0x Guard

Smart contracts security assessment

Final report

Tariff: Standard

Lander

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Contents

Introduction

The report has been prepared for **Lander**.

Lander (LDR) is an ERC-20 standard token with ERC20Burnable and ERC20Permit extensions made by OpenZeppelin. The token has no mint functionality, no taxes.

The contract is available at 0x8A032E09E4Cd10D742c811897Eb892c4ff3077c7 in the BNB Smart Chain.

Name	Lander
Audit date	2024-12-13 - 2024-12-16
Language	Solidity
Platform	Binance Smart Chain

Contracts checked

Name	Address
LDRToken	0x8A032E09E4Cd10D742c811897Eb892c4ff3077c7

Procedure

We perform our audit according to the following procedure:

Automated analysis

- Scanning the project's smart contracts with several publicly available automated Solidity analysis tools
- Manual verification (reject or confirm) all the issues found by the tools

Manual audit

- Manually analyze smart contracts for security vulnerabilities
- Smart contracts' logic check

Known vulnerabilities checked

Title	Check result
Unencrypted Private Data On-Chain	passed
Code With No Effects	not passed
Message call with hardcoded gas amount	passed
Typographical Error	passed
DoS With Block Gas Limit	passed
Presence of unused variables	passed
Incorrect Inheritance Order	passed
Requirement Violation	passed
Weak Sources of Randomness from Chain Attributes	passed
Shadowing State Variables	passed
Incorrect Constructor Name	passed
Block values as a proxy for time	passed
Authorization through tx.origin	passed
DoS with Failed Call	passed
Delegatecall to Untrusted Callee	passed
Use of Deprecated Solidity Functions	passed
Assert Violation	passed
State Variable Default Visibility	passed
Reentrancy	passed

Unprotected SELFDESTRUCT Instruction	passed
Unprotected Ether Withdrawal	passed
Unchecked Call Return Value	passed
Floating Pragma	passed
Outdated Compiler Version	passed
Integer Overflow and Underflow	passed
Function Default Visibility	passed

Classification of issue severity

High severity	High severity issues can cause a significant or full loss of funds, change of contract ownership, major interference with contract logic. Such issues require immediate attention.
Medium severity	Medium severity issues do not pose an immediate risk, but can be detrimental to the client's reputation if exploited. Medium severity issues may lead to a contract failure and can be fixed by modifying the contract state or redeployment. Such issues require attention.
Low severity	Low severity issues do not cause significant destruction to the contract's functionality. Such issues are recommended to be taken into consideration.

Issues

High severity issues

No issues were found

Medium severity issues

No issues were found

Low severity issues

1. Unused code (LDRToken)

Status: Open

The LDRToken contract inherits the AccessControlEnumerable from OpenZeppelin, but it's never initialized nor used anywhere.

```
contract LDRToken is
    ERC20,
    ERC20Burnable,
    AccessControlEnumerable,
    ERC20Permit
{
    TokenVesting public growthLockToken;
    TokenVesting public teamLockToken;
    TokenVesting public participantsToken;

    string name_ = "Lander";
    string symbol_ = "LDR";

    constructor(
        address lend,
        address staking,
        address liquidity,
        address airdrop
    ) ERC20(name_, symbol_) ERC20Permit(symbol_) {. . .}
}
```

2. Possible typo (LDRToken)

Status: Fixed

The initial mint is split into 7 portions, 3 of which are vested with linear TokenVesting contracts. The `participantsToken` vesting is 365 days long, while the `growthLockToken` and `teamLockToken`

vesting contract are 5* 356 days long (46 or 47 days less than 5 years).

```
    constructor(
        address lend,
        address staking,
        address liquidity,
        address airdrop
    ) ERC20(name_, symbol_) ERC20Permit(symbol_) {
        growthLockToken = new TokenVesting(
            msg.sender,
            block.timestamp,
            0 days,
            356 * 5 days
        );
        teamLockToken = new TokenVesting(
            msg.sender,
            block.timestamp,
            0 days,
            356 * 5 days
        );
        participantsToken = new TokenVesting(
            msg.sender,
            block.timestamp,
            0 days,
            365 days
        );
        _mint(lend, 590 * 1e6 * 1e18);
        _mint(staking, 130 * 1e6 * 1e18);
        _mint(liquidity, 50 * 1e6 * 1e18);
        _mint(airdrop, 10 * 1e6 * 1e18);
        _mint(address(growthLockToken), 159 * 1e6 * 1e18);
        _mint(address(teamLockToken), 31 * 1e6 * 1e18);
        _mint(address(participantsToken), 30 * 1e6 * 1e18);
    }
```

Recommendation: Verify TokenVesting instances.

Lander team response: 356 is final time.

Conclusion

Lander LDRToken contract was audited. 2 low severity issues were found.

1 low severity issue has been fixed in the update.

