SOLIDProof

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Blockchain Security | Smart Contract Audits | KYC

MADE IN GERMANY

Audit

Security Assessment
27. July, 2021

For

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Version	Date	Description
1.0	23. July 2021	Layout project
	24. - 26. July 2021	Automated- /Manual-Security Testing
	27. July 2021	Summary

Network
Binance Smart Chain (BEP20)

Website
https://www.gameologycrypto.com/

Telegram
https://t.me/GAMEOLOGYV2

Twitter
https://twitter.com/Gameology7

Instagram
https://www.instagram.com/gameology_crypto/

Discord
https://discord.gg/SHydayRJHx

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

Description

Gameology is a decentralized platform for all gamers in the world! Do you love videogames, streams and challenge other players like you? With us all this will be possible! Play, fight in our arenas, earn GMY and spend them on our platform!

GMYX is an utility token based on the
Gameology (GMYX) was born from the idea of the two CEOs back in 2019 and finally brought to light.

Project Engagement

During the 23rd of July 2021, **Gameology 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. **Gameology Team** provided Solidproof.io with access to their code repository and whitepaper.

Logo

Contract Link

TBA

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:
- OpenZeppelin
    - Address
    - Ownable
    - SafeMatch
- Uniswap
    - UniswapV2Factory
    - UniswapV2Pair
    - UniswapV2Router01
   - UniswapV2Router02

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.
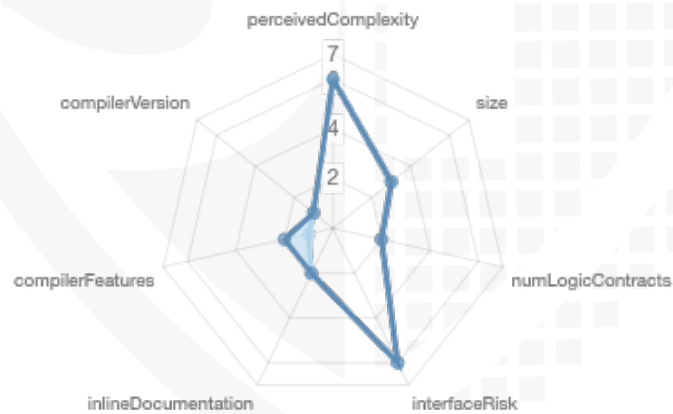
File Name	SHA-1 Hash
contracts/gameology.sol	52e36adbc85de7753b4e07c3b1e4c1714448dae4

Metrics

Source Lines
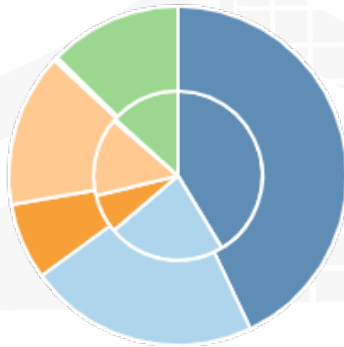
Risk Level

Capabilities

Components

Contracts	Libraries	Interfaces	Abstract
4	4	7	2

Exposed Functions

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

Public	Payable
155	8

External	Internal	Private	Pure	View
111	141	7	29	58

State Variables

Total	Public
71	48

Capabilities

Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts

`^0.7.0`
`>=0.6.0`
`<0.8.0`
`>=0.6.2`
`>=0.5.0`
`^0.7.6`
		Yes	****
			(0 asm blocks)	

| Transfers ETH	Low-Level Calls	Delegate Call	Uses Hash Functions	ECRecover	New/ Create/ Create2
yes					yes → NewContract: GAMEOLOGYv2DividendTracker

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
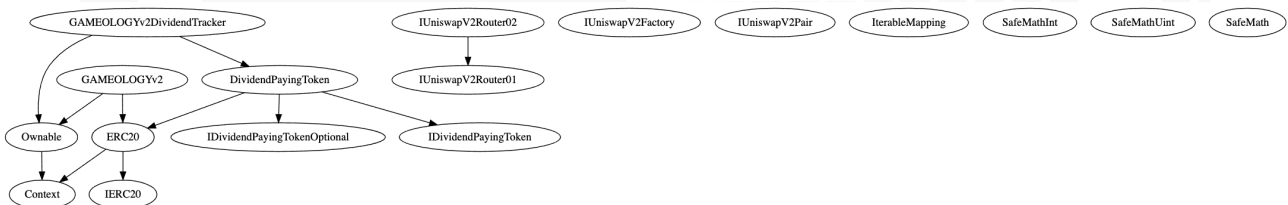
Verify Claims
Correct implementation of Token standard

