



Operon Origins
Smart Contract
Audit Report

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AUDITED DETAILS

Audited Project

Project name	Token ticker	Blockchain
Operon Origins	ORO	Binance Smart Chain

Addresses

Contract address	0xfc4f5a4d1452b8dc6c3cb745db15b29c00812b19
Contract deployer address	0x4EfD81A57EEC5b6e51d4C26053b0146828bDe11C

Project Website

<https://operonorigins.com/>

Codebase

<https://bscscan.com/address/0xfc4f5a4d1452b8dc6c3cb745db15b29c00812b19#code>

SUMMARY

Operon Origins is the first card-based NFT combat game with an epic art style pushing competitive play-to-earn GameFi.

Contract Summary

Documentation Quality

Operon Origins provides a very good documentation with standard of solidity base code.

- The technical description is provided clearly and structured and also dont have any high risk issue.

Code Quality

The Overall quality of the basecode is standard.

- Standard solidity basecode and rules are already followed by Operon Origins with the discovery of several low issues.

Test Coverage

Test coverage of the project is 100% (Through Codebase)

Audit Findings Summary

- SWC-100 SWC-108 | Explicitly define visibility for all state variables on lines 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347 and 363.
- SWC-110 SWC-123 | It is recommended to use of revert(), assert(), and require() in Solidity, and the new REVERT opcode in the EVM on lines 804.

CONCLUSION

We have audited the Operon Origins project released on December 2021 to discover issues and identify potential security vulnerabilities in Operon Origins Project. This process is used to find technical issues and security loopholes which might be found in the smart contract.

The security audit report provides satisfactory results with low-risk issues.

The issues found in the Operon Origins smart contract code do not pose a considerable risk. The writing of the contract is close to the standard of writing contracts in general. The low-risk issues found are some state variable visibility is not set, and state variable visibility is not set. It is best practice to set the visibility of state variables explicitly. The default visibility for "_thisSaleContribution" is internal. Other possible visibility settings are public and private. A requirement was violated in a nested call, and the call was reverted. Ensure valid inputs are provided to the nested call (for instance, via passed arguments).

AUDIT RESULT

Article	Category	Description	Result
Default Visibility	SWC-100 SWC-108	Functions and state variables visibility should be set explicitly. Visibility levels should be specified consciously.	ISSUE FOUND
Integer Overflow and Underflow	SWC-101	If unchecked math is used, all math operations should be safe from overflows and underflows.	PASS
Outdated Compiler Version	SWC-102	It is recommended to use a recent version of the Solidity compiler.	PASS
Floating Pragma	SWC-103	Contracts should be deployed with the same compiler version and flags that they have been tested thoroughly.	PASS
Unchecked Call Return Value	SWC-104	The return value of a message call should be checked.	PASS
Unprotected Ether Withdrawal	SWC-105	Due to missing or insufficient access controls, malicious parties can withdraw from the contract.	PASS
SELFDESTRUCT Instruction	SWC-106	The contract should not be self-destructible while it has funds belonging to users.	PASS
Reentrancy	SWC-107	Check effect interaction pattern should be followed if the code performs recursive call.	PASS
Uninitialized Storage Pointer	SWC-109	Uninitialized local storage variables can point to unexpected storage locations in the contract.	PASS
Assert Violation	SWC-110 SWC-123	Properly functioning code should never reach a failing assert statement.	ISSUE FOUND
Deprecated Solidity Functions	SWC-111	Deprecated built-in functions should never be used.	PASS
Delegate call to Untrusted Callee	SWC-112	Delegatecalls should only be allowed to trusted addresses.	PASS