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Slither output

```
INFO:Detectors:
Reentrancy in TokenVesting.release(address) (contracts/LDRToken.sol#94-104):
        External calls:
        - IERC20(token).safeTransfer(beneficiary,unreleased) (contracts/
LDRToken.sol#101)
        Event emitted after the call(s):
        - Released(unreleased) (contracts/LDRToken.sol#103)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-
vulnerabilities-3
INFO:Detectors:
TokenVesting.vestedAmount(address) (contracts/LDRToken.sol#118-129) uses timestamp for
comparisons
        Dangerous comparisons:
        - block.timestamp < cliff (contracts/LDRToken.sol#122)
        - block.timestamp >= start.add(duration) (contracts/LDRToken.sol#124)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#block-
timestamp
INFO:Detectors:
Version constraint >=0.6.0 contains known severe issues (https://
solidity.readthedocs.io/en/latest/bugs.html)
        - AbiReencodingHeadOverflowWithStaticArrayCleanup
        - DirtyBytesArrayToStorage
        - NestedCalldataArrayAbiReencodingSizeValidation
        - ABIDecodeTwoDimensionalArrayMemory
        - KeccakCaching
        - EmptyByteArrayCopy
        - DynamicArrayCleanup
        - MissingEscapingInFormatting
        - ArraySliceDynamicallyEncodedBaseType
        - ImplicitConstructorCallvalueCheck
        - TupleAssignmentMultiStackSlotComponents
        - MemoryArrayCreationOverflow
        - YulOptimizerRedundantAssignmentBreakContinue.
It is used by: - >=0.6.0 (contracts/LDRToken.sol#9)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#incorrect-
versions-of-solidity
INFO:Detectors:
```

```
Low level call in SafeERC20._safeApprove(IERC20,address,uint256) (contracts/
LDRToken.sol#13-19):
        - (success,data) =
address(token).call(abi.encodeWithSelector(0x095ea7b3,to,value)) (contracts/
LDRToken.sol#15-17)
Low level call in SafeERC20.safeTransfer(IERC20,address,uint256) (contracts/
LDRToken.sol#26-32):
        - (success,data) =
address(token).call(abi.encodeWithSelector(0xa9059cbb,to,value)) (contracts/
LDRToken.sol#28-30)
Low level call in SafeERC20.safeTransferFrom(IERC20,address,address,uint256) (contracts/
LDRToken.sol#34-40):
        - (success,data) =
address(token).call(abi.encodeWithSelector(0x23b872dd,from,to,value)) (contracts/
LDRToken.sol#36-38)
Low level call in SafeERC20.safeTransferETH(address,uint256) (contracts/
LDRToken.sol#42-45):
        - (success,None) = to.call{value: value}(new bytes(0)) (contracts/
LDRToken.sol#43)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#low-level-
calls
INFO:Detectors:
LDRToken.name_ (contracts/LDRToken.sol#139) should be constant
LDRToken.symbol_ (contracts/LDRToken.sol#140) should be constant
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-
variables-that-could-be-declared-constant
INFO:Detectors:
LDRToken.growthLockToken (contracts/LDRToken.sol#135) should be immutable
LDRToken.participantsToken (contracts/LDRToken.sol#137) should be immutable
LDRToken.teamLockToken (contracts/LDRToken.sol#136) should be immutable
TokenVesting.beneficiary (contracts/LDRToken.sol#64) should be immutable
TokenVesting.cliff (contracts/LDRToken.sol#66) should be immutable
TokenVesting.duration (contracts/LDRToken.sol#68) should be immutable
TokenVesting.start (contracts/LDRToken.sol#67) should be immutable
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-
variables-that-could-be-declared-immutable
INFO:Slither:. analyzed (33 contracts with 93 detectors), 17 result(s) found
```

Slither ERC Conformance

```
## Check functions
[☒] totalSupply() is present
        [☒] totalSupply() -> (uint256) (correct return type)
        [☒] totalSupply() is view
[☒] balanceOf(address) is present
        [☒] balanceOf(address) -> (uint256) (correct return type)
        [☒] balanceOf(address) is view
[☒] transfer(address,uint256) is present
        [☒] transfer(address,uint256) -> (bool) (correct return type)
        [☒] Transfer(address,address,uint256) is emitted
[☒] transferFrom(address,address,uint256) is present
        [☒] transferFrom(address,address,uint256) -> (bool) (correct return type)
        [☒] Transfer(address,address,uint256) is emitted
[☒] approve(address,uint256) is present
        [☒] approve(address,uint256) -> (bool) (correct return type)
        [☒] Approval(address,address,uint256) is emitted
[☒] allowance(address,address) is present
        [☒] allowance(address,address) -> (uint256) (correct return type)
        [☒] allowance(address,address) is view
[☒] name() is present
        [☒] name() -> (string) (correct return type)
        [☒] name() is view
[☒] symbol() is present
        [☒] symbol() -> (string) (correct return type)
        [☒] symbol() is view
[☒] decimals() is present
        [☒] decimals() -> (uint8) (correct return type)
        [☒] decimals() is view
## Check events
[☒] Transfer(address,address,uint256) is present
        [☒] parameter 0 is indexed
        [☒] parameter 1 is indexed
[☒] Approval(address,address,uint256) is present
        [☒] parameter 0 is indexed
        [☒] parameter 1 is indexed
        [ ] LDRToken is not protected for the ERC20 approval race condition
```

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