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	✓	✓	✓

Optional implementations

Function	Description	Exist	Tested	Verified
renounceOwnership	Owner renounce ownership for more trust	✓	✓	🚩

Deployer cannot mint any new tokens

Tested	Verified	File	Comment
✓	✓	Main	Line: -

Max / Total Supply: 50000000000

```solidity
constructor() public ERC20("GAMEOLOGYv2", "GMYX") {
    // LP burn address
    burnAddress = address(0x54934474463e4A31923c8F2f4D0f2e0A45f01b69);
    uint256 _processDividendTime = block.timestamp;
    processDividendTime = _processDividendTime;

    dividendTracker = new GAMEOLOGYv2DividendTracker();

    IUniswapV2Router02 _uniswapV2Router = IUniswapV2Router02(0x10ED43C718714eb63d5aA57B78B54704E256024E);
     // Create a uniswap pair for this new token
    address _uniswapV2Pair = IUniswapV2Factory(_uniswapV2Router.factory())
        .createPair(address(this), _uniswapV2Router.WETH());

    uniswapV2Router = _uniswapV2Router;
    uniswapV2Pair = _uniswapV2Pair;

    _setAutomatedMarketMakerPair(_uniswapV2Pair, true);

    // exclude from receiving dividends
    dividendTracker.excludeFromDividends(address(dividendTracker));
    dividendTracker.excludeFromDividends(address(this));
    dividendTracker.excludeFromDividends(address(_uniswapV2Router));
    dividendTracker.excludeFromDividends(owner());



    // exclude from paying fees or having max transaction amount
    excludeFromFees(burnAddress, true);
    excludeFromFees(address(this), true);
    excludeFromFees(owner(), true);



    // enable owner and fixed-sale wallet to send tokens before presales are over
    canTransferBeforeTradingIsEnabled[owner()] = true;
    /*
        _mint is an internal function in ERC20.sol that is only called here,
        and CANNOT be called ever again
    */
    _mint(owner(), 50000000000 * (10**9));
}
```

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

    _beforeTokenTransfer(address(0), account, amount);

