Alien Worlds Trilium

Smart Contract Audit Report

SYSFIXED

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AUDITED DETAILS

Audited Project

Project name	Token ticker	Blockchain
Alien Worlds Trilium	TLM	Binance Smart Chain

Addresses

Contract address	0x2222227e22102fe3322098e4cbfe18cfebd57c95
Contract deployer address	0x5903b5f7eB3733FEc8477Be1b0A0Fd149b33b547

Project Website

https://alienworlds.io/

Codebase

https://bscscan.com/address/0x2222227e22102fe3322098e4cbfe18cfebd57c95#code

SUMMARY

Alien Worlds (TLM) is a decentralized, non-fungible token (NFT) metaverse, where players compete for scarce resources, Trillium (TLM), in a stimulated economy centered around planetary worlds. Due to this, Alien Worlds also has a decentralized finance (DeFi) element to the game, as players advance by staking TLM and using TLM to vote in Planet Decentralized Autonomous Organizations (DAOs).

Contract Summary

Documentation Quality

Alien Worlds Trilium provides a very poor documentation with standard of solidity base code.

- The technical description is provided unclear and disorganized.

Code Quality

The Overall quality of the basecode is poor.

- Solidity basecode and rules are unclear and disorganized by Alien Worlds Trilium.

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 212, 213 and 215.
- SWC-103 | Pragma statements can be allowed to float when a contract is intended on lines 5.
- SWC-107 | It is recommended to use a reentrancy lock, reentrancy weaknesses detected on lines 324.
- 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 463.
- SWC-116 | It is recommended to use oracles for block values as a proxy for time on lines 383.
- SWC-127 | A developer should not allow a user to assign arbitrary values to function type variables on lines 14.

CONCLUSION

We have audited the Alien Worlds Trilium project released on March 2021 to find issues and identify potential security vulnerabilities in the Alien Worlds Trilium project. This process is used to find technical issues and security loopholes that may be found in smart contracts.

The security audit report yielded unsatisfactory results, discovering high-risk and low-risk issues.

Writing a contract that does not follow the Solidity style guide can pose a significant risk. The serious and low problems we found in the smart contract are the caller can redirect execution to arbitrary bytecode locations, and low-risk issue call to a user-supplied address is executed, state variable visibility is not set, control flow decision is made based on The block.timestamp environment variable, requirement violation. Redirecting the control flow to arbitrary locations in the code is possible. This may allow an attacker to bypass security controls or manipulate the business logic of the smart contract. Avoid using low-level operations and assembly to prevent this issue. The current pragma Solidity directive is ""^0.6.12"". Specifying a fixed compiler version is recommended to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code. It is best practice to set the visibility of state variables explicitly. The default visibility for "allowed" is internal. Other possible visibility settings are public and private.

We were recommended to keep being aware of investing in this risky smart contract.

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.	ISSUE FOUND
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.	ISSUE FOUND
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.	ISSUE FOUND
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.	ISSUE FOUND

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 abi.encodePacked() with multiple variable length arguments can, in certain situations, lead to a hash collision.	PASS
Hardcoded gas amount	SWC-134	The transfer() and send() 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	Monday Mar 29 2021 01:06:10 GMT+0000 (Coordinated Universal Time)
Finished	Tuesday Mar 30 2021 17:01:15 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	TeleportToken.sol

Detected Issues

ID	Title	Severity	Status
SWC-127	THE CALLER CAN REDIRECT EXECUTION TO ARBITRARY BYTECODE LOCATIONS.	high	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-107	A CALL TO A USER-SUPPLIED ADDRESS IS EXECUTED.	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-116	A CONTROL FLOW DECISION IS MADE BASED ON THE BLOCK.TIMESTAMP ENVIRONMENT VARIABLE.	low	acknowledged
SWC-123	REQUIREMENT VIOLATION.	low	acknowledged

SWC-127 | THE CALLER CAN REDIRECT EXECUTION TO ARBITRARY BYTECODE LOCATIONS.

LINE 14

high SEVERITY

It is possible to redirect the control flow to arbitrary locations in the code. This may allow an attacker to bypass security controls or manipulate the business logic of the smart contract. Avoid using low-level-operations and assembly to prevent this issue.

Source File

- TeleportToken.sol

Locations

```
13
14   function recoverSigner(bytes32 message, bytes memory sig)
15   public
16   pure
17   returns (address)
18
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 5

low SEVERITY

The current pragma Solidity directive is ""^0.6.12"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Source File

- TeleportToken.sol

Locations

```
4
5   pragma solidity ^0.6.12;
6   /*
7   * SPDX-License-Identifier: MIT
8   */
9
```

SWC-107 | A CALL TO A USER-SUPPLIED ADDRESS IS EXECUTED.

LINE 324

low SEVERITY

An external message call to an address specified by the caller is executed. Note that the callee account might contain arbitrary code and could re-enter any function within this contract. Reentering the contract in an intermediate state may lead to unexpected behaviour. Make sure that no state modifications are executed after this call and/or reentrancy guards are in place.

Source File

- TeleportToken.sol

Locations

```
323   emit Approval(msg.sender, spender, tokens);
324   ApproveAndCallFallBack(spender).receiveApproval(msg.sender, tokens, address(this),
data);
325   return true;
326   }
327
328
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 212

low SEVERITY

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

Source File

- TeleportToken.sol

Locations

```
211
212   mapping(address => uint) balances;
213   mapping(address => mapping(address => uint)) allowed;
214
215   mapping(uint64 => mapping(address => bool)) signed;
216
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 213

low SEVERITY

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

Source File

- TeleportToken.sol

Locations

```
212   mapping(address => uint) balances;
213   mapping(address => mapping(address => uint)) allowed;
214
215   mapping(uint64 => mapping(address => bool)) signed;
216   mapping(uint64 => bool) public claimed;
217
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 215

low SEVERITY

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

Source File

- TeleportToken.sol

Locations

```
214
215   mapping(uint64 => mapping(address => bool)) signed;
216   mapping(uint64 => bool) public claimed;
217
218   event Teleport(address indexed from, string to, uint tokens, uint chainId);
219
```

SWC-116 | A CONTROL FLOW DECISION IS MADE BASED ON THE BLOCK.TIMESTAMP ENVIRONMENT VARIABLE.

LINE 383

low SEVERITY

The block.timestamp environment variable is used to determine a control flow decision. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- TeleportToken.sol

Locations

```
382   require(thisChainId == td.chainId, "Invalid Chain ID");
383   require(block.timestamp < SafeMath.add(td.ts, (60 * 60 * 24 * 30)), "Teleport has
expired");
384
385   require(!claimed[td.id], "Already Claimed");
386
387
```

SWC-123 | REQUIREMENT VIOLATION.

LINE 463

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

- TeleportToken.sol

Locations

```
462   function transferAnyERC20Token(address tokenAddress, uint tokens) public onlyOwner
returns (bool success) {
463   return ERC20Interface(tokenAddress).transfer(owner, tokens);
464   }
465   }
466
```

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