DoS (Denial of Service)	SWC-113 SWC-128	Execution of the code should never be blocked by a specific contract state unless required.	PASS
Race Conditions	SWC-114	Race Conditions and Transactions Order Dependency should not be possible.	PASS
Authorization through tx.origin	SWC-115	tx.origin should not be used for authorization.	PASS
Block values as a proxy for time	SWC-116	Block numbers should not be used for time calculations.	PASS
Signature Unique ID	SWC-117 SWC-121 SWC-122	Signed messages should always have a unique id. A transaction hash should not be used as a unique id.	PASS
Incorrect Constructor Name	SWC-118	Constructors are special functions that are called only once during the contract creation.	PASS
Shadowing State Variable	SWC-119	State variables should not be shadowed.	PASS
Weak Sources of Randomness	SWC-120	Random values should never be generated from Chain Attributes or be predictable.	PASS
Write to Arbitrary Storage Location	SWC-124	The contract is responsible for ensuring that only authorized user or contract accounts may write to sensitive storage locations.	PASS
Incorrect Inheritance Order	SWC-125	When inheriting multiple contracts, especially if they have identical functions, a developer should carefully specify inheritance in the correct order. The rule of thumb is to inherit contracts from more /general/ to more /specific/.	PASS
Insufficient Gas Griefing	SWC-126	Insufficient gas griefing attacks can be performed on contracts which accept data and use it in a sub-call on another contract.	PASS
Arbitrary Jump Function	SWC-127	As Solidity doesnt support pointer arithmetics, it is impossible to change such variable to an arbitrary value.	PASS

Typographical Error	SWC-129	A typographical error can occur for example when the intent of a defined operation is to sum a number to a variable.	PASS
Override control character	SWC-130	Malicious actors can use the Right-To-Left-Override unicode character to force RTL text rendering and confuse users as to the real intent of a contract.	PASS
Unused variables	SWC-131 SWC-135	Unused variables are allowed in Solidity and they do not pose a direct security issue.	PASS
Unexpected Ether balance	SWC-132	Contracts can behave erroneously when they strictly assume a specific Ether balance.	PASS
Hash Collisions Variable	SWC-133	Using <code>abi.encodePacked()</code> with multiple variable length arguments can, in certain situations, lead to a hash collision.	PASS
Hardcoded gas amount	SWC-134	The <code>transfer()</code> and <code>send()</code> functions forward a fixed amount of 2300 gas.	PASS
Unencrypted Private Data	SWC-136	It is a common misconception that private type variables cannot be read.	PASS

SMART CONTRACT ANALYSIS

Started	Wednesday Dec 01 2021 12:59:05 GMT+0000 (Coordinated Universal Time)
Finished	Thursday Dec 02 2021 06:23:53 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	OperonOrigins.sol

Detected Issues

ID	Title	Severity	Status
SWC-108	STATE VARIABLE VISIBILITY IS NOT SET.	low	acknowledged
SWC-108	STATE VARIABLE VISIBILITY IS NOT SET.	low	acknowledged
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SWC-108	STATE VARIABLE VISIBILITY IS NOT SET.	low	acknowledged
SWC-108	STATE VARIABLE VISIBILITY IS NOT SET.	low	acknowledged
SWC-123	REQUIREMENT VIOLATION.	low	acknowledged

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 337

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "_whitelistedAddress" is internal. Other possible visibility settings are public and private.

Source File

- OperonOrigins.sol

Locations

```
336 // Special business use case variables
337 mapping (address => bool) _whitelistedAddress;
338 mapping (address => uint256) _lockingTimeForSale;
339 mapping (address => uint256) _recordSale;
340 mapping (address => bool) _addressLocked;
341
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 338

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "_lockingTimeForSale" is internal. Other possible visibility settings are public and private.

Source File

- OperonOrigins.sol

Locations

```
337 mapping (address => bool) _whitelistedAddress;  
338 mapping (address => uint256) _lockingTimeForSale;  
339 mapping (address => uint256) _recordSale;  
340 mapping (address => bool) _addressLocked;  
341 mapping (address => uint256) _finalSoldAmount;  
342
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 339

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "_recordSale" is internal. Other possible visibility settings are public and private.

Source File

- OperonOrigins.sol

Locations

```
338 mapping (address => uint256) _lockingTimeForSale;
339 mapping (address => uint256) _recordSale;
340 mapping (address => bool) _addressLocked;
341 mapping (address => uint256) _finalSoldAmount;
342 mapping (address => mapping(uint256 => bool)) reEntrance;
343
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 340

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "_addressLocked" is internal. Other possible visibility settings are public and private.

Source File

- OperonOrigins.sol

Locations

```
339 mapping (address => uint256) _recordSale;  
340 mapping (address => bool) _addressLocked;  
341 mapping (address => uint256) _finalSoldAmount;  
342 mapping (address => mapping(uint256 => bool)) reEntrance;  
343 mapping (address => uint256) specialAddBal;  
344
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 341

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "_finalSoldAmount" is internal. Other possible visibility settings are public and private.

