compliance. This audit report does not extend to the compiler layer, any other areas beyond the programming language, or other programming aspects that could present security risks. Cryptographic tokens are emergent technologies, they carry high levels of technical risks and uncertainty. You agree that your access and/or use, including but not limited to any services, reports, and materials, will be at your sole risk on an as-is, where-is, and as-available basis. This audit report could include false positives, false negatives, and other unpredictable results.

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Vital Block provides intelligent blockchain Security Solutions. We provide solidity and Raw Code Review,

testing, and auditing services. We have Partnered with 15+ Crypto Launchpads, audited 50+ smart

contracts, and analyzed 200,000+ code lines. We have worked on major public blockchains e.g.,

Ethereum, Binance, Cronos, Doge, Polygon, Avalanche, Metis, Fantom, Bitcoin Cash, Aptos, Oasis, etc.

Vital Block is Dedicated to Making Defi & Web3 A Safer Place. We are Powered by Security engineers,

developers, Ul experts, and blockchain enthusiasts. Our team currently consists of 5 core members, and

4+ casual contributors.

Website: https://Vitalblock.org

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GitHub: https://github.com/vital-block

Telegram (Engineering): https://t.me/vital_block

Telegram (Onboarding): https://t.me/vitalblock_cmo