    _totalSupply = _totalSupply.add(amount);
    _balances[account] = _balances[account].add(amount);
    emit Transfer(address(0), account, amount);
}
```

Deployer cannot burn or lock user funds

Name	Tested	Exist	Verified
No Lock function	✓	✓	✓
No Burn function	✓	✓	✓

Deployer cannot pause the contract

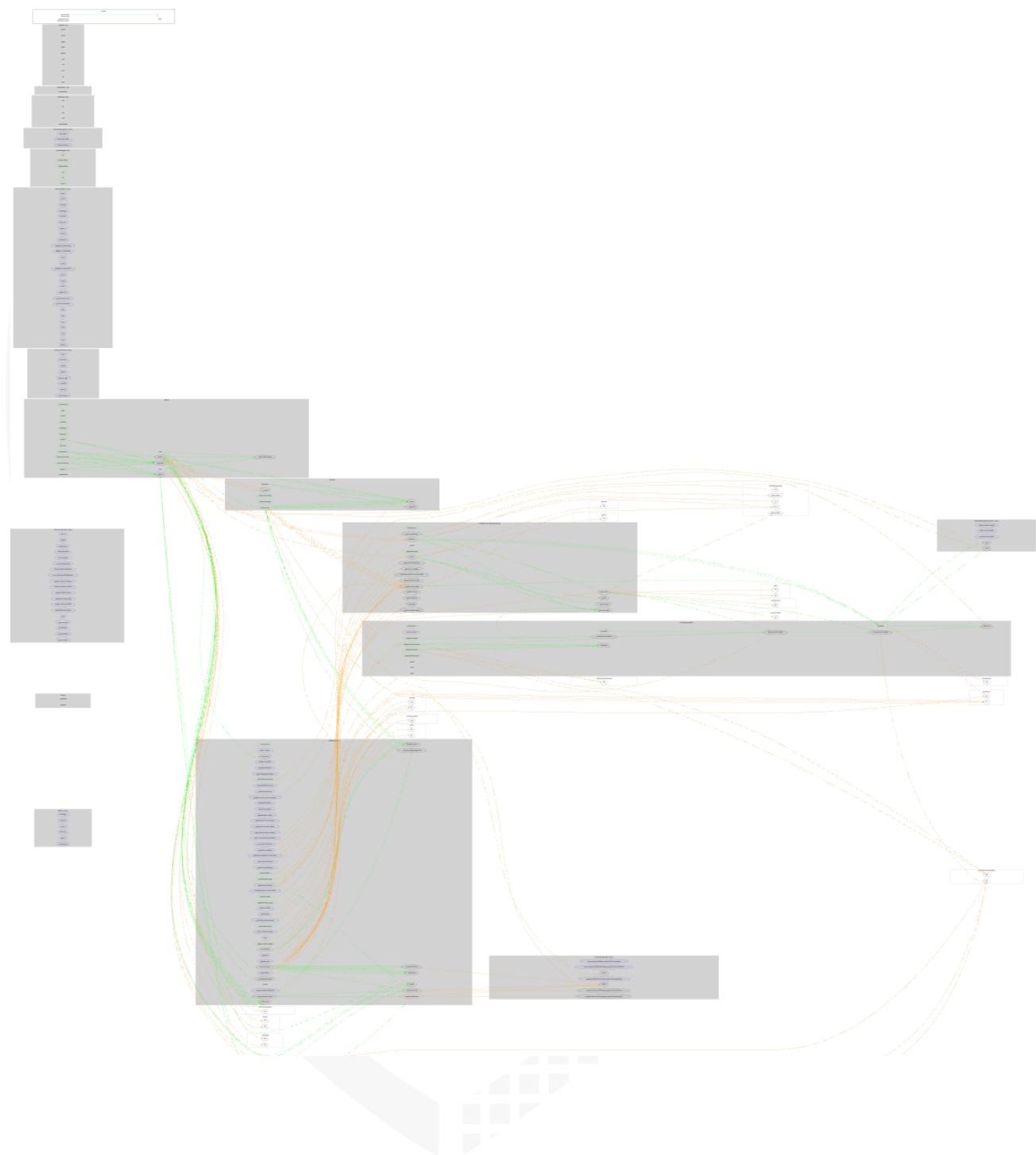| Tested	Verified	No pause function
✓	✓	✓

Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

Legend

Attribute	Symbol
Verfified / Checked	✓
Partly Verified	🚩
Unverified / Not checked	✗

CallGraph

Source Units in Scope

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
📝🗨️🔍🐍	contracts/gameology.sol	10	7	2291	1932	1040	652	977	💰🔽🔵☀️
📝🗨️🔍🐍	Totals	10	7	2291	1932	1040	652	977	💰🔽🔵☀️

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 found -

High issues
- no high issues found -

Medium issues
- no medium issues found -

Low issues

Issue	File	Type	Line	Description
#1	Main	A floating pragma is set	2	The current pragma Solidity directive is ""^0.7.0"".
#2	Main	Use of "tx.origin" as a part of authorization control.	1725, 1873	Using "tx.origin" as a security control can lead to authorization bypass vulnerabilities.
#3	Main	Unused local variable "data".	1921, 1936, 1952, 2058	The local variable "data" is declared within the functions of contract "GAMEOLOGYv2" but its value does not seem to be used anywhere in the functions.

Informational issues
- no informational issues found -

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

Line	Comment
1402	//

1496	/*
	    function updateBurnAddress(address _burnAddress) external onlyOwner {
	      burnAddress = _burnAddress;
	   }*/

1529	//dividendTracker.excludeFromDividends(marketAddress);
1535	//dividendTracker.excludeFromDividends(charityAddress);
1541	//dividendTracker.excludeFromDividends(buyBackAddress);
1616-1619	- //require(_isExcludedFromFees[account] != excluded, "GAMEOLOGYv2: Account is already the value of 'excluded'"); - //dividendTracker.excludeFromDividends(account); - //emit ExcludeFromFees(account, excluded);
1623	//require(_isExcludedFromFees[account] != excluded, "GAMEOLOGYv2: Account is already the value of 'excluded'");
1626	//emit ExcludeFromFees(account, excluded);
1636	//require(_isExcludedFromFees[account] != excluded, "GAMEOLOGYv2: Account is already the value of 'excluded'");
1638	//emit ExcludeFromFees(account, excluded);
1918-1919	//_transfer(address(this), burnAddress, marketFeePortion); //emit Transfer(address(this), burnAddress, marketFeePortion);
1933-1934	//_transfer(address(this), burnAddress, charityFeePortion); //emit Transfer(address(this), burnAddress, charityFeePortion);

Recommendation
Remove the commented code, or address them properly.

There are many more comments in the contract (line: 1938, 1939, 1947, 1949, 1950, 1954, 1955, 1960, 2112, 2118, 2122, 2124).

Audit Comments

- Owner can update Trading enabled time
- Owner can update dividend time
- Owner can update minimum balance for dividend

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	NOT 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	**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	**NOT 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	NOT 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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