Source File

- OperonOrigins.sol

Locations

```
340 mapping (address => bool) _addressLocked;  
341 mapping (address => uint256) _finalSoldAmount;  
342 mapping (address => mapping(uint256 => bool)) reEntrance;  
343 mapping (address => uint256) specialAddBal;  
344 mapping (address => uint256) _contributionBUSD;  
345
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 342

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "reEntrance" is internal. Other possible visibility settings are public and private.

Source File

- OperonOrigins.sol

Locations

```
341 mapping (address => uint256) _finalSoldAmount;  
342 mapping (address => mapping(uint256 => bool)) reEntrance;  
343 mapping (address => uint256) specialAddBal;  
344 mapping (address => uint256) _contributionBUSD;  
345 mapping (address => mapping(uint256 => uint256)) _claimedByUser;  
346
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 343

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "specialAddBal" is internal. Other possible visibility settings are public and private.

Source File

- OperonOrigins.sol

Locations

```
342 mapping (address => mapping(uint256 => bool)) reEntrance;  
343 mapping (address => uint256) specialAddBal;  
344 mapping (address => uint256) _contributionBUSD;  
345 mapping (address => mapping(uint256 => uint256)) _claimedByUser;  
346 mapping (address => mapping(uint256 => uint256))_thisSaleContribution;  
347
```


SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 344

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "_contributionBUSD" is internal. Other possible visibility settings are public and private.

Source File

- OperonOrigins.sol

Locations

```
343 mapping (address => uint256) specialAddBal;  
344 mapping (address => uint256) _contributionBUSD;  
345 mapping (address => mapping(uint256 => uint256)) _claimedByUser;  
346 mapping (address => mapping(uint256 => uint256)) _thisSaleContribution;  
347 mapping (address => uint) _multiplier;  
348
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 345

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "_claimedByUser" is internal. Other possible visibility settings are public and private.

Source File

- OperonOrigins.sol

Locations

```
344 mapping (address => uint256) _contributionBUSD;  
345 mapping (address => mapping(uint256 => uint256)) _claimedByUser;  
346 mapping (address => mapping(uint256 => uint256)) _thisSaleContribution;  
347 mapping (address => uint) _multiplier;  
348  
349
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 346

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "_thisSaleContribution" is internal. Other possible visibility settings are public and private.

Source File

- OperonOrigins.sol

Locations

```
345 mapping (address => mapping(uint256 => uint256)) _claimedByUser;  
346 mapping (address =>mapping(uint256 => uint256))_thisSaleContribution;  
347 mapping (address => uint) _multiplier;  
348  
349 address[] private _whitelistedUserAddresses;  
350
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 347

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "_multiplier" is internal. Other possible visibility settings are public and private.

Source File

- OperonOrigins.sol

Locations

```
346 mapping (address =>mapping(uint256 => uint256))_thisSaleContribution;  
347 mapping (address => uint) _multiplier;  
348  
349 address[] private _whitelistedUserAddresses;  
350 uint256 private saleStartTime;  
351
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 363

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "whitelistFlag" is internal. Other possible visibility settings are public and private.

Source File

- OperonOrigins.sol

Locations

```
362 uint256 public BUSDPrice;  
363 bool whitelistFlag = true;  
364 address private Reserve = 0xc6BBb38478861ff1eA4A729e79DAffa20ad5A18E;  
365 address private Marketing = 0x7cF44E816070f4E3471F770dF5E4Bde8efB9a0B4;  
366 address private Team = 0xa67A04b3a6fBF6771c301CcE85b52BbA9e4F504B;  
367
```

SWC-123 | REQUIREMENT VIOLATION.

LINE 804

low SEVERITY

A requirement was violated in a nested call and the call was reverted as a result. Make sure valid inputs are provided to the nested call (for instance, via passed arguments).

Source File

- OperonOrigins.sol

Locations

```
803  iBUSD = IBUSD(_contractAdd);
804  iBUSD.transfer(msg.sender, _amount);
805  return true;
806
807  }
808
```

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This is a limited report on our findings based on our analysis, in accordance with good industry practice as of the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn’t say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the below disclaimer below – please make sure to read it in full.

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